

***Pan-Canadian Approach
to Pricing
Carbon Pollution***

INTERIM REPORT 2020



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada

Canada 

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PAN-CANADIAN APPROACH TO PRICING CARBON

POLLUTION

Interim Report (2020)

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Introduction

Pan-Canadian Framework on Clean Growth and Climate Change

In December 2016, Canada's First Ministers committed to take further action on climate change and adopted the *Pan-Canadian Framework on Clean Growth and Climate Change* (PCF) to fight climate change, build resilience to the changing climate, and drive clean economic growth. Carbon pricing is a central part of the PCF, and a price on carbon pollution now applies in every province and territory. The PCF notes that carbon pricing is broadly recognized as one of the most effective, transparent, and efficient policy approaches to reduce greenhouse gas (GHG) emissions and drive innovation. It also notes that many Canadian provinces are leading the way internationally on pricing carbon pollution. British Columbia (BC) and Québec (QC) have had a broad carbon pollution pricing system in place for over a decade. Alberta (AB) has priced industrial GHG emissions, which represents over half their economy's emissions, since 2007.

Canada continues to be a carbon pricing leader in 2020, with carbon pollution pricing in place across the country.

The Pan-Canadian Approach to Pricing Carbon Pollution

The *Pan-Canadian Approach to Pricing Carbon Pollution*, released in October 2016, sets a 'federal benchmark' establishing minimum national standards of stringency for carbon pricing systems in Canada, while also providing provinces and territories the flexibility to implement systems tailored to their jurisdiction. The benchmark includes¹:

- Common scope. Pricing will be applied to a common and broad set of sources to ensure effectiveness and minimize interprovincial competitiveness impacts. At a minimum, it should apply to substantively the same sources as British Columbia's carbon tax.
- Two systems. Jurisdictions can implement: a) an explicit price-based system (a carbon tax like BC's, or a performance-based emissions system like in AB) that is combined with a carbon levy, or b) a cap-and-trade system (e.g. in Quebec)
- Legislated increases in stringency, based on modelling, to contribute to Canada's national target to reduce GHG emissions and provide market certainty.
 - For jurisdictions with an explicit price-based system, the carbon price should start at a minimum of \$10 per tonne of CO₂ equivalent (t CO₂e) in 2018, and rise by \$10 per year to \$50/t CO₂e in 2022.
 - Provinces with cap-and-trade need: a) a 2030 emissions reduction target equal to or greater than Canada's 30 percent reduction target, b) declining (more stringent) annual caps to at least 2022 that correspond, and at a minimum, to the projected emissions reductions resulting from the carbon price that year in price-based systems.
- Revenues from carbon pricing remain in the jurisdiction of origin.

¹ See [Pan-Canadian Approach to Pricing Carbon Pollution](#) for the full text outlining the elements of the benchmark. The text presented here in the report has been slightly updated from the original 2016 text to account for changes to provincial systems only. In August 2017, the Government of Canada published further [Guidance on the Pan-Canadian Carbon Pollution Pricing Benchmark](#). In December 2019, the Government of Canada subsequently published [additional guidance](#) on the benchmark.

A ‘federal backstop’ carbon pollution pricing system applies (in part or in full) in any jurisdiction that requests it or that does not implement its own carbon pricing system that meets the federal benchmark.

Under the federal *Greenhouse Gas Pollution Pricing Act*² that came into effect on June 21, 2018, the federal carbon pollution pricing system has two parts:

- a regulatory charge on fuel (fuel charge)
- a regulatory trading system for large industry, known as the Output-Based Pricing System (OBPS)

Provinces and territories clarified their carbon pricing plans by September 1, 2018. The Government of Canada confirmed in October 2018 in which jurisdictions the federal OBPS would apply starting in January 2019 (July 2019 for the territories), and where the federal fuel charge would apply starting in April 2019 (July 2019 for the territories). All provincial and territorial carbon pricing systems in place at the time of writing this report meet the federal benchmark in 2020 for the sources they cover.

At the time of writing this report, the federal fuel charge applies in Alberta, Saskatchewan, Manitoba, Ontario, Yukon, and Nunavut. The federal OBPS applies in Manitoba, Ontario, New Brunswick, Prince Edward Island, Yukon, Nunavut, and partially in Saskatchewan. Provincial and territorial systems continue to apply in British Columbia (carbon tax), Quebec and Nova Scotia (cap and trade), Newfoundland and Labrador (carbon tax and provincial OBPS) and Northwest Territories (carbon tax). A provincial OBPS for large industrial emitters is in place in Alberta and in part in Saskatchewan. A provincial fuel charge is in place in Prince Edward Island and as of April 1, 2020, in New Brunswick. The map below provides a visual of current systems in place across Canada.

Overall, for 2020 as of April 1st, the federal backstop covered an estimated 31% of Canada’s GHG emissions, and estimates of coverage for provincial and territorial systems combine for an additional 47% of Canada’s GHG emissions.³

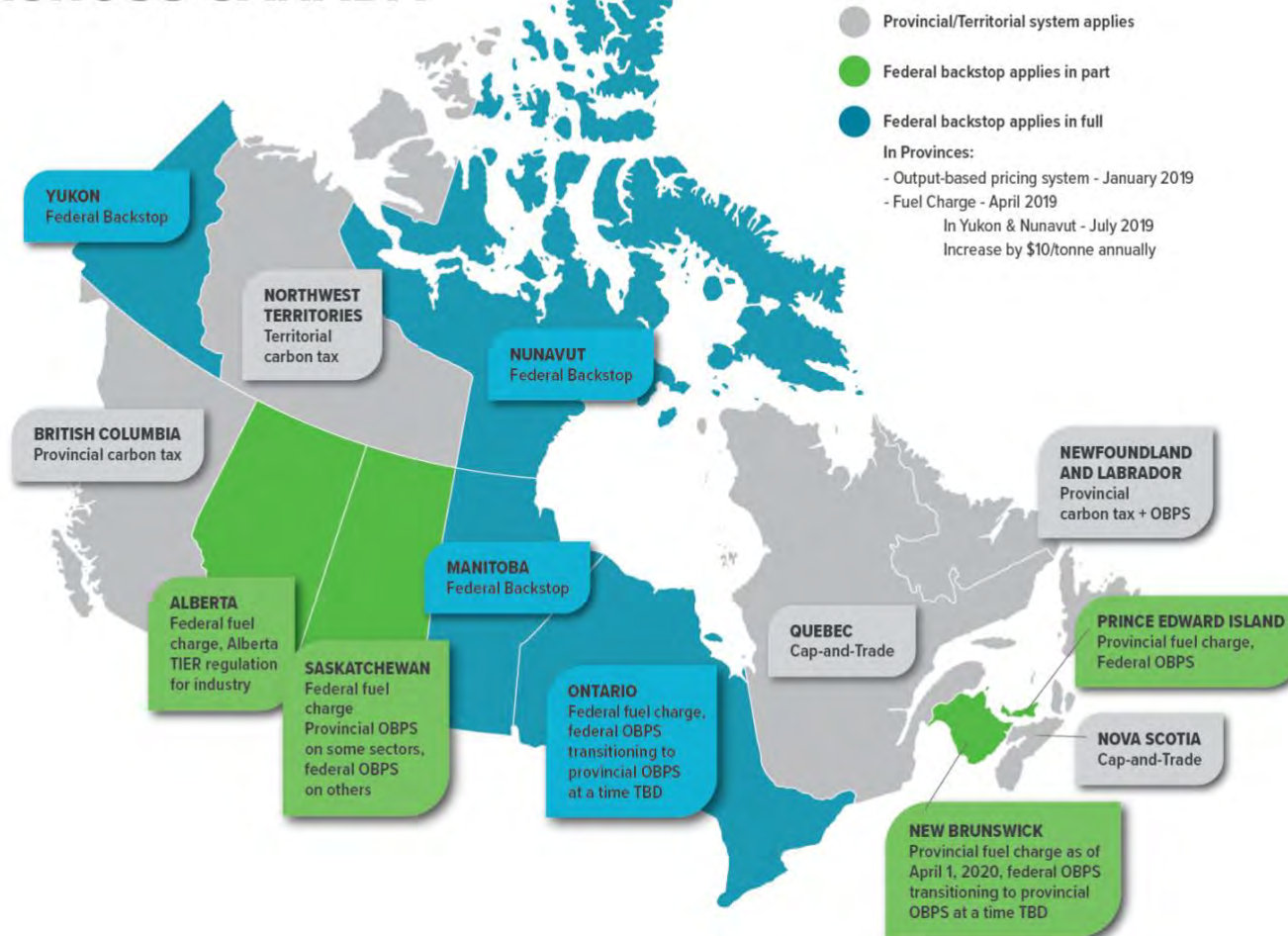
On September 20, 2020, the Minister of the Environment and Climate Change informed the Governments of Ontario and New Brunswick that their carbon pollution pricing systems for industrial facilities meet the federal government’s minimum stringency benchmark requirements for pricing carbon pollution for the sources that it covers. As a result, the Government of Canada intends to stand down its OBPS in both provinces as of a date in the future, to be determined in consultation with each of the two provincial governments.

² At the time of writing this report, Saskatchewan, Ontario, Manitoba and Alberta are legally challenging the *Greenhouse Gas Pollution Pricing Act*, including its constitutionality.

³ Based on estimates by Environment and Climate Change Canada (ECCC).

Current State of Play – Provincial & Territorial Systems

CARBON PRICING ACROSS CANADA



Purpose of the 2020 Interim Report on Carbon Pricing

The PCF includes the following commitment:

“Federal, provincial and territorial (FPT) governments will work together to establish the approach to review carbon pricing, including expert assessment of stringency and effectiveness that compares carbon pricing systems across Canada, which will be completed by early 2022 to provide certainty on the path forward. **An interim report will be completed in 2020 which will be reviewed and assessed by First Ministers.** As an early deliverable, the review will assess approaches and best practices to address the competitiveness of emissions-intensive trade-exposed (EITE) sectors.”

A Steering Committee of representatives from the Government of Canada and all provincial and territorial governments was established in August 2020 for overseeing the *2020 Interim Report on Carbon Pricing*. The Steering Committee was co-chaired by officials from the Government of Canada (Environment and Climate Change Canada), Québec (Le Ministère de l’Environnement et de la Lutte contre les changements climatiques) and British Columbia (Ministry of Environment and Climate Change Strategy).⁴

The purpose of this Interim Report is to provide First Ministers with an update on the current status of carbon pricing systems implemented across Canada. It provides details of each system currently in place, by each jurisdiction, including where a mix of federal and provincial systems are integrated. The report notes operational linkages and interactions between the different FPT carbon pricing systems under the PCF, for example with respect to offset systems.

The multitude of different carbon pricing systems within Canada make our approach somewhat unique compared to other countries. Overall, some measures have been taken towards ensuring the efficient interaction between systems in Canada. However, in recognition that there remains certain elements to address in order to improve in this regard, FPT governments continue to work together to maintain a broad coverage and to avoid overlap between systems. This takes into account the overall commitment in the December 2016 PCF for “the federal government to work with provinces and territories to complement and support their actions without duplicating them”⁵

The following sections contain profiles of the carbon pricing systems currently in place for each province and territory, as well as an overall profile of the federal backstop carbon pricing system.

This Interim Report also appends a report on *Addressing competitiveness and carbon leakage risks under carbon pollution pricing* for EITE sectors. This report was undertaken by a previous FPT Steering Committee, who completed their work in 2019. The report was subsequently updated in Fall 2020 to ensure it was factually up-to-date.

⁴ Separately, as part of the PCF commitment to review carbon pricing, in fall 2020 the Government of Canada commissioned an independent third-party Expert Assessment of carbon pricing systems in Canada, with input from provinces, territories and Indigenous Peoples.

⁵ Under “Elements of collaboration” in the [Pan-Canadian Framework on Clean Growth and Climate Change](#)

The PCF recognizes that complementary climate actions can play an important role in reducing emissions by addressing market barriers where pricing alone is insufficient. While this Interim Report is focused on carbon pricing systems as part of the specific PCF commitment to review carbon pricing in Canada, other reporting under the PCF including the annual Synthesis Report provides an overall update on all measures and progress by federal, provincial and territorial governments, in partnership with Indigenous Peoples, to address climate change.

2020 Interim Report: Pricing Profiles by Jurisdiction

Federal Pollution Pricing System

SYSTEM INFORMATION	
Overall description	<p>The federal carbon pollution pricing system is designed to be a backstop and apply in provinces and territories that requested it or in those that do not have a carbon pollution pricing system that meets the federal benchmark. Under the <i>Greenhouse Gas Pollution Pricing Act</i>, the federal carbon pollution pricing system has two parts:</p> <ul style="list-style-type: none">• a regulatory charge on fossil fuels (the fuel charge); and• a performance-based emissions trading system for industrial facilities, known as the Output Based Pricing System (OBPS). <p><u>Federal Fuel Charge:</u></p> <p>The fuel charge applies to 21 fossil fuels including gasoline, light fuel oil (e.g., diesel), and natural gas. It also applies to combustible waste (e.g., tires). The fuel charge is generally paid by fuel producers and fuel distributors that deliver fuel in a jurisdiction where the fuel charge applies. The federal fuel charge is administered by the Canada Revenue Agency (CRA).</p> <p>The fuel charge rates reflect a carbon pollution price of \$20/t CO₂e as of April 1, 2019, rising by \$10/t CO₂e per tonne annually to \$50 per tonne as of April 1, 2022. The rates are based on global warming potential factors and emission factors used to report Canada's emissions to the United Nations Framework Convention on Climate Change.</p> <p><u>Federal OBPS:</u></p> <p>The federal OBPS is designed to put a price on carbon pollution from industry while minimizing competitiveness and carbon leakage risks from exposure to the federal fuel charge.</p> <p>The federal OBPS is mandatory for facilities located in backstop jurisdictions that are primarily engaged in the industrial activities listed in the <i>Output-Based Pricing System Regulations</i> (OBPS Regulations), and that emit 50kt CO₂e per year or more. In addition, persons responsible for facilities located in backstop jurisdictions may voluntarily apply for their facility to be a covered facility in the OBPS (opt-in). These applications are assessed taking into account the considerations in the Policy regarding Voluntary Participation in the OBPS. To be considered, these facilities should emit or, in certain circumstances, expect to emit, 10kt CO₂e per year or more. Facilities should also either be carrying out an activity for which an output-based standard is prescribed in the OBPS Regulations (under Part 1 of the Policy) or be from a sector at risk of carbon leakage and competitiveness impacts from carbon pollution pricing (under Part 2 of the Policy).</p>

	<p>The federal OBPS sets an emissions-intensity standard, or output-based standard, for industrial activities that is based on emissions per-unit of output for a given product or activity. The OBPS Regulations currently include 78 standards covering a wide range of industrial sectors and activities. Output-based standards may also need to be calculated by voluntary (opt-in) participants undertaking an activity that is not listed in Schedule 1 of the Regulations.</p> <p>Facilities that emit less than their limit, calculated based on their output-based standard, are issued “surplus credits” that they can bank for future use or sell. Facilities with emissions above their limit must provide compensation by a prescribed deadline for each tonne of greenhouse gas emissions above the limit.</p>
Date of implementation	<p><u>Federal Fuel Charge:</u> The federal fuel charge applies, as of April 1, 2019, in Ontario, New Brunswick, Manitoba and Saskatchewan; as of July 1, 2019 in Yukon and Nunavut; and as of January 1, 2020 in Alberta. The federal fuel charge no longer applies in New Brunswick, as of April 1, 2020, as the province implemented a provincial tax on carbon emitting products that meets the federal benchmark stringency requirements for the sources it covers.</p> <p><u>Federal OBPS:</u> The federal OBPS came into force on January 1, 2019, in Ontario, New Brunswick, Manitoba, Prince Edward Island, and partially in Saskatchewan^[1]. The federal OBPS came into force on July 1, 2019 in Yukon, Nunavut.</p> <p>On September 20, 2020, the Minister of the Environment and Climate Change informed the Governments of Ontario and New Brunswick that their carbon pollution pricing systems for industrial facilities meet the federal benchmark. The Government of Canada will stand down the federal OBPS in Ontario and New Brunswick as of a date in the future. That date will be determined in consultation with each of the two provincial governments. The federal OBPS remains in effect in Ontario and New Brunswick until the federal system is formally stood down.</p>
Authorizing legislation/regulations	<p>The <i>Greenhouse Gas Pollution Pricing Act (GGPPA)</i>, which received Royal Assent on June 21, 2018, established the framework for the federal backstop carbon pollution pricing system in provinces and territories that requested it or in those that do not have a carbon pollution pricing system that meets the federal benchmark.</p>
Compliance options	<p><u>Federal OBPS:</u> Under the federal OBPS, the methods for providing compensation are either paying the carbon price by paying the excess emissions charge, remitting compliance units, or a combination of both. Compliance units include:</p>

	<ul style="list-style-type: none"> • surplus credits, • eligible offset credits from an existing provincial system (recognized units), or • federal offset credits (system under development). <p>Surplus credits are issued to facilities whose emissions are lower than their facility emissions limit for a given compliance period. Facilities can choose whether they want to sell or bank their surplus credits for future use.</p> <p>Recognized units are eligible offset credits issued by a provincial or territorial offset system that can be remitted as compensation for excess emissions under the federal OBPS. Only provincial or territorial offset programs and protocols that meet distinct eligibility criteria in the OBPS Regulations will be placed on ECCC's List of Recognized Offset Programs and Protocols for the Federal OBPS. ECCC will update this list from time to time, to add or remove protocols, as provinces and territories put in place new eligible protocols, including updates to existing ones, or as new offset programs are established.</p> <p>As announced in Budget 2019, a federal GHG offset system is being developed to further extend the carbon pollution price signal and incentivize activities leading to GHG reductions that are not required under existing regulations or covered by other measures related to carbon pollution pricing. Federal offset credits will provide a low-cost compensation option under the federal OBPS. Publication of draft regulations for the federal GHG offset system is targeted for winter 2021. The federal GHG offset system will not replace provincial or territorial offset systems.</p> <p>Starting with the 2022 compliance period, a minimum of 25% of a facility's compensation obligation must be made as an excess emissions charge payment. Federal offset credits and recognized units are eligible as compensation under the OBPS Regulations for eight calendar years after the year in which the related GHG reduction occurred. Surplus credits are eligible as compensation under the OBPS Regulations for five calendar years after they are issued.</p>
Links and interactions with other systems (if applicable)	As noted above, the federal OBPS includes the possibility of using eligible offset credits issued by a provincial or territorial offset system as compensation for excess emissions. Currently administrative MOUs which enable the tracking and use of eligible provincial offset credits as recognized units are in place with Alberta and British Columbia.
GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	Total % of GHG emissions covered: See jurisdictional profiles for % of total provincial/territorial GHG emissions covered by the federal fuel charge* and OBPS* where they apply.

	<p>*As calculated by ECCC for 2020 as of April 1st. For the federal OBPS, this represents the total emissions from facilities that are covered under the system. Whereas only those emissions above a facility's emissions limit are subject to a compliance obligation, the ability of a facility to generate surplus credits under the federal OBPS translates into a price signal on its total emissions.</p>
<p>By source</p> <p>By sector, with details on thresholds/standards for coverage</p> <p>Exemptions</p>	<p><u>Federal Fuel Charge:</u></p> <p>By source:</p> <p>The purpose of the <i>GGPPA</i> is to reduce greenhouse gas emissions by ensuring that carbon pollution pricing applies broadly throughout Canada. The fuel charge applies to 21 fossil fuels including gasoline, light fuel oil (e.g., diesel), and natural gas. It also applies to combustible waste (e.g., tires).</p> <p>Generally, relief is provided upfront through exemption certificates, when certain conditions are met.</p> <ul style="list-style-type: none"> • Farmers – the <i>GGPPA</i> provides that a registered distributor can generally deliver, without the fuel charge applying, gasoline or light fuel oil (e.g., diesel) to a farmer at a farm or at a cardlock, if the fuel is for use exclusively in the operation of eligible farming machinery and all or substantially all of the fuel is for use in the course of eligible farming activities. Farmers do not need to be registered for the purposes of this relief. • Fishers – the <i>GGPPA</i> provides that a registered distributor can generally deliver, without the fuel charge applying, gasoline and light fuel oil (e.g., diesel) to a fisher, if the fuel is for use exclusively in an eligible fishing vessel and all or substantially all of the fuel is for use in the course of eligible fishing activities. Fishers do not need to be registered for the purposes of this relief. • Greenhouse Operators – relief of 80 percent of the fuel charge is provided on marketable natural gas and propane delivered by a registered distributor if the fuel is for use exclusively to heat an eligible greenhouse or to supplement carbon dioxide in an eligible greenhouse to grow or produce plants. • Remote Power Plant Operators – the <i>GGPPA</i> provides relief of the fuel charge on light fuel oil (diesel) and marketable natural gas delivered by a registered distributor if the fuel is used exclusively at a remote power plant in the operation of the remote power plant to generate electricity for the public in remote communities.

	<ul style="list-style-type: none"> Aviation Fuel in the Territories – the fuel charge applies at a rate of \$0 per litre to aviation gasoline and aviation turbo fuel for listed territories (Yukon and Nunavut), reflecting the high-reliance on air transportation in the territories. <p><u>Federal OBPS:</u></p> <p>By source:</p> <ul style="list-style-type: none"> Stationary fuel combustion Industrial processes Industrial product use Venting, flaring, and leakage, On-site transportation Waste and wastewater <p>Notes:</p> <p>Carbon dioxide (CO₂) emissions from biomass are not covered. Methane (CH₄) and nitrous oxide (N₂O) emissions generated from stationary combustion for the purpose of producing useful heat must be reported but are not included in the calculation of a facility's total emissions. Methane (CH₄) emissions from venting or leakage is not included in the calculation of a facility's total emissions for facilities engaged in the production of bitumen and other crude oil, upgrading of bitumen or heavy oil, processing of natural gas, transmission of processed natural gas.</p> <p>By sector:</p> <p>Mandatory for facilities that are primarily engaged in the industrial activities listed in the OBPS Regulations, and that emit 50kt CO₂e per year or more. A facility remains covered even if its emissions decline to below the 50kt threshold (or 10kt for opt-in facilities) over time.</p> <p>In addition, persons responsible for facilities located in backstop jurisdictions may voluntarily apply for their facility to be a covered facility in the OBPS (opt-in). These facilities should emit or, in certain circumstances, expect to emit, 10kt CO₂e or more, and should also either be carrying out an activity for which an output-based standard is prescribed in the OBPS Regulations (under Part 1 of the Policy) or be from a sector at risk of carbon leakage and competitiveness impacts from carbon pollution pricing (under Part 2 of the Policy).</p>
PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	<p>The carbon pollution price is set at \$20/t CO₂e for 2019, rising by \$10/t CO₂e annually to \$50/t CO₂e in 2022. In the case of the fuel charge, the price increases are effective on April 1 (i.e., up to \$50/t CO₂e on April 1, 2022). The federal fuel charge rates reflect this carbon pollution price. The excess emissions charge under the federal OBPS is aligned with the carbon pollution price and the price increase is effective January 1.</p>

INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	<p><u>Federal OBPS:</u></p> <p>Output-based standards were set at 80% of a sector's production-weighted average emissions intensity in Canada as a starting point, with the potential for adjustments from that starting point based on an assessment of the potential competitiveness and carbon leakage risks due to carbon pricing.</p> <p>ECCC undertook a three-phase assessment of these risks. Phase 1 consisted of a "static" test using historical data at the national level to calculate sectoral estimates of emissions intensity and trade exposure. This approach is similar to the quantitative tests used in a number of other jurisdictions, including California, Alberta and Quebec.</p> <p>Phase 2 employed a "dynamic" test using economic modeling to project emissions and economic data to evaluate the same emissions intensity and trade exposure metrics as Phase 1, for the year 2022. In Phase 3, stakeholders were invited to submit additional supporting information and analyses on aspects of competitiveness to supplement the results of Phases 1 and 2. This information could include evidence of significant facility-level impacts due to carbon pricing, domestic or international market considerations, or consideration of indirect costs on sectors associated with carbon pricing.</p> <p>Sectors found to be at high risk in any of Phases 1, 2 or 3, received an adjustment to their output-based standards from 80% of average emissions intensity to 90%. Sectors that remained at high risk at 90% received a further adjustment to 95%. Sectors with an average proportion of industrial process emissions of 30% or greater were also adjusted.</p> <p>In the regulatory framework for the output-based pricing system published in January 2018, the Government of Canada indicated that the stringency of output-based standards would increase over time.</p> <p><u>Funding Programs:</u></p> <p>The Government of Canada has a wide range of tools and funding opportunities to support EITE sectors through improving energy efficiency and developing and adopting clean technologies. These includes the Low Carbon Economy Fund for leveraging investments in projects that will generate clean growth, reduce greenhouse gas emissions and help to exceed Canada's Paris Agreement commitments. Other key federal initiatives to support the development, adoption and scaling-up of clean technology include: the Clean Growth Hub; the Strategic Innovation Fund; Innovation Superclusters Initiative;; the Sectoral Initiatives Program; the International Business Development Strategy; Sustainable Development Tech Fund; the Cleantech Impact Program; the Green Infrastructure fund; Clean Growth in the Natural Resources program; the Agricultural Clean Technology Program; and, support for firms through the Business Development Bank of Canada and Export Development Canada. The Government of Canada has also</p>

	increased support for clean technologies for Indigenous Peoples, northern and remote communities.
REVENUE RECYCLING/RETURN	
How revenues from carbon pricing are used/returned	<p>The Government of Canada has committed to return all net direct proceeds from the federal carbon pollution pricing system to the jurisdictions of origin.</p> <p>In Yukon and Nunavut, net direct proceeds from the fuel charge are returned directly to those governments.</p> <p>In Ontario, New Brunswick (2019 and first 3 months of 2020), Manitoba, Saskatchewan, and Alberta (starting 2020), the bulk of direct proceeds from the fuel charge are returned directly to individuals and families in the form of tax-free Climate Action Incentive payments. In those provinces, the remaining proceeds are used to provide support to schools, hospitals, small and medium-sized businesses, colleges, universities, municipalities, not-for-profits, and Indigenous communities in the province.</p> <p>The proceeds collected from the OBPS will be used to help decarbonize industrial sectors.</p>
REPORTING REQUIREMENTS	
Public reporting by government	<p>The Minister of the Environment has an obligation under section 270 <i>GGPPA</i> to report annually on the administration of the Act. The inaugural report was tabled in Parliament on December 4, 2020.</p> <p><u>Federal Fuel Charge:</u></p> <p>The <i>GGPPA</i> provides for 12 different types of registrations. Certain persons (e.g., fuel distributors and fuel producers that deliver fuel to other persons in a backstop jurisdiction) must register or may register with the CRA and pay the federal fuel charge to the CRA, as required. Registered persons are generally required to file a monthly return and pay net fuel charge amounts monthly.</p> <p>There are also special rules in place for the transportation sector. For example, persons that are inter-jurisdictional air carriers, inter-jurisdictional marine carriers, inter-jurisdictional rail carriers and inter-jurisdictional road carriers (e.g., truckers) that operate in a backstop jurisdiction are required to register with the CRA. These registered carriers must calculate fuel use in the backstop jurisdiction and file monthly returns (except for registered road carriers who file quarterly). Depending on where fuel is purchased and used by these carriers, these carriers will either have a net fuel charge owing or will be eligible for a refund.</p>
Reporting by regulatees	

	<p><u>Federal OBPS:</u></p> <p>Facilities covered by the OBPS must register with ECCC. They must also prepare a report that covers each compliance period and contains:</p> <ul style="list-style-type: none"> • the facility's emissions limit, • the total greenhouse gas emissions and production, • the compensation to be provided or surplus credits to be issued. <p>The annual report must be verified by an independent third-party verifier. Annual reports accompanied by verification reports are due June 1st of the year following the compliance period for which the annual report is prepared.^[2]</p>
UPCOMING MILESTONES	
	<p>The Pan-Canadian Framework on Clean Growth and Climate Change includes a commitment for a review of the overall Pan-Canadian Approach to Pricing Carbon Pollution, to be completed by 2022 for providing certainty on the path forward and helping to ensure that carbon pollution pricing is fair and effective across Canada, as well as an interim report in 2020.</p> <p>The Regulatory Impact Analysis Statement (RIAS) for the federal OBPS Regulations committed to a review of the regulations in 2022. The RIAS also indicated that the design of the OBPS may be adjusted in response to the reviews of carbon pricing committed to in the PCF.</p>
KEY LINKS	
	<p>The Greenhouse Gas Pollution Pricing Act</p> <p>The Federal OBPS website</p>

^[1] In Saskatchewan, the federal OBPS applies to electricity generation and natural gas transmission pipelines.

^[2] Given the extraordinary circumstances during the COVID-19 pandemic, Environment and Climate Change Canada amended the OBPS Regulations to postpone the compensation dates for the 2019 compliance year. The reporting deadline was extended from June 1, 2020 to October 1, 2020. The regular-rate compensation deadline was extended from December 15, 2020 to April 15, 2021. The increased-rate compensation deadline was extended from February 15, 2021 to June 15, 2021.

