GOVERNMENT OF CANADA RESPONSE TO RECOMMENDATIONS IN THE TENTH REPORT OF THE STANDING COMMITTEE ON ENVIRONMENT AND SUSTAINABLE DEVELOPMENT:
SUPPORT FOR CLEAN TECHNOLOGIES IN CANADA TO REDUCE DOMESTIC AND INTERNATIONAL GREEHNHOUSE GAS EMISSIONS

The Government of Canada has reviewed the report of the Standing Committee and thanks its members for their work. The Government also wishes to extend its thanks to the numerous witnesses who gave expert testimony to the Committee, providing the members with a diversity of perspectives on the role of cleantech in reducing greenhouse gas emissions.

STANDING COMMITTEE RECOMMENDATION #1: That the Government of Canada, building on the Regional Energy and Resource Tables led by Natural Resources Canada, facilitate dialogue among provinces and territories in relation to interprovincial electricity transmission and recognize the important role of renewable energies in the adoption and deployment of clean technologies by prioritizing renewable and non-emitting energy sources to optimize the electricity grid.

Government Response:

The Government of Canada agrees with this recommendation.

Canada's electricity systems will be the backbone of Canada's net-zero economy. Decarbonizing electricity grids by 2035 will play a significant role in enabling the rest of the economy to meet their emissions reduction goals by 2050. In June 2023, the Government of Canada released a vision paper titled *Powering Canada Forward: Building a Clean, Affordable and Reliable Electricity System for Every Region of Canada*. This paper is the Government's vision for transforming Canada's electricity sector, to decarbonize grids by 2035, keep electricity systems reliable and ensure household energy costs are affordable. The paper will inform the development of Canada's first *Clean Electricity Strategy*, to be released in 2024.

Enabling the building of grids across the country that are reliable, affordable, and non- or low-emitting, at the pace and scale necessary, is an enormous undertaking that must be done in a way that respects the roles of provinces and territories and protects the rights of Indigenous peoples.

The federal government has four distinct roles that support the deployment of renewable and non-emitting energy sources to optimize the electricity grid, as well as collaboration and funding related to interprovincial electricity transmission:

- Convening
- Investment
- Regulation
- Targeted strategies

<u>Convening</u>
The Government of Canada has been taking an important convening and coordinating role to decarbonize and expand our electricity systems following the adoption of the Pan-Canadian Framework on Clean Growth and Climate Change ("the Pan-Canadian Framework") in 2016. This has included:

- Establishing three **distinctions-based senior bilateral tables** in 2016 with the Assembly of First Nations, Inuit Tapiriit Kanatami, the Métis National Council and representatives of regional organizations. These tables have built a structured, collaborative approach for ongoing engagement with Indigenous Peoples in the implementation of the framework and on broader Indigenous-specific clean growth and climate change priorities.
- Launching regional dialogue processes (e.g. **Regional Energy and Resource Tables** initiative; **Canada-Alberta Working Group**) to prioritize and advance net-zero growth opportunities across the country. The Government of Canada has played a key role in convening relevant parties to help achieve a clean power future.

- In May 2023, the **Canada Electricity Advisory Council** was launched as an independent body of 19 experts who will provide the Government of Canada with advice – through the Minister of Natural Resources – to help accelerate investments that promote sustainable, affordable and reliable electricity systems. The Council will prepare a report outlining its analysis and recommendations to the Minister at the end of its one-year term.
- The **Nuclear Leadership Energy Table** (formerly titled the SMR Action Plan Leadership Table) launched in April 2022 as a direct response to the recommendation in Canada's SMR Action Plan to develop a pan-Canadian approach for nuclear energy development and deployment. The Leadership Table brings together senior leaders from the federal government, interested provincial and territorial governments, an Indigenous Advisory Council, utilities, industry (nuclear and high-emitting sectors), and non-governmental organizations. Natural Resources Canada continues to lead the convening of this table as a forum for capacity building.

Investment

Budget 2023 announced an unprecedented made-in-Canada plan for a clean economy centred on three tiers of federal financial incentives to attract new investment, create good middle-class jobs, and build Canada's clean economy: clear and predictable investment tax credits, low-cost financing, and targeted programming. These investments will be underpinned by Canada's pollution pricing systems and large-emitter credit markets, which Budget 2023 proposes to reinforce with other tools, such as contracts for difference. With the investments made in Budget 2023, the Government of Canada has now committed more than $40 billion to support Canada's clean electricity sector, including support through the clean electricity investment tax credit, public financing and grants and contributions.

Tax credits

The Government has announced a suite of clean economy investment tax credits (ITCs) to support the domestic manufacturing of the clean technologies necessary for Canada's energy transition, as well as to support the production of clean energy in Canada. While broad in scope, many of these tax credits will help support decarbonization of the electricity system, particularly:

- Clean Technology ITC (estimated value of $7.5 billion, 2023-24 through 2027-28); and
- Clean Electricity ITC, which includes equipment for the transmission of electricity between provinces and territories as an eligible investment (estimated value of $6.3 billion, 2024-25 through 2027-28).

Low-cost financing

The Canada Infrastructure Bank (CIB) was established in 2017 with the mandate to invest, as well as attract private and institutional investments, in revenue-generating infrastructure projects that are in the public interest. To support its mandate, the CIB has a $35 billion funding envelope. As announced in Budget 2023, the CIB will invest at least $10 billion in clean power projects (e.g. non-emitting generation, transmission lines, and storage projects,) and at least $10 billion in green infrastructure projects (e.g. green building retrofits and zero-emission vehicle charging and fueling infrastructure.) Discussions between the CIB, provinces and territories on optimizing and decarbonizing electricity grids are ongoing and a number of projects are underway to support these objectives.

Targeted programming

The Government of Canada has committed over $5 billion in grants and contributions for targeted clean electricity programs. This includes:

- Approximately $4.5 billion for the *Smart Renewables and Electrification Pathways Program* (SREPs) which has already committed funding to support 74 energy infrastructure projects totalling 2,750 MW of new, clean generation capacity, and 2,300 megawatt hours (MWh) of energy storage capacity.
- Over $500 million to support the reduction of electricity generated by diesel, including for the *Clean Energy for Indigenous, Rural and Remote Communities (CERRC) Program* and the complementary *Indigenous Off-Diesel Initiative*

- Over $85 million (from the Low Carbon Economy Fund) to help homeowners transition from home heating oil to more affordable and greener home heating sources, such as electric heat pumps.
- $250 million for the *Electricity Pre-development Program* to support predevelopment activities associated with nationally and regionally significant, large-scale non-emitting clean electricity infrastructure projects.
- $200 million for the *Emerging Renewable Power Program*
- $100 million for the *Smart Grid Program* (Budget 2018) plus $46 million (Budget 2023) to renew the program to support smart grid research, development and demonstrations, under the Energy Innovation Program
- $30 million for the *Enabling Small Modular Reactors Program*, to support research and studies as provinces and territories work to develop and deploy SMRs as part of their respective decarbonization and economic development plans.
- $25 million for the *Strategic Intertie Pre-development Program, which* has been supporting inter-provincial electricity transmission project predevelopment activities for the modified Atlantic Loop.

<u>Regulations</u>
Federal policy for Canada's electricity sector is built around three clean electricity and climate-related objectives:

- transitioning off unabated coal-fired generation by 2030;
- achieving a net-zero electricity sector by 2035; and,
- achieving net-zero emissions in Canada by 2050.

These are underpinned by Canada's flexible approach to putting a price on carbon pollution. The carbon pollution pricing system has two parts: a regulatory charge on fossil fuels like gasoline and natural gas, known as the fuel charge, and a performance-based system for industries, known as the Output-Based Pricing System. The fuel charge applies in Ontario, Manitoba, Yukon, Alberta, Saskatchewan, Nunavut, Nova Scotia, New Brunswick, Newfoundland and Labrador, and Prince Edward Island. The Output-Based Pricing System applies in Manitoba, Prince Edward Island, Yukon, and Nunavut. All other provinces and territories are implementing their own pricing systems.

The revenue generated from the federal fuel charge is returned to consumers in the form of Climate Action Incentive payments (CAIP), distributed quarterly. Through these payments, the majority of Canadian families receive more money back than they pay, with low-income Canadians benefitting the most. Households and individuals who take steps to reduce their use of fossil fuels can save even more money by not paying the carbon price.

With this revenue neutral approach, the carbon price signal encourages consumers to reduce the consumption of fossil fuels while ensuring households are not worse off, on average. While this can seem counterintuitive, carbon pricing is proven as one of the lowest cost and effective ways to reduce emissions.

To drive progress toward Canada's target of net-zero emissions by 2050, and building on the successes to date with respect to phasing out unabated coal by 2030, the proposed *Clean Electricity Regulations* (published in August 2023) send a clear regulatory signal that Canada is transitioning toward a net-zero electricity grid by 2035 to help drive investments in the sector.

To support reliability and affordability, the draft regulations include flexibilities that allow a limited and declining ongoing role for fossil fuel generation. This flexible approach will enable provincial utilities and system operators to plan and manage their systems in accordance with relevant provincial circumstances, while creating a clear signal for reducing emissions over time and facilitating investments in renewable and non- or low-emitting energy projects. Extensive consultations are being conducted on the proposed regulations to gather feedback from electricity system stakeholders from across the country. The final regulations, and the flexibility measures within them, will be crafted with this feedback in mind. These consultations are being

conducted to ensure that the regulations maintain and promote reliability, affordability, and sustainability of electricity systems across the country.

Clean growth projects, such as interprovincial transmission lines, also require provincial and territorial regulatory approvals. Ensuring regulatory processes are efficient and effective is a shared responsibility. Building on the success of the federal-provincial cooperation agreement signed with British Columbia, the federal government stands ready and willing to work with provinces and territories to deepen federal-provincial cooperation to reach the goal of 'one project, one assessment'.

As an example of federal/provincial collaboration on specific initiatives to decarbonize the electricity system, the Governments of Canada, New Brunswick, and Nova Scotia released a *Joint Policy Statement on Developing and Transmitting Clean, Reliable and Affordable Power in Nova Scotia and New Brunswick* in October 2023. The Policy Statement outlined efforts to advance two tracks of work to support the phase-out of coal-fired electricity generation by 2030 and to drive to net-zero electricity by 2035 and a net zero economy by 2050. A critical component of the first track is moving forward with the reliability inter-tie between the two provinces as the first phase of a modified Atlantic Loop, with a target in-service date of 2029.

Targeted strategies

Building on the Pan-Canadian Framework, the Government of Canada published *Canada's Strengthened Climate Plan: A Healthy Environment and a Healthy Economy in 2020*. It also passed the Canadian Net-Zero Emissions Accountability Act in 2021 and presented Canada's *2030 Emissions Reduction Plan* in 2022. In addition, it established the Net-Zero Advisory Body (NZAB) in 2021 to provide the Minister of Environment and Climate Change with independent, expert advice on pathways to help Canada achieve its climate targets. The NZAB released its first annual report in 2023, and it includes a line of inquiry on net-zero energy systems with specific recommendations for the electricity sector.

The Government also continues to show leadership by developing and implementing strategies that support the clean electricity transformation. In accordance with Article 4, paragraph 19 of the Paris Agreement (a legally binding international treaty on climate change adopted at the 21st UN Climate Change Conference in 2015), Canada committed to formulating and communicating a long-term low-greenhouse-gas-emission development strategy. Canada submitted Canada's *Mid-Century Long-Term Low-Greenhouse Gas Development Strategy* to the UNFCCC in 2016. In October 2022, Canada submitted *Exploring Approaches for Canada's Transition to Net-Zero Emissions* to the UNFCCC, showing illustrative approaches to 2050 based on modelled scenarios.

STANDING COMMITTEE RECOMMENDATION #2: That the Government of Canada steer its investments and support programs to require that the effectiveness of technologies in reducing greenhouse gas emissions be demonstrated.

Government Response:

The Government of Canada agrees with this recommendation in principle, while differentiating between investments and support programs focused on the adoption of available technologies as opposed to those that focus on developing new technologies.

While the adoption of clean energy technologies leads to direct reductions in GHG emissions, it is more difficult to calculate the impacts of federal investments in the development of new technologies. Both are discussed below.

The Government of Canada recognizes that relevant, and accurate information on GHG emission reduction outcomes linked to federal spending is important. Federal programs continue to improve the application of GHG accounting principles while maintaining reasonable reporting expectations for program applicants.

The Clean Growth Hub, or Hub (an initiative co-led by Natural Resources Canada and Innovation, Science and Economic Development Canada) has been contributing to tracking data collected and provided by programs on outcomes related to federal cleantech funding, through the Clean Tech Data Strategy (CTDS). As part of this exercise, the Hub has developed a guidance document to strengthen the capacity of federal programs to track and report on outcomes arising from cleantech investments.

Supporting the adoption of 'proven' clean technologies

Most adoption-focused federal cleantech programs restrict eligible funding to the deployment of established, proven, commercially available technologies that meet Canada's climate change goals. For example, the *Smart Renewables and Electrification Pathways Program* (SREPs) provides approximately $4.5 billion until 2035 for smart renewable energy and electrical grid modernization projects. Projects must use market-ready technologies whose impact on GHG emissions is well documented and well understood.

That being said, some adoption-focused programs may provide funding that can be used for the first-in-kind commercial use of a technology. This would be in a situation where a technology has been proven to work and have GHG reductions in its final form and under expected conditions, but has not been successfully deployed in an operational or 'real-life' setting with expected results. Funding for first commercial deployment enables a technology developer to partner with an adopter to undertake developmental testing and evaluation of whether a given technology will meet operational requirements and expected environmental outcomes at commercial scale. This allows technology developers to achieve a 'first-sale' and demonstrate the viability of their technology. This can unlock additional domestic and global sales.

For example, the Low Carbon Economy Fund's Indigenous Leadership Fund supports Indigenous-owned and Indigenous-led projects that incorporate or make use of renewable energy, energy efficiency, or low-carbon heating technologies and practices at Technology Readiness Level 8 or above (i.e. ready for commercial-scale deployment). At a minimum, the eligible technology needs to be completed and qualified through tests and demonstrations but may not have been deployed in an operational setting. The Canada Growth Fund provides another example of how federal funding can support first-of-kind commercial scale deployments, as one of its focus areas is to fund projects that use less mature technologies and processes, proven in pilots but not yet widely adopted, to reduce emissions across the Canadian economy.