British Columbia

SYSTEM INFORMATION	
Overall description	<p>British Columbia (BC) has a provincial carbon tax</p> <p>The BC carbon tax applies to the purchase and use of fossil fuels (with some exemptions), and is collected at either the point of retail (e.g. at the pump for gasoline and diesel) or is self-assessed and paid directly to government (e.g. by facilities that produce and combust natural gas).</p>
Date of implementation	BC's carbon tax came into effect July 1, 2008, followed by rate increases as described below.
Authorizing legislation/regulations	<i>The Carbon Tax Act (2008)</i>
Compliance options	Payment of tax.
Links and interactions with other systems (if applicable)	The BC Greenhouse Gas Emission Offset system has met the eligibility criteria outlined in the federal OBPS Regulations and has been added to the <i>List of Recognized Programs and Protocols</i> on ECCC's website. There are currently no BC protocols on the List. Eligible provincial offset credits can be used by facilities covered by the federal OBPS to compensate for emissions that exceed their emission limit as outlined under Part 2 of the GGPPA.
GHG COVERAGE	
<p>% of total GHG emissions from jurisdiction covered:</p> <p>By source</p> <p>By sector, with details on thresholds/standards for coverage</p>	<p>Total % of BC's GHG emissions covered by:</p> <p>BC Carbon Tax: 78%*</p> <p>* As calculated by BC for 2018, based on GHG emissions reporting in Canada's National Inventory Report</p> <p>Covered emissions include those from the purchase or use of fossil fuel (except for the below exemptions), "use" of fossil fuels includes methane that is vented in order to operate equipment in the upstream natural gas sector (e.g. methane vented in pneumatic devices).</p> <p>Of the emissions that are covered by the carbon tax, all have the full cost of the carbon tax applied. However, under the CleanBC Program for industry, some large industrial emitters with low emissions for their sector can receive incentive payments up to the amount of incremental carbon tax they pay above \$30/t CO₂e , which lowers the net cost applied (see below for more information).</p>

Exemptions	<p>The following are exempted from BC's carbon tax:</p> <ul style="list-style-type: none"> • Fuels not combusted but used for certain other uses, including as a raw material in a chemical or industrial process; • Fuel sold and exported outside B.C.; • Locomotive fuel purchased by an inter-jurisdictional rail service. • Fuel purchased on First Nations land by an eligible First Nations individual or band; • Coloured fuel purchased by a qualifying farmer that is delivered to their farm-land; • Fuel purchased by a visiting force or member of the diplomatic and consular corps; • Fuel purchased by an end purchaser for their own use outside B.C. • Fuel used in an interjurisdictional cruise ship; • Fuel used in a ship prohibited from coasting trade under the <i>Coasting Trade Act</i> (Canada); • Fuel purchased in sealed, pre-packaged containers of four litres or less. <p>Further details about exemptions can be found at: https://www2.gov.bc.ca/gov/content/taxes/sales-taxes/motor-fuel-carbon-tax/business/faqs#exempt-refund</p>																				
PRICE/CAPS																					
Additional details on either carbon price or caps including changes over time	<p>BC's carbon tax was introduced on July 1, 2008, at a rate of \$10/t CO₂e. It increased by \$5/t CO₂e on April 1 each year for four years, until it reached \$30/t CO₂e in 2012. It remained at this rate for six years until April 2018, then resumed its annual increase by \$5/t CO₂e each year, starting with \$35/t CO₂e in 2018 and reaching \$40/t CO₂e in 2019. This increase was scheduled to continue for another two years, until the rate reached \$50/t CO₂e in 2021. However, due to the impacts of COVID-19, the planned increase for 2020 has not been enacted; the rate will remain at \$40/t CO₂e until April 2021, when it is now due to increase to \$45/t CO₂e, and then \$50/t CO₂e in April 2022.</p> <table border="1"> <thead> <tr> <th>Fiscal Years (Apr 1-Mar 31)</th><th>Carbon Tax Rate (\$/t CO₂e)</th></tr> </thead> <tbody> <tr> <td>2008-2009</td><td>10</td></tr> <tr> <td>2009-2010</td><td>15</td></tr> <tr> <td>2010-2011</td><td>20</td></tr> <tr> <td>2011-2012</td><td>25</td></tr> <tr> <td>2012-2018</td><td>30</td></tr> <tr> <td>2018-2019</td><td>35</td></tr> <tr> <td>2019-2021</td><td>40</td></tr> <tr> <td>2021-2022</td><td>45</td></tr> <tr> <td>2022-</td><td>50</td></tr> </tbody> </table>	Fiscal Years (Apr 1-Mar 31)	Carbon Tax Rate (\$/t CO ₂ e)	2008-2009	10	2009-2010	15	2010-2011	20	2011-2012	25	2012-2018	30	2018-2019	35	2019-2021	40	2021-2022	45	2022-	50
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INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	<p>The CleanBC Program for Industry (CIIP), with a budget based on an estimate of the incremental carbon tax revenue above \$30/t CO₂e paid by large industrial emitters (i.e. those that emit more than 10kt CO₂e annually), provides both incentives for facilities based on their emissions intensity and financial support for their emissions reduction projects. For most facilities all facilities emissions are included to calculate a facility's emissions intensity including combustion, venting, fugitive and process emissions. For some facilities, it also includes emissions associated with the production of the electricity that is used onsite.</p> <p>Operators of facilities, that emit 10kt CO₂e or more annually in any sector (with a small number of exceptions) and who submit emission reports and an application, are eligible. This includes all facilities within a linear facility organization (LFO) (i.e. the B.C. facilities within an upstream oil and gas value chain) that individually emit more than 1kt CO₂e and collectively emit more than 10kt CO₂e annually. The program is not restricted to emissions-intensive and trade-exposed sectors.</p> <p>An operator with emissions intensity below an eligibility benchmark is eligible to receive an incentive payment. The eligibility benchmark is two times the B.C. sector's production-weighted-average emissions intensity for the particular product or activity.</p> <p>The amount of the incremental carbon tax paid by the facility above \$30/t CO₂e that an operator receives back as an incentive payment is based on how the facility's emissions intensity compares with a performance benchmark for the product or activity of the facility. Facilities with emissions intensity at or below the benchmark will receive back all incremental carbon tax they paid; those with emissions intensity between the eligibility benchmark and the performance benchmark receive a pro-rata portion. For 2020/21, the incentives operate under a transition framework, where all operations receive a minimum 75% incentive, with benchmarks determining an incentive up to 100%.</p> <p>The balance of funds remaining unclaimed goes into the CleanBC Industry Fund (CIF) – a fund that provides grants to CIIP eligible facilities to support industrial GHG emission reduction projects.</p> <p>Additional programs designed to address any risk of carbon leakage include the Greenhouse Carbon Tax Relief Grant (GCTRG) Program, which refunds up to 80% of the carbon tax paid by eligible commercial vegetable, floriculture, wholesale nursery, and forest seedling greenhouse operators for the combustion of natural gas and propane for heating and the production of CO₂ for fertilization. Greenhouses that emit over 10kt CO₂e are still eligible for the CleanBC Industrial Incentive Program, with a maximum incentive of 20% of the over \$30/t CO₂e carbon tax given they already receive 80%.</p>

REVENUE RECYCLING	
How revenues from carbon pricing are used	<p>Some revenue from the tax is returned to low- and middle-income taxpayers through the Climate Action Tax Credit.</p> <p>The Climate Action Revenue Incentive Program (CARIP) returns carbon tax revenue paid by local governments that have signed the BC Climate Action Charter back to those governments, to support their operations and encourage investment in climate action.</p> <p>The budget for the CleanBC Program for Industry is based on an estimate of the incremental portion of the carbon tax above \$30/t CO₂e paid by large industrial emitters (i.e. those with annual emissions above 10kt CO₂e). The program has two components: the CleanBC Industrial Incentive Program (CIIP) and the CleanBC Industry Fund as described above.</p> <p>For details on the clean initiatives the BC government funds, see p.20 of the CleanBC Accountability Report.</p>
REPORTING REQUIREMENTS	
<p>Public reporting by government</p> <p>Reporting by regulatees</p>	<p>Revenue from the carbon tax is publicly reported in B.C.'s annual Public Accounts documents and in the legislated annual Accountability Report as referenced above. Projections for the next three years are published in B.C.'s annual Budget document.</p> <p>Under the <i>Carbon Tax Act</i>, on or before the 15th day of each month, the first seller of covered fuel after its production or import must, in addition to remitting the tax collected and security payable, deliver to the B.C. Government a return for the tax collected or security payable on sales in the previous month.</p> <p>Under the <i>Greenhouse Gas Industrial Reporting and Control Act</i> (GGIRCA), and not connected to the carbon tax, emissions are reported to the B.C. Government by industrial operators that emit more than 10kt CO₂e per year. This data is publicly available online. This data is used to administer the CIIP and CIF.</p>
UPCOMING MILESTONES	
	The B.C. Government announced in September 2020 that the carbon tax rates will increase on April 1, 2021, to reach \$45/t CO ₂ e, having remained at \$40/t CO ₂ e since April 1, 2019, and will increase to \$50/t CO ₂ e on April 1, 2022.
KEY LINKS	
	<p>Ministry of Finance <i>Tax Schedule</i>, Tax rates by fuel type</p> <p>The carbon tax is key component of B.C.'s CleanBC Plan to reduce emissions</p>

Alberta

SYSTEM INFORMATION	
Overall description	<p>Alberta (AB) has a provincial <i>Technology Innovation and Emissions Reduction (TIER) Regulation</i> for managing greenhouse gas emissions from large industrial emitters in the province. The federal fuel charge also applies to fuel consumed outside of TIER facilities in AB.</p> <p><u>TIER:</u> The TIER Regulation is an industrial carbon pricing and emissions trading system that automatically applies to any facility that has emitted 100,000t CO₂e greenhouse gases (GHGs) in 2016, or any subsequent year.</p> <p>A facility with fewer than 100,000t CO₂e GHG emissions per year may voluntarily apply to opt-in to the TIER system if it competes against a facility regulated under TIER, or has emissions greater than 10,000t CO₂e per year and is in an emissions-intensive, trade-exposed (EITE) sector.</p> <p>Multiple small conventional oil and gas facilities with a common person responsible can also enter into TIER by voluntarily applying to be regulated as an aggregate facility.</p> <p><u>Federal Fuel Charge:</u> see federal profile.</p>
Date of implementation	<p><u>TIER:</u> The TIER Regulation replaced AB's Carbon Competitiveness Incentive Regulation (CCIR) on January 1, 2020. CCIR was in place in 2018 and 2019. AB's Specified Gas Emitters Regulation was in place from 2007 to 2017.</p> <p><u>Federal Fuel Charge:</u> see federal profile.</p>
Authorizing legislation/ regulations	<p><u>TIER:</u> The TIER Regulation is made under the Emissions Management and Climate Resilience Act (EMCRA).</p> <p><u>Federal Fuel Charge:</u> see federal profile.</p>
Compliance options	<p><u>TIER</u> TIER provides regulated facilities with a number of compliance options, including:</p> <ul style="list-style-type: none"> • On-site emission reductions; • Use of emissions performance credits (produced and traded by facilities that exceed their emission reduction obligations); • Use of Alberta-based emissions offsets; • Payment into a TIER fund (for the 2020 compliance year, a price of \$30/t CO₂e has been set);

	<p>Under TIER, emissions performance credits and emissions offsets combined may not be used to satisfy more than 60 percent of a facility's total compliance obligation for a single compliance year.</p> <p>TIER also includes a credit expiry timeline for emissions performance credits and emission offsets:</p> <ul style="list-style-type: none"> • Performance credits and emission offsets from 2014 or earlier expire after 2020. • Performance credits and emission offsets from 2015 or 2016 expire after 2021. • Performance credits from 2017 and onward have an eight-year expiry starting from the year following the year it was issued for. • Emission offsets from 2017 and onwards have a nine-year expiry starting from the year in which the reduction was made. <p>TIER regulated facilities are eligible to become exempt from Part 1 of the <i>GGPPA</i>, the federal fuel charge.</p> <p><u>AB's Emission Offset System</u></p> <p>AB's Emission Offset System is enabled under the TIER Regulation. Emission offsets are generated by projects that have voluntarily reduced their greenhouse gas emissions. Emission offsets are quantified using Alberta-approved methodologies called quantification protocols, and are verified by a third party.</p> <p>Emission offsets encourage facilities to make emissions reductions beyond regulatory requirements in other sectors, a key linkage being methane emissions from small oil and gas facilities. The market-based system is resulting in real results in reducing methane emission reductions in advance of regulation, including replacing high bleed pneumatic devices with low or zero emitting devices.</p>
Links and interactions with other systems (if applicable)	<p>The AB Emission Offset System and several of AB's offset protocols have met the eligibility criteria outlined in the federal OBPS Regulations and have been added to the <i>List of Recognized Programs and Protocols</i> on ECCC's website. Eligible provincial offset credits can be used by facilities covered by the federal OBPS to compensate for emissions that exceed their emission limit as outlined under Part 2 of the <i>GGPPA</i>.</p>

GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	<p>Total % of AB's GHG emissions covered by: AB TIER Regulation: 59%* Federal Fuel Charge: 17%**</p> <p>*As calculated by AB, this estimate for 2020 represents the total emissions from facilities that are covered under the TIER Regulation, including aggregate conventional oil and gas facilities. For each facility under the TIER Regulation, only those emissions above a facility's allowable emissions are subject to a compliance obligation. Facilities also have the ability to generate emissions performance credits if they emit less than their allowable emissions. Also, this does not take into account the portion of emissions in the province that are eligible to generate emissions offsets. While participation in the offset system is voluntary, it does extend the reach of the incentive structure created by carbon pricing to reduce emissions beyond the sectors and facilities regulated by the TIER Regulation.</p> <p>The Government of Alberta is currently undertaking analysis for calculating these percentages. The estimate of 2020 emissions coverage is based on Canada's 2018 National Inventory Report (NIR) emissions data to forecast emissions coverage under the federal fuel charge and the TIER Regulation. The Government of Alberta assumes that emissions coverage from 2018 to 2020 is approximately the same, as the TIER Regulation and federal fuel charge cover the same emissions sources as the now repealed <i>Climate Leadership Act</i>.</p> <p>The main difference between emissions covered between 2018 and 2020 is that conventional oil and gas facilities are no longer exempt from carbon pricing in 2020. Therefore, the percentage of provincial GHG emissions covered for aggregate conventional oil and gas facilities is added to the percentage of provincial GHG emissions covered by the TIER Regulation. The percentage of emissions covered for aggregate conventional oil and gas facilities in 2018 is an approximate estimate as it is calculated by dividing the quantity of GHG emissions covered for aggregated facilities under TIER by the total NIR GHG emissions for the sector in 2018.</p> <p>** As calculated by ECCC for 2020.</p>

By source	<u>TIER:</u>
By sector, with details on thresholds/standards for coverage	By source: Covered emission types include emissions from: <ul style="list-style-type: none"> • Stationary fuel combustion • Industrial processes • Venting • Flaring • Fugitive/Other • On-site transportation • Waste and wastewater • Formation CO₂
Exemptions	<p>Notes:</p> <p>Regulated emissions do not include biomass CO₂ nor the emissions from federally levied fuels at a time when an exemption certificate had been issued. Methane (CH₄) and nitrous oxide (N₂O) emissions from either biomass combustion, fermentation or decomposition are included in regulated emissions.</p> <p>Though not part of regulated emissions, indirect emissions are accounted for in the TIER Regulation under the allowable emissions calculation. Indirect emissions are emissions associated with electricity, industrial heat, and hydrogen that are imported by a facility. The allowable emissions for each regulated facility is adjusted for these imports. For example, the allowable emissions of a facility importing electricity will be adjusted to receive fewer allowable emissions.</p> <p>There is no reduction requirement for industrial process emissions. Industrial process emissions are included in benchmarks at 100 percent of facility-specific production weighted average emissions intensity for facility-specific benchmarks, or the average emissions intensity of the top 10 percent performing facilities in a sector for the high performance benchmarks.</p> <p>Imported and exported CO₂, as well as CO₂ that is used as a feedstock for urea production, are accounted for in the calculation of total regulated emissions.</p> <p>For aggregate conventional oil and gas facilities, only stationary fuel combustion emissions, and exported CO₂ from stationary fuel combustion sources are included in regulated emissions.</p> <p><u>Federal Fuel Charge</u>: see federal profile.</p>

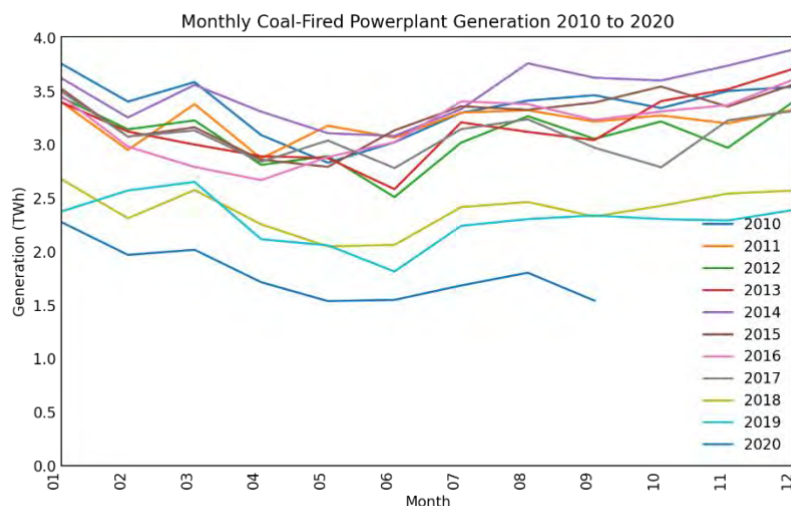
PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	<p><u>TIER:</u> The TIER fund price is set at \$30/t CO₂e for 2020, and \$40/t CO₂e for 2021.</p> <p>The stringency of facility-specific benchmarks will increase by 1 percent annually beginning in 2021. See “Tightening Rate” below in “Industrial Competitiveness” section.</p> <p><u>Federal Fuel Charge:</u> see federal profile.</p>
INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	<p>The primary mechanism for preventing carbon leakage under the TIER system is to only apply the marginal carbon price to emissions in excess of facility benchmarks, sometimes referred to as free allocations. This maintains the marginal price signal to drive emissions improvements while limiting the total cost to reduce competitiveness risks relative to jurisdictions with less stringent policies. All TIER regulated sectors are significantly trade exposed to international competition (other than electricity and pipelines which provide essential services to trade exposed sectors).</p> <p><u>Benchmarking Methodology</u> Under the TIER Regulation, emissions reduction obligations are determined according to a facility-specific benchmark approach, and high-performance benchmark approach. In most cases, a regulated facility is subject to the less stringent of the two approaches for that facility.</p> <p>Under the facility-specific benchmark methodology, a facility is required to reduce emissions intensity by 10 percent relative to the facility’s historical production-weighted average emissions intensity.</p> <p>High performance benchmarks are set to the average emissions intensity of the most emissions efficient facilities (performers in the top 10 percent) producing each benchmarked product over specified reference years. If there are fewer than ten facilities producing a product, the high-performance benchmark for a product is then set based on the emissions intensity of the best-performing facility.</p> <p>The TIER Regulation currently includes high performance benchmarks for 14 products (listed in Schedule 2 of the TIER Regulation).</p> <p>Exceptions:</p> <ul style="list-style-type: none"> Facility-specific benchmarks are not applicable to facilities in the electricity sector, which is subject to a “good-as-best gas” benchmark of 0.37 tonnes per megawatt-hour (MWh). This unique treatment in the electricity sector applies a consistent carbon price signal to all electricity in the system, regardless of generation fuel type.

	<ul style="list-style-type: none"> Where a facility produces a product that does not have a high performance benchmark, the facility-specific benchmark approach applies. <p>Allowable emissions for a facility are calculated based on the applicable facility-specific or high performance benchmark. Facilities are subject to a compliance obligation on emissions above the facility's annual allowable emissions. Facilities with annual emissions below their allowable emissions are eligible to earn emissions performance credits.</p> <p><u>Tightening Rate:</u> The stringency of facility-specific benchmarks will increase by 1 percent annually beginning in 2021. For example, a facility with a 90 percent free emissions allocation (or a 10 percent emissions intensity reduction requirement) in 2020 would receive 89 percent free allocation in 2021, 88 percent in 2022, and so on.</p> <p>The tightening rate will not apply to industrial process emissions, emissions from electricity generation, high performance benchmarks or benchmarks for aggregate conventional oil and gas facilities. The high performance benchmarks will act as the tightening rate end point for the facility-specific benchmark.</p> <p><u>Voluntary Participation:</u> A facility with fewer than 100,000t CO₂e GHG emissions per year may be eligible to opt-in to the TIER system if it competes against a facility regulated under TIER, or has greater than 10,000t CO₂e of annual emissions and is in an EITE sector. Multiple small conventional oil and gas facilities with a common person responsible can also enter into TIER by applying to be regulated as an aggregate facility.</p> <p>The TIER Regulation's EITE threshold aligns with the federal OBPS tests, which include defining an EITE sector as a sector:</p> <ul style="list-style-type: none"> (i) that has an emissions intensiveness that equals or exceeds 1 percent and a trade exposure that equals or exceeds 10 percent; (ii) that has an emissions intensiveness that equals or exceeds 3 percent and a trade exposure of any level is achieved; or (iii) that has an emissions intensiveness of any level and a trade exposure that equals or exceeds 80 percent. <p>Note that Alberta's conventional oil and gas sector is eligible to opt in under the TIER regulation, even if those facilities are under 10,000t CO₂e of annual emissions because they compete directly with larger oil producers who are regulated under TIER.</p> <p><u>Compliance Cost Containment:</u> The Compliance Cost Containment Program provides support to regulated facilities in EITE sectors experiencing economic hardship as a result of</p>
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	<p>compliance costs under the TIER system. Facilities for which total TIER compliance costs are greater than three percent of facility sales, or 10 percent of facility profits, may be eligible for the following support mechanisms:</p> <ul style="list-style-type: none"> • Additional compliance flexibility (exception to the 60 percent credit limit); • Additional free benchmark allocations.
REVENUE RECYCLING	
How revenues from carbon pricing are used	<p><u>TIER:</u> Industries regulated under the TIER regulation can pay into a TIER fund as one compliance option when they do not meet their emissions targets. The Government of Alberta has committed to invest the first \$100 million in revenues and 50 percent of remaining revenues into emission reduction and climate resilience projects.</p> <p>The TIER fund is being spent on programs that will bring investment to Alberta, help industrial facilities find innovative ways to reduce emissions and invest in clean technology to stay competitive and save money, and enhance the ability of Alberta's communities to adapt to changes in the climate.</p> <p>Up to \$750 million in TIER funding and other public and industry dollars were announced in fall 2020 to support a range of technology and emissions reduction programs, including carbon capture, utilization and storage technology development and deployment, industrial energy efficiency projects, methane emissions reduction programs for the oil and gas sector, and funding for flood mitigation infrastructure, watershed restoration projects and programs to help municipalities and Indigenous communities adapt and become resilient to future floods. This funding is in direct response to the unprecedented economic consequences of the COVID-19 pandemic and low oil prices, funding a suite of programs that are supporting up to 8,700 jobs when investments from industry and other funding sources are included, and injecting about \$1.9 billion into AB's economy.</p> <p>The eligible uses of the TIER funds are bound by the EMCRA.</p> <p>AB established the Climate Change and Emissions Management Corporation in 2009, now operating as Emissions Reduction Alberta (ERA), to leverage carbon pricing funds to accelerate the deployment of emissions reduction technologies for Alberta and the world. Since 2009, ERA has committed more than \$611 million toward 185 projects worth over \$4.4 billion, including up to \$280 million in recent funding from TIER and the federal Low Carbon Economy Leadership Fund.</p> <p>Carbon pricing revenue is also used to fund \$1.2 billion committed to two commercial scale projects capturing CO₂ from Hydrogen plants for oil sands upgrading and fertilizer manufacturing, now capturing 2.76 Mt per year. One of these projects includes a CO₂ pipeline with capacity to transport 13 more Mt of CO₂ per year from Alberta's industrial heartland to Alberta's vast sequestration geology.</p>

	<u>Federal Fuel Charge</u> : see federal profile.
REPORTING REQUIREMENTS	
Public reporting by government Reporting by regulatees	<p><u>TIER</u>: Facilities are subject to quantification and reporting standards. Regulated facilities are required to submit annual compliance reports by June 30 of the following year. Facilities emitting more than 1,000,000t CO₂e per year are also required to submit an annual forecasting report by November 30, for the following year. Compliance reports include:</p> <ul style="list-style-type: none"> • the facility's total regulated GHG emissions and production; • the facility's calculated allowable emissions; • the compliance obligation (compensation to be provided) or emissions performance credits to be issued. <p>Annual compliance reports are required to be verified by a qualified third-party assurance provider. Government reviews all regulatory submissions and contracts full third party reverifications of a sample of submissions each year.</p> <p>Emissions offset project reports have similar verification requirements and government review.</p> <p><u>Federal Fuel Charge</u>: see federal profile</p>
UPCOMING MILESTONES	
	A full review of the TIER Regulation is scheduled to be completed by the end of 2022. Subsequent reviews will occur every five years after that.
KEY LINKS	
	<p><i>The Emissions Management and Climate Resilience Act</i></p> <p>TIER Regulation Website</p> <p><i>The TIER Regulation</i></p> <p>TIER Conventional Oil and Gas Website</p> <p>Alberta Emission Offset System Website</p> <p><u>Federal Fuel Charge</u>: see federal profile.</p>
OTHER INFORMATION	
	While 2020 is the first reporting period under TIER, with reporting due June 30, 2021, year to date results can be observed from other sources, and results are available from the last 12 years of carbon pricing in Alberta. See results from the SGER .

The electricity sector has seen the most dramatic results from industrial carbon pricing in Alberta in recent years. Since moving to a single clean good-as-best-gas benchmark in 2018 coal fired power emissions in Alberta have declined steadily. 2018 GHG emissions from coal fired power, as reported in Canada's 2020 National Inventory Report, were 18.1 Mt CO₂e (41 percent) below 2014 and 12 Mt CO₂e (32 percent) below 1990. Further emissions declines have been observed in 2019 and 2020 as shown in the following figure.



Similarly, regulatory data shows that [aggregate oil sands emissions intensity fell 22 percent from 2009 to 2018](#).

These results are direct emissions only and do not include the net emissions impacts of emissions offsets used by the sectors. Over 59 million tonnes of emissions reductions have been registered as emissions offsets in Alberta to date, representing real verified emissions reductions beyond the reductions made directly at regulated facilities.

Additionally, Alberta has seen over \$1 billion in announced investments in market-based renewable as a result of Alberta's environmental policies, energy-only market, and the falling costs of wind and solar technology. Alberta's decision to retain an energy-only market for electricity is deliberate part of the market-driven approach to renewables. The TIER Regulation has accelerated investment in market-based renewables by ensuring they benefit from providing emissions-free electricity to Alberta.

Saskatchewan

SYSTEM INFORMATION	
Overall description	<p>Saskatchewan (SK) has a provincial Output Based Pricing System (OBPS) for large industrial emitters, with exception of the electricity generating and transmission pipeline sectors that are subject to the federal OBPS. The federal fuel charge also applies in SK.</p> <p><u>SK OBPS System for Large Industrial Emitters:</u> Saskatchewan has introduced an OBPS for large industrial emitters. Recognizing the need to minimize competitiveness and carbon leakage risks, SK's OBPS automatically applies to facilities in a regulated sector with annual emissions greater than 25,000t CO₂e. A voluntary opt-in is available for facilities with annual emissions of at least 10,000t CO₂e.</p> <p>To address the unique considerations of the upstream oil and gas sector, SK's OBPS allows for the aggregation of small, individual facilities into a single "aggregate facility" for the purposes of regulation. At least two facilities must be included in an aggregate facility, and there is no minimum emissions amount required for registration.</p> <p>SK's OBPS system places an emissions intensity performance standard on regulated facilities. The standards are sector specific, and are designed to be technically achievable by regulated emitters. This approach spurs innovation and emissions reductions, while avoiding imposing unreasonable and undue penalties on industry. The thresholds become increasingly stringent over the duration of the program (established to cover 12 compliance years, 2019 - 2030).</p> <p>The emissions intensity reductions are applied against individual baselines set for each regulated facility. Baselines are established based on emissions intensity performance of the regulated facility across a three-year period within the five years preceding registration. The baselines set a benchmark of past performance against which future performance can be judged.</p> <p><u>Federal OBPS and Fuel Charge:</u> see federal profile.</p>
Date of implementation	<p>SK's provincial OBPS system effective January 1, 2019.</p> <p>Federal OBPS and Fuel Charge: see federal profile.</p>
Authorizing legislation/regulations	<p><u>SK OPBS:</u> <i>The Management and Reduction of Greenhouse Gases Act</i></p> <p><i>The Management and Reduction of Greenhouse Gases (Standards and Compliance) Regulations</i></p>

	<p><i>The Management and Reduction of Greenhouse Gases (Baselines, Returns and Verification) Standard</i></p> <p><i>The Management and Reduction of Greenhouse Gases (Upstream Oil and Gas Aggregate Facility) Standard</i></p> <p><u>Federal OBPS and Fuel Charge:</u> see federal profile.</p>
Compliance options	<p><u>SK OBPS:</u></p> <p>Regulated facilities for which the total regulated emissions are in excess of the permitted emissions in a compliance year accrue a compliance obligation, equal to the excess tonnes of CO₂e. Compliance obligations may be fulfilled using flexible compliance options:</p> <ul style="list-style-type: none"> • Payment into the provincial Technology Fund. The rate of payment is established by Cabinet annually, and equates a dollar value to a tonne of CO₂e. Regulated emitters may access funds held in the Technology Fund to support industrial innovation and projects which reduce greenhouse gas emissions. • Best performance credits. A best performance credit is awarded to a regulated emitter that reduces emissions beyond what is required. The best performance credits may be remitted against a compliance obligation by that regulated emitter in the future, or traded with other regulated emitters. • SK offset credits. Saskatchewan is developing an offset system to incent and reward projects which reduce, sequester, or capture greenhouse gas emissions. These projects exist outside of regulated emissions sources, and so extend the incentive to reduce emissions to the entire economy. Regulated emitters may purchase offset credits and remit them to fulfill a compliance obligation. <p>Other compliance options may be considered in the future (e.g. international offsets approved as Internationally Transferred Mitigations Outcomes (ITMOs) for meeting Canada's GHG reduction commitment under the Paris Agreement.</p> <p><u>Federal OBPS and Fuel Charge:</u> see federal profile.</p>
Links and interactions with other systems (if applicable)	<p>Saskatchewan is exploring how its provincial offset system may be linked with other jurisdictional systems across Canada.</p>

GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	Total % of SK's GHG emissions covered by: SK OBPS:22%* Federal OBPS:18%* Federal Fuel Charge: 19%*
By source	* As calculated by ECCC for 2020.
By sector, with details on thresholds/standards for coverage	<u>SK OBPS Coverage By Source:</u> <i>The Management and Reduction of Greenhouse Gases (Standards and Compliance) Regulations</i> covers the following regulated source categories*:
Exemptions	<ul style="list-style-type: none"> • Stationary fuel combustion • Industrial process emissions • Industrial process use emissions • Venting emissions • Flaring emissions • Leakage emissions • On-site transportation emissions • Waste Emissions • Waste-water emissions <p>* <i>The Management and Reduction of Greenhouse Gases (Standards and Compliance) Regulations</i> is specific to stationary fuel combustion for the upstream oil and gas sector. Saskatchewan <i>Oil and Gas Emissions Management Regulations</i> covers additional source categories for this sector.</p> <p><u>SK OBPS Coverage By Sector:</u></p> <p>SK's OBPS places the following stringencies on industrial sectors:</p> <ul style="list-style-type: none"> • 5% - mining, iron and steel, fertilizer manufacturing, pulp mills, ethanol manufacturing, grain and oilseed processing, char production, activated carbon production • 10% - refining and upgrading of oil petroleum • 15% - upstream oil and gas stationary fuel combustion <p>The following sectors are exempted from SK's OBPS: agriculture, transportation (other than on-site transportation), pipelines, landfills, public institutions (universities and hospitals), electricity (main or sole product).</p> <p><u>Federal OBPS and Fuel Charge:</u> see federal profile.</p>

PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	<p><u>SK OBPS:</u> Saskatchewan's Cabinet annually sets a rate of payment into the provincial Technology Fund for its use as a compliance option by regulated emitters. The Technology Fund rate was set at \$20/t CO₂e in 2019 and \$30/t CO₂e in 2020.</p> <p><u>Federal OBPS and Fuel Charge:</u> see federal profile.</p>
INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	<p>As the majority of provincial exports are in sectors that are considered "energy intensive, trade exposed" (EITE), trade is one of the key factors which impacts competitiveness. Much of Saskatchewan's exports are commodities which trade at world prices. Saskatchewan has one of the highest proportion of exports of total GDP. In 2018 Saskatchewan exports made up 40.8% of the provincial GDP.</p> <p><u>SK OBPS:</u> Saskatchewan's EITE metric calculates emissions intensity for each sector by aggregating direct GHG emissions and dividing by the value of sales while trade exposure is calculated by taking the ratio of the value of exports and imports for a sector to a total market value (total production plus imports).</p> <p>The EITE analysis shows that all of Saskatchewan's sectors would face a high risk of competitiveness concerns. However, each sector is exposed to a different degree. As a result, Saskatchewan implemented different reduction stringencies to fully reflect the competitiveness risks for various sectors and the ability of the sectors to reduce emissions in an economically and technological achievable fashion.</p> <p>In addition to the EITE analysis, Saskatchewan conducted extensive modelling (e.g. a CGE model), using company and sector data specific to Saskatchewan, in order to inform and help to determine appropriate thresholds within the OBPS program.</p> <p><u>Federal OBPS:</u> see federal profile.</p>
REVENUE RECYCLING	
How revenues from carbon pricing are used	<p><u>SK OBPS:</u> Regulated emitters may access funds held in the Technology Fund to support industrial innovative and projects which reduce greenhouse gas emissions. The fund is administered by Innovation Saskatchewan, and recommendations on its activities will be provided by the Saskatchewan Technology Fund Advisory Committee consisting of membership from industry.</p>

	<p>Revenue collected under the federal fuel charge and OBPS program is recycled according to federal policies (see Government of Canada's section for more details). Data specific to Saskatchewan is not available at this time.</p> <p><u>Federal OBPS and Fuel Charge</u>: see federal profile.</p>
REPORTING REQUIREMENTS	
<p>Public reporting by government</p> <p>Reporting by regulatees</p>	<p><u>SK OBPS:</u></p> <p>Provincial Greenhouse Gas Emissions Reporting: Facilities which emit over 10,000t CO₂e in annual emissions must report those emissions under <i>The Management and Reduction of Greenhouse Gases (Reporting and General) Regulations</i>.</p> <p>Reporting Specific to Electricity Producers: Regulated emitters who generate electricity and are subject to <i>The Management and Reduction of Greenhouse Gases (General and Electricity Producer) Regulations</i> must submit an annual return detailing greenhouse gas emissions.</p> <p>Reporting Specific to the Provincial OBPS Program: Regulated emitters under <i>The Management and Reduction of Greenhouse Gases (Standards and Compliance) Regulations</i> must report emissions and production information in accordance with the reporting schedules found within <i>The Management and Reduction of Greenhouse Gases (Baselines, Returns and Verification) Standard</i> or <i>The Management and Reduction of Greenhouse Gases (Upstream Oil and Gas Aggregate Facility) Standard</i>. In practice, a report is due once every two compliance years. An emissions return must be verified by a third party prior to submission.</p> <p><u>Federal OBPS and Fuel Charge</u>: see federal profile.</p>
UPCOMING MILESTONES	
	<p><u>SK OBPS:</u></p> <p>Development of the compliance options for regulated emitters under the provincial OBPS program is ongoing. Details governing the awarding and remittance of best performance credits are anticipated for release in fall 2020. The provincial offset program has been delayed due to engagement concerns stemming from the COVID-19 pandemic, with launch now anticipated to occur in 2022.</p>
KEY LINKS	
	<p>Saskatchewan Climate Change: www.saskatchewan.ca/climate-change</p> <p>Prairie Resilience:</p>

	<p>https://www.saskatchewan.ca/business/environmental-protection-and-sustainability/a-made-in-saskatchewan-climate-change-strategy/prairie-resilience</p> <p>Methane Action Plan: https://www.saskatchewan.ca/business/environmental-protection-and-sustainability/a-made-in-saskatchewan-climate-change-strategy/methane-action-plan</p> <p>Legislation and Regulations: https://www.saskatchewan.ca/business/environmental-protection-and-sustainability/a-made-in-saskatchewan-climate-change-strategy/legislation-and-regulations</p>
OTHER INFORMATION	
	<p>Saskatchewan's climate change strategy is not limited to the pricing of carbon emissions. <i>Prairie Resilience</i> is a comprehensive strategy which details 40+ actions designed to enhance Saskatchewan's overall resilience to climate change.</p> <p>Saskatchewan tracks its resiliency to climate change through the <i>Climate Resilience Measurement Framework</i>. This government-wide framework was released in November 2018 to track and annually report on 25 resilience measures across five key areas: natural systems, physical infrastructure, economic sustainability, community preparedness and human well-being. Each of the measures have specific targets to serve as benchmarks on progress. These measures provide a picture of how Saskatchewan is strengthening its ability to prepare for the impacts of a changing climate.</p> <p>As committed to in <i>Prairie Resilience</i>, the province will continue to track and report on the climate resilience measures to help identify areas of further focus and improvement, and to better understand Saskatchewan's resilience to climate change. The first annual resilience report was released in April 2019, presenting the baselines and targets for each measure. The second annual resilience report continues with reporting on status and trends for each measure.</p> <p>In addition to the provincial OBPS, Saskatchewan has implemented other regulatory approaches designed to reduce emissions.</p> <p><i>The Management and Reduction of Greenhouse Gases (General and Electricity Producer) Regulations</i> place a descending cap on overall greenhouse gas emissions permitted from Saskatchewan's electricity generation sector. These Regulations, in effect since January 1, 2018, will result in a 40 percent reduction below 2005 levels by 2030. SaskPower, Saskatchewan's electricity generation crown corporation, is also on target to expand renewable energy to 50 percent of total generation capacity. Saskatchewan's electricity regulations are the basis for an equivalency</p>

	<p>agreement on the federal <i>Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations</i>.</p> <p>Saskatchewan's <i>Methane Action Plan</i> is a comprehensive approach to reducing greenhouse gas emissions from venting and flaring activities in the upstream oil and gas industry. A part of the Methane Action Plan, <i>The Oil and Gas Emissions Management Regulations</i> cover flare and vented methane emissions in the upstream oil and gas sector, and will lead to annual emission reductions of 40 to 45 percent by 2050. These Regulations are the basis for an equivalency agreement for the federal <i>Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)</i> which is in the process of being finalized.</p>
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Manitoba

SYSTEM INFORMATION	
Overall description	In Manitoba (MB) both the federal fuel charge and federal OBPS apply: see federal profile.
Date of implementation	Federal Fuel Charge and OBPS: see federal profile.
Authorizing legislation/regulations	Federal Fuel Charge and OBPS: see federal profile.
Compliance options	Federal Fuel Charge and OBPS: see federal profile.
Links and interactions with other systems (if applicable)	Federal Fuel Charge and OBPS: see federal profile.
GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	Total % of MB's GHG emissions covered by: Federal Fuel Charge: 46%* Federal OBPS: 9%* * As calculated by ECCC for 2020.
By source By sector, with details on thresholds/standards for coverage Exemptions	Federal Fuel Charge and OBPS: see federal profile.
PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	Federal Fuel Charge and OBPS: see federal profile.

INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	See federal profile for details on addressing industrial competitiveness under the Federal OPBS.
REVENUE RECYCLING/RETURN	
How revenues from carbon pricing are used/returned	<p>The Government of Canada has committed to return all net direct proceeds from the federal carbon pollution pricing system to the jurisdictions of origin.</p> <p>See federal profile for more details.</p>
REPORTING REQUIREMENTS	
<p>Public reporting by government</p> <p>Reporting by regulatees</p>	Federal Fuel Charge and OBPS: see federal profile.
UPCOMING MILESTONES	
	Federal Fuel Charge and OBPS: see federal profile.
KEY LINKS	
	Federal Fuel Charge and OBPS: see federal profile.

Ontario

SYSTEM INFORMATION	
Overall description	<p>In Ontario (ON) both the federal fuel charge and federal OBPS are currently in effect (December 2020): see federal profile for more details.</p> <p>ON's Emissions Performance Standards (EPS) program was developed as an alternative to federal OBPS component of the federal carbon pollution pricing system that is now in effect in Ontario. The EPS are part of Ontario's commitment in Preserving and Protecting our Environment for Future Generations: A Made-in-Ontario Environment Plan to regulate industrial emissions, and a key commitment under Ontario's Environment Plan. to:</p> <ul style="list-style-type: none"> • Encourage the industrial sector to reduce greenhouse gas emissions. • Maintain competitiveness of Ontario businesses. • Minimize carbon leakage – the risk of production leaving the province for other jurisdictions with less stringent climate policies. <p>This Made-in-Ontario solution includes measures for making polluters accountable for their actions with a system that is tough but fair, cost-effective and flexible to the needs and circumstances in ON. It also ensures strong enforcement of the rules.</p> <p>The EPS program establishes limits on greenhouse gas emissions. Covered facilities are required to acquire compliance units if the limits are not met. It does not enforce a blanket cap on emissions across ON and takes into consideration specific industry and facility conditions while allowing for economic growth.</p> <p>This program is tailored for ON's environment and economy to achieve emission reductions from big polluters and work towards ON's share of Canada's 2030 emissions reduction target, while including measures to avoid driving away business and job creators.</p> <p>The EPS program applies performance standards that increase in stringency over time and are tailored to the types of industries in Ontario.</p> <p>Standards are detailed in the GHG Emissions Performance Standards and Methodology for the Determination of the Total Annual Emissions Limit (the Methodology) and are comprised of:</p> <ul style="list-style-type: none"> • Product output-based standards that are emissions intensity based and tie greenhouse gas emissions to the level of output from a facility or sector (e.g., tonnes of CO₂e per tonne of cement).

	<ul style="list-style-type: none"> ○ These standards were generally developed from emissions and production data from years in the range of 2014 to 2018 taking into account anomalous years. • Energy use standard on an input basis (tonnes of CO₂e per GJ of fossil-based energy input, based on natural gas or fuels used in mobile equipment). • Thermal energy and cogeneration standards (e.g., tonnes of CO₂e per GJ of thermal output based on natural gas and a boiler efficiency of 80%). • Fossil fuel electricity generation standard on an output basis (420 tonnes of CO₂e per GWh of electricity output). • Historical average of emissions based on emissions data from years 2015 to 2017 in limited cases. <p>Standards apply to both fixed process emission and non-fixed process emissions including combustion, fugitive and mobile sources. Multiple standards may apply to a facility to address different sources of emissions at the facility.</p> <p><u>ON's EPS Stringency</u></p> <p>Performance standards also include the application of a stringency factor to incent industry to be energy efficient and encourage emission reductions.</p> <ul style="list-style-type: none"> • In recognition of the significant reductions made in the electricity sector, a stringency factor has not been applied. <p>The stringency factor considers competitiveness impacts for industry in order to minimize carbon leakage. Separate stringency factors are applied to non-fixed process emissions and fixed process emissions to recognize that fixed process emissions are harder to reduce.</p> <ul style="list-style-type: none"> • A stringency factor starting at 98% in 2019, declining by 2% each year until 2022 (when it will be 92%), applies to non-fixed process emissions (i.e., combustion emissions) from sectors assessed as highly emission intensive and/or trade exposed (EITE). • A stringency factor starting at 95% in 2019, declining by 5% each year until 2022 (when it will be 80%) applies to non-fixed process emissions from sectors assessed as low/medium EITE. • No stringency factor applies to fixed process emissions for either high or medium/low EITE sectors. <p>Stringency factor also includes an adjustment factor based on energy input from biomass. (i.e., facilities with significant amounts of biomass used as fuel have a lower stringency factor and hence a higher TAEI). This is to recognize that facilities which already use significant amounts of biomass as energy input may have limited additional cost-effective abatement opportunities in the near term.</p>
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Date of implementation	<p><u>Federal Fuel Charge and OBPS</u>: see federal profile.</p> <p><u>ON EPS Program</u> Ontario's Greenhouse Gas Emissions Performance Standards regulation (O. Reg. 241/19 or the EPS Regulation) came into effect on July 4, 2019. The incorporated document entitled GHG Emissions Performance Standards and Methodology for the Determination of the Total Annual Emissions Limit (the Methodology) sets out the emission performance standards and calculations that must be done to determine the Total Annual Emissions Limit (TAEL).</p> <p>Currently, only the registration and record keeping related provisions apply. Other key provisions (e.g., performance standards, sales of compliance units, compliance obligations) do not currently apply until Ontario is removed from Part 2 of Schedule 1 of the federal Greenhouse Gas Pollution Pricing Act (GGPPA).</p> <p>In September 2020, the federal government indicated that the ON EPS program meets the federal benchmark, as well as indicating its intent to stand down the federal OBPS and be replaced by the ON EPS. The ON and federal governments are working closely together to ensure a smooth transition for industry and to ensure there is clear understanding around compliance requirements.</p> <p><u>Ontario's Greenhouse Gas Emissions Reporting</u> Amendments to the Greenhouse Gas Emissions: Quantification, Reporting and Verification regulation (O. Reg 390/18 or the Reporting Regulation) were also made to support the EPS Program. The incorporated document entitled Guideline for Quantification, Reporting and Verification of Greenhouse Gas Emissions (the Guideline) sets out the quantification methods to quantify GHG emissions from an activity. This regulation supports the EPS program by providing verified emissions, production and TAEL data for all registrants in the EPS program which would be needed to determine a facility's compliance obligation under the EPS program.</p> <p>Similar to the EPS Regulation, certain provisions in the Reporting Regulation (e.g., reporting and verification of the TAEL) do not currently apply until Ontario is removed from Part 2 of Schedule 1 of the federal GGPPA.</p> <p>Further amendments were filed on February 11, 2020 to harmonize with the federal requirements and reduce unnecessary costs and regulatory burden for reporters.</p> <p>The amendments:</p> <ul style="list-style-type: none"> Align the definition of "facility" under the Reporting Regulation with the facility definition under the federal Greenhouse Gas Reporting Program (GHGRP);
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	<ul style="list-style-type: none"> Align Ontario methods and requirements with the federal quantification methods and other requirements for facilities, where feasible. In some cases, Ontario requires certain parameters to be reported by covered facilities to support the EPS program that are in addition to what is required under the federal program; Provide the ability for the director to require a revised GHG report from a covered facility under certain circumstances; Delay verification of production parameters until Ontario's EPS is accepted by the federal government and the application of the federal OBPS is removed from Ontario.
Authorizing legislation/regulations	<p><u>Federal Fuel Charge and OBPS</u>: see federal profile.</p> <p><u>ON EPS Program</u>: Both the EPS Regulation and the Reporting Regulation are made under Ontario's Environmental Protection Act (EPA) which includes a robust compliance and enforcement regime including investigations, inspections, and regulatory prosecution resulting in fines or, in certain circumstances, imprisonment.</p>
Compliance options	<p><u>Federal Fuel Charge and OBPS</u>: see federal profile.</p> <p><u>ON EPS Program</u>: The EPS program establishes limits on greenhouse gas emissions. A facility's compliance obligation would be the difference between the facility's verified total emissions and its verified TAEI.</p> <p>A facility could meet the emissions performance standards by:</p> <ul style="list-style-type: none"> Reducing its GHG emissions; Purchasing compliance units from the government (called excess emissions units), or other facilities (e.g., those that have compliance units, called emissions performance units, for having emissions lower than their limit) to satisfy their compliance obligation. <p>Excess emissions units are non-tradable. Emissions performance units can be banked or traded with other covered facilities in the program for up to five years. Additionally, limits have been placed on the quantity of units for covered facilities that have determined the TAEI based on the historical based performance standard to avoid issuing units to facilities that reduce production.</p> <p>The addition of offsets as a compliance mechanism may be considered in the future.</p>
Links and interactions with other systems (if applicable)	<p><u>Federal Fuel Charge and OBPS</u>: see federal profile.</p> <p><u>ON EPS Program</u>: not applicable.</p>

GHG COVERAGE	
% of total GHG emissions from jurisdiction, covered by systems currently in effect	<p>Total % of ON's GHG emissions covered by:</p> <p>Federal Fuel Charge: 56%*</p> <p>Federal OBPS: 27%*</p> <p>* As calculated by ECCC for 2020.</p>
By source	Federal Fuel Charge and OBPS: see federal profile.
By sector, with details on thresholds/standards for coverage	<p><u>Ontario's Greenhouse Gas Emissions Reporting</u></p> <p>By source: Covered emission types include emissions from:</p> <ul style="list-style-type: none"> • Stationary fuel combustion • Industrial processes • Industrial product use • Venting, flaring, and leakage, • On-site transportation • Waste and wastewater
Exemptions	<p><u>ON EPS Program</u></p> <p>Ontario's EPS program covers both fixed process and non-fixed process emissions of facilities.</p> <ul style="list-style-type: none"> • Fixed process emissions are generally the result of chemical or physical reactions (that are not related to combustion). • Non-fixed process emissions include combustion, fugitive and on-site mobile sources. Combustion emissions include greenhouse gases from the burning of fuel. Fugitive emissions result from equipment leaks and unintentional losses. <p><i>By Sector:</i></p> <p>The EPS program applies to facilities that have emitted 50,000 tonnes or more of carbon dioxide equivalent per year, in any year starting from 2014 onward.</p> <p>Facilities that have emitted between 10,000 and 50,000 tonnes of carbon dioxide equivalent per year, in any year starting from 2014 onward may choose to opt into the program.</p> <p>We are regulating the same sectors that are covered by the federal OBPS to simplify reporting and compliance and to provide clarity for Ontario businesses. See Schedule 2 of the EPS Regulation for a complete list of covered sectors.</p> <p><i>Facilities that must register:</i></p> <p>The owner or operator of the facility is required by law to register the facility in the EPS program if it meets the following criteria under section 2 of O. Reg. 241/19:</p>

	<ul style="list-style-type: none"> • The owner or operator of the facility was required to report the facility's greenhouse gas emissions for 2014 or for any subsequent year; • The facility reported 50,000 tonnes or more of CO₂e emissions in one or more reporting year from 2014 onward; • The primary activity at the facility is an industrial activity listed in paragraphs 1 to 38 of Schedule 2 of O. Reg. 241/19 or the owner or operator of the facility has registered the facility under Part II of the <i>Greenhouse Gas Pollution Pricing Act</i> (Canada). <p><i>Facilities that may opt-in:</i> The owner or operator of the facility may choose to register the facility in the EPS program if it meets all the following criteria under section 4 of O. Reg. 241/19:</p> <ul style="list-style-type: none"> • The owner or operator of the facility was required to report the facility's greenhouse gas emissions for 2014 or for any subsequent year; • The facility reported between 10,000 and 50,000 tonnes of CO₂e emissions in one or more reporting year from 2014 onward. • An activity at the facility is an industrial activity listed in Schedule 2 of O. Reg. 241/19; • The owner or operator of the facility has registered the facility under Part II of the <i>Greenhouse Gas Pollution Pricing Act</i> (Canada).
PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	<p><u>Federal Fuel Charge and OBPS:</u> see federal profile.</p> <p><u>ON EPS Program:</u> The non-tradable compliance units that can be purchased from the government for excess emissions (excess emission units) start at \$20 per tonne of carbon dioxide equivalent for 2019 emissions and increase by \$10 per tonne per year up to \$50 per tonne for 2022 emissions – the same price as the federal OBPS.</p> <p>Ontario's regulation has those price increases written into it. Transparency in the price escalation is a critical design feature for signaling to industry certainty around the price they will face and promoting innovation and early action.</p>
INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	<p><u>Federal OBPS:</u> See federal profile for details on addressing industrial competitiveness under the Federal OPBS.</p> <p><u>ON EPS Program:</u> Performance standards also include the application of a stringency factor to incent industry to be energy efficient and encourage emission reductions.</p>

The stringency factor considers competitiveness impacts for industry in order to minimize carbon leakage.

The risk of carbon leakage can be determined based on the results of the emissions intensity (EI) and trade exposure (TE) assessments. The *Ontario Competitiveness and Carbon Leakage Assessment Table* (see below) provides formulas and thresholds for emissions intensity and trade exposure. These form the basis of Ontario's approach to assessing the risk of competitiveness and carbon leakage impacts for businesses subject to carbon control policies, including the emissions performance standards.

Ontario Competitiveness and Carbon Leakage Assessment Table

	Carbon Leakage Risk Indicators	
	Emissions Intensity	Trade Exposure
Step 1: Emissions Intensity and Trade Exposure	$\frac{\text{Emissions (t CO}_2\text{e)}}{\text{Value added ($m)}}$	$\frac{\text{Value of exports + imports}}{\text{Value of domestic shipments + imports}}$
Step 2: Re-assess Medium and Low on Basis of Trade Exposure Only	n/a	$\frac{\text{Value of exports + imports}}{\text{Value of domestic shipments + imports}}$

	Thresholds		
	EITE Rating	Emissions Intensity and Trade Exposure Combination	
Step 1: Emissions Intensity and Trade Exposure		Emissions Intensity	Trade Exposure
	High	≥ 1000	≥ 10%
	Medium	< 1000	≥ 10%
	Low	< 1000	< 10%
Step 2: Re-assess Medium and Low on Basis of Trade Exposure Only	High	n/a	≥ 30%
	Medium or Low	n/a	< 30%

The approach uses a two-step process to determine if a sector is at risk of carbon leakage and to classify the risk as high, medium or low.

- Step 1 of the process uses a combination of emissions intensity and trade exposure (see thresholds in the table) to determine the carbon leakage risk category;
- Step 2 of the process recognizes that for industry in Ontario, trade exposure is high, broad and of great importance. Step 2 employs trade exposure as a standalone metric (see thresholds in the table) to determine carbon leakage risk for sectors that do not fall into the high category in step 1. The European Union also uses trade exposure as a standalone metric for determining carbon leakage risk attributable to its emissions trading system.

The EPS program encourages industry to find innovative ways of reducing their greenhouse gas emissions.

By reinvesting funds into industry, we can help industry make investments in cleaner technology in Ontario, preserve local jobs and improve our environmental performance.

Data and Gaps:

The competitiveness risk of Ontario sectors is evaluated at the level of best available data. In the emission intensity and trade exposure formulas detailed in the table, competitiveness risk is calculated using Statistics Canada data including GDP, shipments and value added data, Industry Canada for trade data, and for greenhouse gas data, Ontario's greenhouse gas reporting data are supplemented with other sources (Environment and

	Climate Change Canada's National Inventory Report, Statistics Canada). Most sectors are evaluated using the North American Industry Classification System (NAICS).
REVENUE RECYCLING/RETURN	
How revenues from carbon pricing are used/returned	<p><u>Federal Fuel Charge and OBPS:</u> The Government of Canada has committed to return all net direct proceeds from the federal carbon pollution pricing system to the jurisdictions of origin.</p> <p>See federal profile for more details.</p> <p><u>ON EPS Program:</u> Funds collected from payments for excess emissions units are required under the EPS to be used primarily to carry out or support GHG and GHG reduction initiatives, particularly in the sectors regulated by the EPS program, and on the administration of the related regulations (the EPS and GHG Reporting regulations).</p>
REPORTING REQUIREMENTS	
Public reporting by government Reporting by regulatees	<p><u>Federal Fuel Charge and OBPS:</u> see federal profile.</p> <p><u>ON EPS Program:</u> <i>Public Reporting:</i> Ontario posts yearly summaries of greenhouse gas emissions by regulated facilities on its Data Catalogue.</p> <p>EPS program related information will be made available on the EPS Program website following the program's full implementation.</p> <p><i>Ontario's Greenhouse Gas Emissions Reporting:</i> The Reporting Regulation and Guideline support the EPS program by providing verified emissions, production parameters and TAEI for all EPS covered facilities which would be needed to determine a facility's compliance obligation under the EPS program.</p> <p>Entities that must submit an annual report include facilities that:</p> <ul style="list-style-type: none"> • Import greater than zero megawatt hours of electricity per year; • Emit 10,000 tonnes or more of carbon dioxide equivalent (CO₂e) per year. <p>Entities that must have their report verified by a third-party include EPS covered facilities which are facilities:</p> <ul style="list-style-type: none"> • Registered under the EPS Regulation; • Required to register under the EPS Regulation.

	<p>Annual reports must include emissions data and for all covered facilities, production parameters. When Ontario is removed from Part 2 of Schedule 1 of the federal GGPPA, the TAEI will also be required to be included in the annual report for all covered facilities.</p> <p>Verification of annual reports are based on the ISO standards framework and must be carried out by an accredited verification body (a verification body that is accredited to ISO 14065 by a member of the International Accreditation Forum).</p> <p>The verification statement includes three types of verification conclusions; one for each of:</p> <ul style="list-style-type: none"> • Emissions • Production parameters • TAEI <p>The provisions requiring the verification of production parameters and TAEI do not currently apply until Ontario is removed from Part 2 of Schedule 1 of the federal GGPPA.</p> <p>Annual reports are to be submitted through the federal Single Window system by June 1 in the year following the year for which the report is prepared. Verification statements and verification reports are to be submitted through Single Window by September 1 in the year following the year for which the report is prepared.</p> <p>To provide temporary relief to businesses, we have extended the June 1, 2020 deadline for greenhouse gas reporting to align with the federal government's recent extension and to maintain reporting harmonization.</p> <ul style="list-style-type: none"> • Emissions reports for 2019 emissions, except production parameters, are now due on July 31, 2020. • Production parameter information for 2019 (paragraph 6 of Schedule 5) is now due on October 1, 2020. • Verification reports and statements for 2019 emissions are now due on October 1, 2020.
UPCOMING MILESTONES	
	<p><u>Federal Fuel Charge and OBPS</u>: see federal profile.</p> <p><u>ON EPS Program</u>: The Governments of ON and Canada are working closely together to ensure a smooth transition to ON's EPS program and removal of ON from Part 2 of Schedule 1 of the federal GGPPA.</p>

	<p>ON is now in a period of transition to work out administrative details with the federal government and determining the timing and next steps for ON's facilities to transition from the federal OBPS to Ontario's EPS program. Further regulatory amendments will be needed to facilitate the transition of ON industry from the federal OBPS program to ON's EPS program.</p> <p>The EPS program is currently designed to the end of 2022. Certain program design elements (e.g., price of excess emissions units, stringency factors, baseline emissions intensities, etc.) will need to be determined for the next phase of the program.</p>
KEY LINKS	
	<p><u>Federal Fuel Charge and OBPS</u>: see federal profile.</p> <p><u>ON</u>:</p> <p>Ontario's Made-in-Ontario Environment Plan</p> <p>Ontario's EPS Program website</p> <p>Ontario's GHG Reporting website</p>

Quebec

SYSTEM INFORMATION	
Overall description	<p>Quebec (QC) has a Cap-and-Trade System for Greenhouse Gas Emissions Allowances (C&T system) to combat climate change. Its primary objective is to encourage businesses and individuals to innovate and make changes to their behaviour to reduce GHG emissions.</p> <p>How does the C&T system work?</p> <ul style="list-style-type: none"> • Emitters must obtain an emissions allowance (term designating emission units and offset credits) per tonne of GHG emitted into the atmosphere and remit all allowances to the government at the end of each compliance period (three years). • The government sets annual caps on GHG emission units (maximum emissions limit). Caps are progressively lowered over time to reduce GHG emissions. • Emission units are sold off by the government at quarterly auctions. Only registered emitters and participants may take part in these auctions. • Emitters exposed to national or international competition receive a portion of the units needed to cover their emissions free of charge. However, the number of units allocated without charge is gradually lowered over time to encourage emitters to take further action to reduce emissions. Allocating units free of charge is a mechanism of the C&T system designed to maintain business competitiveness and to limit the risk of “carbon leakage”. • Emitters that reduce their GHG emissions to below the number of units allocated free of charge (e.g. by improving their production efficiency or by incorporating the use of less polluting green technologies) may sell their surplus units on the carbon market to other emitters who have exceeded their allocation of GHG emissions. • Emitters are also allowed to offset part of their GHG emissions with the use of offset credits. • The C&T system is a green taxation tool that both reduces GHG emissions and develops an entire strategic sector for Quebec’s economy (clean technologies, energy efficiency, transportation electrification, etc.).
Date of implementation	Quebec’s C&T system was introduced in 2012, and compliance obligation began on January 1, 2013.
Authorizing legislation/regulations	<p>In June 2009, the National Assembly of Quebec unanimously passed An Act to amend the Environment Quality Act and other legislative provisions in relation to climate change, which granted the government the power to implement, by regulation, a cap-and-trade system.</p> <p>In November 2009, the Government of Quebec adopted a new GHG emission reduction target of 20% below 1990 levels by 2020 (French only).</p>

	<p>In November 2015, the government set another GHG emission reduction target of 37.5% below 1990 levels by 2030 (French only). These targets are essential for setting the annual GHG emission caps of the C&T system and are legally enforceable.</p> <p>In December 2011, the Government of Quebec passed the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, which set out the rules regarding the operation of the C&T system. Since then, the regulations have been amended multiple times to, for example, incorporate the offset credits system and to link the system with California in 2014.</p>
Compliance options	<p>Compliance periods are three years long (two years for the initial period in 2013–2014).</p> <p>Emissions allowances that are eligible for coverage of emissions:</p> <ul style="list-style-type: none"> • Emission units; • Offset credits (up to 8% of an entity's compliance obligation) ; • Credits for early reductions; • Reserve emission units.
Links and interactions with other systems (if applicable)	<p>Quebec has been a member of the Western Climate Initiative (WCI) since 2008 and officially linked its system with California on January 1, 2014. On January 1, 2018, Quebec's system was also linked with Ontario's, until Ontario repealed its system in mid-2018.</p> <p>Quebec's move to link its market with California as part of the WCI resulted in the creation of the largest carbon market in North America and was the first of its kind to be designed and managed by subnational governments from different countries.</p>
GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	<p>Total % of GHG emissions in QC covered by: QC SPEDE: 80%*</p> <p>*As calculated by Quebec for 2020.</p>
By sector, with details on	<p>Quebec's C&T system targets the following companies (emitters).</p> <p>By source:</p> <ul style="list-style-type: none"> • carbon dioxide (CO₂); • methane (CH₄); • nitrous oxide (N₂O); • hydrofluorocarbons (HFC); • perfluorocarbons (PFC); • sulphur hexafluoride (SF₆); • nitrogen trifluoride (NF₃).