The lack of risk-tolerant capital willing to fund first-in-kind commercial-scale deployments has been identified as a major barrier to the commercialization of Canadian technologies. That is why it is critical for at least some federal supports to facilitate first-in-kind adoption of new technologies.

In addition to restricting funded proponents to using proven technologies, adoption-focused programs may also use one or more of the following mechanisms to ensure that funding is used to adopt technologies whose effectiveness at reducing greenhouse gas emissions can be demonstrated:

- **Prior to providing funding**: Federal programs can ask funding applicants to estimate the potential impact of their projects on GHG emissions reductions. For example, as part of the Strategic Innovation Fund Net Zero Accelerator proposal evaluation process, all projects are evaluated based on the potential GHG impact as well as their alignment with a net zero economy by 2050. The Low Carbon Economy Challenge, Emissions Reduction Fund, and Smart Renewables and Electrification Pathways Program also require applicants to estimate GHG emissions reductions as part of the application and evaluation process. In its third intake period, the Emissions Reduction Fund Onshore Program (ERF-OP) only funded projects that fully eliminated intentional routine venting and flaring of methane, a cost per tonne threshold ($250/tCO2e) became part of the

eligibility criteria and applicants were required to estimate the emission reductions that would exceed methane regulatory requirements.

- **After funding has been provided:** Federal programs can:
    - Require ongoing reporting on GHG emissions reductions being achieved as a result of the funded project, through annual progress reports. The Emissions Reduction Fund (ERF) goes even further, in two ways. During the project, the ERF requires companies to install meters to continuously track the volumes of gas conserved (and thus, emissions reductions achieved) by the funded project. Even after funding has concluded, proponents are required to monitor GHG emissions reductions results through annual outcome reports for an additional five years, starting twelve months after project completion.
    - Require recipients of funding to report on the actual GHG emission reductions achieved as a result of having implemented their project. For example, *Emissions Reduction Fund* (ERF) recipients are required to continuously meter and log data on emissions sources and report annually for five years following the completion of projects. Contribution agreements may also include other reporting requirements, including on GHG emissions. The *Smart Renewables and Electrification Pathways Program* (SREPs) also requires reporting on GHG emissions reductions, in addition to other outcomes, for five years following project completion. Canada Growth Fund will track emissions reductions on a portfolio basis.
    - Make disbursement of some funding (or repayability conditions) contingent upon acceptable project outcomes, such as GHG emissions reductions. Both ERF and SREPs are designed to include holdback provisions where a percentage of payment to recipients is contingent on acceptable project outcomes such as GHG emissions reductions. In the case of the Emissions Reduction Fund, 5% of funding is released upon satisfactory GHG emissions reductions after 12 months following project completion. The ERF-OP provided funding through either fully repayable or partially repayable contribution agreements. The repayable percentage was based on a cost-per-tonne formula, with lower cost per tonne projects receiving a lower repayable percentage.
    - Require independent (i.e. third party) verification of GHG emissions reductions outcomes achieved by projects that have received federal supports. For example, if tied to repayment conditions, the SIF-NZA will require third-party verification of GHG emissions reductions reported by the funded entity.

Tax policy can also support the adoption of clean technologies, for example through the use of tax credits. Several clean economy investment tax credits (ITC) have been announced in recent years, most of which specifically target proven technologies that have demonstrated their ability to reduce greenhouse gas emissions. For example, technologies supported by the Clean Technology ITC (e.g. wind, solar, air- and ground-source heat pumps) are expected to help reduce GHG emissions. The level of financial support available through the Clean Hydrogen ITC would be tied to the carbon intensity of the hydrogen produced, as calculated on a life cycle basis. The Carbon Capture Utilization and Storage (CCUS) ITC will only support projects in which the captured CO_2 is stored by dedicated geological storage, in an Environment and Climate Change Canada (ECCC) approved jurisdiction or sequestered via an ECCC approved end use, which is currently sequestration in concrete. Enhanced Oil s Recovery (EOR) is not eligible under the CCUS ITC.

<u>Support to develop new clean technologies</u>

Meeting Canada's climate commitments, as set out in the Canadian Net-Zero Emissions Accountability Act and Canada's 2030 Emissions Reduction Plan, requires deploying commercially ready technologies as well as developing new ones. According to the International Energy Agency (IEA), reaching net zero by 2050 requires further rapid deployment of available technologies plus widespread use of technologies not yet on the market. The IEA

estimates that about 35% of emissions reductions needed to reach net zero by 2050 will come from technologies that are currently at the demonstration or prototype phase.

As a result, with respect to federal supports for the development of new clean technologies, most of the impacts of federal funding for innovation (on emissions reductions) accrue indirectly, over the long term, as a result of the commercialization, scale-up and deployment of the clean energy technologies and solutions supported by the program.

Steering federal supports to solely (or even primarily) focus on technologies that are commercially available and proven to reduce GHG emissions would restrict the growth and scale-up of technologies that are currently unproven but may be critical for getting to net-zero.

That being said, innovation-focused funding programs (e.g. the *Energy Innovation Program* (EIP) led by the Office of Energy Research and Development, or OERD, within Natural Resources Canada) are able to ask potential recipients to estimate the potential for GHG reductions that might arise from the funding provided by the federal government, particularly for later stage projects that are closer to commercialization. This becomes one of the criteria used to evaluate applicants. The Strategic Innovation Fund Net Zero Accelerator (SIF-NZA) also uses, as one of its criteria for evaluating early-stage technologies (such as small modular reactors), an assessment of the potential impact of the technology on GHG emissions reductions and alignment with a net-zero economy by 2050.

In addition, programs may ask funded recipients to report on actual GHG emission reductions achieved as a result of federal funding, particularly for demonstration-scale projects that are closer to commercialization. For example, NRCan-funded demonstration projects that expect to achieve direct GHG emission reductions are required to report on emission reductions at the end of their project funding and for five years following. In one fiscal year (2022-23), demonstration projects funded through NRCan's energy innovation RD&D programs resulted in 2.95 Mt of direct emission reductions. Sustainable Development Technology Canada (SDTC) also asks recipients of innovation funding to report on actual emissions reductions achieved. According to SDTC's annual report for fiscal year 2022-23, an estimated 24.7 Mt in annual greenhouse gas emissions reductions can be attributed to SDTC-supported technologies.

STANDING COMMITTEE RECOMMENDATION #3: That the Government of Canada promote innovation and support the electrification of marine and aviation transport as a means of reducing emissions.

Government Response:

The Government of Canada agrees in principle with this recommendation, while noting that there are other ways to decarbonize these sectors aside from electrification (e.g. biofuels and hydrogen).

Transport Canada is responsible for developing policy related to decarbonization of all modes of transportation and defines the government's overall approach to reducing the environmental impact of this economically important sector. Transportation is essential to the economy but is also Canada's second-highest emitting sector, accounting for approximately one quarter of Canada's total annual greenhouse gas emissions.

The marine and aviation modes of transportation, along with trucking and rail, can be challenging to abate due to the equipment's long lifespan, the high capital costs of infrastructure and clean technologies, and technological uncertainty about viable decarbonization pathways. Reducing emissions across the entire transportation sector is essential to meeting Canada's climate goals.

The Government of Canada is working closely with domestic and international partners and stakeholders to promote electrification of end-use applications, including in the marine and aviation transportation sectors, where appropriate. It aims for technology-neutral regulatory

instruments, where applicable, to provide longer periods of regulatory certainty as well as the flexibility for businesses to adopt the technologies they deem best to achieve required regulatory outcomes. In the near term, electric and hybrid energy sources are likely to be concentrated in light and short-haul applications, as well as at airports and seaports, while early action on heavy and long-haul routes focuses on alternative low-carbon fuels.

The Government's approach recognizes our important role in providing guidance to stakeholders. This involves working domestically and internationally through the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) to establish regulatory standards to drive change and using financial tools to help de-risk investments and cleantech adoption across the marine and aerospace ecosystems.

Aviation

Domestic initiatives

Canada's Aviation Climate Action Plan (2022-2030), developed in consultation with Canadian aviation stakeholders and with reviews planned in 2024 and 2027, establishes a long-term vision for achieving a net-zero aircraft emissions by 2050. It also defines key decarbonization measures and activities. This includes developing and adopting new green aircraft technologies (such as electric and hydrogen powered aircraft), continuing to improve operations in the air and on the ground, and the use of sustainable aviation fuel (SAF), which is expected to have the biggest emission reduction impact (on a life-cycle basis) by 2050. To send a clear signal of the importance of SAF, the Action Plan sets an ambitious goal of 10% SAF use by 2030.

This Action Plan is a first step and a signal for more work to come, as the Government of Canada works collaboratively with key stakeholders to implement the measures needed to support the sector's transition to a low-carbon future.

As a measure under the Action Plan, Transport Canada and Environment and Climate Change Canada are working with key stakeholders to develop an inventory of airport ground support equipment and infrastructure to better understand the landscape and to determine an approach for supporting the adoption of electric/ low-carbon ground support equipment and green infrastructure.

Transport Canada's Civil Aviation (TCCA) National Aircraft Certification (TCCA NAC) Branch is currently working with multiple applicants from within the Canadian and foreign low-emission aircraft industries. Active projects include several full-electric conversions of existing gas-power aircraft by domestic applicants, two foreign electric engine validations, two hybrid-electric technology demonstrators, as well as pre-application discussions supporting various potential low-emissions aircraft applicants. In order to foster the development of innovative new technologies, TCCA NAC has engaged with various stakeholders earlier than typical in traditional certification context in order to better guide electric propulsion applicants through the certification process.

NRC's Industrial Research Assistance Program (IRAP) provides advice and funding for the innovation projects of Canadian SMEs across the country, including aerospace companies involved in the electrification of aviation transport as a means of reducing emissions. For example, NRC funded Duxion Motors for a project related to electric jet propulsion technology in FY 2022-23. NRC's Aerospace Research Centre works with the Canadian aviation industry to provide research, technical teams and facilities (e.g., wind tunnels) for new material development and experimental research aircraft. Recent projects have included an electric powered plane.

In 2021, NRC's Aerospace Gas Turbine Lab (GTL) opened a one-of-a-kind hybrid test facility to help industry develop sustainable, low-carbon aviation technology. The Hybrid Electric Research Outfit (HERO) offers innovators in the aircraft electrification space a flexible platform to scientifically test new ideas on a ground-based micro-grid.

Additionally, NRC's *Low-emission Aviation Program* is supporting the Canadian aviation sector's decarbonization transition by rapidly developing market ready, sustainable solutions, establishing a collaborative ecosystem to stimulate the aviation industry's transition, and supporting government departments in developing technology policies and regulations.

NRCan's *Sky's the Limit Challenge*, which ended in 2022, provided targeted support for the decarbonization of aviation transport by challenging Canadians to develop an affordable, cleaner aviation fuel. The top 4 consortia-based teams each received up to $2.15 million to develop the best ways to scale up sustainable aviation fuel in Canada. An additional $5 million grand prize was awarded to Enerkem, which developed and uses advanced biochemical processes to convert municipal solid waste, as well as forestry and agricultural biomass, into sustainable chemicals and advanced biofuels, including sustainable aviation fuel (SAF).

Multilateral Initiatives

Transport Canada is working on global targets coupled with maximum thresholds for carbon intensity and comprehensive sustainability criteria for Sustainable Aviation Fuels use through the International Civil Aviation Organization.

As a signatory to the International Aviation Climate Ambition Coalition (IACAC) since its inception at COP28, Canada has worked with like-minded countries to promote ambitious action with respect to decarbonization of the aviation sector, and to promote the development and use of cleaner fuels and technologies.

Marine

Domestic initiatives

Transport Canada launched the $165.4 million Green Shipping Corridor Program (GSCP) as funded in Budget 2023. The GSCP will provide funding to support de-risking industry-led investments, both on vessels and onshore, via two streams to establish green shipping corridors towards the decarbonization of the marine sector:

- The Clean Ports stream, which will provide funding for infrastructure at ports and terminals contributing towards the adoption of commercially available cleantech (e.g., commercially available shore power, electrification of port equipment, vessel charging and clean fuel infrastructure), as well as funding to ports to establish/augment incentive programs to help attract clean vessels.
- The Clean Vessel Demonstration stream, which will provide funding to study, test, and pilot zero and near zero fuel propulsion systems for shipping vessels.

Transport Canada's Clean Transportation research, development and demonstration (RD&D) Program advances multimodal research, development and testing of cleantech solutions for Canada's transportation system. This program is supporting the demonstration of battery-electric and low carbon propulsion technologies for Canada's marine sector. Projects funded include the demonstrations of an electric fishing vessel conversation kit in Nova Scotia; testing the use of 100% biofuels in a Great Lakes and St. Lawrence Seaway laker; the development of an electric escort tug design; and testing the integration of solar power into smaller in-shore vessels in the Pacific region.

Transport Canada's work to establish international multimodal green shipping corridors involving Canadian ports, as described below, is also aligning with domestic industry initiatives to establish corridors between Canadian ports. At COP28 the Port of Montreal, Oceanex and QSL announced their collaboration to create the first domestic green shipping corridor between Quebec and Newfoundland and Labrador.

TC is also developing a Marine Climate Action Plan and targeting completion by the end of 2024. This action plan will set out how Canada's marine sector and its stakeholders can do their part

to achieving our climate goals. The action plan will identify potential pathways to emission reductions as well as opportunities for the stakeholders to collaborate and partner. The action plan will also provide direction and guidance on areas to focus investments and identify government initiatives the sector can leverage to increase electrification and reduce emissions.

In the marine space, the Ocean Program of the National Research Council of Canada (NRC) supports the development of technologies to improve the operational performance of marine assets within Canada's waterways. Aspects of this collaborative research include reducing operational costs for marine assets which directly correlates to a reduction in the environmental footprint, advancing marine renewable technology and developing technology for operations related to cold and harsh environments.

As it does in the aviation sector, NRC's Industrial Research Assistance Program (IRAP) provides advice and funding for the innovation projects of Canadian SMEs across the country, including marine companies involved in the electrification of marine transport as a means of reducing emissions.

Recently, researchers with NRC's Advanced Clean Energy program investigated the performance of a heavy-duty diesel engine running on an ammonia–diesel fuel mix. They were able to achieve close-to-diesel efficiency while delivering lower overall greenhouse gas emissions by 50% to 60% in lab tests. One day this could substitute for diesel power in marine transport.