<p>thresholds/standards for coverage</p>	<p>By sector:</p> <ul style="list-style-type: none"> • Transport; • Industry; • Residential, commercial and institutional; • Electricity generation. <p>Since 2013:</p> <ul style="list-style-type: none"> • Industrial establishments that emit 25,000 tonnes of CO₂ equivalent (tCO₂e) or more per year (aluminum smelters, cement plants, refineries, chemical plants, steel mills, mines, etc.); • Electricity producers and importers whose GHG emissions associated with electricity generation are ≥ 25,000 tCO₂e per year. <p>Since 2015:</p> <ul style="list-style-type: none"> • Distributors that distribute 200L or more of fuels and fossil fuels used in Quebec. <ul style="list-style-type: none"> ○ Distributors must cover GHG emissions from the use of products they distribute. <p>Since 2019:</p> <ul style="list-style-type: none"> • Industrial establishments that report annual emissions that are ≥ 10,000 tCO₂e, but less than the coverage threshold of 25,000 tCO₂e, may voluntarily register to become emitters subject to the C&T system. <p>Quebec's system was designed with efficiency in mind—that is, with the aim of covering the maximum amount of GHG emissions while limiting the number of subject entities.</p> <p>The carbon market is also open to individuals and corporations who wish to participate (i.e. participants) even if they have no regulatory obligation to do so (investors, brokers, consultants, offset credit developers, etc.).</p>
<p>Exemptions</p>	<p>Emitters must report their atmospheric emissions every year in accordance with the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere. Reporting must be done before June 1 of the following year and must be verified by an independent third party. The C&T system does not cover emissions from the following sources:</p> <ul style="list-style-type: none"> • Waste (non-energy); • Agriculture (non-energy); • Emissions originating from air and marine transport. <p>Although these sources are not directly covered by the system, they remain part of it, since it is possible to create offset credits for certain reductions in these sectors.</p> <p>To this end, the implementation of offset credit projects is governed by a protocol that determines the conditions and rules to be followed—</p>

	<p>particularly with regard to project eligibility and the quantification, reporting and verification of emission reductions to ensure the quality of credits issued and their fungibility on the carbon market.</p> <p>The Quebec Regulation currently contains five offset credit protocols:</p> <ul style="list-style-type: none"> • Protocol 1 - Covered manure storage facilities – CH₄ destruction; • Protocol 2 - Landfill sites – CH₄ treatment or destruction; • Protocol 3 - Destruction of ozone-depleting substances (ODS) contained in insulating foam or used as refrigerants removed from refrigerators, freezers and air conditioners; • Protocol 4 - Active coal mines – Destruction of CH₄ from drainage systems; • Protocol 5 - Active underground coal mines – Destruction of CH₄ from ventilation systems.
PRICE/CAPS	
Additional details on either carbon price or caps, including changes over time	<p><u>Market prices</u></p> <p>According to the prices reported in the Compliance Instrument Tracking System Service (CITSS) during emission transfers, the average sale price (weighted average) of emissions units transferred in the third quarter of 2020 [link in French] was \$22.75/t CO₂ e.</p> <p><u>Market stability mechanisms</u></p> <p>Quebec's C&T system includes mechanisms to stabilize market prices and create the predictability required to plan investments while avoiding large fluctuations in the market. These measures include a minimum selling price and a strategic reserve (the Minister's reserve).</p> <p>1. Auctions</p> <p>Emission units are sold by the government at quarterly auctions.</p> <p>During auctions, the government sets a minimum selling price on units. In 2020, Quebec's minimum price for one emission unit is \$16.34/tCO₂e. However, for joint auctions with California, the minimum price corresponds to the highest of the minimum prices set by the partner governments. The minimum joint price is calculated based on the exchange rate in effect the day prior to the auction or, if that rate is not available, based on the most recently available rate published by the Bank of Canada. As a result, although Quebec's minimum price is \$16.34/tCO₂e, the minimum price applied at the last auction (November 2020) was \$21.83/tCO₂e, i.e. the conversion of California's minimum price (USD\$16.68/tCO₂e).</p> <p>It should be noted that the minimum price in Quebec and California is increased annually by 5% plus inflation and that there is no maximum price during an auction.</p>

2. [Sales by mutual agreement by the Minister](#)

Emission units are sold by the Government of Quebec at sales by mutual agreement by the Minister, which take place a maximum of four times per year. These sales are intended as a last resort opportunity for emitters to obtain the units required to comply with their regulatory obligation.

Participation in a sale by mutual agreement by the Minister is reserved for emitters in Quebec. To date, no units have been sold at such a sale.

GHG emission units made available to emitters during a sale by mutual agreement by the Minister come from the Minister's reserve, which was created when the C&T system was implemented. To accomplish this, 1% was removed from the 2013 and 2014 emission unit budgets, 4% from the 2015, 2016 and 2017 budgets, 7% from the 2018, 2019 and 2020 budgets, and 4% from the 2021–2030 emission budgets. When the reserve was created, GHG emission units made available to emitters were also divided into three categories (A, B and C).

In 2020, the selling price of emission units is expected to be \$60.79 for category A units, \$68.38 for category B units and \$75.97 for category C units.

Prices of reserve units are increased annually by 5% plus inflation.

Annual caps on emission units

Annual caps on GHG emission units (maximum emissions limit) are set by the government. Caps are progressively lowered over time to reduce GHG emissions.

In accordance with Orders in Council [1185-2012](#) and [1126-2017](#), annual caps are as follows:

- for the year 2013, 23.20 million emission units;
- for the year 2014, 23.20 million emission units;
- for the year 2015, 65.30 million emission units;
- for the year 2016, 63.19 million emission units;
- for the year 2017, 61.08 million emission units;
- for the year 2018, 58.96 million emission units;
- for the year 2019, 56.85 million emission units;
- for the year 2020, 54.74 million emission units;
- for the year 2021, 55.26 million emission units;
- for the year 2022, 54.02 million emission units;
- for the year 2023, 52.79 million emission units;
- for the year 2024, 51.55 million emission units;
- for the year 2025, 50.31 million emission units;
- for the year 2026, 49.08 million emission units;
- for the year 2027, 47.84 million emission units;

	<ul style="list-style-type: none"> • for the year 2028, 46.61 million emission units; • for the year 2029, 45.37 million emission units; • for the year 2030, 44.14 million emission units.
INDUSTRIAL COMPETITIVENESS	
Mitigating the risks of loss of competitiveness and carbon leakage in the context of carbon pollution pricing	<p>Given the potential impact of the C&T system on operating costs and the limited ability of emitters to transfer costs associated with carbon pricing to their customers, emitters identified as emissions-intensive trade-exposed (EITE), e.g. aluminum smelters, steel mills, cement plants, and pulp and paper mills, are considered more vulnerable to carbon leakage.</p> <p>To maintain business competitiveness and promote innovation in the above sectors, the Government of Quebec has, like other governments that have implemented C&T systems, introduced a mechanism directly into its system to reduce the risk of carbon leakage: the allocation of emission units free of charge.</p> <p>The number of emission units allocated per year to most EITE emitters is calculated based on their production and their GHG emission intensity targets. Intensity targets are set by taking into account the types of GHG emitted by companies (combustion, fixed process or other, mainly fugitive, emissions) and the various reduction options available to them. To encourage companies to continue innovating and improving their environmental performance, intensity targets are gradually reduced over time.</p> <p>On the one hand, this approach allows companies to increase their production without being penalized. On the other, it also prevents allocating too many free emission units to companies that have reduced their production or whose environmental performance has not improved. Calculation method used to determine the quantity of emission units allocated free of charge</p> <p>The number of emission units allocated to EITE emitters is calculated on the basis of the actual quantity of reference units produced or used and their GHG emission intensity target (intensity target). Generally, intensity targets are set based on the quantity of GHGs reported per reference unit during a reference period (i.e. levels observed between 2007 and 2010 for most EITE emitters) and are expressed in tonnes of CO₂ equivalent (tCO₂e) per reference unit.</p> <p>Number of free emission units = Assistance factor × (Intensity target × Quantity of reference units)</p> <p>Intensity targets:</p>

For the first compliance period (2013–2014), intensity targets were set at 100% of the historical averages for fixed process emissions and other (mainly fugitive) emissions. For combustion emissions, targets were set at between 80% and 100%, depending on the fuels used.

Between 2015 and 2020, intensity targets for fixed process emissions remained at 100%, whereas targets for combustion and other emissions were lowered by 1%–2% each year so as to encourage companies to reduce their emissions. For 2021–2023, intensity targets for fixed process emissions, combustion emissions and other emissions decreased by 0.5%, 1.5% and 3% per year, respectively.

Similar rules apply to new emitters and to those who decide to voluntarily opt into the system, with reference years adapted based on the year in which participants reach the coverage threshold or the year in which they submit a voluntary opt-in application.

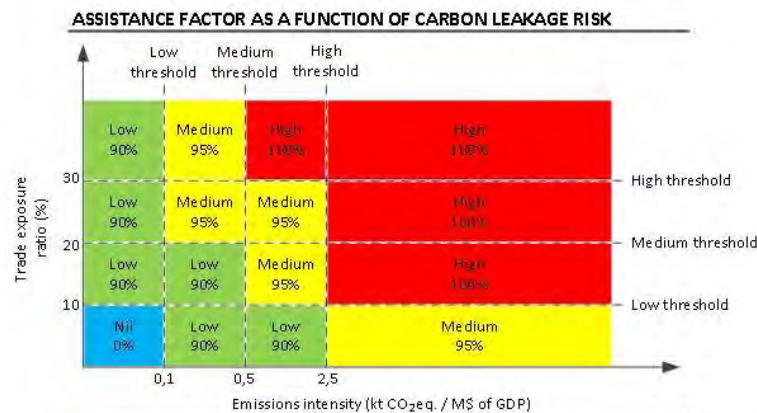
Assistance factors (AF):

The number of emission units allocated free of charge to each establishment is adjusted based on the emitter's assistance factor (AF), which depends on the estimated level of carbon leakage risk for its industry sector. The AF for all EITE emitters has been set at 100% through to 2020.

For 2021–2023, AFs will vary depending on the estimated carbon leakage risk. The level of risk depends on the combination of the trade exposure ratio and emission intensity metrics described above. The diagram below presents the classification used.

Note that, according to this classification, AFs for EITE emitters vary from 90% to 100%.

Note that in certain conditions, the AF for the electricity sector is 60%, whereas in other cases, the AF is zero (0).



REVENUE RECYCLING	
How revenues from carbon pricing are used	<p>For the Government of Quebec, the fight against climate change is a key priority issue. Working together with its partners, Quebec will continue to take proactive steps and maintain its momentum to achieve even greater accomplishments in this area.</p> <p>Using proceeds from the carbon market, which are paid into the Electrification and Climate Change Fund (French only), the Government of Quebec is supporting businesses, local municipalities and individuals in the transition to a lower-carbon world. All revenue is reinvested in the implementation of the 2013–2020 Climate Change Action Plan and the 2021–2030 Plan for a Green Economy (PGE), which will allow Quebec to reduce its GHG emissions and better respond to the effects of climate change.</p> <p>These measures, which rely on innovative solutions from researchers and contractors, pave the way for Quebec to develop its expertise in new niche sectors and to accelerate its shift towards a sustainable, vibrant and competitive economy. Thus, the fight against climate change is helping to build an economy that is both robust and low-carbon.</p>
REPORTING REQUIREMENTS	
Public reporting by government	<p>Under section 35 of the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, the Minister must publish the list of registered emitters, participants and clearing houses and a summary of transactions conducted the previous year at least once a year on the departmental website.</p> <p>In addition to the above, more information and many reports on Quebec’s C&T system are available under the carbon market documentation section on the website of the Ministère de l’Environnement et de la Lutte contre les changements climatiques.</p>
Reporting by regulates	
UPCOMING MILESTONES	
	<p>The Government of Quebec is currently determining the rules for the allocation of emission units free of charge to support EITE emitters in 2024–2030. For example, free allocations to emitters may be adjusted according to international carbon pricing levels, thus taking into consideration the gap between carbon pricing levels in Quebec and those in other parts of the world.</p>
KEY LINKS	
	<p>An Act to amend the Environment Quality Act and other legislative provisions in relation to climate change</p>

	<p><i>Regulation respecting a cap-and-trade system for greenhouse gas emission allowances</i></p> <p><i>Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere</i></p> <p>Quebec's commitments to the fight against climate change</p> <p>Quebec, an international leader</p> <p>2013–2020 Climate Change Action Plan</p> <p>2021–2030 Plan for a Green Economy</p> <p>Electrification and Climate Change Fund (French only)</p> <p>Carbon market section on the website of the Ministère de l'Environnement et de la Lutte contre les changements climatiques</p>
OTHER INFORMATION	
	<p>The key objectives of Quebec's 2021–2030 Plan for a Green Economy include the following:</p> <ul style="list-style-type: none"> • Reduce GHG emissions by 37.5% below 1990 levels by 2030. • Achieve carbon neutrality by 2050. • Have 1.5 million electric vehicles on the road in Quebec by 2030. • No sales of new gasoline-powered vehicles as of 2035. • 55% of city buses and 65% of school buses electrified by 2030. • 100% of governmental cars, SUVs, vans and minivans and 25% of pickup trucks electrified in 2030. • 50% reduction in emissions related to heating for buildings by 2030. • 60% reduction in emissions from government buildings by 2030. • 10% renewable natural gas (RNG) in the network in 2030. • 50% increase in bioenergy production by 2030. • 70% of off-grid systems energy supply from renewable sources by 2025. <p>The Plan will build on complementary policies and action plans to achieve its climate objectives, including:</p> <ul style="list-style-type: none"> • Quebec Energy Transition, Innovation and Efficiency Master Plan • 2030 Energy Policy (in French) • Sustainable Mobility Policy (in French) • Quebec's strategy for developing the battery sector (in French) • Quebec Plan for the Development of Critical and Strategic Minerals • Quebec's International Vision • Government Sustainable Development Strategy

New Brunswick

SYSTEM INFORMATION	
Overall description	<p>New Brunswick (NB) has a provincially administered carbon tax. The federal OBPS is currently in effect (December 2020) in NB: see federal profile for more details.</p> <p>A NB OBPS has been developed as an alternative to the federal OBPS. The NB OPBS has been accepted by the federal government with transition negotiations underway.</p> <p><u>The NB carbon tax</u> commenced under the <i>Gasoline and Motive Fuel Tax Act</i> as of April 1, 2020. The tax is set at \$30/t CO₂e and applies to 20 separate fuels.</p> <p><u>NB OBPS:</u> In July 2019, New Brunswick submitted a proposal for a provincial OBPS (NB OBPS) to the Government of Canada, with the intention of replacing the federal OBPS in the province. In September 2020, the federal government indicated that the proposal meets the federal benchmark criteria, as well as indicating its intent to stand down the federal OBPS and be replaced by the NB OPBS. At the time of writing this report, the NB and federal governments are working closely together to ensure a smooth transition.</p> <p>In November 2020, New Brunswick posted for public comment a draft regulation under the <i>Climate Change Act</i> titled the <i>Reduction of Greenhouse Gas Emissions Regulation</i> to support the NB OBPS (the “draft NB OBPS Regulation”).</p> <p>The NB OBPS is a regulatory approach that establishes facility specific GHG emissions intensity performance standards that New Brunswick’s large industry will be required to achieve. For electricity generation, the NB OBPS sets performance standards for gaseous, solid and liquid fuels used in electricity generation. The standards for electricity generation have been designed to reduce GHG emissions while minimizing rate impacts on New Brunswickers.</p> <p>For both industry and electricity generation, facilities which do not meet their respective standards will have a compliance obligation.</p> <p>The approach ensures that industry and electricity generators are contributing their share to reduce the province’s overall</p>

	<p>GHG emissions in a way that is fair, cost-effective and flexible to the unique circumstances within New Brunswick.</p> <p>Facilities that emit 50,000 t CO₂e per year or more will be required to participate in the system. Facilities emitting between 10,000 t CO₂e per year and the mandatory threshold will be permitted to voluntarily opt-in to the program. Facilities subject to the NB OBPS will be exempt from the provincial carbon tax.</p>
Date of implementation	<p><u>NB carbon tax</u>: The NB carbon tax came into effect on April 1, 2020 replacing the federal fuel charge in the province.</p> <p><u>Federal OBPS</u>: see federal profile.</p> <p><u>NB OBPS</u>: The draft NB OBPS Regulation proposes an implementation date of January 1, 2020.</p>
Authorizing legislation/regulations	<p><u>NB carbon tax</u>: The NB carbon tax contained within the <i>Gasoline and Motive Fuel Tax Act</i>.</p> <p><u>Federal OBPS</u>: see federal profile.</p> <p><u>NB OBPS</u>: The NB OBPS is contained within the <i>Climate Change Act</i> and the proposed draft <i>Reduction of Greenhouse Gas Emissions Regulation</i>.</p>
Compliance options	<p><u>NB carbon tax</u>: payment of tax.</p> <p><u>Federal OBPS</u>: see federal profile.</p> <p><u>NB OBPS</u>: The draft NB OBPS Regulation proposes that a regulated facility will have a compliance obligation imposed if the total quantity of regulated emissions exceeds the emissions limit within a given compliance period. It is proposed that regulated facilities will have the following options to fulfill a compliance obligation:</p> <ul style="list-style-type: none"> • Purchase fund credits at the established price (set at the federal requirement of \$30/tonne in 2020, increasing by \$10 per year to \$50/tonne in 2022); • Purchase performance credits from other high performing regulated facilities, if enabled by government; and/or • Purchase offset credits, if enabled by government.
Links and interactions with other systems (if applicable)	<p><u>For Federal OPBS</u>: see federal profile.</p>

GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	<p>Total % of NB's GHG emissions covered by:</p> <p>NB carbon tax:31%*</p> <p>Federal OBPS:55%*</p> <p>* As calculated by ECCC for 2020, as of April 1, 2020 when the NB carbon tax came into effect.</p>
<p>By source</p> <p>By sector, with details on thresholds/standards for coverage</p> <p>Exemptions</p>	<p><u>The NB carbon tax</u> applies to the following fuels:</p> <ul style="list-style-type: none"> • Butane; • Diesel fuel; • Ethane; • Gas liquids; • Gasoline; • Heavy fuel oil; • Light fuel oil; • Methanol; • Naphtha; • Petroleum coke; • Pentanes plus; • Propane; • Coke oven gas; • Marketable natural gas; • Non-marketable natural gas; • Still gas; • Coke; • High heat value coal; • Low heat value coal; and • Combustible waste. <p>As of April 1, 2020, consumers in possession of a valid purchasers permit, which entitles the holder to purchase tax exempt motive fuel, were entitled to an exemption of the tax for the following classes of consumer:</p> <ul style="list-style-type: none"> • Aquaculturalist; • Farmer; • Fisher; • Silviculturalist; • Wood Producer; • Forest Worker; • Manufacturer; • Mining and Quarrying; • Operation of a registered vessel; and • Large emitter

	<p>In addition to the exemptions provided for under subsection 6.3(10) of the <i>Gasoline and Motive Fuel Tax Act</i>, diesel fuel, light fuel oil and propane may also be purchased, acquired, used or consumed exempt of the tax on carbon emitting products in accordance with section 6.3(11) of the Act for the purposes of preparing food, heating and lighting of premises, and heating water for domestic use.</p> <p>If consumers listed above choose not to obtain a purchaser's permit, they can also opt to buy their fuel and/or carbon emitting product tax paid and subsequently apply for a refund.</p> <p><u>Federal OBPS</u>: see federal profile.</p> <p><u>NB OBPS</u>: Under the draft NB OBPS Regulation, it is proposed that facilities emitting greater than 50,000 tonnes of CO₂e per year are required to participate under the system. Facilities emitting between 10,000 and 50,000 tonnes of CO₂e will be permitted to voluntarily opt in.</p> <p>The NB OBPS will cover GHG emissions from the following sectors in the province:</p> <ul style="list-style-type: none"> • Electricity Generation; • Food sectors; • Lime; • Non-ferrous metal smelting, refining (i.e. nickel, copper); • Petroleum refining • Pulp and paper; and • Wood product manufacturing. <p>For large industrial emitters, as per the draft NB OBPS Regulation, it is proposed that these facilities will be required to reduce emissions by 10% by 2030.</p> <p>For regulated facilities involved in electricity generation, it is proposed that these facilities will be required to annually meet the three-fuel standard as set out below in the draft NB OBPS Regulation.</p>
PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	<p><u>NB carbon tax</u>: The NB carbon tax is set at \$30/t CO₂e for the year 2020-2021.</p> <p><u>NB OBPS</u>: The price per tonne will be set at the federal requirement of \$30/tonne in 2020, increasing by \$10 per year to \$50/tonne in 2022.</p>

INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	<p><u>Federal OBPS:</u> See federal profile for details on addressing industrial competitiveness under the federal OBPS.</p> <p><u>NB OBPS:</u> New Brunswick's Emissions Intensity Trade Exposure ("EITE") analysis adopts federal EITE metrics to address industries' carbon leakage and competitiveness risk under carbon pricing. Specifically, the emission intensity is calculated as the cost of GHG emission per unit of gross value added, while the trade exposure is expressed as an industry's total volume of trade flow (i.e., sum of imports and exports) divided by the sum of its domestic sales. In addition, a two-step process is introduced to recognize the reality of NB large emitters' low ability to pass through carbon costs to their consumer due to the high exposure.</p> <p>The NB EITE analysis results illustrate that all NB large industrial emitters are at the high carbon leakage and competitiveness risk. Therefore, the NB OBPS warrants stringency adjustments to mitigate the negative impacts of carbon pricing on NB large emitters by addressing their carbon leakage and competitiveness concerns in an economically and technological achievable way.</p>
REVENUE RECYCLING	
How revenues from carbon pricing are used	<p><u>NB carbon tax:</u> Incremental revenue from NB's carbon tax has been committed to support climate change mitigation and adaptation related initiatives.</p> <p><u>Federal OBPS:</u> see federal profile.</p> <p><u>NB OBPS:</u> Revenue from the NB OBPS will be directed to the Climate Change Fund to support climate change related initiatives.</p>
REPORTING REQUIREMENTS	
Public reporting by government Reporting by regulatees	<p><u>NB carbon tax:</u> As per the <i>Climate Change Act</i>, the Minister is required to report at least once every year outlining the status of the actions set out in the New Brunswick Climate Change Action Plan and the outcomes and impacts of carbon pricing policies.</p> <p><u>Federal OBPS:</u> see federal profile.</p> <p><u>NB OBPS:</u> The Minister is required to prepare a report on the Climate Change Fund outlining a description of the amounts</p>

	credited to the fund for the year, a description of the initiatives that were funded, and any other information prescribed by the draft NB OBPS Regulation.
UPCOMING MILESTONES	
	<u>NB OBPS</u> : Development of the NB OBPS associated regulation and standards are ongoing. Once there is a federal decision on the effective date of the NB OBPS, more details on the system can be finalized.
KEY LINKS	
	NB Climate Change Action Plan Holding Large Emitters Accountable: New Brunswick's Output-Based Pricing System <u>Federal OBPS</u> : see federal profile.

Nova Scotia

SYSTEM INFORMATION	
Overall description	<p>Nova Scotia (NS) has a provincial cap-and-trade program that sets yearly limits or “caps” on the total amount of GHG emissions allowed in the province for the years 2019–2022. Each year, the province creates a set number of emission allowances that can be put in circulation equal to that year’s cap.</p> <p>Some of the emission allowances are provided free of charge to mandatory participants, some are sold through auction, and some are set aside for sale through a government-held reserve. Mandatory participants can also buy emission allowances on the secondary market from another participant.</p> <p>The compliance period is from 2019–2022. Each year, the cap declines, which means fewer emission allowances are available and there is a greater incentive to find ways to reduce GHG emissions.</p> <p>Only mandatory participants can directly participate in the program. These include:</p> <ul style="list-style-type: none"> • Facilities generating 50,000 tonnes or more per year of GHG emissions from specified GHG activities; • Petroleum product suppliers that first place 200 litres of fuel or more per year on the Nova Scotia market for consumption (includes automotive gasoline, diesels, light fuel oils (No. 1, 2), heavy fuel oils (No. 3, 4, 5, 6), and propane); • Natural gas distributors that deliver natural gas for consumption in Nova Scotia that, when combusted, produces 10,000 tonnes of GHG emissions or more per year; • Electricity importers that import electricity into the province for consumption in the province and whose GHG emissions from the generation of the electricity imported is greater than 10,000 tonnes of GHGs annually.
Date of implementation	NS’s cap-and-trade program was implemented on January 1st, 2019.
Authorizing legislation/regulations	<p>The following legislation and/or regulations governs the program:</p> <p><i>Environment Act</i> amendments to enable economy-wide cap-and-trade system came into force on February 15, 2018.</p>

	<p>Greenhouse gas <i>Quantification, Reporting, and Verification Regulations</i> came into force on February 18, 2018 to support the development and implementation of the cap and trade program.</p> <p><i>Cap and Trade Program Regulations</i> came into force on November 13, 2018.</p> <p><i>Petroleum Products Pricing Regulations</i> were amended as of November 13, 2018 to allow for carbon costs to be included in the price of regulated fuels.</p>
Compliance options	<p>On December 15, 2023, mandatory participants will need to remit one emission allowance for each tonne of GHG emissions that they emitted over the course of the compliance period (2019-2022).</p> <p>Only emission allowances created by the province are recognized under the cap-and-trade program. These can be acquired through sale at auction, government-held reserve sales and trading between participants.</p>
Links and interactions with other systems (if applicable)	NS's cap-and-trade program is not linked with other systems.
GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	<p>Total % of NS's GHG emissions covered by: NS Cap and Trade System: 87%*</p> <p>* As calculated by ECCC for 2020.</p>
<p>By source</p> <p>By sector, with details on thresholds/standards for coverage</p> <p>Exemptions</p>	<p>NS's cap-and-trade program covers the following greenhouse gas emissions:</p> <ul style="list-style-type: none"> • carbon dioxide (CO₂) • methane (CH₄) • nitrous oxide (N₂O) • hydrofluorocarbons (HFC) • perfluorocarbons (PFC) • sulfur hexafluoride (SF₆) • nitrogen trifluoride (NF₃) <p>The GWPs used are in Schedule 1 of <i>Quantification, Reporting, and Verification Regulations</i>.</p> <p>Sectors included in the cap are all those captured by verification requirements in the <i>Quantification, Reporting and Verification Regulations</i>. This includes:</p>

	<ul style="list-style-type: none"> • Cement production • Electricity generation • Electricity importation • General stationary combustion • Operation of equipment for an electricity transmission or distribution system • Operation of equipment related to the transmission, storage and transportation of natural gas • Onshore petroleum and natural gas production and natural gas processing • Pulp and paper production • Supplying petroleum products in the Province • Distributing natural gas in the Province <p>NS's <i>Cap-and-Trade Program Regulations</i> require the following to participate in the program (includes fuels and sources):</p> <ul style="list-style-type: none"> • Facilities generating 50,000 tonnes or more per year of GHG emissions from specified GHG activities; • Petroleum product suppliers that first place 200 litres of fuel or more per year on the Nova Scotia market for consumption (includes automotive gasoline, diesels, light fuel oils (No. 1, 2), heavy fuel oils (No. 3, 4, 5, 6), and propane) • Natural gas distributors that deliver natural gas for consumption in Nova Scotia that, when combusted, produces 10,000 tonnes of GHG emissions or more per year; • Electricity importers that import electricity into the province for consumption in the province and whose GHG emissions from the generation of the electricity imported is greater than 10,000 tonnes of GHGs annually. <p>Exemptions include:</p> <ul style="list-style-type: none"> • GHG emissions from non-combustion sources in agriculture and waste sectors • GHG emissions from offshore oil and gas production • coal mine methane • GHG emissions from coal storage • industrial process emissions • carbon dioxide emissions from combustion of biomass • fugitive natural gas emissions from the operation of equipment related to the transmission, storage, and transportation of natural gas • fugitive hydrofluorocarbon (HFC) emissions from the operation of cooling units at electricity generators • fugitive gas emissions from the operation of geothermal electricity generating facilities • GHG emissions from industrial wastewater
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	<ul style="list-style-type: none"> GHG emissions from fuels used in aviation and marine applications <p>Further details on the scope of emission coverage can be found in:</p> <p><i>Quantification, Reporting, and Verification Regulations</i></p> <p><i>Cap and Trade Program Regulations</i></p>
PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	<p>Annual caps for the 2019-2022 period are:</p> <ul style="list-style-type: none"> 2019 cap: 13,683,000 Mt 2020 cap: 12,725,000 Mt 2021 cap: 12,258,000 Mt 2022 cap: 12,148,000 Mt <p>The minimum price is \$20 per emission allowance for auctions held in 2020. For each year after 2020, the minimum price will increase by 5% plus inflation.</p>
INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	<p>Eligible EITE facilities including cement, natural gas and pulp and paper receive some allowances free of charge in accordance with an industrial facility allocation based on a production intensity benchmark.</p> <p>Industrial facilities are eligible to receive free allowances based on a historical facility production intensity benchmark established relative to a historical baseline. Electricity sector facilities are not included.</p> <p>Specific production levels, assistance factors as well as an established cap decline rate factor into the number of allowances an industrial facility will receive each year. More information on specific calculations performed are described in Schedule 1—Calculation of Allocation of Emissions Allowances Without Charge to Facility Emitters Other than NSPI, in the <i>Cap and Trade Program Regulations</i>.</p> <p>EITE facilities account for a very small proportion of the GHG emissions covered by the Cap and Trade Program, 1.2% in 2019. The opportunity to receive eligible free allowances based on benchmarking helps address some competitiveness concerns.</p>

REVENUE RECYCLING/RETURN	
How revenues from carbon pricing are used/returned	<p>All revenue is deposited into the Green Fund and must be used to support the following legislated purposes:</p> <ul style="list-style-type: none"> • financing measures to reduce, limit or avoid greenhouse gas emissions; • financing the research and development of innovative technology to reduce, limit or avoid greenhouse gas emissions; • financing measures to mitigate the economic and social impact of measures to reduce, limit or avoid greenhouse gas emissions; • financing public awareness campaigns respecting climate change or measures to reduce, limit or avoid greenhouse gas emissions; • financing adaptation to climate change; • financing the development of, and the participation of the Government of the Province in, regional and international initiatives respecting climate change.
REPORTING REQUIREMENTS	
<p>Public reporting by government</p> <p>Reporting by regulatees</p>	<p>The Minister of Environment has an obligation under section 112 P(2) of the <i>Environment Act</i> to report annually on the use of the revenue in the Green Fund.</p> <p>Cap-and-trade participants are required to annually submit independent verified third-party GHG reports.</p> <p>Annual GHG emissions from regulated entities are publicly available.</p> <p>Nova Scotia publicly reports an auction summary including the settlement price, number of emission allowances sold, and a list of registered participants.</p>
KEY LINKS	
	NS's cap-and-trade program website

Prince Edward Island

SYSTEM INFORMATION	
Overall description	<p>Prince Edward Island (PEI) has a provincial regulatory levy on fossil fuels ‘fuel levy’). The federal OBPS also applies in the province: see federal profile for more details.</p> <p><u>PEI Fuel Levy:</u> The fuel levy applies to fossil fuels listed in the federal GGPPA. PEI’s <i>Climate Leadership Act</i> contains a schedule (Schedule 1) indicating the carbon levy for 26 different fuel types for both 1 April 2019, and 1 April 2020.</p> <p>The fuel charge is collected primarily at the wholesale level; wholesalers under the provincial <i>Petroleum Producers Act</i> who distribute a fuel listed in Schedule 1 must register as an Agent of the Province for the collection of the carbon levy.</p> <p>If you are not subject to the above, but you do sell any fuel that is subject to a levy under the <i>Climate Leadership Act</i>, you are required to register as an Agent of the Province for the collection of the levy</p> <p>After April 1, 2019, as a consumer who is using fuel on which the carbon levy has not been paid, you must self declare on the fuel used and pay the carbon levy on that fuel.</p>
Date of implementation	<p><u>PEI’s Fuel Levy:</u> came into force on 1 April 2019.</p> <p><u>Federal OBPS:</u> see federal profile.</p>
Authorizing legislation/regulations	<p>PEI’s Climate Leadership Act received Royal Assent on 5 December 2018. The fossil fuel levy regulations were published in the Royal Gazette on 23 February 2019, while amendments to the regulations were published on 22 August 2020. Prince Edward Island indicated that it was going to voluntarily participate in the federal OBPS as part of its Climate Change Action Plan.</p>
Compliance options	<p><u>PEI Fuel Levy:</u> payment of levy</p> <p><u>Federal OBPS:</u> see federal profile</p>
Links and interactions with other systems (if applicable)	<p><u>For Federal OBPS:</u> see federal profile</p>

GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	<p>Total % of PEI's GHG emissions covered by:</p> <p>PEI Fuel Levy: 52%*</p> <p>Federal OBPS: 4%*</p> <p>* As calculated by ECCC for 2020.</p>
<p>By source</p> <p>By sector, with details on thresholds/standards for coverage</p> <p>Exemptions</p>	<p><u>PEI Fuel Levy:</u></p> <p>PEI's <i>Climate Leadership Act</i> contains a schedule indicating the carbon levy for 26 different fuel types for both 1 April 2019, and 1 April 2020.</p> <p>Exemptions exist for the following types of fuels:</p> <ul style="list-style-type: none"> • The fuel levy does not apply to furnace oil and propane • The fuel levy applies at a lower rate for marked gasoline and marked diesel (1 cpl from 1 April 2019 to 1 April 2020, and 2 cpl from 1 April 2020 to 1 April 2021) <p>Exemptions exist for the following use cases:</p> <ul style="list-style-type: none"> • Farmers - Fuel purchased by a farmer is exempt from the levy if the farmer provides at the time of purchase a valid levy exemption permit for the fuel, or other evidence of exemption for the fuel in accordance with the regulations; and the fuel is marked fuel to be used for agricultural operations on a farm or for travel between or within farms. • Fishers - Fuel purchased by a fisher is exempt from the levy if the fisher provides at the time of purchase a valid levy exemption permit for the fuel, or other evidence of exemption for the fuel in accordance with the regulations; and the fuel is marked fuel to be used for commercial fishing operations. • Aquaculturists - Fuel purchased by an aquaculturist is exempt from the levy if the aquaculturist provides at the time of purchase a valid levy exemption permit for the fuel, or other evidence of exemption for the fuel in accordance with the regulations; and the fuel is marked fuel to be used for aquaculture operations. • Custom agricultural contractors - Fuel purchased by a custom agricultural contractor is exempt from the if the custom agricultural contractor provides at the time of purchase a valid levy exemption permit for the fuel, or other evidence of exemption for the fuel in accordance with the regulations; and the fuel is marked fuel to be used for custom agricultural contracting operations on a farm. • Interjurisdictional passenger and cargo flights - Fuel purchased for use in a flight is exempt if evidence is provided at the time of purchase that the flight (a) is operated by an interjurisdictional air service; and (b) begins or

	<p>ends outside the province, and that beginning or ending outside the province is integral to the provision of the air service. Exception - emergency landing</p> <ul style="list-style-type: none"> • Cruise ships - Fuel purchased for use in the operation of a cruise ship is exempt from the levy if evidence is provided at the time of purchase that the cruise is offered to members of the public for a fee; and the cruise ship has a scheduled port of call outside of the province. • Commercial vessel - Fuel purchased for use in the operation of a commercial vessel is exempt if the commercial vessel is being used for the carriage of passengers or freight from this province to another province, territory or country for a fee; or the dredging of the ocean bed in extra-territorial waters. • Out of province marine craft - Fuel purchased for use in the operation of a marine craft that is registered outside the province is exempt from the levy if (a) the owner of the marine craft is in possession of a valid levy exemption permit issued on behalf of the province of registration of the marine craft; (b) the marine craft is actually being employed in commercial fishing operations; and (c) the fuel is marked fuel to be used in commercial fishing operations. <p><u>Federal OBPS</u>: see federal profile for coverage of facilities.</p> <p>Note: a significant share of PEI's GHG emissions come from the agricultural sector (e.g. from livestock and croplands) that are not covered by either the PEI Fuel Levy or the federal OBPS.</p>
PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	<p><u>PEI Fuel Levy</u>: PEI's carbon price began at \$20/ t CO₂e on 1 April 2019, and increased to \$30/t CO₂e on 1 April 2020.</p> <p><u>Federal OBPS</u>: see federal profile.</p>
INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	<p>The manufacturing sector, specifically food processing is the part of the Island economy where EITE industries are located. Potato processing exports 80 percent of its product internationally, with the majority going to the United States (87.5 percent in 2017). This product competes against product from the United States which does not have any carbon pricing. Though manufacturing represents over 10 percent of the Island economy, industry is responsible for only six percent of greenhouse gas (GHG) emissions, with food processing representing a fraction of this.</p>

	<p>Consequently, the province indicated in its 2018 Climate Change Action Plan that it will adopt the federal backstop including the federal OBPS for large emitters. Prince Edward Island has only one facility that emits more than 50kt CO₂e, and thus one facility covered by the federal OBPS in 2020. There are several medium-sized food processing facilities that could potentially opt-into the system.</p> <p>See federal profile for more details on addressing industrial competitiveness under the federal OBPS.</p>
REVENUE RECYCLING	
How revenues from carbon pricing are used	<p>At the time of receiving Royal Ascent, all revenues from the fuel levy were to be returned to Islanders through a variety of incentives:</p> <ul style="list-style-type: none"> • A grant to help reduce transit fees on T3 buses (the Island's inter and intra community bus service) • Free driver's licenses • Free vehicle registration for electric and plug-in electric vehicles • Half price registration for hybrid vehicles • A 20 percent reduction on the registration fee of other vehicles <p>Subsequent changes in government resulted in the abolishment of free driver's licenses and the 20 percent reduction on the registration fees of other vehicles as of 1 January 2020. This revenue has instead been redirected toward active transportation projects.</p>
REPORTING REQUIREMENTS	
<p>Public reporting by government</p> <p>Reporting by regulatees</p>	<p>At the time the Climate Leadership Act came into force, the government asked the Office of the Auditor general to verify the commitment made by the government to return all revenues raised by the Act to Islanders.</p>
UPCOMING MILESTONES	
	<p>At the time of writing this report, PEI indicated it will be making decisions about its carbon price for 2021.</p>
KEY LINKS	
	<p>In the PEI Climate Change Action Plan, tabled on 11 May 2018, the Province committed to lowering emissions to 30 per cent below 2005 levels by 2030. The Province has endorsed the regional New England Governors-Eastern Canadian Premiers target to reduce regional (11 jurisdictions) GHGs by 35%-45% below 1990 by 2030. In 2020 the province adjusted their 2030 GHG target to 40% below 2005 levels and adopted a net zero target by 2040.</p>

	<p>Prince Edward Island <i>Climate Leadership Act</i></p> <p>Prince Edward Island <i>Climate Leadership Act Regulations</i></p> <p>Amendments to the <i>Climate Leadership Act Regulations</i></p> <p>Prince Edward Island <i>Climate Change Action Plan</i></p> <p><i>A Path toward Net Zero (2040) Proposed Framework</i></p>
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Newfoundland and Labrador

SYSTEM INFORMATION	
Overall description	<p>Newfoundland and Labrador (NL) has a provincial OBPS with (performance) standards for large industrial facilities and large-scale electricity generation, and a provincial carbon tax on transportation, building fuels, electricity generation, and other fuels combusted in the province.</p> <p><u>NL OBPS:</u> OBPS participants face facility-specific performance standards based on average historic emissions intensity, with performance targets set a 6 percent below the baseline for 2019, increasing to 12 percent by 2022.</p> <p><u>NL Carbon Tax:</u> The carbon tax is enacted as fuel charge through NL's Revenue Administration Act.</p>
Date of implementation	NL's carbon pricing system came into force on January 1, 2019.
Authorizing legislation/regulations	<p><u>Industrial sector performance standards:</u> Management of Greenhouse Gas Act (2017)</p> <p>Management of Greenhouse Gas Regulations (2018)</p> <p>Management of Greenhouse Gas Reporting Regulations (2017)</p> <p>Administrative Penalty Regulations (2017)</p> <p>Opted-In Facilities Regulations (2018)</p> <p><u>Carbon tax component:</u> Revenue Administration Act (2009) (see Parts III.1 and III.2) Revenue Administration Regulations (2011) (see Parts IV, VI.1 and VI.2)</p> <p>The federal and provincial governments amended the <i>Atlantic Accord Implementation Acts</i> in 2018 to facilitate the application of the <i>Management of Greenhouse Gas Act</i> to the offshore area.</p> <p>The provincial Act is located here (the parallel federal Act is not referenced here): (see sections 29.2, 159.1 and 159.2).</p>

Compliance options	<p><u>NL OBPS:</u></p> <p>The <i>Management of Greenhouse Gas Act</i> provides for three forms of greenhouse gas reduction credits to be used as alternative compliance options, including:</p> <ul style="list-style-type: none">• Purchase of Greenhouse Gas Reduction Fund credits from the minister, similar to compliance payments in federal regulations;• Submission of performance credits earned by a regulated facilities, similar to that provided in federal regulations; and• Offsets credits, which are not in force at this time. <p><u>NL Carbon Tax:</u> payment of tax.</p>				
Links and interactions with other systems (if applicable)	There are no direct linkages with other systems.				
GHG COVERAGE					
% of total GHG emissions from jurisdiction covered	<p>Total % of NL’s GHG emissions covered by:</p> <table><tr><td>NL Carbon Tax:</td><td>35%*</td></tr><tr><td>NL OBPS:</td><td>47%*</td></tr></table> <p>* As calculated by ECCC for 2020.</p>	NL Carbon Tax:	35%*	NL OBPS:	47%*
NL Carbon Tax:	35%*				
NL OBPS:	47%*				
By source	<p><u>NL OBPS:</u></p> <p>Facilities that emit 25,000t CO₂e per year are required to participate in the province’s OBPS, and facilities that emit between 15,000 and 25,000t CO₂e can opt-in voluntarily. The system covers both on-shore and off-shore facilities.</p> <p><u>NL Carbon Tax:</u></p> <p>As described in sections 16.1, 19, and 19.1 of the Revenue Administration Regulations, there are exemptions to the application of the carbon tax. Examples of exemptions include: gasoline used in farming, logging, fishing and within a fish plant, quarrying, locomotives, mineral exploration, and municipal vehicles or equipment; and carbon products used in farming, silviculture activities, offshore petroleum exploration, government operations, home heating, and in an aircraft.</p>				
By sector, with details on thresholds/ standards for coverage					
Exemptions					
PRICE/CAPS					
Additional details on either carbon price or caps including changes over time	<p>The purchase price for Greenhouse Gas Reduction Fund credits mirrors the federal carbon price. This is set at \$20/t CO₂e for 2019, rising by \$10/ t CO₂e annually to \$50/t CO₂e in 2022.</p> <p>The province has maintained the federal carbon price in applying the carbon tax. A fuel charge of \$20/t CO₂e was applied in 2019. A fuel charge of \$30/t CO₂e was applied in 2020. Impacts of COVID-19 resulted in a later than expected tabling of Budget 2020.</p>				

INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	<p>NL's carbon pricing system for large industry has several features to address competitiveness issues:</p> <p>A phased-in approach to GHG reduction targets, increasing from a 6% reduction target against a 2016-2017 baseline in 2019, to an 8% reduction target against a 2016-2018 baseline period in 2020, to 10% below the 2016-2018 baseline in 2021, and to 12% below the 2016-2018 baseline in 2022 and subsequent years;</p> <p>Tailoring to local circumstances including, for example, setting absolute reduction targets for offshore petroleum, framing targets for in-pit mining activities around total materials moved, and providing for product-specific targets for facilities that produce multiple products;</p> <p>An opt-in provision for facilities that emit between 15,000 and 25,000 tonnes of greenhouse gas emissions per year;</p> <p>Provision for an arms-length industry-funded GHG Reduction Fund through which government can invest in GHG reduction products such as capital deployment; and</p> <p>Phasing-in the greenhouse gas reduction target for new entrants that are expected to employ best available control technologies when constructed.</p>
REVENUE RECYCLING	
How revenues from carbon pricing are used	<p>With respect to greenhouse gas reduction credits, it is expected that most facilities will use, to the extent possible, performance credits. As per the legislation, any revenues from the sale of Greenhouse Gas Reduction Fund credits will be deposited into an arms-length Fund that must be used for greenhouse gas reduction projects. No revenues have been received to date.</p> <p>The province has increased the amount of funding for initiatives that reduce greenhouse gas emissions in recent years, such as funding to:</p> <ul style="list-style-type: none"> the 50:50 federal cost shared Low Carbon Economy Fund (\$89.4 million); improve energy efficiency (e.g. heat pump rebate program; \$1 million); and facilitate climate change adaptation capacity building. <p>There is no earmarking of carbon tax revenues for these purposes.</p>

REPORTING REQUIREMENTS	
Public reporting by government	<p>For the large industrial sector, the minister must report on revenues received by, and expended by, the Greenhouse Gas Reduction Fund each year. The <i>Management of Greenhouse Gas Reporting Regulations</i> require:</p> <p>Annual emissions reports (using the Western Climate Initiative protocol) be filed for facilities that emit 15,000t CO₂e or more of greenhouse gas emissions in the previous year. This report includes production, energy, and greenhouse gas data. Facilities that emitted less than 15,000t CO₂e in the previous year but emitted 15,000t CO₂e or more in a prior year (starting 2016) must also report.</p> <p>Annual verification reports to be filed for facilities that emitted 25,000t CO₂e of greenhouse gas emission in the previous year, or 15,000-25,000t CO₂e and who wish to opt-in to be regulated by the <i>Management of Greenhouse Gas Act</i> (rather than be subject to a carbon tax). Annual emissions data are made public after verification reports are received.</p> <p>Annual compliance report be filed by facilities subject to a greenhouse gas reduction target demonstrating how the facility was in compliance with its target. The province will report on compliance obligations, at a system-wide level, after compliance reports are submitted.</p> <p>A copy of emissions data from the large industrial sector is available at: www.gov.nl.ca/eccm/occ/greenhouse-gas-data/.</p> <p>Given the extraordinary circumstances caused by the COVID-19 pandemic, the Department of Environment, Climate Change and Municipalities amended the <i>Management of Greenhouse Gas Reporting Regulations</i> to postpone the deadline for the:</p> <ul style="list-style-type: none"> • emissions report from June 1, 2020 to July 31, 2020; • verification report from September 1, 2020 to October 15, 2020; • compliance report from November 1, 2020 to December 15, 2020; and • to not require a site visit during the verification process related to the 2019 reporting year. <p>A copy of this change is available at: www.gov.nl.ca/dgsnl/files/NLG20200424.pdf. www.assembly.nl.ca/Legislation/sr/regulations/rc170014.htm.</p> <p>Carbon tax revenues received from taxes on transportation, building fuels, electricity generation, and other fuels combusted in the province are reported on through the annual provincial budget process.</p>
Reporting by regulatees	

UPCOMING MILESTONES	
	Section 27 of the <i>Management of Greenhouse Gas Act</i> states that the minister shall, every 5 years, conduct a review of the Act and associated regulations and consider the areas that may be improved. This section of the Act came into force in 2019.
KEY LINKS	
	<p>Greenhouse gas emissions data are available at: www.gov.nl.ca/eccm/occ/greenhouse-gas-data/.</p> <p>A copy of the (2019) is available at: www.gov.nl.ca/eccm/files/publications-the-way-forward-climate-change.pdf.</p> <p>Examples of the 2020 provincial commitment to net zero include: www.gov.nl.ca/wp-content/uploads/ECCM-Mandate-Letter.pdf (Minister's Mandate Letter); and www.gov.nl.ca/releases/2020/nr/0710n05/. (Electric vehicle program).</p>

Northwest Territories

SYSTEM INFORMATION	
Overall description	The Northwest Territories (NWT) has a territorial carbon tax on carbon based fuels.
Date of implementation	The NWT carbon tax came into effect September 1, 2019.
Authorizing legislation/regulations	<i>Petroleum Products and Carbon Tax Act</i> <i>Petroleum Products and Carbon Tax Regulations</i>
Compliance options	Payment of tax.
Links and interactions with other systems (if applicable)	There are no direct linkages with other systems.
GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	Total % of NWT’s GHG emissions covered by: NWT Carbon Tax: 75% * As calculated by ECCC for 2020.
By source By sector, with details on thresholds/ standards for coverage Exemptions	Aviation fuels and wood are exempt from the NWT carbon tax.
PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	Carbon tax rate increasing as per the pan-Canadian agreement. Rate increased to \$30/t CO ₂ e on July 1, 2020.
INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	EITE considerations in the NWT: EITE designated facilities are diamond mines. Diamond mines account for around one-fifth to one-quarter of NWT GDP.

	There are currently two operating diamond mines (Diavik and Gahcho Kue), with a third shut down during COVID-19 (Ekati). According to current mine plans, no diamond mine will operate in the NWT past 2034. All NWT rough diamond output is exported to Europe, Africa or Asia for further value added. Rough diamond prices are established in global markets, with NWT mines being price takers. Cost pressures associated with GHG emissions include that mines are located in remote locations and have to generate their electricity.
REVENUE RECYCLING	
How revenues from carbon pricing are used	<p>The Government of NWT (GNWT) carbon tax revenues are spent as follows:</p> <ul style="list-style-type: none">• Heating Fuel Rebate - for residents, governments and business entities with less than 50kt CO₂e of annual greenhouse gas emissions, the carbon tax on heating fuel is rebated at the point of purchase.• Rebate for Electrical Power Producers - Northwest Territories Power Corporation and other power producers receive rebates of carbon tax paid on diesel fuel or natural gas purchased to generate electricity for distribution to their customers.• Cost of Living Offset (COLO) – this non-income tested and tax-free benefit is provided quarterly to all NWT tax filers and families. There are two benefit levels: one for adults aged 18 or older and one for children under the age of 18. This benefit increases annually as NWT carbon tax rates are increased. <p>Large Emitters (50kt CO₂e or more annual greenhouse gas emissions) Offset in two parts:</p> <ul style="list-style-type: none">• 72 percent rebate of all carbon tax paid by the large emitter, and• 12 percent of all carbon tax paid by the large emitter is held in individual accounts and the large emitter may apply to use the account to offset its investments to reduce greenhouse gas emissions. <p>Any residual carbon tax revenue will fund GNWT investments to reduce greenhouse gas emissions.</p>
REPORTING REQUIREMENTS	
Public reporting by government	The GNWT reports carbon tax revenues and carbon revenue recycling measures in the Public Accounts as normal business practice and publishes a separate report annually that provides this same information plus emission amounts. The separate report is used to report actions under the GNWT Climate Change Strategic Framework .
Reporting by regulatees	
UPCOMING MILESTONES	
	Annual carbon tax report to be tabled usually by August of the next fiscal year.

KEY LINKS	
	<p>October 27, 2020, tabled the NWT Annual Carbon Tax Report</p> <p><i>NWT Petroleum Products and Carbon Tax Act</i></p> <p><i>NWT Petroleum Products and Carbon Tax Regulations</i></p>

Yukon

SYSTEM INFORMATION	
Overall description	The Yukon (YK) requested that the federal fuel charge and federal OBPS apply: see federal profile for more details.
Date of implementation	Federal Fuel Charge and OBPS: see federal profile.
Authorizing legislation/regulations	Federal Fuel Charge and OBPS: see federal profile.
Compliance options	Federal Fuel Charge and OBPS: see federal profile.
Links and interactions with other systems.	Federal Fuel Charge and OBPS: see federal profile.
GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	Total % of YK's GHG emissions covered by: Federal Fuel Charge: 78%* Federal OBPS: 0%* *As calculated by ECCC for 2020.
By source By sector, with details on thresholds/standards for coverage Exemptions	Federal Fuel Charge and OBPS: see federal profile.
PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	Federal Fuel Charge and OBPS: see federal profile.

INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	See federal profile for details on addressing industrial competitiveness under the Federal OPBS.
REVENUE RECYCLING/RETURN	
How revenues from carbon pricing are used/returned	<p>The Government of Canada has committed to return all net direct proceeds in Yukon from the federal carbon pollution pricing system to Yukon government.</p> <p>YT Rebates: Under the <i>Yukon Government Carbon Price Rebate Act</i> 100% of the federal carbon levy is returned to Yukoners.</p> <p>The following groups are eligible for the rebate:</p> <ul style="list-style-type: none"> • Yukon individuals; • Yukon businesses; • placer- and quartz-mining operations (part of the business rebate); • First Nations governments; and • municipal governments. <p>Yukon individuals The Canada Revenue Agency (CRA) administers quarterly rebates for Yukon individuals. An individual must have filed a Yukon income tax return and be 19 years or older to be eligible for the rebate. Individuals living outside of Whitehorse receive a 10% remote supplement.</p> <p>Yukon businesses CRA administers the general business rebate. The business rebate is a refundable tax credit which can be claimed on a corporation's T2 corporate tax return, or in the case of self-employed individuals, on their T1 income tax return.</p> <p>The credit is based on a weighting of assets that:</p> <ul style="list-style-type: none"> • either consume fossil fuels; or • displace the consumption of fossil fuels. <p>As a result, businesses will receive larger rebates by investing in the territory. The credit will reduce a business' tax liability.</p> <p>A company is eligible for the general business rebate if it:</p> <ul style="list-style-type: none"> • is a Yukon business; • files a tax return in Yukon; and • has not applied for the placer- and quartz-mining rebate.

	<p>The credit is based on a weighting of prescribed CCA classes. Eligible classes are assigned an inclusion rate to calculate the credit. The classes are grouped into 3 categories:</p> <ul style="list-style-type: none"> • buildings; • equipment that burns fossil fuels; and • 'green' assets designed to replace carbon-based fuel consumption. <p>A Super Green Credit supports companies as Yukon transitions to a cleaner economy. It also encourages future investments in green technology and equipment.</p> <p>Placer- and quartz-mining operations (part of the business rebate)</p> <p>The Government of Yukon administers rebates to producing placer- and quartz-mining operations.</p> <p>Miners can apply for a rebate if they are a producing:</p> <ul style="list-style-type: none"> • placer-mining operation; or • quartz-mining operation not under the Output Based Pricing System (OBPS). <p>The rebate for eligible placer miners is 100% of carbon levies paid.</p> <p>The rebate for quartz mining operations is:</p> <ul style="list-style-type: none"> • 100% of the carbon levy on the initial 6 kilotonnes; and • 50% of the carbon levy on all emissions between 6 to 10 kilotonnes. <p>Non-producing placer- or quartz-mining operations or exploration projects are eligible to apply for the general business rebate.</p> <p>First Nations governments</p> <p>The Government of Yukon administers rebates to First Nations governments on March 31 annually. The First Nations share of the rebate is divided between the fourteen Yukon First Nations governments as outlined in regulation.</p> <p>Municipal governments</p> <p>The Government of Yukon administers rebates to municipal governments on April 1 annually. The municipal governments' share of the rebate is divided between the eight municipal governments as outlined in regulation.</p> <p>Federal Fuel Charge and OBPS: see federal profile.</p>
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REPORTING REQUIREMENTS	
Public reporting by government	Federal Fuel Charge and OBPS: see federal profile.
Reporting by regulatees	
UPCOMING MILESTONES	
	Federal Fuel Charge and OBPS: see federal profile.
KEY LINKS	
	Federal Fuel Charge and OBPS: see federal profile.

Nunavut

SYSTEM INFORMATION	
Overall description	In Nunavut (NU) both the federal fuel charge and federal OBPS apply: see federal profile for more details.
Date of implementation	Federal Fuel Charge and OBPS: see federal profile.
Authorizing legislation/regulations	Federal Fuel Charge and OBPS: see federal profile.
Compliance options	Federal Fuel Charge and OBPS: see federal profile.
Links and interactions with other systems.	Federal Fuel Charge and OBPS: see federal profile.
GHG COVERAGE	
% of total GHG emissions from jurisdiction covered	<p>Total % of NU's GHG emissions covered by: Federal Fuel Charge and OBPS: 72%*</p> <p>*As calculated by ECCC for 2020.</p>
By source By sector, with details on thresholds/standards for coverage Exemptions	Federal Fuel Charge and OBPS: see federal profile.
PRICE/CAPS	
Additional details on either carbon price or caps including changes over time	Federal Fuel Charge and OBPS: see federal profile.

INDUSTRIAL COMPETITIVENESS	
Addressing Carbon Leakage and Competitiveness in Carbon Pricing System Design	Federal Fuel Charge and OBPS: see federal profile.
REVENUE RECYCLING	
How revenues from carbon pricing are used	<p>The Government of Nunavut (GN) has implemented the Nunavut Carbon Rebate to help Nunavummiut adapt to the carbon tax. The rebate subsidizes half the tax at points-of-sale and will be in place over ten years. The initial 50% reduction will be in place for the first 5-years. Starting in 2024, the rebate will decrease 10% every year until it is completely phased out in 2028. At that time, Nunavummiut will be subject to the full costs of the Federal Backstop.</p> <p>Federal Fuel Charge and OBPS: see federal profile.</p>
REPORTING REQUIREMENTS	
Public reporting by government Reporting by regulatees	Federal Fuel Charge and OBPS: see federal profile
UPCOMING MILESTONES	
	Federal Fuel Charge and OBPS: see federal profile.
KEY LINKS	
	Federal Fuel Charge and OBPS: see federal profile.

Annex: A study addressing competitiveness and carbon leakage risks under carbon pollution pricing

Approaches and best practices to address the competitiveness of emissions-intensive trade-exposed sectors

Report developed by the Federal-Provincial-Territorial Steering Committee over the course of 2017-2019, with factual updates only undertaken in 2020.

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1 – Executive Summary and Key Findings

Carbon pollution pricing is widely regarded as one of the most efficient policies to reduce greenhouse gas (GHG) emissions.¹ Around the world, 46 nations and 25 sub-national jurisdictions have implemented or are scheduled to implement a carbon pricing system.² In Canada, carbon pollution pricing has been in place for over a decade, with well-established and successful systems operating in Alberta, Quebec and British Columbia. Carbon pricing is a pillar of the Pan-Canadian Framework on Clean Growth and Climate Change (PCF), the federal-provincial-territorial plan to grow the economy while reducing GHG emissions and building resilience to adapt to a changing climate. Under the PCF, in 2019, all jurisdictions across Canada will have a price on carbon pollution.

The goal of pricing carbon pollution is to shift behaviour toward lower carbon activities and drive innovation. A carbon price can be applied directly on GHG emissions from industrial facilities or as a charge on fossil fuels. Evidence shows that, when it costs more to pollute, consumers and businesses adjust their actions and investments by making choices that will lead to less pollution.

Globally, not all jurisdictions are placing prices on carbon pollution. Industries that compete with companies in jurisdictions that don't have similar carbon pricing policies, price levels and/or stringency can be disadvantaged. These companies risk losing business to competitors with lower costs and which could offer lower cost products. This can lead to carbon leakage, in which production or investment – and thus emissions – simply shift, or “leak” to jurisdictions without carbon pricing in place. If this happens, it undermines the ultimate environmental objective of reducing global emissions and would impact Canada's economy.

This report has two goals:

- to introduce and explore the issues of carbon leakage and the competitiveness of emissions-intensive trade-exposed (EITE) sectors, and;
- to identify best practices that address potential risks to competitiveness and carbon leakage for EITE sectors resulting from the application of carbon pricing.

In particular, the report focuses on:

- identifying the potential competitiveness and leakage risks resulting from carbon pricing, and the components of the Canadian economy that may face competitiveness and leakage risks, and quantifying the degree of those risks;
- identifying potential metrics to track competitiveness impacts over time; and
- reviewing the best practices and lessons learned from approaches used to mitigate competitiveness and leakage risks.

Undertaking this review was a key commitment by federal, provincial and territorial governments in the Pan-Canadian Framework. It is an early deliverable of a broader commitment to work together to establish the approach to review carbon pricing across Canada by early 2022 to provide certainty on the path forward, with an interim report in 2020. To that extent, depending of the scope that will be adopted by federal, provincial and territorial governments for this review process, the recommendations contained in this report could be used accordingly.