Multilateral initiatives

Transport Canada is working to establish international multimodal green shipping corridors involving Canadian ports, as a signatory to the Clydebank Declaration and as per the commitment made by G7 Transportation Ministers. In line with the government's commitment to facilitate green shipping corridors, Canadian ports are taking a clear leadership role with two ports announcing participation in international corridors (Halifax-Hamburg; Montreal-Antwerp) and a third port taking part in a route-specific feasibility assessment (Vancouver, Seattle, and numerous cruise line operators). At COP28, a fourth initiative was announced following a Memorandum of Understanding to establish corridor between Canada's west coast and ports in the United Arab Emirates, Korea and Japan.

TC is also working to establish green shipping corridors in the Great Lake St. Lawrence Seaway as per the COP27 announcement by Canada and the United States. To date, three industry-led engagements have been held including the most recent in Montreal in September focused on clean fuels. Transport Canada and the United States Department of Transportation are working with the St. Lawrence Seaway Management Corporation and the Great Lakes St. Lawrence Seaway Development Corporation on specific goals for the initiative out to 2030.

The Government of Canada is coordinating efforts to propose the designation of an Emissions Control Area (ECA) in Canadian Arctic waters to the International Maritime Organization (IMO). The proposal will be considered at the 81st meeting of the Marine Environmental Protection Committee of the IMO in March 2024. Once finalized, an Arctic ECA would require marine vessels travelling in Canada's Arctic to use cleaner engine technologies and cleaner fuels that have lower levels of pollution. In addition, the Government is participating in the development of new climate measures for international marine shipping by 2025, in accordance with the IMO 2023 Greenhouse Gas Strategy. The new measures will include an international marine fuel greenhouse gas intensity standard and a pollution pricing mechanism.

Finally, TC is developing a Canadian Carbon Intensity Indicator (CCII) for the domestically trading marine fleet, which will require operational improvements to vessels, resulting in reduced GHG emissions. The CCII is based on the IMO's Carbon Intensity Indicator but with Canadian-fleet baselines to address the uniqueness of the Canadian fleet, while ensuring at the same time that the fleet achieves annual GHG reductions.

STANDING COMMITTEE RECOMMENDATION #4: That the Government of Canada support the development of shore power at Canadian ports as a means of reducing emissions from docked vessels.

Government Response:

The Government of Canada agrees with this recommendation.

Development of shore power is an important element in reducing emissions at Canadian ports and reducing emissions within the entire marine sector. The government's support for the development of shore power follows from efforts to decarbonize the entire marine sector. Those efforts include extensive engagements with industry, financial support through targeted programs, and development of a marine climate action plan to guide industry priorities and investments towards the transition to a net zero economy.

Domestic Initiatives

As noted in the response to Recommendation #3 above, the *Green Shipping Corridor Program* will provide funding to support the development of shore power through the Clean Ports stream. TC's forthcoming *Marine Climate Action Plan* will also support the adoption of shore power as an important pathway to reducing emissions.

In addition to the work being undertaken by TC, the Department of Fisheries and Oceans (DFO) operates a diverse range of coastal infrastructure and assets that rely on fossil fuels for energy. Many DFO programs and assets provide essential services to coastal communities, the fishing industry, shipping industry, recreational boaters, and Canadians more broadly.

The marine sector relies on DFO, and the Canadian Coast Guard (CCG) to provide safe and secure waterways through the provision of services such as search and rescue, icebreaking, aids to navigation and environmental response. Investing in the decarbonization and greening of DFO's shoreside infrastructure, through the use of clean technologies such as renewable shoreside energy generation, is critical to advancing efforts to decarbonize the department's marine fleet as fleets themselves transition to cleaner sources of energy.

Small Craft Harbours is a nationwide program run by DFO. More than 5,000 volunteers assist the program annually. It keeps the harbours that are critical to the fishing industry open and in good repair. The program operates and maintains a national system of harbours to provide commercial fish harvesters and other harbour users with safe and accessible facilities. Through the SCH program, DFO considers available decarbonization options when investing in the electrical systems supporting harbour infrastructure and operations.

STANDING COMMITTEE RECOMMENDATION #5: That the Government of Canada scale up its support to the deployment and uptake of proven technologies that would decarbonize the Canadian economy, and support provincial and territorial efforts to expand and modernize renewable electricity generation, distribution and transmission technologies, and employ clean technologies.

Government Response:

The Government of Canada agrees with these recommendations.

As federal efforts to decarbonize the electricity system are summarized in the response to Recommendation #1 above, the government's response to Recommendation #5 will focus on efforts to decarbonize economic activity (i.e. specific industries).

The *2030 Emissions Reduction Plan* (ERP) presented an ambitious and achievable roadmap for economy-wide decarbonization, outlining a sector-by-sector path for Canada to reach 40-45%

emissions reductions below 2005 levels by 2030, accompanied by scenario modelling that indicates priority areas for further action.

Since the release of the 2030 ERP in March 2022, the Government of Canada has been implementing more than 140 climate measures and working with partners, including provinces, territories, and National Indigenous Organizations, to turn ideas into concrete and effective action. As of December 2023, 78% of announced climate measures are ongoing or adopted. The most recent emissions projections in Canada's 2023 Progress Report of the 2030 ERP show Canada is on track to reduce its emissions 36% below 2030 levels. The Government is planning additional actions to get to the 40% target. Job creation continues to grow as emissions decline.

This section will outline economy wide actions to facilitate decarbonization, followed by a summary of actions to decarbonize four priority sectors of the economy.

Economy-wide actions

Actions to date
The Government of Canada has taken extensive action to reduce emissions using the range of mechanisms available, including through regulations, funding support, procurement, research, and communications to inform actions being taken by others. Canada's plan for a clean economy encompasses pollution pricing and a regulatory framework; investment tax credits; strategic finance and targeted programming.

Putting a price on carbon pollution continues to be a fundamental economy-wide measure in Canada's approach to climate action, with the minimum price set at $65 per tonne of CO2 eq in 2023 and rising by $15 per year to $170 in 2030. The carbon price is estimated to be responsible for about one-third of projected emissions reductions in 2030, helping to drive both the adoption of commercially available clean energy technologies and increasing demand for new technologies.

Canada's GHG Offset Credit System enables industries with hard-to-abate emissions to purchase emissions reductions from other sources. This extends the carbon price signal and creates opportunities for foresters, farmers, Indigenous communities, and other project developers to earn revenue by selling GHG offsets. At the same time, the availability of offset credits is expected to help stimulate innovation and private sector investment. The Canadian Greenhouse Gas Offset Credit System Regulations were published in June 2022 and the Government of Canada is continuing to develop offset protocols, which set out the requirements for offset project types.

The Government of Canada has established the following economy-wide initiatives to facilitate the investments required to decarbonize the economy:

- Canada Infrastructure Bank is an arm's length public investment vehicle that invests in revenue-generating infrastructure projects that are in the public interest. This includes two priority sectors, clean power and green infrastructure, to accelerate Canada's transition to a low-carbon economy ($20 billion investment target)
- Canada Growth Fund (CGF), an arm's length public investment vehicle that will help attract private capital to build Canada's clean economy by using investment instruments that absorb certain risks to encourage private investment in low carbon projects, technologies, businesses, and supply chains ($15 billion).
- The Strategic Innovation Fund—Net-Zero Accelerator (SIF-NZA), which is investing up to $8 billion in industrial transformation projects, decarbonization of large emitters, and efforts to establish cleantech and battery ecosystems.
- The Low Carbon Economy Fund (LCEF), which is investing up to $3 billion in projects that help to reduce Canada's greenhouse gas emissions, generate clean growth, build resilient communities, and create good jobs for Canadians.
- The Emissions Reduction Fund (ERF), which is investing $750 million to help onshore and offshore oil and gas companies invest in green solution to reduce greenhouse gas emissions and retain jobs in the sector.

- The Clean Fuels Fund, to de-risk the capital investment required to build or expand existing clean fuel production facilities and to address gaps and misalignments in codes, standards and regulations related to the production, distribution and end-use of clean fuels ($1.5 billion).
- Investment tax credits that support decarbonization, including the:
    - Carbon Capture, Utilization and Storage ITC, to reduce emissions in high-emitting and hard-to-abate sectors (estimated value of $4.6 billion, 2022-23 to 2027-28)
    - Clean Technology ITC (estimated value of $7.5 billion, 2023-24 to 2027-28)
    - Clean Hydrogen ITC (estimated value of $5.6 billion, 2023-24 to 2027-28)

Going forward
The Regional Energy and Resource Tables (Regional Tables) are a key initiative to drive efforts to support workers and communities as Canada shifts to a low-carbon economy, ensuring equitable, inclusive, and sustainable economic growth across the country. The Regional Tables are helping to accelerate Canada's economic growth opportunities by taking into account each region's unique advantages and ability to meet the demands of new and emerging markets (e.g. innovative forest sector products such as biofuels and food packaging). These regional processes are being undertaken in partnership with individual provincial and territorial governments, and through engagement with Indigenous partners, as well as experts, labour organizations, industry, and other stakeholders. The Regional Tables (and similar processes, such as the Canada-Alberta Working Group) will form the basis for implementing joint strategies to leverage energy and resource opportunities to realize each region of Canada's comparative advantages in a net-zero emissions economy.

The Government will continue to collaborate with provinces and territories, along with Indigenous partners and key stakeholders, to:
- Identify and accelerate the most promising clean-growth opportunities in each region;
- Build clean energy projects; and,
- Support workers in the global net-zero future.

This will include ongoing efforts to provide businesses certainty regarding the carbon pollution pricing trajectory, including potential legislative approaches and other new measures, in conjunction with provinces and territories. In addition, the government will continue to explore how border carbon adjustments may fit into Canada's broader climate strategy.

Sector-specific actions

Canada's approach to climate action is organized on a sector-by-sector basis, while recognizing the interconnectedness among sectors. The entire Canadian economy has a role to play in reducing emissions. The sectors identified include economic sectors (buildings, electricity, heavy industry, oil and gas, transportation, agriculture, and waste), economy-wide measures that cut across sectors, and nature-based solutions, which look for opportunities to reduce emissions through nature, such as planting trees and conserving and enhancing other GHG sinks such as wetlands.

Four priority sectors were identified in the 2030 ERP: oil and gas sector; transportation sector; heavy industry sector; and, the building sector.

<u>Oil and gas</u>

Actions to date
The Government of Canada published a regulatory framework for a cap on emissions from the production of oil and gas on December 7, 2023. The cap complements other measures that are driving the adoption of clean energy technologies in the oil and gas sector. These include oil and gas methane regulations, clean fuel regulations, carbon pricing, tax incentives (e.g., the Carbon Capture, Utilization, and Storage Investment Tax Credit) and other programs focused on decarbonization such as the Emissions Reduction Fund (ERF), the SIF-NZA, and the Canada Growth Fund.

As part of Canada's Methane Strategy, Canada published proposed amendments to strengthen the existing oil and gas methane regulations on December 4, 2023, for consultation. The strengthened regulations are expected to contribute to achieving Canada's target of reducing oil and gas methane emissions by at least 75% below 2012 levels by 2030, a target which has been widely regarded as technically feasible. The proposed methane regulations are consistent with calls from the International Energy Agency for all oil- and gas-producing countries to reduce methane emissions from the sector by 75% by 2030.

The implementation of federal and provincial oil and gas methane regulations since 2018 provide an example of how regulations can drive cleantech adoption and economic opportunities. There are now approximately 170 companies focused on providing methane management solutions to companies in Canada and abroad. Final amendments are anticipated to be published in 2024 and will further encourage the adoption of clean technologies in the oil and gas sector.

Going forward
The Government of Canada is investing $30 million to establish a Methane Centre of Excellence in the near term that will improve our understanding and reporting of methane emissions, with a focus on collaborative initiatives to support data and measurement.

The Government of Canada is also engaged with the Pathways Alliance to determine how Canada can further support the carbon capture and storage elements of the multi-project large scale transformative Pathways alliance project for capturing and sequestering carbon emissions from oil sands.

Through the Strategic Innovation Fund, ISED has provided $100 million for the Clean Resource Innovation Network (CRIN) based in Alberta, a pan-Canadian network to enable clean energy development by commercializing and adopting technologies for the oil and gas industry. CRIN pursues and supports innovation by investing in events and competitions in many areas including digital oil and gas, cleaner fuels and carbon capture and value-added products.

The federal government will continue to develop and implement regulations (such as those described above) that will drive emissions reductions in the oil and gas sector. In parallel, the Government of Canada will continue to provide financial supports for decarbonization activities in the oil and gas sector, including through the CCUS Investment Tax Credit.

Transportation

Actions to date
In December 2023, the Government of Canada introduced binding annual ZEV sales target regulations for new light-duty vehicles, which require manufacturers and importers to meet increasing ZEV ratios as part of their overall sales. The targets begin for the 2026 model year, with a requirement that at least 20 percent of new light-duty vehicles offered for sale in that year be ZEVs. The requirements increase annually to 60 percent by 2030 and 100 percent for 2035. The Government is also developing similar requirements for on-road heavy-duty vehicles.

Several initiatives complement these regulatory measures by helping to address barriers to ZEV adoption. For example, the Incentives for Zero-Emission Vehicles (iZEV) Program has contributed to the purchase of over 300,000 ZEVs since its launch in May 2019, and the Incentives for Medium- and Heavy-duty Zero-Emission Vehicles (iMHZEV) Program, launched in 2022, has assisted Canadian businesses in the purchase of more than 1,400 medium- and heavy-duty vehicles.

The Zero-Emission Trucking Program (ZETP) is funding projects to capture data and firsthand experience on zero-emission truck performance in Canadian conditions and is helping accelerate the safe deployment of MHZEVs, including funding for testbeds and to support provinces and territories in the development, modernization, and alignment of codes, standards, and regulations for zero-emission trucking.

The Clean Fuel Regulations set increasingly stringent requirements on producers and importers of fossil fuels to reduce the carbon intensity of gasoline and diesel used in Canada. This reduces emissions while also creating economic opportunities in the development and use of clean fuel alternatives. The Clean Fuel Regulations were published in Canada Gazette, Part II, in July 2022, and the reduction requirements came into force in July 2023.