This report was developed by the Federal-Provincial-Territorial (FPT) Steering Committee for the Emissions-intensive Trade-exposed Review (EITE Review), a collaboration across governments over the course of 2017-2019, with factual updates undertaken in 2020. The Steering Committee sought input and advice from experts and stakeholders in the field. Note that since the beginning of this project, some jurisdictions, such as Ontario and most recently Alberta, revisited their position on sectors at

competitiveness risk. While carbon pricing policies across Canada continue to evolve, and updates have been made to reflect the status of Canadian pricing systems as of Fall 2020, this report reflects the Steering Committee's assessment of best practices and lessons learned based on the state of play of Canada's carbon pricing systems as of Spring 2019.

Note that while the scope of this report is focused on options for addressing competitiveness and carbon leakage impacts from carbon pollution pricing policies, its findings may be relevant to GHG emissions reduction policies writ large. Other GHG emission reduction policies, such as regulations, can create implicit carbon costs for EITE sectors that may have competitiveness implications.

The report is structured as follows:

- Chapter 1 provides a brief introduction and outline the key findings and recommendations.
- Chapter 2 describes the dynamics that can lead to carbon leakage, and explores evidence from the Canadian context.
- Chapter 3 explains which sectors face the greatest risk of carbon leakage, and introduces quantitative metrics for identifying them.
- Chapter 4 reviews a variety of metrics and approaches for tracking and addressing the risk of carbon leakage, and outlines some key considerations for collecting and using appropriate data.
- Chapter 5 details some of the successful approaches and best practices that have been used to address risks to competitiveness and mitigate carbon leakage.
- A series of annexes provides additional detail and contextual information.

1.1 Key Findings and Recommendations

There are several key findings and recommendations that can be extracted from the analyses and best practices presented in this report.

Key findings

1. **The risk of carbon leakage is driven by *uneven* costs for businesses between jurisdictions due to environmental policies such as carbon pollution pricing, and the ability of those businesses to pass costs on to consumers.** If similar carbon pricing approaches were implemented across jurisdictions globally, the risk of carbon leakage would be significantly reduced. Measures to support EITE sectors should be focused on addressing differences in the stringency of pollution pricing policy, and not on protecting inefficient facilities or sectors.
2. **Emissions intensity and trade exposure metrics can be used individually and in tandem** to assess which sectors face carbon leakage risks. Industries must be both emissions intensive and trade exposed to be classified as EITE, but other factors should also be considered, such as sectoral market dynamics. Emissions intensity and trade exposure serve as proxies for a sector's carbon cost and its ability to pass on those costs to consumers. The degree of emissions intensity and trade exposure varies across sectors and can change over time.
3. **There is no single, established approach to determine the significance of a carbon pollution pricing policy's competitiveness impacts.** There are many ways to assess competitiveness, with varying degrees of complexity, and different jurisdictions use different thresholds for assessing significance and providing support. Harmonized approaches and better data could help align these assessments. To that extent standard definitions and simplified metrics (e.g., using proxies) are useful but the analysis could be enhanced with other metrics once more precise

data become available. Accurately identifying sectors at risk of leakage is crucial to avoid compensation to sectors that are not at risk.

4. **The risk of carbon leakage has been successfully managed to date.** A range of tools have been implemented to mitigate the risk of carbon leakage. So far, there is very little empirical evidence of carbon leakage actually occurring, suggesting that existing approaches have been successful at current pricing levels, and also that the risks should not be overstated.
5. **There are significant opportunities for EITE sectors associated with pricing carbon pollution.** Innovating, improving efficiency, and implementing cleaner technologies can help sectors reduce costs and gain longer-term advantage over international competitors. The intent of climate action is to shift away from carbon-intensive production processes; sectors that embrace that shift as an opportunity will be the biggest winners over the longer-term.
6. **Broad coverage of carbon pricing and consistent treatment of EITE sectors improves efficiency, reduces the risk of leakage, and limits administrative burden on industry.** Consistency across pricing systems can be beneficial, recognizing there may be a need for flexibility to adapt systems to local circumstances.

Recommendations

1. **Canadian jurisdictions would benefit from a common understanding, and consistent and transparent definitions of which firms and sectors are considered EITE.** Consistency where possible of methodologies for identifying sectors at risk of carbon leakage would allow results to be compared across programs and jurisdictions. A lack of consistency has the potential to increase administrative burden and create barriers to investment. Transparent methodologies and approaches help regulated industries to understand how they are being classified and what information should be shared.
2. **Policies to mitigate risks to competitiveness and carbon leakage for EITE industries should be flexible and regularly assessed.** These risks evolve over time, as additional jurisdictions implement pricing policies, and as industries make changes to improve their performance. Competitiveness risks should thus be reassessed on a regular basis, and policies should be updated based on findings. Opportunities exist for collaboration in this regard across federal, provincial and territorial governments, including on monitoring and evaluation to inform performance standards or other metrics.
3. **Improving and streamlining data collection and modelling helps ensure EITE sector supports are accurate, targeted and efficient.** Collaborating on data collection and modelling where possible and relevant across jurisdictions could ensure consistency and comparability, creates efficiencies, and reduces administrative burden on industry. Collaboration between governments and industry can help identify appropriate metrics that are meaningful and address confidentiality concerns. This could include expanding and, when possible, coordinating collection of data on:
 - a. facility production and energy use details;
 - b. abatement opportunities and associated costs;
 - c. competitiveness pressures (key influences and associated proxies); and
 - d. relative cost differentials between domestic EITE firms and their international competitors

2 – Understanding Competitiveness and Carbon Leakage Risks

This section focuses on the dynamics of competitiveness and carbon leakage in order to understand how they operate in practice.

Competitiveness can be assessed at many scales – across countries, provinces, sectors or individual firms. Assessing competitiveness involves comparing the productivity of a given country or sector against that of its competitors. A firm's competitiveness is influenced by a wide range of factors, including (but not limited to) corporate and personal income tax rates, foreign exchange rates, labour and capital costs, input prices, commodity prices (as an input or output), regulation, access to markets, and carbon pollution pricing. This report focuses specifically on the potential impacts of carbon pollution pricing on EITE competitiveness and carbon leakage. Firms operating in jurisdictions with less stringent or no carbon pricing policies may gain a competitive advantage, potentially resulting in carbon leakage.

2.1 What is Carbon Leakage?

The World Bank Group explains that carbon leakage occurs:

When an emissions-reduction policy such as a carbon price inadvertently causes an increase in emissions in other jurisdictions that do not have equivalent emissions-reduction policies. This increase in emissions in other jurisdictions may arise because the differences in the costs of complying with policy can cause a shift in the location of production.³

Carbon leakage is thus caused by a difference in costs faced by competitors due to uneven environmental policies, such as carbon pollution pricing, across jurisdictions. In contrast, if there were equivalent carbon pricing policies around the world, there would be limited carbon leakage risks from pricing.

Carbon leakage can be characterized as taking two forms: production leakage and investment leakage. Production leakage is a short-term phenomenon, and occurs when a firm reduces or stops production in a jurisdiction due to the presence of a higher carbon price compared to an alternative production location. Investment leakage occurs over the longer term when a firm chooses to invest in a jurisdiction due to an anticipated lower price on carbon.

2.2 What Factors Drive Carbon Leakage?

Key drivers of the risk of carbon leakage include the increased cost faced by a firm due to carbon pricing, and the ability of that firm to pass on those costs (see Figure 1, below).

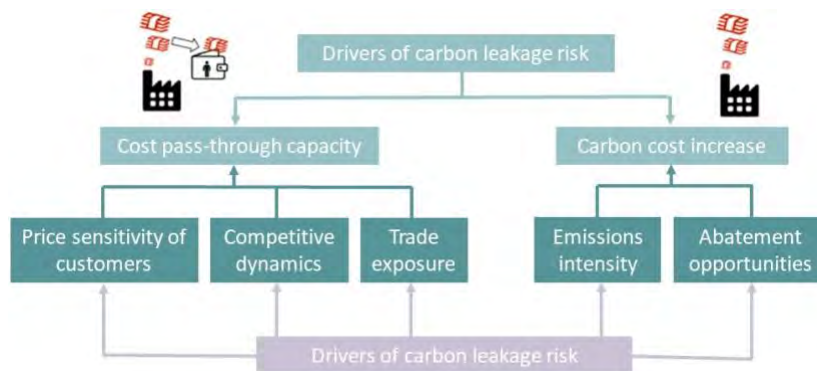


Figure 1: Drivers of carbon leakage risk (Vivid Economics, 2018)

Carbon-related cost increases for a firm are driven by its emissions intensity and the cost of its abatement opportunities.

Carbon costs can be direct or indirect. Direct costs represent the carbon price paid directly by the firm for emissions it produces. Indirect costs are those passed on through the supply chain due to emissions from other firms. For example, a manufacturing facility would pay for its own emissions from its production process (direct carbon cost), as well as the emissions from shipping its raw materials, which would be passed on to the facility by the shipping company (indirect carbon cost).

Carbon costs can also be explicit or implicit. A carbon pricing policy imposes an explicit cost on each tonne of carbon dioxide equivalent (t CO₂e) emitted. Other types of regulations or policies, such as technology standards, may also increase the cost of emitting CO₂, for example, by prescribing what technologies must be used. In the latter case, the policy does not explicitly set a price but does implicitly impose a cost on firms in order to comply. Accurately calculating carbon price differentials between jurisdictions ideally should consider both explicit and implicit costs, although this can be challenging in practice. While implicit carbon costs are important to consider, measures to prevent carbon leakage tend to focus on explicit carbon costs.

Cost pass-through capacity is a reflection of market structure and how prices are set for the given product. It can be influenced by the price sensitivity of consumers, the competitive market dynamics, and trade exposure of the firm. Internationally-traded products from competing producers, such as commodities like oil or cement, typically have low cost pass-through capacity, because a price increase by one producer will simply drive consumers to purchase from a competitor. *Figure 2* shows how different firms operating in different types of markets have differing abilities to pass on costs.



Figure 2: Increasing cost pass-through capacity and pricing (Vivid Economics, 2018)

Carbon leakage can lead to a net increase in emissions globally. This is the case when the emissions intensity of foreign production is higher than domestic production, and a domestic carbon price causes production to move to the higher emissions intensity (but lower cost) jurisdiction. Canadian industry stakeholders consulted in the development of this report noted that the risk of carbon leakage may be higher for some industries that have already reduced emissions, since they may have limited remaining low cost GHG reductions opportunities.

Marginal carbon price: the cost of emitting (or savings from reducing) an additional tonne of carbon pollution. In a system with an explicit price on carbon pollution set by the government, this is the price per tonne.

Average carbon price: the average cost per tonne paid by a firm, taking into account adjustments made to mitigate competitiveness and carbon leakage risks, including free allowances, output-based standards/allocations, coverage, exemptions, other competitiveness incentives, and may include long term price changes. The average price will be lower than the marginal price for firms that receive such assistance.

Investment and production decisions are influenced by marginal and average carbon prices. Generally, at least in the short term, firms can be expected to factor the value of carbon emissions into marginal production decisions regardless of free allowances, output-based allocation or other competitiveness incentives.⁴

Predictability of future carbon price levels is important in order to give confidence to investors and provide the right price signals to guide investments into low-carbon alternatives. Ideally, price signals should include reasonable expectations about both marginal and average carbon prices going forward including if and how measures to prevent carbon leakage (e.g., exemptions, free allocations) will change in the future.

Isolating the Role of Carbon Pricing in Leakage

In assessing the potential for carbon leakage, it is important to isolate the role of carbon pricing, if any, in altering production and investment decisions from what would have occurred in the absence of carbon pricing. Specifically, in measuring carbon leakage, the loss of output from a firm or industry following the implementation of carbon pricing must account for the range of other factors that influence production and investment decisions. Similarly, it is important to distinguish between carbon leakage and decline in demand due to substitution as production and investment shifts towards low-carbon alternatives.

Due to the multitude of factors that influence production and investment decisions (e.g., income tax rates, labor and capital costs, input prices, commodity prices, etc.), isolating the causal influence of carbon pricing on leakage can be methodologically challenging. It is important to avoid over-simplified examples of changes in production or employment levels to demonstrate negative impacts of carbon pricing that fail to isolate causal effects.

2.3 Carbon Leakage in Practice

There has been little empirical evidence to date of carbon leakage in existing carbon pricing programs. This may be due a number of factors, including:

- Data limitations due to relatively few carbon pricing systems with a long history
- Well-designed mechanisms to reduce carbon leakage risks (e.g. free allowance allocation under the EU ETS)^{5 6}
- Generally low carbon prices⁷

- The positive impact of carbon pricing on innovation (discussed further below) potentially leading to upward (positive) pressure on competitiveness indicators.^{8 9}

Studies have shown that ambitious environmental policies can lead to small, short-term impacts on trade, employment, plant location and productivity – but that these impacts are smaller than many other factors affecting trade and investment decisions.¹⁰ Other studies have pointed to evidence from the EU ETS that shows no significant impact on employment or profits, and found increased investment and innovation into low-carbon technologies.¹¹

BC Carbon Tax

B.C.'s carbon tax, implemented in 2008, was the first broad-based carbon tax in North America. A study by Thivierge (2020) found evidence that suggests that the carbon tax may have adversely impacted the competitiveness of B.C.'s cement industry, as indicated by a decrease in net exports (i.e. exports minus imports) as a share of domestic cement production in the province. However, as the paper notes, B.C. introduced measures to support the sector starting in 2015. It was beyond the scope of the paper to assess if the carbon tax had an impact specifically in terms of carbon leakage to another jurisdiction.¹² A paper by Rivers and Murray (2015) reviewed the available evidence on the impact of the B.C. carbon tax on economy-wide economic performance, which suggested little net impact, either positive or negative, with "some evidence of negative effects in emissions-intensive sectors, such as cement, but the positive impacts in other sectors appear[ed] to compensate for those effects."¹³

Models that forecast carbon pricing impacts find a wide range of carbon leakage rates (0-100%), depending on policy design choices and the particular assumptions of the model and sectors analyzed.¹⁴ However, these models often fail to capture the innovation benefits from climate policy and therefore likely overestimate leakage rates and economic impacts.¹⁵ This has been the case historically, where models have tended to overestimate negative competitiveness impacts, likely due to a predisposition for conservative assumptions and challenges in modelling the rate of technological change. Newer models aim at addressing this challenge by incorporating significantly more detailed technological representations which more accurately capture the rate of technological change.

Making low-carbon investments in provinces with a strong price on carbon pollution

British Columbia: LNG Investment

LNG Canada announced in October 2018 a \$40 billion investment to construct a natural gas pipeline from northeast B.C. to a new terminal on the west coast that will process and ship liquefied natural gas (LNG) to Asian markets. An essential part of LNG Canada's final investment decision – the largest private investment in Canada – was the B.C. government's March 2018 fiscal framework, which aimed to put natural gas development on a level playing field with other industries in B.C. The framework follows a review of competitiveness issues facing the LNG sector and a detailed financial analysis of the LNG Canada proposal. LNG Canada has committed to making its Kitimat facility the world's cleanest in terms of GHG emissions intensity.

(For more info, go to: <https://news.gov.bc.ca/releases/2018PREM0073-001910>)

Quebec: Emission-free aluminum production

Rio Tinto and Alcoa Corporation announced a revolutionary process to make aluminum in May 2018. The use of “inert” carbon-free anodes replaces the CO₂ emitted by the traditional smelting process for oxygen, thus eliminating direct GHG emissions from the production of aluminum. In Canada alone, use of the technology could eliminate the equivalent of 6.5 million metric tonnes of GHG emissions, if fully implemented at existing aluminum smelters in the country. Rio Tinto and Alcoa have formed Elysis, a joint venture company which will be headquartered in Quebec, to develop and license the technology so it can be used to retrofit existing smelters or build new facilities beginning in 2024. Canada and Québec are each investing \$60 million (CAD) in Elysis.

(For more info, go to: <https://www.riotinto.com/news/releases/First-carbon-free-aluminium-smelting> and <http://www.greencarcongress.com/2018/05/20180511-elysis.html>)

Leakage Risks for Canadian Jurisdictions

Only a small portion of Canada’s economy appears to be vulnerable to carbon leakage risks due to climate policy.¹⁶ However, EITE competitiveness pressures differ between provinces and territories, as well as internally between their regions based on a number of factors, including size, composition and diversity of the economy, electricity source mix, and trade patterns. Analysis by Canada’s Ecofiscal Commission offers one approach to quantifying the differing carbon leakage risks between provinces.¹⁷ Figure 3 shows the Ecofiscal Commission’s assessment of these different risks: the red bars indicate the portion of GDP from sectors with a carbon cost greater than 5% of GDP (at a \$30/tonne carbon price) and trade exposure greater than 15%. This analysis was conducted at the sector level, and so does not capture impacts on specific facilities and makes use of the EITE thresholds proposed in the U.S. Waxman Markey bill.



Figure 3: Differences in carbon leakage risk across Canadian jurisdictions (Canada's Ecofiscal Commission and Navius Research, 2016¹⁸)

The Ecofiscal Commission’s methodology and results should not be viewed as providing a definitive approach and assessment for Canada. Across different assessments that have been undertaken by jurisdictions and external analysts (including the assessment done by Ecofiscal Commission), a range of different thresholds and formulas have been used to assess the competitive risk associated with carbon pricing, as indicated by emissions-intensity and trade exposure metrics. Moreover, combining multiple

jurisdictions into a “Rest of Canada” category may mask higher levels of emissions intensity and/or trade exposure for individual sectors and/or jurisdictions within this category.

The Ecofiscal Commission analysis also compared provincial contexts by looking at which sectors are most at risk in different jurisdictions. These different contexts result in different considerations for mitigating carbon leakage.¹⁹

Province	Leakage Considerations ²⁰
British Columbia	<ul style="list-style-type: none"> • Cement, refining, and natural gas sectors vulnerable to leakage
Alberta	<ul style="list-style-type: none"> • Larger portion of economy is EITE • Emissions intensity of electricity plays a large role • Lime, fertilizer, cement, chemical manufacturing, petrochemical manufacturing, and oil and gas are most vulnerable sectors
Ontario	<ul style="list-style-type: none"> • Manufacturing sectors largely not vulnerable to leakage • Steel, chemicals, petrochemicals, fertilizer, and refining sectors show high vulnerability and make up less than 1% of GDP
Nova Scotia	<ul style="list-style-type: none"> • High trade exposure for coal, gold, cement, natural gas, pulp and paper, and other resource sectors due to reliance on exports • Vulnerable sectors are often a single facility

In Canada, nearly 40% of all exports are interprovincial.²¹ Measures to limit carbon leakage should thus consider interprovincial dynamics such as existing trade balances and different energy mixes between provinces. In the short term, ensuring that a carbon price signal is in place across regions would help reduce the risk of carbon leakage domestically.

Domestic carbon pricing policies do not eliminate international carbon leakage pressures. Analysis shows that the proportion of international trade with countries that have carbon pricing systems varies considerably by sector.²² The stringency of the various pricing systems would also vary across those countries. Over the longer term, convergence of carbon pricing stringency across jurisdictions can help further reduce the risk of carbon leakage.

Support for EITE industries can be overly generous as a result of efforts to minimize economic impacts. Early over-allocation of credits in Phase 1 of the EU ETS points to a weakness at identifying firms’ cost pass-through ability, as well as the hazard of basing allocations on absolute historical emission levels (i.e., grandfathering).

Current and planned carbon pricing systems in Canada are expected to have low cost impacts on business compared with other competitiveness pressures. The C.D. Howe Institute found that emissions-related costs for oil and gas production are relatively minor compared to other costs such as royalties and income taxes. They found that in 2018, emissions costs represent just 0.13% of all policy-related costs in Alberta, and 0.24% of such costs in Saskatchewan.²³ This could change as carbon prices rise over time, in particular relative to competing jurisdictions; higher carbon costs could make carbon pricing a larger factor in production and investment decisions for EITE sectors.

As countries take steps to achieve their commitments under the Paris Agreement, and more jurisdictions realize the efficiency of explicit carbon pricing systems to reduce emissions, there will likely be less need for EITE support measures. This points to the transitional and non-permanent nature of such support. Over time, support for EITE industries would need to be phased out as carbon pricing is phased in around the world.

3 – Emissions-Intensive and Trade-Exposed Sectors

Some sectors and industries face a greater risk of carbon leakage than others. Carbon pricing imposes costs on GHG emissions, so the industries at greater risk tend to be those that produce a lot of emissions per unit of output (emissions-intensive), and that have a limited ability to pass on costs because they compete in national and international markets (trade-exposed). An initial task is to determine how to define emissions-intensity and trade exposure in order to identify which industries are at greatest risk.

Categorizing sectors or industries as EITE is a combination of two distinct metrics:

- **Emissions-intensity:** can be defined as the GHG emissions per unit of economic activity;²⁴ and
- **Trade-exposure:** in the context of carbon pricing, can refer to industries that are constrained in their ability to pass through carbon costs due to actual or potential international competition.²⁵

Several studies indicate that only firms that are *both* emissions-intensive *and* trade-exposed could face significant carbon leakage risks.²⁶ While the EU ETS is an example of a jurisdiction that treated high levels of trade exposure alone as creating the potential for carbon leakage, this was a temporary measure that is being eliminated in Phase 4 of the system, which at the time of publication of this report is scheduled for the 2021-2030 period.²⁷

A report on decarbonizing heavy industry by the Senate Standing Committee on Energy, the Environment and Natural Resources found that emissions-intensive, trade-exposed industries account for roughly 10% of Canada's total emissions (13% if downstream petroleum refining is included, where a portion of refined fuels are exported for sale).²⁸ Figure 4 below provides an overview of Canada's GHG emissions by economic sector.

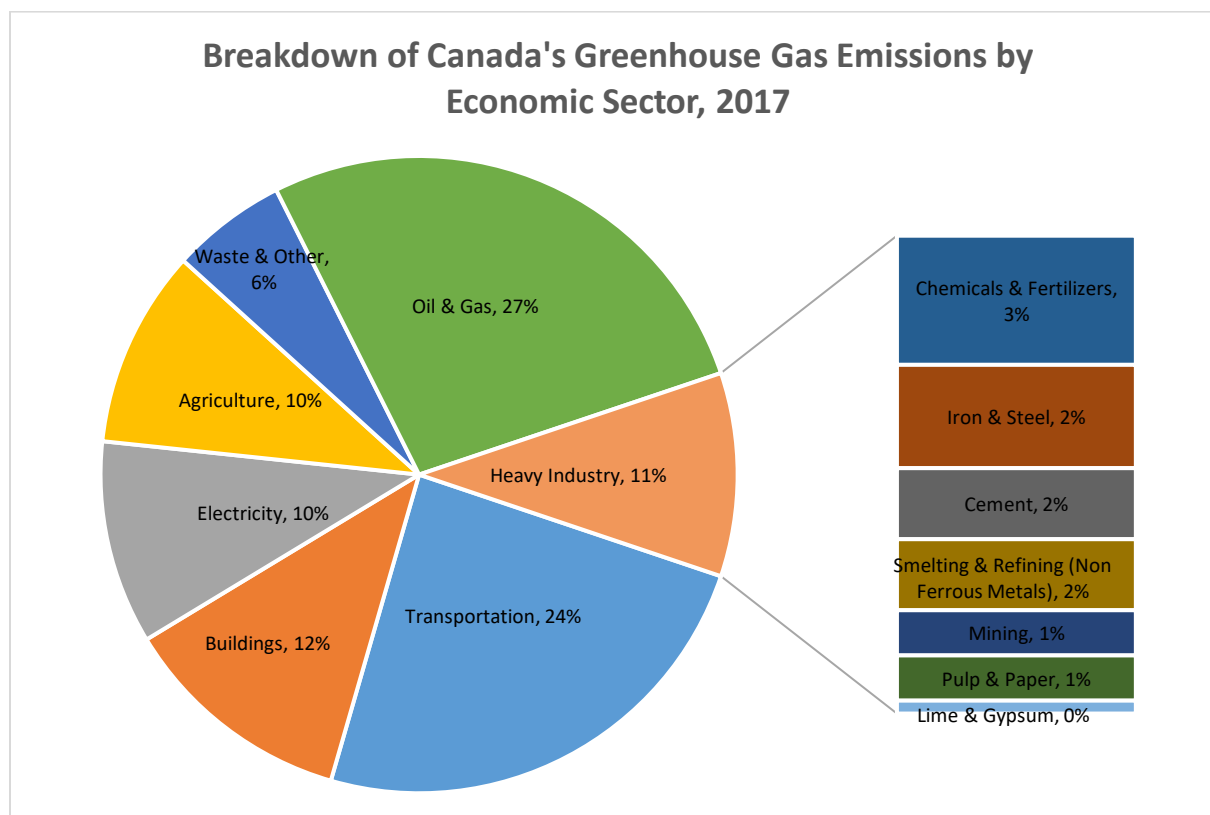


Figure 4: Breakdown of Canada's greenhouse gas emissions by sector, 2017 (Environment and Climate Change Canada, National Inventory Report, 2019)

Is electricity considered EITE?

In Phase 1 of the EU ETS, electricity generators passed through costs despite receiving all their allowances for free. In response, the EU Commission completely excluded electricity generators from EITE sectors, making them ineligible to receive support measures (free allowances) in Phase 3 of the EU ETS. However, emissions intensities across EU power markets vary, necessitating a more nuanced approach, in which:

- Ten member states are allowed to allocate decreasing allowances to generators
- A Modernization Fund provides allowances to support additional investments in sustainable energy systems, and support 10 lower income EU Member States²⁹

In Canada, some jurisdictions have treated electricity as an EITE and others have not, where the type of electricity generation tends to guide those policy treatments. Hydroelectricity (which does not emit GHGs that would result in a high emission-intensity classification) is the dominant source of electricity nationally, comprising nearly 60% of total generation. While Alberta, Saskatchewan and Nova Scotia all source a fairly significant share of their electricity from coal at around 50% in 2016, it has been trending down in these provinces over the 2016-2018 period.³⁰ Some key policy considerations for these jurisdictions in designing their climate change policies include how costs are passed through to consumers, which consumers bear those costs, and how power producers react to market incentives.³¹

3.1 – Emissions-Intensity

Some jurisdictions (e.g., California and Quebec) measure emissions-intensity as a ratio of a sector's total emissions (in CO₂e) to its level of economic activity (gross value added). Other jurisdictions (e.g., Alberta, the EU, and South Korea) use a slightly different formulation, measuring a sector's carbon costs (without free allocations) as a percentage of gross value added. In either case, these measures of emissions-intensity help quantify the impact that carbon pricing will have on a given firm or sector.

$$\text{Emissions intensity } \left(\frac{tCO_2e}{\$M} \right) = \frac{\text{Emissions}(tCO_2e)}{\text{Value added } (\$M)}$$

OR

$$\text{Emissions intensity } (\%) = \frac{\text{Cost of Emissions}(\$)}{\text{Gross value added } (\$)}$$

Measures of emissions-intensity often account for direct carbon costs but not indirect carbon costs of various inputs through the supply chain (including electricity). As with direct carbon costs, indirect carbon costs may also impact competitiveness. However, developing metrics to incorporate indirect emissions cost remains a challenge.

3.2 – Trade Exposure

Trade exposure is typically measured by looking at the value of a jurisdiction's international trade in a particular good (exports plus imports) compared to the size of the domestic market for that good (value of domestic production plus imports).

$$\text{Trade exposure } (\%) = \frac{\text{value of exports} + \text{imports}}{\text{value of domestic shipments} + \text{imports}}$$

Trade exposure can be used as a proxy for the ability to pass on costs to consumers without significant loss of market share. Market power also influences the ability of a firm to pass-through costs to consumers. Depending on the number of firms and relative market share in a sector, some firms may have significant market power to influence the price of goods and maintain competitiveness.

In sectors with limited international trade, firms may face less competition from other jurisdictions, which means they could have a greater ability to pass on costs to consumers without losing market share to international competitors, resulting in lower competitiveness impacts from carbon pricing.

In the early phases of the EU ETS, EITE metrics did not account for the ability of the electricity sector to pass on costs, which resulted in windfall profits.³² While cost pass-through rates vary between sectors (and associated markets/customers), the most emissions-intensive industries tend to have some ability to pass on costs. For example, an assessment of the EU ETS estimated minimum cost pass-through rates ranging from 0% for fertilizers to 60% for iron and steel and above 100% for refined products.³³ In the Canadian context, it is particularly important to consider the extent to which firms are able to pass on costs, since Canadian firms tend to be highly trade exposed. As one indicator of this exposure, exports of goods and services represent about 30.5% of GDP.³⁴

3.3 – Using Emissions-Intensity and Trade Exposure Metrics to Assess Carbon Leakage Risk

Jurisdictions with carbon pricing in place generally measure emissions-intensity and trade exposure using similar metrics.³⁵ However, there are differences in the thresholds for classifying the level of risk faced by different sectors. The particular level of emissions-intensity and trade exposure at which a firm or sector moves from low to medium to high risk varies across carbon pollution pricing systems. Different jurisdictions use and combine indicators in different ways. Using different indicators can allow governments to tailor their approaches to local considerations, including economic structure, size, composition, electricity source mix, and trade patterns. Despite the benefits of such tailoring, aligning approaches across jurisdictions where possible could help to identify EITE sectors.

In addition to the broad metrics assessed through the EITE formulas outlined above, there are a number of other factors that can be considered when assessing risks of carbon leakage, including:

- Access to low-cost emission reductions;
- Emergence of low-carbon technology and innovation;
- Access to low-carbon fuels;
- Emissions-intensity of the electricity grid (indirect costs);
- Ability to pass on costs – market share of individual firms can affect the degree of trade exposure;
- Carbon pricing differences between competing jurisdictions (including provinces); and
- Geographic considerations – similar sectors may have different levels of trade exposure based on their location and exposure to different international markets.

Many jurisdictions with carbon pricing policies in place have designed their systems to increase stringency and/or reduce EITE supports over time. This can be done through a variety of means, depending on the system, including increasing price levels, declining caps, declining output-based standards and reducing EITE support. Key reasons to increase stringency or reduce EITE support are the expectation that firms will improve their performance over time, and thus decrease their emissions-intensity, and the expectation that carbon pricing policies will align across borders over time. In order to make these changes in an appropriate way, policymakers will need to consider a variety of factors, including rates of technological change, abatement costs, and other dynamics that may influence carbon

leakage risk. The goal is to incorporate declining allocation rates and/or benchmarks that accurately reflect actual competitiveness and leakage risks.

Supporting EITE industries as part of the low carbon transition is an important consideration. However, it is also important to recognize that policies to mitigate carbon leakage do treat EITE sectors differently than other sectors (e.g., free allocation of emissions or use of emission-intensity standards).

Furthermore, more and more jurisdictions are adopting carbon pricing as a tool to reduce emissions, which mitigates leakage and competitiveness risks. For these reasons, it is important to continually evaluate risks to competitiveness and of carbon leakage, since they change over time.

4 – Metrics and Data for Monitoring and Responding to Carbon Leakage Risks

This section explores various metrics that can be used to assess and track impacts on competitiveness and carbon leakage over time. Selecting appropriate metrics could be of use in the 2020 and 2022 reviews of carbon pricing.

Accurate and timely data is important for evaluating the risk of carbon leakage. However, there are a number of challenges associated with collecting and using appropriate data. The information needed is varied and often complex, and can be difficult to collect or generate. These difficulties can, in some cases, lead to data gaps, uncertainties, and lags which can all result in less precise analysis.

Undertaking broad, high-level reviews of the impacts of carbon pricing on EITEs is important but provides only coarse/limited levels of analysis and insight. With better data, governments could more accurately assess the level of risk that EITE industries face.

4.1 – Selecting Metrics

There are a number of considerations when determining appropriate metrics to use. First, metrics should be relevant; that is, they should measure a parameter of interest or value. Tools and metrics should be at the appropriate scale for the type of analysis being undertaken. And they should be accessible and available from a reliable source.

There are many types of tools and processes that can help policymakers identify carbon leakage risk. One approach is to use a standard set of macroeconomic indicators such as GDP, employment and investment. This can be done prospectively, using economy-wide, computable general equilibrium (CGE) economic models to predict what the risks might be. Analysis can also be done retrospectively using statistical data. In both cases, a wide array of economic data can be used to populate EITE review metrics. These include impacts on GDP, output, exports and imports, investment, prices and production costs. These indicators are all indirect measures of impact, and point to competitiveness and leakage risks, but rarely provide a conclusive view of the risk.

Competitiveness impacts can be assessed for the economy as a whole, for particular sectors or types of sectors, and for individual facilities. Different levels of analysis have different strengths, trade-offs and data requirements:³⁶

	Overview of Analysis	Indicators	Trade offs
Economy-wide modeling and analysis	<ul style="list-style-type: none"> • Broadest level of analysis • Explores changes in aggregate economic activity (GDP) • Captures market dynamics through price changes in inputs and outputs, including capital and labor 	<ul style="list-style-type: none"> • Gross Domestic Product (GDP) • Supporting indicators include output, trade, investment and employment • Economy-wide emission reductions 	<ul style="list-style-type: none"> • Captures long-term dynamics well • Coarse level of insight/analysis given highly aggregated nature of metrics
Sector-level analysis	<ul style="list-style-type: none"> • Less aggregated than economy-wide • More precise insight on market and trade dynamics within and across sectors 	<ul style="list-style-type: none"> • Hybrid of macroeconomic and facility-level indicators 	<ul style="list-style-type: none"> • Can capture shorter-term dynamics • Coarse insight due to aggregated information
Facility-level analysis	<ul style="list-style-type: none"> • Most detailed analysis • Uses mix of downscaled sector-level data with facility-level data 	<ul style="list-style-type: none"> • Various firm/facility-level metrics such as sales (in dollars or product), energy use, profits, production, emissions • Data can be used to develop models 	<ul style="list-style-type: none"> • Can capture shorter-term dynamics • Weak at capturing broader market dynamics • Level of data appropriately scaled to regulated entities (facilities)

4.2 – Metrics for Assessing Competitiveness Risks

Previous sections of this report focused on EITE tests as a means to assess carbon leakage risks. In this section, other tools are examined to better understand their usefulness in complementing EITE metrics as a means to evaluate impacts of carbon pricing on competitiveness and risks of carbon leakage.

Specifically, this section reviews several tools, tests and metrics that can be used for assessing competitiveness and carbon leakage risk, including EITE tests, sales and profit tests, and measures of revealed comparative advantage.

Emissions-Intensity (EI) and Trade-Exposure (TE) Tests

EITE metrics outlined in Section 3 of this report are a good starting point for any analysis of competitiveness impacts and carbon leakage risks. In particular, they are useful for gauging the relative risks between sectors and jurisdictions. However, they do not account for all of the determinants of competitiveness impacts and carbon leakage risk, including demand elasticity, abatement opportunities and costs, sectoral structure and composition, increased cost of inputs due to carbon pricing, and uptake of carbon pricing in other jurisdictions.

The EITE metric provides a general indication of the potential for carbon leakage, but cannot precisely quantify the level of risk. In a small, open, and export-oriented economy such as Canada's, many sectors are highly trade exposed. A broad indicator such as trade exposure may need to be complemented by additional tests or metrics to more accurately gauge relative risks.

Sales and Profit Tests

Sales and profit tests assess competitiveness impacts on facilities or sectors by estimating a range of compliance costs and indirect carbon costs, and then tracking changes in sales and profits. They can complement EITE tests by adding precision through facility-level assessment of impacts. Data is typically downscaled from historical data or modelled projections and built up from facility-reported GHG emissions and production. Facility financial data can help increase the precision of these tests.

These tests look at direct and indirect compliance costs on facility emissions (whether stationary combustion, process or fugitives), carbon costs embodied in purchased energy, and supply chain carbon costs. The approach also accounts for tax interactions and the ability of some facilities to pass on costs to customers.

Once facility costs have been estimated, the profit test and the sales test are used to explore potential impacts on the facility for the carbon pricing scenarios modelled, which can be seen in Figure 5. In both cases, the estimated carbon costs are divided by baseline profits and revenue to develop a ratio of impact relative to the no carbon policy baseline. As suggested by Sawyer et al. (2018), a typical application of these tests might find:

- A significant profit impact, if the estimated carbon cost as a share of profit is greater than 10%³⁷;
- A significant sales impact, if the estimated carbon cost as a share of revenues is greater than 3% of revenues.³⁸

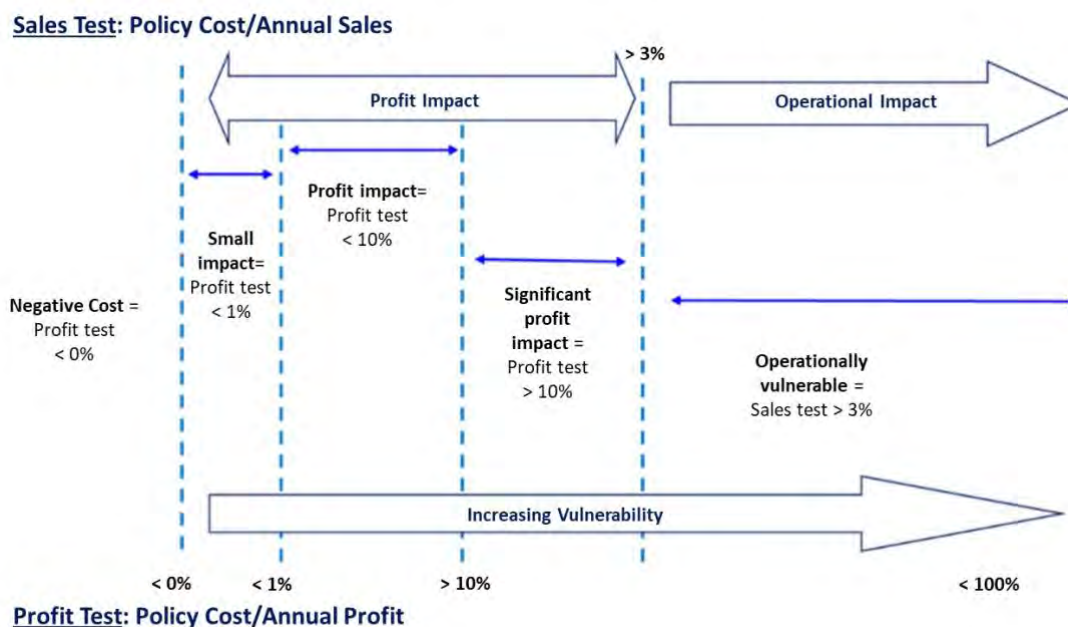


Figure 5: Sales and profit tests (EnviroEconomics, 2018)

Undertaking sales and profit tests can require access to confidential business information. Different jurisdictions have different reporting requirements, and so some governments may have easier access to the required data than others.

Relative Carbon Prices between Competitors

Production and investment leakage can occur when Canadian producers face different carbon prices than their competitors, in both export and import markets. Measuring the price difference involves comparing both the carbon price and covered emissions of Canadian EITE industries with competing jurisdictions, considering both domestic and foreign markets. One approach is to first determine the share of Canadian exports and imports in EITE sectors covered by carbon pricing in other countries. Based on this, the relative weighted average carbon price can be calculated on a per unit basis (e.g.,

price per dollar of output or per tonne of product). This metric allows for a comparison of carbon prices between competitors. However, it is a broad indicator; to the extent that individual firms or product groups deviate from the sector average, the predictive abilities of the indicators will lessen.

The share of EITE exports and imports competing with producers in jurisdictions that have a price on carbon varies by sector (see Figure 6).³⁹ This analysis does not account for actual price levels, and provides a macro-scale picture. Individual facilities will face differing price levels depending on where they are located. In addition, it does not show what percentage of international competitors in a given sector face carbon pricing in their jurisdiction.

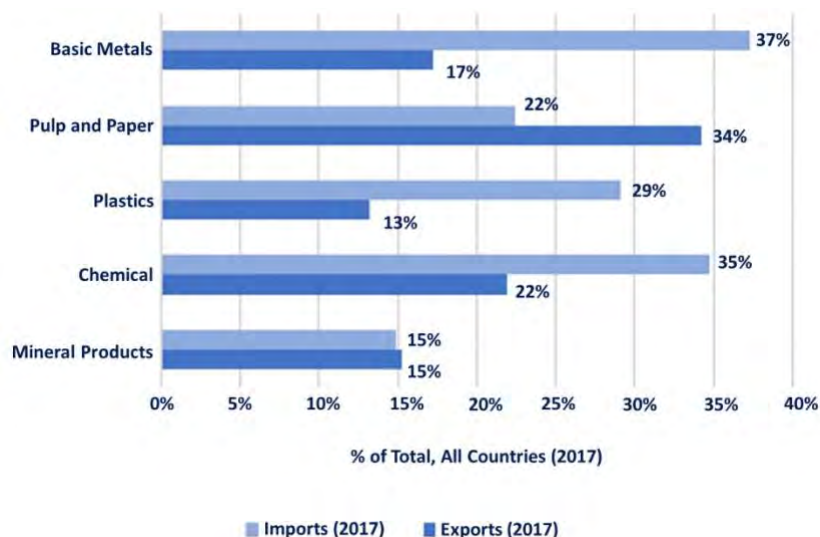


Figure 6: Share of trade by sector covered by carbon pricing in another jurisdiction

Analyzing trade impacts and revealed comparative advantage

Sectors and firms with lower emission intensities may be able to gain an advantage over higher emitting competitors. This comparative advantage can be explored through economic analyses that look at different indicators to examine how sectors might respond to carbon pricing. These indicators include:

- **Ability to produce (composition effects):** this indicator assesses the ability of a sector to transition to a low-carbon economy by measuring changes in the share of the sector's output. The indicator used is a ratio of a sector's share of the total economy before and after the imposition of the carbon price. A positive value indicates the sector can expand output under carbon pricing while a decrease points to a contraction in the size of the sector.
- **Ability to earn (scale effects):** this indicator measures changes in the size of the sector. With carbon pricing, the combination of increased carbon costs and decreased demand could reduce the value created by the sector. However, some sectors do better relative to foreign competitors and other domestic sectors, and so are able to increase economic value in the presence of carbon pricing.
- **Ability to trade:** this indicator compares changes in the sector's import and export ratio with that of the total economy (or a portion thereof). A sector has a revealed "low carbon" comparative advantage relative to other sectors if it can export more under carbon policy.
- **Relative trade balance:** this indicator highlights the response of the trade balance in a sector relative to total trade for the commodity sold in a trading area (e.g., North America). It provides

a measure of overall competitiveness in carbon constrained markets, and how the sector competes both domestically with imports and in the trading region through export markets.

Note that these indicators are of most use when using economic modeling to assess the potential impacts of carbon pricing, since this allows other variables to be held equal. These indicators are less useful when assessing real-world impacts because of difficulties in isolating the effects of multiple variables on each indicator.

Comparing Carbon Pricing Policy across Countries

In order to determine ongoing leakage risk, domestic carbon policy needs to be compared with foreign policies. Based on carbon policy uptake abroad, domestic governments can adjust the stringency levels and/or EITE support levels of their own carbon policies to ensure alignment and maintenance of incentives for continued emissions abatement activities. Three broad categories of metrics can be assessed to determine a country's emissions mitigation efforts reflecting a determined action or policy deviation from its status quo. These categories include:

- Emissions levels, intensity and reduction from forecast
- Implicit/explicit prices of carbon and energy
- Emissions costs as a share of national income or consumption

4.3 Data Considerations

Data Types

The types of data typically required to do quantitative EITE analysis include:

- **Private Sector Data:** can include facility-level information obtained directly from facilities, industry associations or from private sources, as well as market data on metrics such as output prices and production.
- **Public Data:** includes economy-wide and sector-level economic data from Statistics Canada or provincial governments, GHG data by sector from Canada's National Inventory Report, and GHG data reported by facilities. Annual reports or trade publications can be a helpful source for facility- and sector-level analysis.
- **Projected model data:** includes projections of a variety of economy-wide and sectoral economic and emission data output from mathematical models. This data is often produced by government ministries and agencies, as well as independent modelers and other third party organizations.⁴⁰

Data Uncertainty and Inconsistency

Data can be collected from a variety of sources and at different scales, leading to challenges of consistency, alignment and uncertainty. Some emissions data can be generated by using a top-down approach (e.g., by using wholesale fuel use and average emission factors), while other data can be collected directly at the facility level (i.e., through a mandatory reporting program). While facility-level data provides more detail, each of these methods has sources of uncertainty, and inconsistencies between the methods can make reconciling them challenging. Third party verification requirements in mandatory reporting programs can be used to increase confidence in the accuracy of reporting.

Another challenge involves aligning emissions data with certain kinds of economic data. Industries are grouped in different ways for different purposes, and the groupings for measuring GHG emissions do not always line up with those for measuring indicators such as Gross Value Added.

Ex-Post Analysis

Metrics for assessing empirical data rather than using modelled projections can help draw preliminary conclusions. These metrics can be derived from reviewing existing ex-post studies that have assessed data from programs with a longer history. Reviews of existing ex-post studies generally show that carbon pricing induces firms to substantially reduce emissions and that negative effects on competitiveness are limited.^{41 42} Based on existing studies, some options use empirical data include using multiple linear regression models to isolate the impacts of carbon pricing from other variables, assessing multinational firms for leakage, and tracking leakage by attributing changes in emissions to changes in other variables such as trade using the Kaya Identity.⁴³

Relative Emission Intensities

Country and sector level emission inventories can be developed using projected model data or historical data. While using projected model data is the most expedient route, a bottom-up process to develop comparable emission intensities might prove to be more robust.

Having a unified and workable set of emission intensities should be a priority for jurisdictions conducting EITE reviews. In time, other jurisdictions, e.g., US, EU or China, can be added to get a more complete picture of the market environment.

An important takeaway is the emission intensity data can vary significantly for certain sectors. Care is therefore needed to review and compare the emission intensity data from a variety of sources. This is particularly important when using modelling results.

4.4 – Key Data Considerations

Challenges with data availability remain a barrier to improving measurement of the risk of carbon leakage. For example, better understanding the abatement costs of industries would improve the calculation of carbon costs and EITE risk, however this requires detailed firm-level data that is not readily available.

There is a trade-off to balance between detail and simplicity. There are varying degrees of complexity with regard to the analysis that can be done, but standard definitions and simplified metrics (e.g., using proxies) can be used and complemented with new metrics once more data becomes available. Data challenges may be greater in small jurisdictions where only a few firms may be active.

While confidentiality issues and differences between jurisdictions may limit the ability to fully share data or adopt common methodologies, further work would be beneficial to identify data needs and enhance data collection methods where possible. This would facilitate more accurate ex-post analysis of systems and EITE impacts. As Canadian carbon pricing systems progress further, new data gathered over longer periods of time from industry will enable policymakers and economists to better analyze the strengths and weaknesses of different measures for assessing carbon leakage.

Data availability is a key consideration to evaluate carbon leakage and competitiveness impacts. Government data and reporting requirements can impose new costs on industry. However, disaggregated facility-level data can help governments better understand competitiveness impacts.⁴⁴ Without this data, governments must rely on less accurate assumptions, which could reduce the effectiveness of design features aimed at protecting competitiveness.

Streamlining and coordinating data collection and reporting across governments where possible and relevant can help reduce administrative costs for industry. For example, ECCC's Single Window Information Management system integrates data collected through some provincial and federal programs into one streamlined system in order to reduce the administrative cost and paperwork burden of regulatory compliance.

5 – Best Practices and Lessons Learned in Mitigating Carbon Leakage Risk

This section draws upon case studies, perspectives of different governments, academia, and industry to explore tools and best practices to mitigate carbon leakage risks.

All of the approaches examined help mitigate risks of lost competitiveness and carbon leakage by reducing costs faced by EITE industries. This can be done directly, for example by only pricing a portion of emissions, or indirectly, for example through investments in development and deployment of cleaner industrial technologies.

The best practices explored below are evidence of a well-established policy framework that has developed in Canada and internationally for mitigating carbon leakage and competitiveness risks for EITE industries.

5.1 - Principles

A set of guiding principles can be gleaned from best practices and lessons learned. Experience in Canada and around the world suggests that tools should be targeted, transparent, and temporary.⁴⁵

- **Targeted:** Tools need to be targeted in order to respond to the needs of individual sectors. An example of targeted tools are the specific benchmarks, OBPS, or assistance factors assigned to each sector.
- **Transparent:** Standards or the method used to calculate them should be transparent and publically available wherever possible (without revealing business-sensitive information). Transparency can also build accountability and trust among policy stakeholders. Transparent application of standards, definitions, and methodologies can help ensure consistency in support for EITEs over time and across sectors. Using empirically validated analysis and best available data also supports transparency.
- **Temporary:** EITE support is meant to be transitional and temporary. The need for support will decrease as the stringency of climate policies and prices converge across jurisdictions, and as technological innovation occurs. Many jurisdictions are ratcheting down the amount of free allowances provided to EITE industries, with the expectation that their emissions intensity will decrease over time.⁴⁶ Tools to address carbon leakage should also be designed for simple administration and compliance.

5.2 – Tools and Best Practices to Mitigate Carbon Leakage Risks

This section examines several different tools and approaches for mitigating leakage, including sector-specific treatment, benchmarking or output based standards, and indirect measures.

Sector-specific treatment and benchmarking

Treating sectors differently based on their relative risk of competitiveness impacts is a common approach. This can take the form of partial or full exemptions for vulnerable sectors under a carbon levy, allocating free allowances or excluding certain sectors under a cap and trade system, or lessened stringency of emission performance standards in an output-based performance system. Many jurisdictions use these kinds of approaches, including Alberta, California, the EU, Quebec, and South Korea.

Most practices include some form of product-specific benchmarking, often based on the production-weighted average GHG intensity for a certain product. For example, benchmarking can be used in a hybrid system by requiring facilities to pay for emissions that exceed a facility-specific limit, calculated by multiplying that facility's production by the benchmark. This approach maintains the price incentive to reduce emissions and avoids penalizing firms that are already using the lowest-emissions processes or technologies available. By pricing only a portion of emissions, the system will have a low average carbon price (avoiding investment leakage) but the marginal carbon price will remain the same, maintaining the incentive to invest in low-carbon technologies and energy efficiency. To further increase stringency, benchmarks can be set to a percentage of global best-in-class GHG intensity in order to incentivize continuous improvement and innovation for emissions reduction from even the best performers.

Establishing effective benchmarks requires access to good data. There are two main ways to set benchmarks, depending on data availability and the size of an industry: facility-specific benchmarking or industry-wide benchmarking.

Facility-specific benchmarking based on historical emissions and/or production data is useful when an industry is made up of a small number of facilities. Industry-wide benchmarking often uses average production-based emissions intensity across all facilities in a sector or a best-in-class metric (e.g. top quartile or top decile). The advantage of using emission intensity (i.e., emissions per unit of production) is that facilities have an incentive to maintain or increase production and invest in low-carbon projects since the benchmark scales with their level of production. Industry-wide benchmarking can help create a more level playing field for firms that have taken early action to reduce facility emissions.

Indirect measures to support EITE sectors

Indirect measures can support EITE sectors financially. One key tool can be the revenues generated from carbon pricing, which can be used to achieve a variety of policy objectives. While limiting costs to households is a common focus of revenue recycling plans, supporting EITE industries to limit carbon leakage is another option. This kind of support can be customized to local needs. Revenues can be recycled in a variety of ways, including by reducing existing income tax rates, investing in emissions-reducing innovation and technology, and providing transitional support to industry. Under any such measure, it is important to ensure that the carbon price incentive is maintained. As such, an example of a good practice is linking support to production rather than emissions when feasible.

Different approaches have different benefits. Direct transitional support is common because it is more effective than other methods at minimizing carbon leakage. Investments in low-emitting technologies, while not as effective at protecting EITE industries, are expected to reduce emissions more over the longer term. Any of these approaches is expected to have similar impacts on GDP growth. For example, Canada's Ecofiscal Commission has modeled how these three revenue recycling approaches would affect GDP growth scenarios, and found essentially the same impact for all three scenarios range (between 1.99 and 2.01% annual growth rates)⁴⁷.

Tax measures

Reducing costs for industry through the income tax system may help industry remain competitive and incentivize further investments in low-carbon technology. This could include measures such as reducing corporate income tax rates or allowing businesses to claim accelerated capital cost depreciation for investments in clean technologies.

Business income tax reform is often paired with personal income tax reductions in order to mitigate impacts on households. This was the case with British Columbia's carbon tax, where proceeds were committed to revenue neutrality and returned to British Columbians through business and personal income tax cuts, as well as targeted tax incentives.

Investing in emissions-reducing innovation and technology

Investing in technology development and deployment can increase access to lower-carbon technologies, and reduce the financial risk for EITE industries to implement such technologies. Revenues can support the development, improvement and adoption of low-carbon technologies. These kinds of investments may not reduce immediate competitiveness concerns, and the uptake of new technologies can vary significantly across industries. However, over time, the resulting decrease in emissions intensity from adopting low-carbon technology can help transition industries away from EITE status. As such, these kinds of investments are usually part of a broader policy approach for reducing emissions and helping facilitate the transition to lower carbon growth. Governments have supported a wide range of different kinds of projects to help industry reduce emissions.

The Government of British Columbia invested \$14 million to help LafargeHolcim upgrade to low-carbon fuel at its Richmond plant. The Government of Ontario also invested \$3.5 million as part of a \$10 million project to demonstrate the viability of low-carbon fuel as a GHG reduction strategy. The project was also supported by more than \$500 thousand in research funding from the Ontario Centres of Excellence and Carbon Management Canada.

The Government of Alberta invested \$700 thousand in research and development to help Nova Chemicals Corp. reduce the energy footprint for ethylene manufacturing. Nova contributed an additional \$700 thousand for a total cost of \$1.4 million.

Alberta invested \$47.7 million in several projects with Cenovus, including a post-combustion carbon capture using molten carbonate fuel cell pilot, and a flash steam generation prototype for the production of steam for in-situ oil sands extraction.

The Government of Canada is investing \$10 million through Sustainable Development Technology Canada and \$8 million through Natural Resources Canada's Clean Growth Program to help MEG Energy Corp. develop an oil sands extraction technology that uses less energy and produces fewer GHG emissions than current in-situ methods. Alberta Innovates and Emissions Reduction Alberta are providing an additional \$2.3 million and \$10 million, respectively, to the initiative.

A pilot project to install a 3 MW wind turbine was implemented by Tugliq Energy Co in 2014 on the site of Raglan Mine in Northern Quebec. This \$19 million project was funded in part by Canada's Ecoenergy Innovation Initiative and Québec's TechnoClimat and Écoperformance programs. Despite the harsh winter conditions, the wind turbine is still in operation and Raglan Mine has announced, in summer 2018, the installation of a second wind turbine. Together, the two wind turbines are expected to produce about 10% of the site's total energy consumption, representing, according to the mining company, a saving of about 4.4 million liters of diesel per year and annual GHG emission reductions of about 12 000 tonnes.

Direct transitional support

Different kinds of support are used in different kinds of pricing systems. In a cap-and-trade system, free allowances can be allocated to emitters that are classified as EITE. In a carbon tax or levy system, output-based tax rebates could be provided. Under an OBPS, EITE industries pay the carbon price on a portion of their emissions, determined based on their emissions intensity and level of production. The firms that receive these types of support will have a reduced average cost for compliance, but still have incentives to reduce emissions because of the prevailing marginal compliance cost.⁵³ Careful application of direct support is needed to ensure that only firms facing genuine carbon leakage concerns are supported (i.e., avoiding over-allocation).

Border carbon adjustments

An alternative policy option to address competitiveness risks leading to carbon leakage is through a form of tariffs known as border carbon adjustments. By imposing a carbon tariff on imported GHG-intensive goods based on their embedded carbon content (and potentially rebating the carbon pollution price paid to produce exported goods), border carbon adjustments can, in theory, create a level playing field between domestic and imported goods in terms of carbon costs. This can be an effective policy, as it ensures carbon costs are transmitted to end consumers.

There is a foundation of literature on how to design border carbon adjustments.^{48 49} Currently, border carbon adjustments are not among the measures used to mitigate carbon leakage in Canada. Moreover, to date, no country has implemented border carbon adjustments. However, at the time of publication of this report the European Union was giving active consideration to putting in place a Carbon Border Adjustment Mechanism and Canada has joined others including the United States in signalling that we are exploring the potential of border carbon adjustments.

Monitoring

Regardless of the tools used, tracking and monitoring relevant parameters and outcomes is important to keep tools relevant and up to date. Policymakers should monitor changes in stringency of climate-related policies to ensure leakage is minimized. Changes in other jurisdictions will be important to monitor and compare against in order to adjust industry support measures to adequate levels.

To ensure that benchmarks accurately represent the emissions intensity of a sector, technological changes, and the costs to implement new technology should be monitored and incorporated when feasible into updated benchmarks.

The section of this report on data and metrics points to some of the specific parameters that governments may wish to monitor over time.

See Annex I for examples of best practices from jurisdictions in Canada and around the world.

6 – Conclusion

Carbon pricing is a powerful tool to reduce GHG emissions efficiently and at low cost, and to drive innovation. While an uneven global policy environment creates a risk of carbon leakage and competitiveness concerns for EITE sectors, the tools and policies used to date in existing carbon pricing systems appear to have successfully addressed this risk.

As outlined in more detail under Key Findings, this review of best practices finds that governments have developed a variety of robust and effective tools and approaches to identify which sectors are at risk of

carbon leakage, and allow them to provide support to those sectors to help maintain their competitiveness. Information sharing, improved coordination and cooperation across jurisdictions where possible can make these efforts more efficient and successful.

Continuing to review and reassess the issues of competitiveness and carbon leakage over time can also help ensure carbon pricing systems are effective.

Glossary of Terms

Abatement	The reduction of greenhouse gas emissions.
Allocation (of allowances or permits)	The method by which emission permits or allowances are distributed in a cap-and-trade system (typically, permits can be allocated freely or auctioned by government) or in an output-based pricing system (typically through product- or facility-specific emissions-intensity standards).
Average carbon price	The overall average cost per tonne of emissions paid by a firm, taking into account adjustments made to mitigate competitiveness and carbon leakage risk such as free allocation, output-based standard allocation, other competitiveness incentives, and possibly long term price changes.
Benchmark or intensity target	Metric which represents a weighted average emissions-intensity (i.e., GHG emissions per unit of production, raw material or activity) for a particular product or activity.
Border carbon adjustments	An approach to address competitiveness issues through either: 1) requiring imported goods to pay for their un-priced carbon emissions costs, and/or 2) relieving exports of their expected carbon emissions costs. The goal of these approaches is to level the playing field for Canadian firms in domestic and international markets so that carbon pricing does not significantly impact their competitiveness.
Cap-and-trade system	Also known as a “tradable allowance system,” a cap-and-trade system involves setting an overall limit on emissions (a cap) by requiring polluters (emitters) to hold emission permits (or allowances) for each tonne of emissions they produce. Permits can be allocated freely or auctioned by government and those permits can be traded between emitters. Governments set the total number of permits; the price of permits is set by the market.
Carbon Leakage	The displacement, or “leakage,” of GHG emissions from one jurisdiction to another to avoid the costs of an emissions-pricing policy. If this happens, the policy has not reduced the total number of emissions, but has merely caused their point of origin to change. GHG emissions do not respect borders and have the same effect on climate change regardless of their location. Leakage thus reduces the effectiveness of carbon pricing as a policy to mitigate climate change.
Carbon levy	A carbon levy is a type of carbon pricing policy that imposes a per-unit charge on greenhouse gas emissions. Typically, such a system involves levying a charge on fossil fuels that is calculated based on the GHG emissions produced when the fuel is burned. Such a levy may constitute a tax (such as in BC) or a regulatory charge (such as under the federal carbon pollution pricing system).
Competitiveness	Competitiveness refers to the relative position of a firm, a group of firms, or a sector, compared to direct competitors in other jurisdictions. There are many factors that influence competitiveness, including tax rates and market

	conditions. Carbon pricing can affect competitiveness if there is a difference in compliance costs between jurisdictions.
Cost Pass-through capacity	The ability of a company to recover costs of complying with carbon pricing by increasing prices, without significant loss of market share. Companies that compete with firms in other jurisdictions that do not face similar carbon pricing costs often have less ability to pass on their costs in this way. .
Coverage	A carbon pricing policy can be applied to different greenhouse gases, different sectors of the economy, and different emissions sources. This is known as the coverage of the emissions pricing policy.
Direct Carbon Costs	Refers to the price paid by firms to comply with carbon pricing for GHG emissions.
Emissions allowance	Regulatory instrument that authorizes emitters subject to a cap-and-trade system or an output-based pricing system to release a specified quantity of GHG emissions.
Emissions-intensity	The rate of GHG emissions per unit of some specified activity. Output-based pricing systems often employ emissions-intensity standards calculated as emissions per unit of product, or per dollar of output.
Explicit carbon costs	Costs incurred under a carbon pricing system due to activities subject to the carbon price, such as emitting GHGs or purchasing fossil fuels.
Federal fuel charge	A regulatory charge on fossil fuels (fuel charge), administered by the Canada Revenue Agency (CRA) that is one of two parts of the federal carbon pollution pricing system under the <i>Greenhouse Gas Pollution Pricing Act</i> . The fuel charge applies to 21 fossil fuels including gasoline, light fuel oil (e.g., diesel), and natural gas. It also applies to combustible waste (e.g., tires). The fuel charge is generally paid by fuel producers and fuel distributors that deliver fuel in a jurisdiction where the fuel charge applies.
Implicit carbon costs	Costs related to compliance with policies intended to reduce GHG emissions, but without directly pricing carbon emissions, such as clean or renewable fuel standards, coal-fired electricity generation phase out, etc.
Indirect carbon costs	Costs due to carbon pricing embedded in goods and services. These costs are passed on by firms that pay the carbon price directly, and then increase their prices to recover some or all of their carbon costs.
Investment leakage	Diversion of investment capital away from a jurisdiction that has implemented carbon pricing to other jurisdictions that have not implemented similar measures.
Marginal abatement cost	The marginal abatement cost is the cost of reducing an additional unit of GHG emissions, for example by investing in new technologies and/or processes.
Marginal carbon price	The cost of emitting an additional unit of GHGs.
Output-based pricing system	A system that imposes a carbon price on industrial emissions based on emissions-intensity standards and level of output. The result is that only a portion of industrial emissions are subject to pricing. A price signal is maintained by issuing tradable credits where a facility's emissions are below the emissions-intensity standard.
Output-based standard	An emissions-intensity standard for a given facility, product, group of products or sector.