Prioritizing sustainable modes of transportation such as public transit and active transportation is a vital and effective way of reducing greenhouse gas emissions by encouraging modal shift, combatting congestion, and reducing reliance on personal vehicles, and an opportunity to employ clean technologies. Federal investments include the Zero Emission Transit Fund, which is supporting the purchase of 5,000 zero emission buses and builds supporting infrastructure as well as the Active Transportation Fund which supports new and expanded networks of pathways, bike lanes, trails, and pedestrian bridges, in addition to supporting active transportation planning activities.

Going forward
The government will examine options for the development of a new blueprint for a sustainable, net-zero transportation system by 2050. Investing in public transit and active transportation will continue to address pressing environmental challenges to help deliver on Canada's 2030 Emissions Reduction Plan, such as considering ways to support low-carbon construction materials, effective land use planning and densification, and access to funding for zero-emissions transit.

The federal government will explore opportunities to accelerate turnover of older, higher-emitting on-road vehicles as well as opportunities to deploy charging and hydrogen stations for medium- and heavy-duty ZEVs. The Government is also developing climate plans for the marine, rail, and aviation sectors.

<u>Heavy industry</u>

Actions to date
The Strategic Innovation Fund – Net Zero Accelerator (SIF-NZA) is investing in projects to support Canada's largest industrial GHG emitting sectors to reduce emissions, position them to be successful in the net-zero global economy of 2050, and assist in establishing Canada as a cleantech leader. Since its launch in 2021, the initiative has executed a number of contribution agreements in a wide array of sectors including fuel cell technologies, battery development, nuclear, steel, and electric vehicles. These investments include the electrification of the steel sector (Algoma, AM Dofasco) as well as supporting the development of zero carbon aluminum technology through investments in Elysis, a Canadian enterprise delivering a disruptive technology for the aluminum smelting industry.

The Government of Canada has worked with the Cement Association of Canada to develop the Standard on Embodied Carbon in Construction and the development of the data required to disclose and reduce the embodied carbon of ready-mixed concrete supplied to major federal government construction projects. The standard took effect on December 31, 2022, with all Government of Canada procurements over $10 million that take effect after that date required to apply to the standard.

The Government of Canada is also co-chairing the Cement and Concrete Breakthrough, the goal of which is to make clean cement the preferred choice in global markets, with near-zero emission cement production established and growing in every region of the world by 2030. This initiative will increase international collaboration on measures that will further drive investments in the production of low-carbon cement and concrete, and accelerate the adoption of emerging technologies such as greener cement chemistries and carbon capture and utilization.

In addition, Innovation Canada and the National Research Council are leading a low-carbon construction materials challenge that is awarding grants to small businesses that are proposing technologies to support the decarbonization of Canada's building and construction sector. The challenge aims to address the potential challenge posed by a lack of supply of low-carbon construction materials by investing in R&D and accelerating the commercialization of new technologies.

Going forward
Canada will continue to support industry on the road to net zero and promote clean economic growth through initiatives such as the Strategic Innovation Fund and the Canada Growth Fund. In addition, the federal government will continue efforts to address embodied carbon in Canadian infrastructure projects through the investments of the National Research Council to develop tools, solutions, and resources to decarbonize the construction sector. The Government of Canada will also introduce a federal Buy Clean Strategy to support and prioritize the use of low-carbon construction materials.

Buildings

Actions to date
Two key initiatives —the Codes Acceleration Fund and the Deep Retrofit Accelerator Initiative— were launched in early 2023. The Oil to Heat Pump Affordability (OHPA) Grant also launched in 2023. A Discussion Paper on the Canada Green Buildings Strategy was shared for public consultations in 2022 and a What We Heard Report and Summary of Engagement with Indigenous partners were released in July 2023.

Going forward
Canada will continue to develop the Green Buildings Strategy to support a buildings sector that has net-zero emissions is climate-resilient. In addition, the federal government will work with the provinces and territories and other stakeholders to develop new code requirements to limit GHG emissions in new construction and for energy-efficient alterations to existing buildings.

STANDING COMMITTEE RECOMMENDATION #6: That the Government of Canada accelerate efforts to employ clean technologies in the construction and retrofit of housing to substantially reduce greenhouse gas emissions.

Government Response:

The Government of Canada agrees with this recommendation.

Buildings, including homes, represent Canada's third largest source of GHG emissions in Canada, responsible for 13% of direct GHG emissions, or 87 Mt (2021). Greening our buildings will be key to lowering emissions and achieving our country's net zero commitments by 2050.

NRCan manages the *Energy Efficient Buildings Research, Development and Demonstration Program*, which provides funding to accelerate the development and adoption of net-zero-energy-ready building codes and cleaner technologies by:

- Promoting highly energy-efficient building design and construction practices;
- Providing cost-effective building solutions; and,
- Validating these applications with real-world demonstrations.

As of 2022-23, the program has supported 20 demonstration projects that will assist Canadians in improving their home energy efficiency, while also supporting national 2030 and 2050 climate objectives. In 2022-23 NRCan also launched the *Greener Neighbourhoods Pilot Program*, which is investing $35.5 million over five years to pilot the "Energiesprong" model of aggregated deep energy retrofits in up to six community housing neighbourhoods in Canada.

NRCan's *Local Energy Efficiency Partnerships* (LEEP) accelerates energy efficient construction by enabling builders to reduce their time and risk finding and trying innovations that can help them build higher performance homes better, faster and more affordably. LEEP is delivered on a

regional basis with the intent to establish an ongoing critical mass of builders that are capable of pulling through the best innovations suited to their region which can, in turn, pull through a responsive supply chain. The results include energy savings for homeowners, competitive advantage for participating builders and manufacturers, and builder driven enhancement to local building practice.

The Government of Canada continues to help homeowners save money and reduce their environmental impact, while creating new green jobs across Canada, through the Canada Greener Homes Initiative.

- There are currently four components of the broader Canada Greener Homes Initiative: *Canada Greener Homes Grant, Canada Greener Homes Loan, Oil to Heat Pump Affordability Program*, and the *Canada Greener Affordable Housing Program*.
- As of January 2024, a total of over 509,000 grant applications have been received through the national portal and our co-delivery partners in Ontario, Quebec, and Nova Scotia. More than $700 million in grants have been issued to date to homeowners across the county.

The recently enhanced *Oil to Heat Pump Affordability Program* helps below median income Canadian homeowners who are currently heating their homes with oil to transition to electric cold climate air source heat pumps. As of January 2024 over 12,500 applications have been received. More than $9 million has been issued to date to homeowners across the country.

Similarly, the Canada Mortgage and Housing Corporation is committed to finding solutions, working with partners and supporting initiatives that advance housing affordability in a way that is climate compatible and resilient and promotes sustainability in Canada's housing system. CMHC understands that all players in the housing system must focus on designing and building sustainable housing and communities to help achieve the Government of Canada's plan of achieving carbon neutrality by 2050. CMHC integrates climate compatibility incentives into most of its products and programs which promote more climate compatible units.

Though its Green Infrastructure priority sector and its investment target of $10B from Budget 2023, the CIB's *Building Retrofits Initiative* (BRI) provides financing for large-scale building energy retrofits projects. The Initiative invests in the decarbonization of buildings and provides attractive financing to reduce investment barriers and drive carbon savings. Collaboration is done with public and private sector actors as well as other market participants to modernize and improve the energy efficiency of existing buildings. Key examples include commitments made for the Dream Retrofits project (19 commercial buildings in ON and SK) as well as SOFIAC Retrofits (QC), and Ameresco Retrofits (across Canada) which both provide energy efficiency solutions to large-scale building owners.

Budget 2022 provided $183.2 million over seven years, starting in 2022-23, with $8.5 million in remaining amortization , and $7.1 million ongoing, to the NRC to conduct research and development on innovative construction materials and to revitalize national housing and building standards to encourage low-carbon construction solutions. Under the Platform to Decarbonize the Construction Sector at Scale, two NRC Challenge programs have been announced. These support the development and use of low carbon materials and systems in Canada's construction sector, and new solutions to drive construction innovation and productivity using digital technology:

- The Low Carbon Built Environment Challenge program supports the development of carbon accounting and decision support methodologies that will minimize the life-cycle carbon emissions of buildings and infrastructure. The program will make it possible to design, procure, build, retrofit and operate buildings and infrastructure that contributes to achieving the Government of Canada's goals of net-zero emissions by 2050.
- The Construction Sector Digitalization and Productivity Challenge program focuses on increasing productivity by digitalizing construction processes and accelerating innovation through performance-based regulation. It also aims to accelerate low-carbon solutions and retrofits through advanced construction practices.

NRC is also working with stakeholders to develop new low carbon requirements and implement them through standards, specifications, guidelines and publications such as the

Canadian National Master Construction Specification (NMS) and the National Model Codes (building codes). Through a federal-provincial-territorial process, every five years, the NRC releases National Model Codes. These become law as the provinces and territories adopt them. Work is currently underway for the 2025 codes to reduce greenhouse gas emissions in construction, improve energy efficiency, and increase the climate resilience of buildings.

The Green Construction through Wood (GCWood) program was funded in Budget 2017 under the *Pan Canadian Framework on Clean Growth and Climate Change* to support decarbonization efforts in Canada's built environment. As of March 2023, GCWood has funded 16 demonstration projects to de-risk and accelerate the adoption of low carbon, non-traditional wood construction materials and building systems, with the program's cumulative impact of 0.5 to 4.5 Mt CO_2 over 2020 to 2030.

GCWood was renewed under Budget 2023 ($37.98 million over 3 years) shifting focus to support the use of innovative wood-based building technologies and systems and advanced bio-products that have low greenhouse gas emissions and are highly replicable in new and existing buildings. The program seeks to target solutions under key areas of interest, including pre-fabrication, retrofits, and design for disassembly/adaptability.

STANDING COMMITTEE RECOMMENDATION #7: That the Government of Canada offer more flexibility and strive for faster approvals in its clean technology funding programs, including small-scale projects that have not reached widespread commercial scalability, namely by ensuring appropriate human and technical resources.

Government Response:

The Government of Canada agrees with this recommendation.

According to the Clean Growth Hub, there are over forty federal programs that fund the development and/or adoption of clean technologies. Some of these programs solely focus on cleantech, while others fund a broad range of projects including cleantech.

Each program has its own strengths and weaknesses with respect to flexibility and/or decision-making efficiency, particularly as they strive to remain accountable to the terms and conditions imposed by Treasury Board with respect to how funds can be spent, and the due diligence required to be performed (including techno-economic analysis of projects seeking funding).

As it is difficult to offer a comprehensive picture of how federal programs try to enhance their flexibility and/or accelerate decision-making timelines, two programs are discussed here to illustrate federal efforts to enhance flexibility and improve decision-making timelines, while maintaining program integrity and sound stewardship of public funds.

Energy Innovation Program

In 2022, the Government of Canada provided additional funding to renew and consolidate the *Clean Growth Program* and Impact Canada *Cleantech Initiative* under NRCan's *Energy Innovation Program* (EIP). This consolidation of programs created efficiencies by centralizing communications and program delivery capacity, streamlining program processes (e.g., data collection), and decreasing redundancies in activities related to policy, stakeholder engagement, and collaboration with Trusted Partners (Trusted Partnerships are formal agreements between organizations which allow for information sharing, leveraging of expertise and funding processes and parallel calls for proposals to maximize impact).

Program consolidation also allowed for the use of a greater range of transfer payments delivery mechanisms (such as, prizes-based challenges, traditional funding calls, use of Trusted Partnerships, Science and Technology Assistance for Cleantech Model), that allows OERD to select the best option based on the issue to be solved. For example, competitive calls for proposals work best when there are a range of identified solutions to a given problem. By contrast, challenge prizes are best used when there is no clear solution to a given problem.

Prizes can attract diverse communities of solvers that may not otherwise consider harnessing their expertise to provide a solution to a given problem and/or applying to a competitive call.

Wah-ila-toos

In April 2022, NRCan established the Wah-ila-toos administrative unit to support the implementation and coordination of a streamlined approach, engagement pathways, and the development of a long-term strategy to ensure that rural, remote and Indigenous communities that currently rely on diesel have the opportunity to transition to clean, reliable energy by 2030.

In October 2022, Wah-ila-toos implemented a centralized single-window approach, which consolidates intake for NRCan's *Clean Energy for Rural and Remote Communities (CERRC)* program and *Indigenous Off-Diesel Initiative (IODI)*, as well as *CIRNAC's Northern REACHE* program. Since then, these programs have received over 450 funding requests and new proposals arrive on a daily basis.

Further, a pathfinding function was established. When project proposals are ineligible for Wah-ila-toos programs or require co-funding with other programs, they are assigned to the pathfinding function. Pathfinding helps proponents navigate Canada's web of clean energy programs and funding opportunities. A pathfinding officer provides information on programs that are supplementary or alternative to Wah-ila-toos and connects proponents with programs and resources that are better suited for their project(s). Pathfinding can also offer personalized support to Indigenous communities, notably by playing a liaison role and facilitating connections / meetings between applicants and other programs. Pathfinding also develops useful tools for the whole Wah-ila-toos network, notably about relevant programs in the clean energy sphere.

STANDING COMMITTEE RECOMMENDATION #8: That the Government of Canada coordinate energy retrofit programs with provincial programs to facilitate access to Canadians, and work toward developing or supporting energy retrofit programs that are accessible to people with low incomes.

Government Response:

The Government of Canada agrees with this recommendation.

Two programs are discussed below that illustrate how the Government of Canada is facilitating access by Canadians, particularly Canadians with low incomes, to the benefits of energy retrofit programs.

Canada's Green Affordable Housing Program

Although many of CMHC's programs and products are focused on increasing housing supply, there are some programs available which support the retrofitting of multi-unit buildings. For example, CMHC's new program the *Canada Green Affordable Housing Program (CGAH)* helps affordable housing providers complete deep energy retrofits on existing multi-unit residential buildings and reduce their building energy consumption and GHG emissions. While not delivered in collaboration with provinces or territories, jurisdictions were consulted on the design of this initiative prior to its launch. *CGAH* helps improve the quality of residential buildings while supporting them to adapt to climate change and extreme weather events, resulting in increased overall comfort and quality of life for residents.

Additionally, for the *Greener Neighbourhoods Pilot* program highlighted in the response to Recommendation 6, demonstration projects must focus on aggregate deep energy retrofits in community housing homes or housing units (i.e. housing that is offered at below-market rates so that it is more affordable).