Production leakage	A shift in production from one location to another in response to the implementation of a carbon price.
Revenue/proceeds recycling	Reinvestment of direct proceeds from carbon pricing into the economy. There are a variety of different mechanisms for recycling proceeds, including cutting taxes, investing in technology, and providing rebates.
Stringency	The extent to which a carbon pricing policy incentivizes the reduction of GHGs. Stringency can be adjusted through various elements of policy design, including the price level and coverage.
Trade-exposure	The degree to which a firm or sector competes in interjurisdictional markets. Trade exposure is an indicator of a firm or sector's ability to pass on carbon costs to its customers.

Annex I: Best Practices and Lessons Learned

International Best Practices

There are many lessons that can be learned from efforts to address competitiveness risks and carbon leakage in other countries. The European Union's Emissions Trading System (EU ETS) was the first large-scale cap and trade system in the world, and has undergone significant revisions to improve its performance. California's cap and trade program is another system considered best in class that can help inform Canadian approaches. Both systems can offer insights on how best to identify sectors at risk of carbon leakage, and how to design effective mechanisms to reduce that risk.

EU ETS

Identifying sectors at risk of carbon leakage

Under the EU ETS, a sector is classified as having significant risk of carbon leakage if it meets one of the following criteria:

- Carbon costs as a proportion of gross value added exceed 5% and the sector's trade intensity with non-EU countries exceeds 10%;
- Carbon costs as a proportion of GVA exceed 30%;
- Non-EU trade intensity exceeds 30%.

The European Commission maintains an official list of sectors that qualify as facing significant risk of carbon leakage. In order to mitigate potential carbon leakage, firms in sectors on the list receive a higher share of free allowances than other industrial installations.

In Phases 1-3 of the EU ETS, firms qualified as EITE if they had a greater than 30% cost increase or greater than 30% trade intensity. In Phase 4 (2021-2030), the policy approach is set to shift to require high exposure under both metrics (i.e., greater than 30% emissions intensity and trade intensity).⁵⁰

At the time of publication of this report the European Commission was giving active consideration to a Carbon Border Adjustment Mechanism that could be an alternative to current EU ETS measures to mitigate carbon leakage risk (e.g. free allocation of emission allowances).

Effective carbon leakage risk reduction mechanism design

Lessons learned from Phases 1-3 and the design of Phase 4 include:

- **Qualitative assessments of carbon leakage can add flexibility and nuance to quantitative methods.** The EU ETS allows sectors that score just below the threshold on the quantitative carbon leakage risk assessment to provide qualitative information on factors such as abatement potential, competitive dynamics, profitability and other market characteristics to justify their risk status.
- **Accurately identifying the risk of carbon leakage requires assessing both emissions-intensity and trade-exposure.** Phase 4 of the EU ETS moves away from a single metric, requiring that sectors qualify using the combination of emissions intensity and trade exposure. This is partly due to limitations of the trade intensity metric as an indicator of cost pass-through ability, reducing its ability to distinguish carbon leakage risk on its own.
- **Misidentifying sectors as at risk of carbon leakage can lead to overcompensation. This can be avoided by focusing on the cost pass-through ability of firms.** In the early stages of the EU ETS, free allocation was provided to electricity generators who were not at risk of carbon leakage because they could pass on their costs. This resulted in the sector increasing prices and earning considerable profits.
- **In sectors with complex and varied facilities, weighting discrete production processes by their emissions intensities can help overcome benchmarking challenges.** The EU took this approach with refineries through the use of the Complexity Weighted Tonne (CWT), an emissions-intensity metric for refineries designed to account for differences between facilities. The method weights the production from component processes by their average emissions-intensity relative to crude distillation. This allows for emissions-intensities to be compared across refineries with different processes and/or different final product mixes. The CWT method accounts for inherent efficiency differences of different processes and products. California and Alberta have both adopted similar approaches.⁵¹

California Cap-and-Trade Program

Identifying sectors at risk of carbon leakage

California measures emissions intensity and trade exposure similarly to other jurisdictions and assigns sectors a risk level for each indicator in a transparent way. The system combines risk level ratings on each of the two indicators to assign a carbon leakage risk classification. See Section 3 of this report for more detail on how California and other jurisdictions measure and classify EITE sectors.

EI + TE Risk Classification – California		
Risk Level	Emission Intensity (tCO ₂ e/\$)	Trade Exposure (%)
High	> 5000	> 19%
Medium	1000-4999	10% – 19%
Low	100-999	< 10%
Very Low	<100	N/A

Figure 7: California's EITE risk classification chart

		Carbon Leakage Risk Classification – California		
Emissions Intensity	High	High	High	High
	Medium	Medium	Medium	High
	Low	Low	Medium	Medium
	Very Low	Low	Low	Low
	Low	Low	Low	Low
		Low	Medium	High
		Trade Exposure		

Figure 8: California's heat map

Free allowances are allocated to sectors at risk of carbon leakage based on the assistance factor assigned to each carbon leakage risk classification.⁵² Sectors deemed to be at high risk of carbon leakage

include: aluminum, lime, cement, chemical, petrochemical, metallurgy, mining, pelletizing, pulp, paper and petroleum refining sectors.

Effective carbon leakage risk reduction mechanism design

One key best practice from California involves providing support to industries based on current emission and output rather than historical levels. Providing free allocations based on fixed historical production creates an incentive for firms to reduce current production levels and sell excess free allowances. This may reduce emissions but it also reduces economic output.⁵³

Rather than taking this approach, California based free allocations on current output levels. This maintains the incentive to reduce emissions without driving a reduction in production. The incentive under this approach is to improve intensity (i.e., emissions per unit of production). Firms can then maximize both production and abatement. Over time, the stringency of the benchmark can be increased to reduce overall free allocations, as shown in Figure 9.⁵⁴

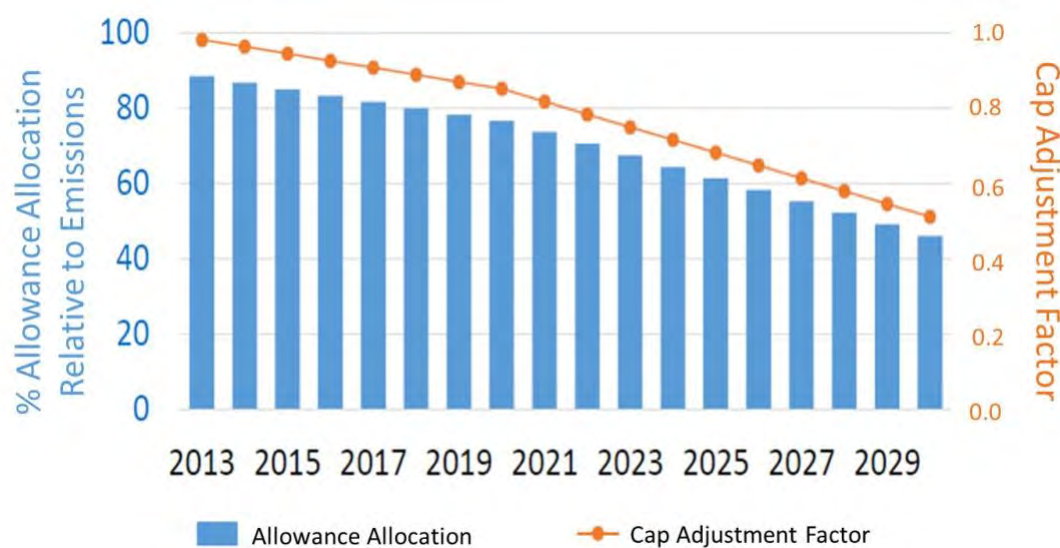


Figure 9: Effect of benchmark stringency and declining cap adjustment factor on allocations

Canadian Best Practices

This section outlines best practices and lessons learned from Canadian jurisdictions, including Quebec, Alberta, British Columbia, and Canada. Lessons can be learned about how to identify sectors at risk of carbon leakage, and how to design effective carbon leakage risk reduction mechanisms.

Quebec's Cap-and-Trade Emissions System

Identifying sectors at risk of carbon leakage

Quebec uses two indicators to determine which emitters subject to the cap-and-trade (C&T) system for GHG emission allowances present a risk of carbon leakage:

- the trade exposure ratio;
- emission intensity.

The trade exposure ratio is used to identify emitters faced with strong national or international competition. Emitters faced with strong national or international competition may not have the

necessary market influence to increase the price of their products. The trade exposure metric is one way to assess an emitter's ability to pass on the carbon cost to its customers.

For emitters who are considered trade-exposed, the second step is to assess the theoretical impact of carbon pricing on the company's production costs. For example, the impact of the carbon price will be greater for emitters that are producing high emission-intensive goods than for those producing low emission-intensive goods. In addition, a limited ability to pass on the costs associated with carbon pricing may be exacerbated when an emitter's GHG emissions are high and the associated costs represent a large share of its operating costs.

Given the potential impact that the C&T system may have on their operating costs as well as on their limited ability to pass on the carbon cost to their customers, emitters deemed EITE are considered to be more vulnerable to "carbon leakage" than other emitters.

[Effective carbon leakage risk reduction mechanism design](#)

Consequently, in order to maintain the competitiveness of these businesses and to promote innovation in these sectors rather than see them relocate to another jurisdiction, the government of Quebec introduced, within the C&T system, a mechanism for reducing the risks of carbon leakage; namely, the free allocation of emission units. This free allocation, made annually, reduces the number of emission allowances that an emitter must purchase on the market to cover its GHG emissions, which in turn reduces the impact of carbon pricing on its competitiveness.

The number of emission units allocated annually to most EITE emitters is calculated on the basis of their actual production and their GHG emission intensity target (intensity target). This approach avoids penalizing emitters that increase their production, and avoids allocating too many free emission units to emitters that reduce their production. This provides incentives to firms to improve their performance on an ongoing basis, regardless of their initial level of performance.

Intensity targets were set so as to take into consideration the type of GHG emissions—combustion, fixed process or other emissions (mainly fugitive)—and therefore the various reduction opportunities.

For most industrial establishments, intensity targets are specific to their individual circumstances. However, for the aluminum, lime and cement sectors, intensity targets are based instead on sector averages, since it is possible to set targets based on the level of performance of all the establishments in a particular sector.

For the first compliance period (2013–2014), intensity targets were set at 100% of historical averages for fixed process emissions as well as for other emissions (mainly fugitive). For combustion emissions, the targets were set at between 80% and 100%, depending on the fuel used.

Between 2015 and 2020, intensity targets for fixed process emissions will remain at 100%, while the targets for combustion and other emissions will be lowered by 1% to 2% per year in order to encourage companies to improve their performance over time. For the 2021–2023 period, the intensity targets for fixed process emissions, combustion emissions and other types of emissions will be lowered respectively by 0.5%, 1.5% and 3% per year.

Similar rules apply to new emitters and to those who decide to voluntarily participate in the system, with reference years adapted based on the year in which they attain the coverage threshold or the year in which they submit an application for voluntary participation.

The number of emission units allocated free of charge for each establishment is then adjusted based on the emitter's assistance factor (AF), which is a function of the estimated level of risk of carbon leakage for its industry sector. Until 2020, the AF for all EITE emitters has been implicitly set at 100%.

$$\text{Number of free emission units} = \text{AF} \times (\text{Intensity target} \times \text{Actual production})$$

For the 2021– 2023 period, AFs will vary according to the estimated risk of carbon leakage, which depends on the combination of the trade exposure ratio and emission intensity metrics described above. The following graph shows the classification adopted (see Figure 10). For EITE emitters, note that AFs vary from 90% to 100% according to this classification.⁵⁵

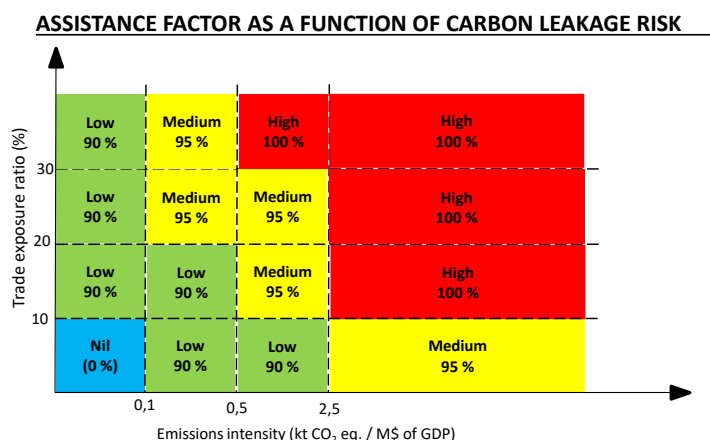


Figure 10: Quebec's carbon leakage risk chart

On the other hand, emitters that are not faced with national or international competition or that can pass on the carbon cost to their customers are not deemed EITE and therefore at risk of carbon leakage. These companies can therefore not receive free allocations.

This applies to most electricity producers and all distributors of fuels and fossil fuels. These companies must therefore buy all the emission units required to meet their emissions coverage obligations.

Alberta Carbon Competitiveness Incentive Regulation

Identifying sectors at risk of carbon leakage

Alberta's Carbon Competitiveness Incentive Regulation (CCIR), which replaced the Specified Gas Emitters Regulation (SGER), applied in 2018-2019 to all heavy emitters (>100,000 tonnes CO₂e/year) while also allowing facilities to opt-in if they competed against regulated firms or emitted more than 50,000 tonnes CO₂e/year or were carbon-intensive and trade-exposed. Note that CCIR was in effect at the time of writing, but was replaced by a new Technology Innovation and Emission Reduction (TIER) regime in January 2020.

The Technology Innovation and Emission Reduction (TIER) Regulation

The TIER Regulation is an industrial carbon pricing and emissions trading system that automatically applies to any facility that has emitted 100,000 tonnes or more of carbon dioxide equivalent (CO₂e) greenhouse gases (GHGs) in 2016, or any subsequent year.

A facility with fewer than 100,000 tonnes of CO₂e GHG emissions per year may voluntarily apply to opt-in to the TIER system if it competes against a facility regulated under TIER, or has emissions greater than 10,000 tonnes of annual GHG emissions and is in an emissions-intensive, trade-exposed (EITE) sector.

Multiple small conventional oil and gas facilities with a common person responsible can also enter into TIER by voluntarily applying to be regulated as an aggregate facility.

Facilities must comply with either a facility specific historic emissions benchmark or a sector-level high performance product benchmark. All electricity facilities remain subject to a 'good-as-best-gas' high performance benchmark. Benchmarks maintain an equal incentive to reduce emissions for all facilities through performance improvements, while reducing total costs.

TIER provides regulated facilities with a number of compliance options, including:

- On-site emission reductions.
- Use of emissions performance credits (produced and traded by facilities that outperform their emission reduction obligations).
- Use of Alberta-based emissions offsets.
- Payment into a TIER fund (\$30 per tonne CO₂e in 2020 and \$40 in 2021).

Under TIER, emissions performance credits and emissions offsets combined may not be used to satisfy more than 60 per cent of a facility's total compliance obligation for a single compliance year.

Only sectors classified as *high* risk of carbon leakage based on the EITE criteria were treated as EITE within the CCIR (see Figure 11).

Carbon Leakage Risk Classification - Alberta				
Emissions Intensity	>30% Very high	High	High	High
	15-30% High	Medium	High	High
	3%-15% Medium	Medium	High	High
	1%-3% Low	Low	Medium	Medium
	<1% Low	Low	Low	Low
		<10% Low	10%-20% Medium	20%-60% High
		Trade Exposure		
		>60% Very High		

Figure 11: Alberta's carbon leakage risk classification chart

In the early stages of the development of CCIR, there were some instances of reluctance from industry to provide data relevant to EITE competitiveness assessment. As a result, general metrics used to assess EITE status were based on data available from Statistics Canada, while additionally providing an opportunity for industry input of facility level data to contribute to assessment of potential competitiveness impacts from carbon pricing.

Effective carbon leakage risk reduction mechanism design

Under the CCIR, several benchmarks were set based on product or sector specificities. The benchmark for electricity was set at a “good-as-best-gas” standard based on the lowest emissions intensity natural gas combined cycle power plant in the province. In-situ and mined bitumen benchmarks were based on provincial top-quartile emissions intensity performance, while upgrading and refining were based on a complexity-weighted barrel approach. For all other sectors, the general approach was to start with an 80% of production-weighted average intensity, which could be adjusted upward by 10% increments (to 90 or 100%) where sectors demonstrated an increased risk of carbon leakage. Additionally, where a benchmark determined using this approach was lower (more stringent) than the best-performing facility in Alberta within a sector, a best-in-class benchmark was applied.

Benchmarks under the CCIR followed a “one product, one benchmark” principle.

Alberta assessed facility performance using profit and sales tests. The CCIR also included facility cost containment provisions which allowed facilities facing economic challenges to provide data in order to receive additional cost relief.⁵⁶

Allocation of emissions allowances was designed to decrease by 1% annually (tightening rate) from 2020 (excluding industrial process emissions) and compliance obligations to phase in from 50% in 2018 to 75% in 2019 and 100% in 2020. The tightening rate was intended to help maintain the incentive to reduce emissions over time and maintained the environmental integrity of the system over time. Phasing in the new regulation allowed facilities time to get accustomed to new rules.

Cost containment mechanisms were in place if CCIR compliance costs exceed 3% of sales or 10% of profit at a facility. The ability for smaller facilities to opt-in also provided flexibility, and ensured a level playing field among competitors.

A key lesson learned in Alberta is to design policy with compliance flexibility to help reduce carbon leakage by decreasing compliance costs while driving further emission reductions at lower economic costs. Under the SGER and CCIR, emitters had the option to purchase offsets and to pursue other compliance opportunities so that they were not facing the full carbon price in the form of higher costs. This policy design supported the carbon offset industry and allowed emitters to optimize investments for their compliance strategies. Credits could also be used for a portion of compliance.

British Columbia Carbon Tax

Identifying sectors at risk of carbon leakage

The carbon tax applies to the purchase and use of fossil fuels, whether by individuals or industry. The CleanBC Program for Industry was created to mitigate the potential unintended consequences of carbon pricing on the province’s industrial sector.

Effective carbon leakage risk reduction mechanism design

The CleanBC Program for Industry (CPI),⁵⁷ with a budget based on an estimate of the incremental carbon tax revenue above \$30/t CO₂e paid by large industrial emitters (i.e. those that emit more than 10 kilotonnes (kt) CO₂e annually), provides both incentives for facilities based on their emissions intensity and financial support for their emissions reduction projects. For most sectors, all facilities' emissions are included to calculate a facility's emissions intensity including combustion, venting, fugitive and process emissions. For some sectors, facilities also include emissions associated with the production of the electricity that is used onsite.

Operators of facilities that emit 10 kt CO₂e or more annually in any sector (with a small number of exceptions), and who submit emission reports and an application, are eligible. This includes all facilities within a linear facility organization (LFO) (i.e. the B.C. facilities within an upstream oil and gas value chain) that individually emit more than 1 kt CO₂e and collectively emit more than 10 kt CO₂e annually. The program is not restricted to emissions-intensive and trade-exposed sectors.

An operator with emissions intensity below an eligibility threshold is eligible to receive an incentive payment. The threshold is two times the B.C. sector's production-weighted-average emissions intensity for the particular product or activity.

The amount of the incremental carbon tax paid by the facility above \$30/t CO₂e that an operator receives back as an incentive payment is based on how the facility's emissions intensity compares with a performance benchmark for the product or activity of the facility. Facilities with emissions intensity at or below the benchmark will receive back all incremental carbon tax they paid; those with emissions intensity between the eligibility threshold and the performance benchmark receive a pro-rata portion. For 2020/21, the incentives operate under a transition framework, where all operations receive a minimum 75% incentive, with benchmarks determining an incentive up to 100%.

The balance of funds remaining unclaimed goes into the CleanBC Industry Fund (CIF) – a fund that provides grants to eligible facilities to support industrial GHG emission reduction projects.

Additional programs designed to address carbon leakage include the Greenhouse Carbon Tax Relief Grant (GCTRG) Program,⁵⁸ which refunds up to 80% of the carbon tax paid by eligible commercial vegetable, floriculture, wholesale nursery, and forest seedling greenhouse operators for the combustion of natural gas and propane for heating for the production of CO₂ for fertilization. Greenhouses that emit over 10 kt CO₂e are still eligible for the CleanBC Industrial Incentive Program, with a maximum incentive of 20% of the over \$30/t CO₂e carbon tax given they already receive 80%.

Federal Output-Based Pricing System

Identifying sectors at risk of carbon leakage

As part of the development of the federal OBPS, the Government of Canada undertook a three-phase assessment of competitiveness and carbon leakage risks due to carbon pollution pricing for industrial sectors. All sector benchmarks⁵⁹ were initially set at 80% of the national production-weighted average emissions intensity. Any sector found to be at high risk through the competitiveness assessment, or found to have a high proportion of industrial process emissions, had its benchmark adjusted to 90% or 95%.

Phase 1 used a static quantitative EITE test based on that used by Alberta in its then-Carbon Competitiveness Incentive Regulation (see Section 3 of this report and the Alberta section of this Annex), but with carbon costs assessed with free emissions allocations at proposed federal benchmark levels. Phase 1 used the same thresholds for high competitive risk classification indicated in Figure 11 above in the Alberta section of this Annex. Phase 2 involved re-running the EITE test from Phase 1 projected to 2022, using output from a dynamic model of the Canadian economy. This allowed for a variety of other factors to be considered, including indirect costs and sectoral changes in response to carbon pricing. In Phase 3, industry was invited to submit additional data and information demonstrating significant risks due to carbon pricing.

Effective carbon leakage risk reduction mechanism design

Benchmarks for sectors assessed as being at high competitiveness or carbon leakage risk due to carbon pollution pricing based on either of the three phases of analysis, or with a high proportion of industrial process emissions, were adjusted to 90%. For sectors that continued to be assessed as high competitiveness and carbon leakage risk due to carbon pollution pricing at 90%, or with a high proportion of industrial process emissions, a second adjustment was made to 95%. The potential to reduce process emissions will be reassessed by 2022 as part of the scheduled review of the Output-Based Pricing System Regulation.

Competitiveness risk assessment also plays an important role under the Policy Regarding Voluntary Participation in the Output-Based Pricing System (the Policy). Under the Part 2 of the Policy, facilities from sectors that have facilities emitting 10 kt CO₂e or more and that are in sectors considered to be at significant risk of carbon leakage and competitiveness impacts from carbon pollution pricing may be able to opt-in to the OBPS. Sectors considered to be at significant risk of carbon leakage and competitiveness impacts include those assessed to be in the “medium” EITE category when paying the full federal fuel charge or if meeting other competitiveness and carbon leakage risk criteria set-out in the Policy. Once opted-in to the OBPS, these facilities receive an 80% benchmark.⁶⁰

Another important element is the PCF commitment to review the approach to carbon pricing by 2022, with an interim review in 2020, and ECCC’s related commitment to review the OBPS regulations by 2022. Periodic review is recognized as a best practice, and will help ensure that up-to-date and accurate data continues to be used to inform the design of pricing systems, including benchmarks.

Annex II - List of Organizations Engaged in Contributing to the EITE Review

Academia and International Agencies

- Johnathan Arnold, EcoFiscal Commission, Canada
- Dr. Chris Bataille, Associate Researcher, Institute for Sustainable Development and International Relations, France and Adjunct Professor, School of Resource and Environmental Management, Simon Fraser University, Canada
- Daniel Besley, Carbon Pricing Leadership Coalition, World Bank, USA
- Dr. Carolyn Fischer, Senior Fellow, Resources for the Future, USA and Canada 150 Research Chair in Climate Economics, Innovation and Policy, University of Ottawa and Smart Prosperity Institute, Canada
- Dr. Meredith Fowlie, Associate Professor, Department of Agricultural and Resource Economics University of California at Berkeley, USA
- Dr. Sara Hastings-Simon, Senior Fellow, The Pembina Institute, Canada and Research Fellow, University of Calgary, Canada
- David McLaughlin, International Institute for Sustainable Development, Canada
- Katherine Monahan, Smart Prosperity Institute, Canada
- Dr. Nancy Olewiler, Professor and Director, School of Public Policy, Simon Fraser University, Canada and Commissioner, Ecofiscal Commission, Canada
- Dr. Janet Peace, Center for Climate and Energy Solutions, USA
- Dr. Nic Rivers, Assistant Professor, Department of Economics and Canada Research Chair in Climate and Energy Policy, University of Ottawa, Canada

Industry, Associations and Consultants

- Adelphi Group, Germany
- ArcelorMittal S.A.
- Canadian Association of Petroleum Producers
- Chevron Corporation, USA
- ClimeCo Corporation
- The Delphi Group
- Dow Chemical Company
- Enbridge Inc.
- EnviroEconomics
- Fertilizer Canada
- LafargeHolcim Ltd.
- Navius Research Inc.
- Questor Technology Inc.
- Resolute Forest Products
- Rio Tinto Group
- Suncor Energy, Inc.
- Teck Resources Limited
- Vivid Economics, United Kingdom

Other Governments

- California Air Resources Board, California, USA
- Directorate-General for Climate Action, European Commission, European Union

Canadian Governments

- Alberta Environment and Parks
- British Columbia Environment and Climate Change Strategy, Climate Action Secretariat
- Government of Canada, Environment and Climate Change, Carbon Markets Bureau and Finance Canada
- Manitoba Conservation and Climate, Climate and Green Plan Implementation Office
- New Brunswick Environment & Local Government, Climate Change Secretariat
- Newfoundland and Labrador Environment, Climate Change and Municipalities, Climate Change Branch
- Northwest Territories Finance, Fiscal Policy
- Nova Scotia Environment, Climate Change Unit
- Nunavut Environment, Climate Change Secretariat
- Ontario Environment, Parks and Conservation, Climate Change
- Prince Edward Island, Climate Change Secretariat
- Québec — Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques, Direction générale de la réglementation carbone et des données d'émission
- Saskatchewan Environment, Climate Change Branch
- Yukon Environment, Climate Change Secretariat

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- ⁴⁵ Beale, E., Beugin, D., Dahlby, B., Drummond, D., Oleweiler, N., and Ragan, C. (2015) Provincial Carbon Pricing and Competitiveness Pressures: Guidelines for Business and Policymakers. *Canada's Ecofiscal Commission*. <http://ecofiscal.ca/wp-content/uploads/2015/11/Ecofiscal-Commission-Carbon-Pricing-Competitiveness-Report-November-2015.pdf>
- ⁴⁶ European Commission (2018) The revision of the EU Commissions Trading System for the period after 2021. https://ec.europa.eu/clima/policies/ets/revision_en
- ⁴⁷ Ecofiscal Commission (2016) Choose Wisely. Options and Trade-offs in Recycling Carbon Pricing Revenues. Canada's Ecofiscal Commission. <https://ecofiscal.ca/reports/choose-wisely-options-trade-offs-recycling-carbon-pricing-revenues/>
- ⁴⁸ Panezi, M. (2015) When CO2 Goes to Geneva: Taxing Carbon across Borders – Without Violating WTO Obligations, *Centre for International Governance Innovation*, CIGI Papers No. 83. <https://www.cigionline.org/publications/when-co2-goes-geneva-taxing-carbon-across-borders-without-violating-wto-obligations>
- ⁴⁹ Condon, M. and Ignaciu, A. (2013) Border Carbon Adjustment and International Trade: A Literature Review, *OECD Trade and Environment Working Papers*, 2013/06. https://www.oecd-ilibrary.org/trade/border-carbon-adjustment-and-international-trade_5k3xn25b386c-en
- ⁵⁰ Vivid Economics (2018) International Carbon Pricing Competitiveness Case Study.
- ⁵¹ Ibid
- ⁵² California Air Resources Board (2018) Appendix A Staff Report: Initial Statement Of Reasons. Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation. <https://www.arb.ca.gov/regact/2018/capandtrade18/ct18pro.pdf>
- ⁵³ Vivid Economics (2018) International Carbon Pricing Competitiveness Case Study.
- ⁵⁴ California Air Resources Board (2018) California Cap and Trade Program: EITE Review Workshop.
- ⁵⁵ Note that for the electricity sector, under certain conditions, an AF of 60% was used whereas the AF used for the others was 0.
- ⁵⁶ Alberta Climate Change Office (2018) Cost Containment Program Fact Sheet. <https://www.alberta.ca/assets/documents/cci-cost-containment-fact-sheet.pdf>
- ⁵⁷ CleanBC Industrial Incentive Program; <https://www2.gov.bc.ca/gov/content/environment/climate-change/industry/cleanbc-industrial-incentive-program>.
- ⁵⁸ Greenhouse Carbon Tax Relief Grant Program; <https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/programs/greenhouse-carbon-tax-relief-grant>

⁵⁹ This term is used here for consistency with how it is used throughout the document. However, it should be noted that ECCC documentation generally refers to benchmarks as Output-Based Standards (OBSs) and not as benchmarks.

⁶⁰ For details on the competitiveness criteria, see: “Voluntary Participation Policy for Output-Based Pricing System” <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/voluntary-participation-policy.html>