Oil to Heat Pump Program

The *Oil to Heat Pump Affordability Program*, launched in spring 2023, provides upfront grants to help low- to median-income households switch from oil heating to electric cold climate air source heat pumps. All eligible homeowners across Canada can receive up to $10,000 in federal support towards their heat pump conversion.

Funds are currently co-delivered via provincial programs in Nova Scotia, Prince Edward Island, and Newfoundland and Labrador, and delivered via an NRCan-run national portal in the rest of Canada. The federal government is interested in co-delivering the OHPA program in as many provinces and territories as possible, as co-delivery leads to the best experience and maximizes funding for citizens in those provinces and territories. Co-delivery leverages the experience of provinces and territories in delivering programming to their citizens, provides a more streamlined experience for applicants, and maximizes the amount of funding available. Discussions with other provinces and territories on co-delivering the OHPA program are ongoing.

As of Fall 2023, the program will provide up to an additional $5,000 in grant funding based on matching of PT contributions, increasing the total possible federal contribution from $10,000 to $15,000 per eligible household. This will apply solely in jurisdictions where oil to heat pump support is or will be co-delivered via a joint agreement between the federal and provincial/territorial (PT) government. The enhanced program is expected to enable an estimated 50,000 households to replace their oil heating systems with electric heat pumps.

STANDING COMMITTEE RECOMMENDATION #9: That the Government of Canada make more of its support to clean technology contingent on greenhouse gas emissions reductions achieved and on the number of clean technology jobs created, particularly good paying union jobs.

Government Response:

The Government of Canada agrees with these recommendations in principle. As the first part of the recommendation was addressed in the response to Recommendation #2 above, this section will discuss the relationship between federal supports for cleantech and job creation.

<u>Sustainable Jobs</u>

The Government of Canada recognizes that a net-zero-emissions future presents opportunities for economic growth and the creation of good-paying, high-quality jobs. The guiding principles introduced through Bill C-50, the *Canadian Sustainable Jobs Act*, would ensure that policies and programs in support of sustainable jobs support the creation of decent work, meaning good-paying, high-quality jobs — including jobs in which workers are represented by a trade union that has entered into a collective agreement – as well as job security, social protection and social dialogue.

The Government also recognizes that there is a need to improve the collection and dissemination of data related to economic growth and the labour market in a net-zero economy. The Government's interim Sustainable Jobs Plan (2023-2025) commits to improve labour market data collection, tracking, and analysis. Ongoing work on the sustainable jobs file will be coordinated by a Sustainable Jobs Secretariat and regular Sustainable Jobs Action Plans will be developed to articulate the Government's approach as it evolves over time. Through these activities, the Government will continue to assess the labour market risks and opportunities of Canada's low-carbon energy future and take action to maximize opportunities and address risks, including in cleantech.

<u>Job creation from supporting the adoption of cleantech</u>

Many federal programs supporting the adoption of clean technologies ask project applicants to indicate how many jobs will be created as a result of the requested funding. This becomes one of the criteria used to inform funding decisions. Other federal programs (e.g. SREPs) will go further and incorporate job-creation and/or equity, diversity and inclusion elements into the

contribution agreement with funded recipients. Similarly, all SIF-NZA projects that are funded also encourage the creation of high-skilled and STEM jobs (science, technology, engineering and math) and other benefits. For many of these agreements, repayment conditions include performance incentives to drive the desired result.

For the *Emissions Reduction Fund Onshore Program*, proponents were required to provide detailed information to NRCan upon project completion, including direct and indirect jobs associated with the project (as well as employment diversity) through the project completion report.

As part of its mandate to scale up companies and technologies that will drive productivity, competitiveness and clean growth and jobs across new and traditional sectors of Canada's industrial base, Canada Growth Fund will track, where possible and appropriate, total jobs created or supported through its investments.

In contrast to federal funding programs, which receive applications for funding that are screened prior to funding being provided, any eligible investors making an eligible investment can claim a tax credit as long as they have met the eligibility criteria set in *the Income Tax Act* and *Income Tax Regulations.* Requirements to pay prevailing union wages and provide apprenticeship training opportunities would need to be met in order to receive the maximum credit rate of the Clean Technology, Clean Hydrogen, Clean Electricity, and CCUS investment tax credits.

Job creation from supporting the development of new clean technologies

While not their primary goal, federal funding to develop new clean energy technologies (as opposed to funding for adoption) can also contribute to the creation and/or retention of jobs. In 2022-23, for example, NRCan's energy innovation RD&D grants and contributions projects contributed the equivalent of 1,191 total (629 direct) jobs annually. Although most of the jobs from energy RD&D accrue indirectly as a result of commercialization and scale up of clean energy technologies, RD&D projects themselves can create or retain jobs, including for research, engineering, construction, suppliers and contracted expertise. To better understand how projects are supporting knowledge transfer and skills development NRCan RD&D programs also ask proponents to report on advanced training provided to project staff, stakeholders and university or college students.

Sustainable Development Technology Canada also tracks the economic benefits that are attributable to SDTC-funded technologies. This includes $3 billion estimated annual revenues from companies participating in the Canadian economy, approximately 24,494 direct and indirect jobs attributed to SDTC-supported projects, and 3,550 new jobs created in 2022-2023 alone.

STANDING COMMITTEE RECOMMENDATION #10: That the Government of Canada integrate its support for clean technology within all existing federal strategies, such as the Critical Minerals Strategy, the National Housing Strategy and the Sustainable Canadian Agricultural Partnership, prioritizing the objectives of reducing greenhouse gas emissions and fostering the development of sustainable jobs.

Government Response:

The Government of Canada agrees with this recommendation in principle. While existing federal strategy may provide opportunities to achieve greenhouse gas emissions reductions and/or the development of sustainable jobs, their ability to do so will be contingent upon the extent to which these objectives were incorporated into the strategies when approved.

Sustainable Jobs

The Government of Canada is committed to supporting the creation of sustainable jobs in every region of the country in the shift to a net-zero emissions economy. The interim Sustainable Jobs Plan (February 2023) outlines the Government's approach to ensuring a people- and worker-centered approach to the net-zero transition across 10 key action areas, encompassing both actions to accelerate the growth of net-zero industries as well as measures to ensure workers and communities are ready to seize related economic opportunities.

The interim Plan highlights existing and planned efforts that support the creation of sustainable jobs, including the Critical Minerals Strategy. Further opportunities to support the creation of sustainable jobs through existing broader initiatives- which are often aimed at fostering vibrant low-carbon industries and sectors in which Canadians can find good quality, high-paying jobs - will be explored in the development of the Government's first complete Sustainable Jobs Action Plan, planned to be released in 2025.

Canadian Minerals and Metals Plan

The Canada Minerals and Metals Plan (CMMP), launched in 2019 and led by Natural Resources Canada, is a pan-Canadian framework that provides strategic directions for governments, industry, and stakeholders to collaboratively drive competitiveness and long-term success in the mining sector. As part of the CMMP's Strategic Directions on Science, Technology, Innovation and the Environment, NRCan has been working collaboratively with its partners to foster the development and adoption of clean technologies and innovative practices to support competitiveness, environmental performance, and efficiency in the mining sector.

Critical Minerals Strategy

At its core the Strategy, backed by nearly $4 billion in investments under Budget 2022, seeks to increase the supply of responsibly sourced critical minerals. The Strategy prioritizes the development of value chains for clean technologies, including zero-emission vehicles (ZEV), batteries and renewable energy systems. One of the Strategy's five core objectives is focused on the promotion of climate action and environmental protection. The Strategy will help advance Canada's circular economy by aiming to keep resources in circulation, minimizing industrial waste through recycling and other means. This strategy will also help create and support hundreds of thousands of well-paying jobs across the country, including in Indigenous communities.

In part to support this objective, the Strategy includes $144.4 million for critical mineral research and development, and the demonstration of technologies and materials to support critical mineral value chains. This initiative builds on Budget 2021 investments of $36.8 million, which are supporting six pilot and demonstration projects, including projects that enhance circularity, recycling, and mineral processing.

In addition, the Strategy contributes to the reduction of greenhouse gas emissions by focusing on the promotion of technologies that enhance energy efficiency and reduce dependence on carbon-intensive materials. Critical minerals play an essential role in the manufacture of renewable energy systems, such as solar panels, wind turbines and electric vehicle batteries. By prioritizing the mining of critical minerals essential to the manufacturing of energy-efficient technologies, Canada aims to support the transition to a green economy. Further, investments in research and innovation under the Strategy are focused on sustainable and environmentally friendly practices for critical minerals, in line with Canada's commitment to a low-carbon future.

Launched in April 2023, the Critical Minerals Geoscience and Data initiative (which is part of the overall Critical Minerals Strategy) will enhance knowledge of critical mineral resources as well as provide data products and predictive models for pre-exploration. It will specifically focus on using ESG principles to define "green economic pathways" to accelerate critical mineral developments.

Earlier in 2023, Canada also announced $1.5 billion over 7 years for the Critical Minerals Infrastructure Fund, under the Strategy, to support clean energy and transportation

infrastructure projects necessary to develop and expand Canada's critical mineral production. This program, launched in November 2023, will align, leverage, and complement existing federal clean energy and transportation infrastructure. The Canadian Critical Minerals Strategy (2022) also positioned the CIB as a complementary financing source to accelerate the development of Canada's critical mineral resources and supply chains through investments in enabling infrastructure. In June 2023, the CIB announced its plan to invest in critical minerals enabling infrastructure with clean power and transportation being key investment priorities, in collaboration with NRCan's Critical Mineral Infrastructure Fund (CMIF).

The Strategy also includes $70 million for the Global Partnerships Initiative (GPI) to support international engagements that increase the resiliency and sustainability of critical mineral supply chains. This includes collaborative activities related to geoscience, research and development, data, investment attraction, market development and the enhancement of global ESG standards, transparency and traceability processes. Through the GPI Canada is collaborating with the International Energy Agency (IEA), the G7, the Energy Resources Governance Initiative, World Bank Climate Smart Mining Initiative, the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, the International Standards Organization and the Extractive Industries Transparency Initiative (amongst others).

Under the GPI, Natural Resources Canada also launched the Critical Minerals Traceability Program Grants ($675,000/3 years) in December 2023, which aims to support Canadian traceability companies to develop commercial pilot projects that identify ESG credentials and create a value proposition for Canadian critical minerals industries.

Further, the Strategy will also help create and support hundreds of thousands of well-paying jobs across the country, including in Indigenous communities, by fostering exploration, mining and processing of critical minerals. This involves supporting projects that extract critical minerals essential for various industries, such as clean energy and technology. The Strategy aims to stimulate economic growth by investing in these sectors, thereby generating employment opportunities throughout the supply chain, from mining to manufacturing and beyond.

<u>Sustainable Canadian Agricultural Partnership</u>

AAFC works collaboratively with stakeholders and other partners to strengthen the agriculture and agri-food sector's capacity to develop and adopt innovative practices, products, and processes. To support the productivity and sustainability of the sector, AAFC also conducts scientific research, develops new knowledge and new technologies, and transfers the results to the sector.

In July 2022, FPT governments reached a $3.5 billion, five-year agreement to support the sector through the *Sustainable Canadian Agricultural Partnership* (S-CAP), which came into effect in April 2023. This framework sets forward government priorities and will provide funding to producers and innovators. S-CAP provides programming support to clean technologies and scientific research to help producers and processors reduce GHG emissions. For example, under the *AgriScience Program*, the sector may be able to access funding with a cost sharing ratio of up to 70:30 (AAFC:sector) for applied research and development projects focusing on GHG emissions reductions in agriculture.

In addition, the *AgriInnovate Program* provides funding to incent targeted commercialization, demonstration and/or adoption of commercially-ready innovative technologies and processes that increase agricultural and agri-food sector competitiveness and sustainability benefits.

to programs under S-CAP, AAFC is investing $470.7M over seven years to support cleantech innovation through the *Agricultural Cleantech Program*. It provides funding to support research, development, demonstration, commercialization and adoption activities, helping the sector to develop transformative solutions and enable the deployment of existing technologies

in three priority areas: green energy and energy efficiency; precision agriculture; and the bioeconomy.

National Housing Strategy

CMHC is working with its federal partners in the evolution of the National Housing Strategy, including support for clean technologies in order to advance climate compatible and resilient housing. CMHC understands that housing is part of a broader system and that all parts need to be strengthened given the interconnectivity of the housing system.

The National Housing Strategy was established to ensure that Canadians have a safe, affordable place to call home. The strategy, which brings together federal departments, provinces, territories, non-profit sectors, Indigenous partners, and private organizations, addresses housing needs through complementary programs and initiatives focused on affordable housing for all Canadians, promoting sustainable and resilient communities and a thriving economy.

Although not the primary objective of the strategy, job creation and skills training (including for sustainable jobs) would be indirect benefits of Canada's housing strategy given its alignment with significant public investments to promote community building.

STANDING COMMITTEE RECOMMENDATION #11: That the Government of Canada pilot outcome-based procurement and contracting, with greater flexibility in its requests for tender, in order to encourage innovative solutions, the adoption of clean technologies, and greater greenhouse gas emissions reductions.

Government Response:

The Government of Canada agrees with this recommendation.

The findings of this Committee report support our overall approach to increasing federal cleantech procurement. This recommendation is in line with TB's new Directive on the Management of Procurement, which took effect in May 2021. This Directive promotes the use of collaborative, innovative, iterative and outcomes-based procurement approaches (where appropriate).

PSPC has begun implementing relevant procurement practices in the following ways:

- Lowest asset lifecycle cost will be used as selection criterion, which is correlated to lowest greenhouse gas (GHG) emissions from assets over their lifecycles, rather than lowest initial capital cost, to select winning proponents of infrastructure solicitations.
- Technical requirements to solicit private sector proposals will specify that materials and processes used for the construction of housing, other types of buildings, and other types of infrastructure shall minimize greenhouse gas (GHG) emissions. For example, the rehabilitation of existing steel and concrete structures shall be prioritized over new builds where technically feasible, and the use of low carbon materials, such as low carbon concrete, will be preferred over the use of traditional materials.
- PSPC has issued guidance on the disclosure and reduction of embodied carbon in structural materials to support project managers in implementing the *TBS Standard on Embodied Carbon in Construction*, which specifies an outcome of 10% lower embodied carbon from a regional baseline.
- Since 2017, PSPC has required all real property projects in Crown-owned buildings to undergo a 'Project GHG Options Analysis' following a PSPC-developed guideline. The guideline's methodology incorporates greenhouse gas emissions reductions and their financial impact into Real Property Investment Decisions. The methodology strengthens the financial analysis, as it not only considers the upfront capital costs but also the estimated utility cost reduction of different project options over the life cycle of the project.
    - For example, the Centre Block Rehabilitation Project completed its Project GHG Options Analysis in 2019.

    - Following the PSPC methodology, the design consultants considered four design options: A baseline option that meets minimum departmental commitments; a design that achieves GHG emission reductions that are cost-neutral over 40 years; a design to achieve maximum GHG emission reductions; and finally, a hybrid GHG emission reduction design that balances GHG emissions with construction and operating costs.
    - PSPC ultimately selected the Hybrid option, which was modelled to deliver a 95% reduction in GHG emissions compared to the existing building, at an incremental construction cost of 3.1%, and an incremental life cycle cost of 1.6%.
- With respect to vehicle procurement, the specification codes groupings used for tenders were reworked to create distinct groups for zero-emission vehicles, providing the Government with increased opportunities to secure more zero-emission vehicle models, as they would not be competing in the same segment as conventional vehicles. As well, products are now bought throughout the year, further increasing green product availability. PSPC meets with manufacturers on a monthly basis to have an open dialogue around product availability, emerging trends, and supply challenges.

PSPC and Shared Services Canada are piloting the implementation of green procurement criteria for cloud services, specifically to reduce greenhouse gas emissions. Two examples of outcome-based procurement criteria are a Renewable Energy Factor (REF), where points will be awarded based on the average percentage of renewable energy consumed in the data centres used to execute the contract and the Global Warming Potential (GWP) of refrigerants, where points will be awarded according to the weighted GWP of the mix of refrigerants used in the data centres cooling systems involved in the execution of the service. The GWP of a mix is calculated as a weighted average, derived from the sum of the weight fractions of the individual substances multiplied by their GWP, including substances that are not fluorinated greenhouse gases.

Complementary to the above initiatives, Innovation Canada and the National Research Council are leading a low-carbon construction materials challenge that is awarding grants to small businesses that are proposing technologies to support the decarbonization of Canada's building and construction sector. The challenge aims to address the potential challenge posed by a lack of supply of low-carbon construction materials by investing in research and development (R&D) and accelerating the commercialization of new technologies.

STANDING COMMITTEE RECOMMENDATION #12: That the Government of Canada enhance its Greening Government Strategy by adopting the following priorities that will enable it to play a leading role for the widespread deployment of clean technologies:

- be an early and important customer for cleantech innovations; and
- plan and execute deep energy retrofits of its real estate portfolio as soon as possible.

Government Response:

The Government of Canada agrees with this recommendation.

As outlined in the *Greening Government Strategy*, the Government of Canada is transitioning to net-zero carbon and climate-resilient operations, while also reducing environmental impacts beyond carbon, including on waste, water and biodiversity.

The government is aiding the transition to a net-zero, circular economy through green procurement that includes life-cycle assessment principles and the adoption of clean technologies and green products and services by supporting departments in adopting cleantech and undertaking cleantech demonstration projects.

The *Greening Government Fund* supports projects by federal government departments and agencies to reduce GHG emissions in their operations by promoting and sharing innovative approaches, including through implementation of cleantech.

The TBS-Centre for Greening Government is working with departments and agencies to green the Government's real property portfolio. The Greening Government Strategy has outlined

specific commitments for real property. Departments have the flexibility to identify the clean technologies and solutions that best meet their operational requirements, while maximizing energy savings and GHG emissions reductions.

To meet these commitments, the *Greening Government Strategy* requires that departments take action, by undertaking activities such as:

- developing and maintaining current, net-zero, and climate-resilient real property portfolio plans that identify the most cost-effective pathway to achieve net-zero and climate-resilient real property operations by 2050;
- constructing new buildings that are net-zero carbon;
- retrofitting buildings using a life-cycle cost-benefit analysis to determine the optimal GHG savings for all major building retrofits, including for significant energy performance contracts (the life-cycle cost approach uses a period of 40 years and a carbon shadow price of $300 per tonne);
- procuring 100% clean electricity by 2025; and,
- reducing the embodied carbon in the concrete used in major projects.

In addition, the NRC has supported federal departments to reduce the carbon footprint and operating cost of their new and existing construction through:

- The *Low-carbon Assets through Life-cycle Assessment Initiative* which, in collaboration with industry, has developed environmental product declarations (EPDs), national guidelines for whole-building life cycle assessment, and a low-carbon concrete primer for federal departments needed to procure low carbon construction materials;
- The preparation of guidance documents and new/updated sections in the *National Master Construction Specifications*, for the procurement of low carbon materials, systems and services, including those used to improve the energy efficiency of heritage buildings; and,
- Pilots in federal projects to de-risk and support deployment at scale of innovative technologies and tools, such as:
    - Building performance evaluation tools and smart building technologies under the Department of National Defence National Smart Building Program and the *Public Services and Procurement Canada (PSPC) Energy Services Acquisition Program* (ESAP);
    - Transition of the Canada Pension Centre in Shediac, New Brunswick, to meet the requirements of the *Canada Green Building Council Zero Carbon Building Standard*;
    - Performance benchmarking of PSPC's district heating system in the National Capital Region and piloting of renewable energy technologies to inform carbon emissions reductions under the energy performance contract led by ESAP.

STANDING COMMITTEE RECOMMENDATION #13: That the Government of Canada improve the regulatory framework by examining the best methods to optimize review and approvals processes of low emissions energy projects and clean technologies, as well as improving access to markets for proven clean technologies in order to help meet Canada's 2030 and 2050 greenhouse gas emissions reduction targets.

Government Response:

The Government of Canada agrees with these recommendations.

<u>Approving low emissions energy projects</u>

Building Canada's clean economy will require significant and sustained private-sector investment in major projects. Ensuring the timely completion of these projects is essential. During the past year, the federal government has taken action to make Canada's rigorous regulatory process more efficient. This includes $1.3 billion over six years, starting in 2022-23, and $55.4 million ongoing, to the Impact Assessment Agency of Canada (IAAC) and 12 other federal departments to continue to improve the efficiency of assessments for major projects.

On Friday October 13, 2023, the Supreme Court of Canada issued its decision that the Impact Assessment Act is unconstitutional as currently written. The Government accepts the Court's decision, which provides new guidance on the Impact Assessment Act, while explicitly affirming the right of the Government of Canada to put in place impact assessment legislation and collaborate with provinces on environmental protection. The Government will work quickly to amend the legislation through Parliament in order to respond to the issues raised in the decision.

The Impact Assessment Agency of Canada and other federal departments are also working together to streamline the impact assessment and regulatory approvals processes and ensure timely decisions that respect federal jurisdiction. Over the course of this year, the Government will propose further process improvements to ensure the effectiveness of Canada's reviews of major projects, which will support the growth of Canada's clean economy while continuing to uphold the highest standards for environmental and other impacts.

In the 2023 Fall Economic Statement, the Government restated its Budget 2023 commitment that it will outline a concrete plan to further improve the efficiency of the permitting and impact assessment processes for major projects, which will include clarifying and reducing timelines, mitigating inefficiencies, and improving engagement and partnerships. To this end, the Ministerial Working Group on Regulatory Efficiency for Clean Growth Projects, announced in September 2023, is coordinating government-wide efforts.

In addition, Budget 2023 proposes to provide $11.4 million over three years, starting in 2023-24, to Crown-Indigenous Relations and Northern Affairs Canada to engage with Indigenous communities and to update the federal guidelines for federal officials to fulfil the Crown's duty to consult Indigenous peoples and accommodate impacts on their rights. This will support the implementation of the *United Nations Declaration on the Rights of Indigenous Peoples Act* and provide more clarity on how the Government will proceed to ensure an effective and efficient whole-of-government approach to consultation and accommodation.

Natural Resources Canada has also been working with IAAC, as well as the provinces and territories, on regulatory efficiency and is the lead for the Critical Minerals Concierge Service for Federal Regulations, which helps project proponents navigate the federal regulatory process.

The Impact Assessment Act does not generally apply in Canada's territories as each territory has a distinct regulatory environment, defined by Land Claim Agreements. However, the Act does apply in the Inuvialuit Settlement Region to a limited extent and may apply to transboundary projects between provinces and territories.

The Northern Projects Management Office (NPMO) was established by CanNor in 2010 to improve the efficiency of how federal government departments participate in territorial environmental assessment and regulatory review processes for proposed major resource development and infrastructure projects in the territories. NPMO has offices in Nunavut, Northwest Territories, and Yukon.

- NPMO organizes federal departmental working groups focused on specific projects, coordinates federal departmental input into environmental assessment and regulatory review processes, and provides ongoing communication channels to address issues. The process is established through a departmental working agreement.
- NPMO's role in facilitating and coordinating activities and processes throughout the lifecycle of proposed major projects in the territories, helps to improve the efficiency, timeliness, predictability and transparency of environmental assessment and regulatory review processes.
- Note: NPMO is not a regulator and does not have decision-making responsibilities.
- In its role as coordinator, NPMO works collaboratively with the other federal departments and agencies that have regulatory roles related to major projects to:
    - facilitate a coordinated federal response to the environmental assessment and regulatory review process including the implementation, monitoring and

enforcement requirements of Project/Development Certificate and regulatory permitting of Projects;
- provide leadership, issues management, project management, communication and coordination services to promote process certainty and consistency for Project proponents;
- coordinate effective and timely participation of federal departments and agencies in Board processes and respect statutory / board driven timelines;
- coordinate Department of Justice legal advice sought by federal departments and agencies in relation to individual projects to ensure consistency of interpretation;
- work with the other federal departments and agencies to coordinate, monitor and track Indigenous-Crown consultation activities during the environmental assessment Projects, as required to ensure a consistent federal government approach to Crown consultations; and,
- maintain the official record of Crown consultation with Indigenous rights holders for Projects.

Natural Resources Canada is also working to improve regulatory frameworks across the country. The Regional Energy and Resource Tables will help to align resources and timelines across all levels of government and better coordinate regulatory and permitting processes – all while respecting the rights and engaging the interests of Indigenous peoples, as well as enlisting the expertise of union partners, workers, industry, municipalities, experts and think tanks.

<u>Reducing regulatory barriers inhibiting the development and/or the adoption of new technologies</u>

A number of reports (e.g. the final report of the Cleantech Economic Strategy Table) have discussed the roles of regulations, codes and standards in either enabling or inhibiting the adoption of clean technologies.

In 2021, led by NRCan, federal departments and agencies collaborated in the development of a Cleantech Regulatory Review, with a view to addressing regulatory barriers and developing new regulatory approaches to enhance clean innovation and competitiveness. This review was one of three recommended by the External Advisory Committee on Regulatory Competitiveness in May 2019.

The Cleantech Regulatory Review Roadmap was published in June 2021, with three thematic focus areas. The Roadmap is in the process of being implemented, with regular updates made available online. The latest updates are summarized here, by theme.

Ensuring regulatory readiness to facilitate the adoption of new technologies

Departments and agencies are advancing initiatives that aim to make the regulatory system ready to assess new technology and address regulatory gaps, outdated approaches, and challenges in verifying the performance of environmental technologies.

For instance, to address stakeholder requests for greater clarity on licence application requirements for fusion technology (e.g., nuclear reactors), CNSC contracted industry consultants with expertise in fusion technology to review its regulatory framework. As a result, the *Review of the CNSC Regulatory Framework for Readiness to Regulate Fusion Technologies* was published in October 2021 and has been shared widely with industry and international nuclear regulators, helping the CNSC to establish a leadership role in regulating fusion technology at the international level. This work was supported by the Treasury Board of Canada Secretariat's Centre for Regulatory Innovation.

Enhancing coordination across jurisdictions

Departments and agencies are advancing initiatives to support the deployment of clean technologies by making it easier for Canadian companies to move into international markets. For instance, in 2021, NRCan and the Standards Council of Canada (SCC) established a working group to assess codes and standards for low-carbon fuel technology and infrastructure to increase coordination across Canadian and international jurisdictions. The working group is developing an action plan, expected for publication in summer 2023, to ensure codes and standards are continuously being evaluated.

Since 2021, stakeholders have been engaged through meetings, seminars, and workshops to develop content for standards regarding hydrogen production, delivery and storage, and end-use. This initiative aims to remove barriers that impede market adoption of clean fuels like hydrogen and advanced biofuels and provide a clear market framework for low-carbon fuel producers, retailers, and others. This work is linked to the *2020-2021 Regulatory Cooperation Council Work Plan: Codes & Standards for Low Carbon Transportation Technologies and Infrastructure*.

Novel regulatory approaches

ECCC conducted a foresight case study exercise from January to March 2022 to improve its ability to anticipate and respond to a range of plausible future scenarios and to gain insights on the future of cleantech in Canada. The exercise resulted in the development of insights and scenarios describing potential developments and disruptions in the cleantech sector. The findings have been shared with regulatory programs and other teams within ECCC to support the department's capacity to use foresight to help build resiliency in the design of policy and regulatory instruments in support of environmental objectives.

The ENVI report made a specific reference to the regulatory delays experienced by innovators seeking to make electric planes available for use/adoption. Since 2021, Transport Canada's National Aircraft Certification (TC NAC) Branch has launched a series of research projects through the TC Innovation and Experimentation Fund, in partnership with the National Research Council (NRC) Low-Emissions Aviation Program (LEAP), to enable the certification of electric propulsion technologies for the aviation sector (an investment totaling $580,000 to date). These research projects have developed TCCA expertise in electric propulsion and will benefit the Canadian electric aircraft industry by making the results publicly available.

Additionally, Transport Canada maintains a high level of participation in the development of certification standardization groups (SAE International, ASTM International, etc.) on aircraft electrification topics and is an active member of the Certification Management Team (CMT; comprised of the Federal Aviation Authority, European Union Aviation Safety Agency, TCCA and National Civil Aviation Agency of Brazil) Task Specific Team on Electric and Hybrid-Electric Propulsion System. These standards development activities, as well as authority harmonization efforts, have placed Transport Canada in a leading role in establishing the means and methods of compliance of electric aircraft in an evolving regulatory landscape.

<u>Supporting cleantech companies with exports and market access</u>

The Government of Canada recognizes that Canada's cleantech sector is well positioned to take advantage of industrial decarbonization efforts, both at home and abroad. Accordingly, it has invested in a robust ecosystem of programs and services to help Canadian cleantech companies compete internationally. These services and supports (which are primarily provided through three federal organizations, as outlined below) facilitate the export of Canadian clean technologies, goods, and services.

1. *Global Affairs Canada (GAC) Trade Commissioner Service (Cleantech team)*

The Trade Commissioner Service (TCS) provides Canadian firms with practical advice on foreign markets and on-the-ground intelligence to help them make better, more timely and cost-effective business decisions. During fiscal year 2022-2023, the TCS helped more than 1,461 clients and partners by providing over 6,581 services, access to over 836 business opportunities,

and funding for 95 business development projects. Over 244 Canadian companies reported successes in 69 countries. During the same period, the TCS facilitated 14 greenfield / expansion foreign direct investment projects in Canada in the cleantech sector, representing a value of more than $13.61 billion, creating approximately 4,708 new jobs. From fiscal years 2018-19 to 2022-23, the TCS facilitated 33 cleantech wins valued at $14.3 billion, leading to more than 5,050 new jobs.

The International Business Development Strategy for Cleantech (Strategy), launched in 2017 and renewed in 2021, has doubled the annual funding provided to the TCS to support the expansion of Canadian cleantech firms internationally. The Strategy receives $4.3 million in annual funding and pays for 15 positions dedicated to supporting ECT exporters. This has enabled the TCS to staff eight regional cleantech and climate finance trade commissioner positions in Europe, the Asia-Pacific region, the Caribbean, Latin America, and Africa. The TCS has also deployed a team of five climate finance trade commissioners at GAC who coordinate global climate finance work and support Canadian ECT companies to identify and access climate action funding sources, to undertake climate adaptation and mitigation projects in developing countries.

Since the launch of the Strategy and with the addition of dedicated resources, the TCS has increased the number of services to cleantech firms by 51 percent, generating 563 cleantech commercial deals and supporting the negotiation of another 1,494 commercial deals with a total estimated value of $1.2 billion. While the Strategy has successfully helped exporters diversify markets by generating commercial outcomes in an additional 65 countries, compared with FY 2017-18, the U.S. continues to remain Canada's top export market with the greatest number of recorded successes. Looking ahead, the TCS is committed to increasing the number and quality of services provided to Canadian cleantech firms owned or run by persons belonging to under-represented groups, helping them export their ECT goods and services, diversify markets and access growing pools of global climate finance.

The TCS proactively engages with Canadian cleantech exporters in many different but complementary ways. At both domestic and international industry events, the TCS leverages knowledge of in-market opportunities and buyer needs to provide tailored support, help forge partnerships with local buyers or technology developers, and attract investment into Canadian cleantech projects. The TCS closely collaborates with the Clean Growth Hub, the National Research Council's Industrial Research Assistance Program (NRC-IRAP), Business Development Bank of Canada (BDC), Sustainable Development Technology Canada, and Export Development Canada (EDC), along with other government departments.

These organizations participate in various international sector events and initiatives where they assist Canadian companies with their international business development needs and identification of suitable programs and services. For instance, in 2022, the TCS partnered with Environment and Climate Change Canada to deliver the Canada-EU CETA Cleantech Summit Virtual Business Workshop, where actionable intelligence on opportunities in the EU and Canadian markets was shared with over 200 Canadian and EU firms.

The TCS engages regional stakeholders in its programming, such as for the delivery of annual water and energy roadshows (e.g., to California, Nevada, Arizona). These have now expanded to target markets experiencing strained local power grids, high energy use and conservation issues – increasingly top priorities for local governments. The TCS also organizes ministerial trade missions, often featuring cleantech components (e.g., Team Canada Trade Missions to the Indo-Pacific).

In addition, the TCS engages with Canadian environmental and cleantech (ECT) firms through a variety of online platforms. On-line tools and resources include: the TCS website; webinars providing essential information on funding, support services and key contacts; TCS Enquiries Services, which provide market and sector-specific information for small and medium-sized enterprises; CanadExport TCS magazine, which features articles on trade and investment; and MyTCS, an online registration platform that enables Canadian businesses to access export information and tools. TCS corporate social media channels promote initiatives with a national or international scope to diverse business audiences. Posts can include announcements of new

services, new web content, trade shows and events, business opportunities, and other relevant information.

Canadian ECT exporters are increasingly leveraging CTS programs, funding, and mentoring that support international trade diversification. Four examples of CTS initiatives are outlined here:

- **Canadian Technology Accelerator (CTA):** Since 2013, the CTA has supported over 200 Canadian cleantech firms and helped accelerate their growth in international markets. In 2022-23, several CTA initiatives focussed on cleantech, including: a multi-city program and a women-led business program, both in the U.S., and separate programs in India, the UK, and the ASEAN region.
- **CanExport SMEs:** Since 2016 has approved over $11 million worth of support for over 360 cleantech projects in foreign market.
- **CanExport Innovation** has approved approximately $1.3 million for 95 cleantech projects to establish foreign R&D partnerships.
- **CanExport Associations** has provided $3.5 million for 10 Canadian cleantech national trade associations to undertake international business development (IBD) activities in 26 foreign markets.

The TCS has increasingly focused efforts on identifying and assisting the international business development needs of Indigenous-, women-, and youth-owned business clients to ensure the success of these small- and medium-sized enterprises (SMEs) internationally.

2. *Export Development Canada's (EDC) Cleantech Team*

EDC provides financial and non-financial solutions to Canadian companies, including cleantech companies at different stages of the commercialization continuum. This support can facilitate the international growth of Canadian cleantech companies into other geographic markets and enable new or continued international sales of Canadian goods, technologies, and services.

Financial solutions to ECT exporters offered by EDC include working capital and debt support through guarantee programs, direct lending solutions to fund growth into new markets, as well as credit insurance to mitigate payment risk as Canadian companies sell goods or services into non-Canadian geographies. EDC's investment matching program has been very impactful for cleantech companies raising equity to fund their continued growth.

EDC offers non-financial support through its Connections Program and its Knowledge Program which provides high level guidance and advice to companies regarding their international growth journey, and through its introductions to Canadian and international value-added partners, including the TCS, BDC, and NRCan. Finally, through events and webinars, EDC provides additional information to Canadian cleantech companies for their plans to scale beyond Canada's borders.

Since launching the Cleantech team at EDC in 2012, the number of Canadian cleantech companies supported via financial solutions has grown year over year. Some 435 Canadian Cleantech companies were supported in 2023. Also in 2023, the total volume of trade facilitated by EDC in the cleantech sector and across all its financial solutions will exceed $10 billion.

3. *National Research Council Industrial Research Assistance Program (NRC-IRAP)*

NRC IRAP's Clean Tech Sector Team also supports Canadian cleantech exporters via the Fast Pilot in Foreign Markets Program, to reduce the barriers for innovative SMEs to commercialize their cleantech products globally. This program provides funding to firms already working with IRAP to support demonstration or pilot projects abroad with foreign partners. Under the Indo-Pacific Strategy, IRAP will be expanding this program into new markets.

STANDING COMMITTEE RECOMMENDATION #14: That the Government of Canada conduct a gap analysis of the incentives in place for clean technology in Canada and the United States, to study differences and understand policy gaps within the specific regional and national context to inform future policy decisions.

Government Response:

The Government of Canada agrees in principle with this recommendation.

Multiple organizations across the Government of Canada have conducted various types of internal analysis to better understand the potential impacts of the incentives in place for cleantech in the United States, particularly with respect to the U.S. Inflation Reduction Act (IRA) of 2022.

The U.S. IRA leverages significant public capital in the form of tax incentives, grants, loans and financial tools. The primary objectives of the IRA are to: 1) reshape the U.S. economy across key industries, including energy, transportation and manufacturing; 2) reduce greenhouse gas emissions (GHG); and 3) reshore and enhance U.S. manufacturing in key sectors. These significant incentives have clear timelines for phase-out, which provide the long-term certainty in future cash flows that businesses need to make large-scale investment decisions.

Independent analyses show that Canada's clean economy plan is competitive with both the U.S. and the EU and will ensure that Canada can attract clean investment. As an important pillar of Canada's clean economy plan, the Government is focused on implementing, on a priority basis, the new clean economy investment tax credits for carbon capture, utilization, and storage; clean technology adoption; clean hydrogen; clean technology manufacturing; and clean electricity."

The Government of Canada is enacting several other key measures to help Canada remain a competitive environment for large-scale investment in decarbonization projects into the future. This includes financial supports offered through the Strategic Innovation Fund Net-Zero Accelerator and the Canada Growth Fund (which will offer innovative financial instruments like carbon contracts for difference) as well as through investment tax credits. Other supports include opportunities to generate increasingly valuable credits for emissions reductions under federal and provincial carbon pricing systems and the Clean Fuel Regulations.

The Government of Canada will be continuously monitoring and assessing the effectiveness of its domestic measures to support cleantech commercialization and adoption, in consultation with stakeholders.

STANDING COMMITTEE RECOMMENDATION #15: That the Government of Canada enter into contracts for differences to provide greater certainty with respect to scheduled increases to carbon pricing.

Government Response:

The Government of Canada agrees with this recommendation.

According to the Ontario Securities Commission, a ‘contract for difference’ (CFD) is a “derivative product that allows an investor to obtain economic exposure (for speculative, investment or hedging purposes) to an underlying asset (the underlying asset), such as a share, index, market sector, currency or commodity, without acquiring ownership of the underlying asset. A CFD typically involves a contract between two parties, a seller and a buyer, that creates payment rights and obligations based on the price movements of the underlying asset.”

While the recommendation above mentions CFDs, a careful reading of the ENVI report clearly indicates that the Committee is referring to a particular type of CFD, namely carbon contracts for difference (CCFDs). CCFDs are financial instruments that set a contractually agreed-upon price of carbon over the life of a contract. These contracts provide greater certainty on the price of carbon that can help decarbonization projects reach final investment decisions (FID) as proponents of such projects want to ensure the price of carbon and/or carbon credits are protected should policy change in the future. Carbon contracts for difference reduce the risk for businesses investing in clean technologies by guaranteeing the price of carbon for a fixed period of time.

As announced in the 2023 Fall Economic Statement, Canada Growth Fund (CGF) will be the principal federal entity issuing carbon contracts for difference. CGF is a $15 billion investment fund with a mandate to help attract private capital, to build Canada's clean economy by using investment instruments that absorb certain risks in order to encourage private investment in low-carbon projects, technologies, businesses, and supply chains.

Canada Growth Fund will allocate, on a priority basis, up to $7 billion of its current $15 billion in capital to issue all forms of contracts for difference and offtake agreements.

The Canada Growth Fund is negotiating carbon contracts for difference with a number of project proponents across a range of sectors. On December 20, 2023, Canada Growth Fund announced its first CCFD in the form of a carbon offtake agreement with a carbon capture and sequestration company, Entropy Inc., located in Calgary, Alberta. Canada Growth Fund's carbon contracts for difference will also support the establishment of robust carbon credit markets.

As outlined in the 2023 Fall Economic Statement, the Government will continue to explore additional ways to provide businesses certainty regarding the carbon pricing trajectory, including potential legislative approaches and other new measures, in conjunction with provinces and territories. In addition, the Government remains committed to enforcing the existing requirement under the carbon pricing benchmark that the design of provincial and territorial output-based pricing systems preserve a marginal price signal at or above the minimum national carbon pollution price, on an ongoing basis, to maintain a strong carbon credit market.

STANDING COMMITTEE RECOMMENDATION #16: That the Government of Canada collaborate with provinces and territories to invest more in skills training, including skills upgrading and requalification programs, in order to ensure that:

- Canada has a workforce that is skilled and available to meet the labour needs that will be created by the deployment of clean technologies;
- strategies and programs related to the introduction of clean technologies clearly value professional requalification and upgrading skills of workers in transforming sectors; and
- pay equity is attained by supporting women in the cleantech sector.

Government Response:

The Government of Canada agrees with this recommendation.

<u>Developing a skilled workforce (including through professional requalification and skills upgrading)</u>

Through the interim Sustainable Jobs Plan 2023-25 and Bill C-50, the Canadian *Sustainable Jobs Act* (currently before Parliament), the Government has outlined a comprehensive approach to ensure that workers and communities are supported in the shift to a net-zero economy, including through the creation of a transparency, governance, and engagement framework to ensure continued action over time.

The 2022 Fall Economic Statement provided funding to Employment and Social Development Canada (ESDC) to create the Sustainable Jobs Training Fund. This is also a component of the proposed $250 million investment to help Canadian workers thrive in the economy of the future. The Fund seeks to bring together workers, unions, employers, and training institutions to examine the skills of the labour force today, forecast future skills requirements to help 15,000 workers upgrade or gain new skills.

The 2022 Fall Economic Statement also announced funding for a new Sustainable Jobs stream in the Union Training and Innovation Program under the Canadian Apprenticeship Strategy. This stream will aim to support unions in leading the development of green skills training for workers in the trades. It is expected that an additional 20,000 apprentices and journeypersons could benefit from this investment.

Budget 2021 announced $250 million for the Upskilling for Industry Initiative to support the development and implementation of short-cycle upskilling programs based on industry needs in high-growth sectors. This investment is expected to help more than 15,000 Canadian workers, including those from under-represented groups, transition into new jobs in high-growth sectors such as digital technology, cybersecurity, agriculture technology, advanced manufacturing, cleantech and biomanufacturing. In February 2023, Palette Skills (a national not-for-profit organization) was selected as a national delivery partner for the Upskilling for Industry Initiative following a merit-based call for applications.

In addition, ESDC has a large suite of skills and employment programming and is currently exploring how these programs can be leveraged to support a transition to a low-carbon economy. Examples include:

- The **Labour Market Development Agreements** and the **Workforce Development Agreements** with provinces and territories that support Canadian workers looking to re-enter the workforce, particularly those in hard-hit sectors;
- The **Red Seal Program**, a federal, provincial and territorial partnership that sets national occupational standards for trades that are designated Red Seal. The Program is working with industry stakeholders to add "green" learning objectives to the national occupational standards;
- The **Sectoral Workforce Solutions Program**, a program that helps key sectors of the economy implement solutions to address their current and emerging workforce needs, including priority areas such as 'Building Talent for the Clean Economy';
- The **Canadian Apprenticeship Strategy**, which provides funding to help groups such as apprentices and tradespeople succeed in skilled trades careers.
- The **Indigenous Skills and Employment Training Program**, a distinctions-based program that funds skills development and job training. Indigenous service delivery organizations have the autonomy to determine their own priorities and design programming that meets the needs of their people and communities, which may include initiatives related to the net-zero transition.
- The **Skills and Partnership Fund**, a project-based skills-training fund that supports partnerships between Indigenous organizations and industry employers including industries that support more efficient use and alternative sources of energy and resources.
- The **Youth Employment and Skills Strategy**, a horizontal initiative led by ESDC and delivered in collaboration with 11 other federal departments, agencies and Crown Corporations. The YESS provides funding to organizations to deliver a range of activities that help youth overcome barriers to employment and develop a broad range of skills and knowledge to participate in the current and future labour market.
- The **Opportunities Fund for Persons with Disabilities**, a program that assists persons with disabilities overcome barriers to participation in the Canadian labour market, and support employers hiring persons with disabilities.
- The **Foreign Credential Recognition Program**, to support the labour market integration of skilled newcomers by funding projects that will make credential recognition processes faster and more efficient, and providing loans (up to $30,000), support services, and employment supports to help skilled newcomers acquire Canadian work experience, including within the low-carbon sector.

There are also targeted programs within departments with cleantech expertise to support skills development. For example, NRCan has a program that supports job creation for youth in cleantech is NRCan's Science and Technology Internship Program (STIP)-Green Jobs. Since 1997, this program has provided funding to employers to de-risk hiring youth (aged 15-30) in the natural resources and cleantech sectors in jobs with environmental benefits. Since 1997, STIP-Green Jobs has created quality and inclusive work experiences for youth to kick start their careers, increased their labour market attachment, and helped build a skilled, diverse, and future-ready workforce in the natural resources sector. Most employers who participate in the program are small- and medium-sized enterprises from the cleantech sector. Over 5,000 placements have been created over the last five years alone.

<u>Supporting women in the cleantech sector</u>

Supporting women and other equity-deserving groups to enter the trades is a priority for the Government of Canada. It has introduced many initiatives under the *Canadian Apprenticeship Strategy* to encourage women and other equity-deserving groups to enter and succeed in Red Seal trades where they are underrepresented:

- The *Apprenticeship Service* provides small and medium-sized employers a financial incentive of $10,000 when they hire an apprentice who is member from an equity deserving group, including women, in one of 39 Red Seal trades found predominately in the construction and manufacturing sectors. In addition, employers can also access other supports, such as welcoming workplace training, which will make it easier for them to hire first-year apprentices.
- The new *Women in the Skilled Trades* initiative, announced in Fall 2022, complements the Apprenticeship Service by providing $43.5 million in funding for projects that support the recruitment, retention and success of women in the same 39 Red Seal trades. Projects funded under this initiative are expected to be announced in the coming months.

Budget 2022 announced $84.2 million over four years for the *Union Training and Innovation Program* to help apprentices from equity deserving groups – including women – begin and succeed in careers in the skilled trades through mentorship, career services, and job-matching. Projects funded under this initiative are expected to be announced in the coming months.

In addition, Bill C-50, the *Canadian Sustainable Jobs Act*, would require that the Government's approach to building a net-zero economy is inclusive and addresses barriers to employment with an emphasis on encouraging the creation of employment opportunities for groups underrepresented in the labour market, including women, persons with disabilities, Indigenous peoples, Black and other racialized individuals, 2SLGBTQI+ and other equity-seeking groups.

According to the 2021 Equal by 30 Reporting Framework, the energy industry remains one of the most gender imbalanced sectors, with women making up only 32% of the global energy workforce, and just 26% of all executives and C-Suite leaders. Looking outward at the natural resource sector workforce, NRCan is exploring ways to influence industries to take action on inclusion, diversity, equity, and accessibility. The department's focus includes building these principles into staffing, governance structures, and supply chains. NRCan is committed to fostering workforce renewal through employee support, skills development, learning opportunities, internships, and gender equity targets.

The Sustainable Jobs Plan outlines a worker- and people-centred approach to the net-zero future that is equitable, fair and inclusive, and encompasses various initiatives aimed at promoting inclusivity in the green economy. Notably, it highlights Natural Resources Canada's *Smart Renewables and Electrification Pathways Program* (SREPs), which aims to decrease barriers to participation for underrepresented groups, including women, gender-diverse individuals, Indigenous peoples, racialized communities, and persons with disabilities. Furthermore, agreements with proponents under this program typically include a minimum allotment of funds to support projects owned by First Nations, Inuit, and Métis.
Additionally, Canada leads Equal by 30, an international campaign under the Clean Energy Ministerial, which is working towards equal pay, equal leadership and equal opportunities for women and marginalized groups in the international energy sector, by 2030. This commitment extends to women and gender-diverse individuals from historically marginalized backgrounds. Since its launch in 2018, the campaign has reached over 200 signatories worldwide, across multiple energy sub-sectors. Signatories include Canadian companies, organizations, and the provinces and territories of British Colombia, Nova Scotia, Nunavut PEI, and Yukon.

NRCan's Energy Innovation and Cleantech program, delivered by the Office of Energy Research and Development (OERD), supports research, development, and demonstration (RD&D) of emerging clean technologies to accelerate the transformation of Canada's energy system to reach net-zero emissions by 2050. In 2022-23, OERD continued to implement a Phased Approach to Inclusion, Diversity, Equity and Accessibility (IDEA) for its grants and contributions

programs to help understand the short-, medium- and long-term impacts of its programs and who benefits from the funded clean energy technologies.

Through the implementation of its Phased Approach to IDEA, OERD adopted a methodical approach to increase the inclusion of IDEA in program scoping, design, delivery, implementation, reporting, and evaluation through GBA Plus. The Phased Approach begins with establishing a baseline through data collection (requesting voluntary IDEA information in project proposals and requesting disaggregated employment and training data for women and gender-diverse people and Indigenous Peoples from funded proponents) in order to better understand the state of GBA Plus in the clean energy technology sector and identify gaps that need to be addressed. The IDEA data collected will then be used to explore possibilities for implementation of targeted interventions to reduce barriers to access and participation in OERD's RD&D programs.

Launched in 2018 by Natural Resources Canada (NRCan), and delivered in partnership with MaRS Discovery District and Natural Resources Canada (NRCan), the *Women in Cleantech Challenge* was designed to have a meaningful impact on the underrepresentation of women in Canada's cleantech sector by supporting a cohort of entrepreneurs with the financial, business, and technical resources they need to be globally competitive. It set sights on leveling the playing field for women innovators, and increasing awareness of the key role women must play in tackling some of the greatest energy and environmental challenges that face society, while also inspiring the next generation of female cleantech entrepreneurs.

Following a national call and expert selection process, six finalists were chosen from almost 150 applicants to participate in an intensive two and a half year program. Each entrepreneur received up to $800k. All received business advice, and the financial and technical support they need to grow and succeed as entrepreneurs, including the opportunity to validate and de-risk their technology with the help of federal labs and researchers. At the conclusion of the Challenge in 2021, a $1 million grand prize was awarded to Amanda Hall (CEO, Summit Nanotech), judged to have advanced the most during the Challenge and most likely to succeed commercially, as determined by an independent and expert jury coordinated by MaRS. Based on the success of the Women and Cleantech Challenge, MaRS launched a follow-up (privately funded) RBC Women in Cleantech Accelerator.
More broadly, the *Pay Equity Act* (Act) and Pay Equity Regulations (Regulations) came into force on August 31, 2021.

- The Act and Regulations apply to federally regulated public and private sector employers with 10 or more employees, including federal workplaces that employ cleantech.
- Employers regulated under the Act include public sector employers, such as the Parliamentary institutions, the Prime Minister's Office and ministers' offices, the federal public service, Crown corporations, the Royal Canadian Mounted Police, and the Canadian Armed Forces, as well as private sector employers in industries such as transportation (road, air, rail, maritime), banks, telecommunications and broadcasting, postal and pipelines, and grain handling. Approximately 5,000 employers and close to 1.4M employees are covered by the federal pay equity legislation.
- Under the Act, employers are required to take proactive steps to ensure they are providing equal pay for work of equal value.
- Employers must establish a pay equity plan within three years of becoming subject to the Act. In addition, employers are required to review and update their pay equity plan at least every five years in order to identify and close any pay gaps that may emerge.
- The regime is administered and enforced by Canada's Pay Equity Commissioner at the Canadian Human Rights Commission.

The cleantech sector also includes value chains that enable the manufacturing of clean technologies. Through the collaborative framework of the Canadian Minerals and Metals Plan (CMMP), NRCan has worked with provincial and territorial governments and other partners and stakeholders to develop and deploy strategies to grow a skilled and diverse workforce and strengthen the talent pipeline to enable the desired development of our critical minerals sector and support the clean energy transition. A pan-Canadian Task Team on Workforce of Future was

launched in late 2022 to identify initiatives that will increase diversity and attract talent to the mining sector.

STANDING COMMITTEE RECOMMENDATION #17: That the Government of Canada accelerate its support for Indigenous, northern and isolated communities in their transition from diesel to local clean electricity production, with priority given to renewable sources.

Government Response:

The Government of Canada agrees with this recommendation.

In April 2022, NRCan established the Wah-ila-toos administrative unit to support the implementation and coordination of a streamlined approach, engagement pathways, and the development of a long-term strategy to ensure that rural, remote and Indigenous communities that currently rely on diesel have the opportunity to transition to clean, reliable energy by 2030.

In October 2022, Wah-ila-toos implemented a centralized single-window approach, which consolidates intake for NRCan's *Clean Energy for Rural and Remote Communities (CERRC)* program and *Indigenous Off-Diesel Initiative (IODI)*, as well as CIRNAC's *Northern REACHE* program. Since then, these programs have received over 450 funding requests and new proposals arrive on a daily basis.

In December 2022, a distinctions-based Indigenous Council was established to support Wah-ila-toos by providing guidance and advice on programs and policy development. The Indigenous Council will also direct an engagement process and develop recommendations on a long-term strategy for the clean energy transition. Along with the Indigenous Council, a Governing Board was established to include a mix of federal officials and Indigenous Council members that will review and endorse projects, along with strategic policy direction. Since CERRC, Northern REACHE, and IODI were launched in 2018, 253 projects have been approved, totalling $272M in funding. This includes 28 projects, totalling $40M in funding, since the Governing Board was launched.

On February 6, 2023, the interdepartmental initiative was gifted the name Wah-ila-toos following a sacred name gifting ceremony held by Grandmothers and Elders. The name Wah-ila-toos represents our collective responsibility to uphold our good relations with each other.

The Indigenous Off-Diesel Initiative (IODI) is a clean energy training program that supports Indigenous-led climate solutions in remote Indigenous communities that currently use diesel or fossil fuels for heat and power. IODI supports a cohort of participants (called Energy Champions) in their journey from training through to project planning and development. In collaboration with the Indigenous Clean Energy Social Enterprise and the Pembina Institute, IODI provided tailored renewable energy training, access to expertise and mentors, and funding to support an initial cohort of 14 Indigenous Clean Energy Champions and their communities in community-driven renewable energy and energy efficiency projects to reduce diesel in their communities. Following approvals by a distinguished all-Indigenous panel of jurors, in 2022 NRCan issued 14 final prize-grants of up to $1.6 million for the Energy Champions and their communities to continue to implement projects. A second cohort of the IODI has now launched and 10 Energy Champions have been selected to receive up to $1.52M to lead engagement, clean energy planning, and project development within their communities. The IODI team also continues to support the first cohort of 14 Energy Champions.

The Clean Energy for Rural and Remote Communities (CERRC) program support projects that reduce reliance on diesel and other fossil fuels in Canada's Indigenous, rural, and remote communities. As of September 30, 2023, 147 grant and contribution agreements had been signed under CERRC since the program launched in 2018. These projects are helping demonstrate and deploy community-led renewable energy projects, encouraging energy efficiency, and building skills and capacity. Projects included the St. Mary's River Energy Project,

supported by $4.3M in funding from CERRC, which was successfully completed in early 2023. The project refurbished an existing 240 kW hydro system with new generating components and a modern control system and installed a 250 kW solar photovoltaic plant and 500 kW lithium-ion battery storage integrated into the existing diesel grid at Mary's Harbour, NL. The project has demonstrated improved technical readiness of an integrated diesel microgrid including hydro, solar and battery components and is expected to reduce diesel consumption by 30%.

The CIB can support Indigenous, northern and isolated communities in their transition from diesel to clean electricity production through its Clean Power priority investment area ($10B), its Indigenous Community Infrastructure Initiative (ICII) and its Indigenous Equity Initiative (IEI). The IEI (recently launched, on November 27, 2023) supports First Nation, Métis and Inuit communities in purchasing equity ownership stakes in infrastructure projects within their traditional territories that the CIB is also investing in. This represents a significant milestone for Indigenous communities who face barriers in owning critical clean power infrastructure projects across the country.

In addition to the CIB, the LCEF Indigenous Leadership Fund provides funding for renewable energy, energy efficiency and low-carbon heating projects led by Indigenous governments, communities and organizations. As announced in Budget 2023, NRCan is also actively engaging Indigenous partners on the development of the National Benefits-Sharing Framework, which will aim to ensure that Indigenous groups benefit from natural resource projects on their territories. As the cornerstone of the Framework, the 2023 Fall Economic Statement announced the development of an Indigenous Loan Guarantee Program to support Indigenous groups' access to affordable capital to purchase equity stakes in projects. Taken together, these initiatives will support Indigenous leadership and participation in projects critical to the transition to net zero.

The NRC is also supporting innovation efforts to address climate change for northern and Indigenous communities. For example, the *Canada–Inuit Nunangat–United Kingdom (CINUK) Arctic Research Programme* addresses key themes connected to climate-driven changes to the terrestrial, coastal and near-shore marine environments in Inuit Nunangat as well as impacts on Inuit and community health and well-being. The NRC is currently supporting a CINUK project on "*Renewable Energy Microgrid Integration for Remote, Off-grid Cabins in Nunavut*".

The NRC's *Arctic and Northern Challenge Program* also conducts applied research and/or technology development to improve Arctic and Northern homes, including energy efficiency. Program activities are aligned with the climate adaptation priorities of national Indigenous organizations.