

# Carbon Emissions: Who makes big polluters pay

A comparison of provincial and federal industrial carbon pricing systems for industrial emitters

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Isabelle Turcotte, Jan Gorski and Brianne Riehl

November 2019



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# 1. Introduction

Globally, unprecedented efforts are underway to take action to address climate change through the deployment of innovative low-carbon solutions. Canada's leadership in protecting the environment and climate is essential to building a competitive low-carbon global economy. In 2016, the Government of Canada established its first national climate plan, which includes 50 measures to bring Canada closer to a low-carbon future.

In this report, we study the application of one of these measures: carbon pricing. More specifically, we look at carbon pricing systems for heavy emitters as a tool to cost-effectively trigger innovation and emissions reductions in Canada's industrial sector. The federal government's carbon pricing system includes an output-based pricing system (OBPS) for industrial emitters. Provinces and territories were given the option of adopting the federal approach, or proposing their own carbon pricing system to ensure deep emission cuts in the industrial sector. To date, four provincial OBPS systems are under consideration to see if they meet the federal benchmark requirements: British Columbia, Alberta, Ontario, and New Brunswick.

Policies that fairly and effectively address emissions from this high-emitting sector are critical as we aim to meet Canada's climate target and favourably position our economy in a race towards the \$26 trillion low-carbon economy. We cannot afford to miss this opportunity.

This report undertakes a comparative analysis of the provincial and federal approaches to reduce emissions from heavy emitters. It compares the federal, B.C., Alberta, Ontario and New Brunswick OBPSs, basing analysis on each system's ability to achieve the two fundamental objectives of a pricing system on high emitters: effectively reduce emissions and incentivize innovation, while addressing competitiveness concerns. We compare each system's potential to effectively unlock investments and bring down mitigation costs, and how they hold Canada's large emitters to account.

The results of our analysis highlight B.C.'s system as a reflection of the province's sustained leadership on carbon pricing, and the federal system as a fair and effective approach for pricing industrial emissions. It finds Alberta's most recently proposed OBPS to be weaker than the provincial system currently in effect. Further, Ontario's proposed OBPS is revealed to be weaker on heavy emitters than the federal system currently in effect. If implemented, Alberta's and Ontario's new proposed systems would provide a weaker signal for innovation to the provincial industrial sectors at a

time when profound shifts in the industry are needed to attract new investment and remain competitive in the 21<sup>st</sup> century economy. Findings also indicate areas where New Brunswick’s system requires strengthening. Encouragingly, New Brunswick’s government announced on October 23<sup>rd</sup>, 2019 that it will revise its proposed approach to “look at how to comply” with the federal minimum requirements for a pricing system.<sup>1</sup>

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<sup>1</sup> Jacques Poitras, “Higgs may create his own carbon tax in wake of federal Liberal win,” CBC News, October 22, 2019. <https://www.cbc.ca/news/canada/new-brunswick/carbon-tax-new-brunswick-higgs-federal-election-1.5330765>

## 2. The pan-Canadian price on pollution in a new era of climate policy in Canada

Economists and institutions such as the Organization for Economic Cooperation and Development (OECD), the World Bank, and the International Energy Agency (IEA) all agree that a broadly applied carbon price is an effective and low-cost way of reducing emissions. According to the High-Level Commission on Carbon Prices “a well-designed carbon price is an indispensable part of a strategy for reducing emissions in an efficient way”.<sup>2</sup> This tool is quickly becoming the norm around the world — as of April 2019, 46 national and 28 subnational jurisdictions are putting a price on carbon pollution.<sup>3</sup>

Until recently, carbon pricing systems had been in application in Canada’s four biggest provinces: British Columbia, Alberta, Ontario, and Quebec. In the last two years both Alberta and Ontario have rolled back or cancelled carbon pricing policies.

British Columbia, first introduced a tax on fossil fuels in 2008 which applied across the economy, including for heavy emitters. The tax started at \$10/t-CO<sub>2</sub>e with a \$5/year schedule increase, frozen in 2013 and restored in 2018. Alberta had been pricing emissions from industrial emitters since 2007. The scope of the policy was extended in 2017 with the application of a \$20/t-CO<sub>2</sub>e levy on fuels. In 2018, the levy was increased to \$30 and the system for heavy emitters was strengthened. Quebec and Ontario joined California’s cap-and-trade system in 2014 and 2017, respectively.

Building on provincial leadership, the federal government introduced a national price on carbon in 2016. The government put forward a flexible, yet consistent approach whereby subnational governments were encouraged to implement their own carbon pricing system, as long as it met a minimum set of benchmark requirements, or could choose to apply the federal backstop.

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<sup>2</sup> Carbon Pricing Leadership Coalition, *Report of the High-Level Commission on Carbon Prices* (2017), 1. [https://static1.squarespace.com/static/54ff9c5ce4b0a53deccfb4c/t/59b7f2409f8dce5316811916/1505227332748/CarbonPricing\\_FullReport.pdf](https://static1.squarespace.com/static/54ff9c5ce4b0a53deccfb4c/t/59b7f2409f8dce5316811916/1505227332748/CarbonPricing_FullReport.pdf)

<sup>3</sup> Carbon Pricing Leadership Coalition, “Carbon Pricing in Action,” June 2019. <https://www.carbonpricingleadership.org/who>

The federal carbon pricing backstop includes an output-based pricing system (OBPS) for addressing emissions from heavy-emitting industrial sectors (i.e. cement, natural gas, aluminum and refining industries) to encourage innovation and emissions reductions from these sectors, while balancing competitiveness pressures from external jurisdictions that do not yet have a carbon price in place. The federal government implemented the OBPS on January 1<sup>st</sup>, 2019 in Manitoba, New Brunswick, Prince Edward Island, Saskatchewan and Ontario. The newly elected Ontario government had previously cancelled the existing cap-and-trade system in October 2018, leaving the province without a system for holding heavy emitters to account, triggering the application of the federal backstop. The New Brunswick government was originally supportive of implementing the federal backstop, but has since withdrawn support in favour of a provincial approach that would align with the federal benchmark requirements.

Ontario<sup>4</sup> and New Brunswick<sup>5</sup> both put forward their own regulations for pricing emissions for heavy emitters after the federally set submission deadline and, subsequently, the application of the federal OBPS in January 2019. In June 2019, the recently elected Alberta government cancelled its carbon levy and put forward a new system for large industrial emitters to replace the existing system, the carbon competitiveness incentive regulation (CCIR).<sup>6</sup> The final regulations for the Technology Innovation and Emissions Reduction (TIER)<sup>7</sup> system are expected before the end of the year.<sup>8</sup> The proposed systems in these provinces will be assessed by the federal government in the coming months to determine if they meet the federal requirements.

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<sup>4</sup> Government of Ontario, Greenhouse Gas Emissions Performance Standards, O. Reg. 241/19. <https://www.ontario.ca/laws/regulation/r19241>

<sup>5</sup> Government of New Brunswick, Holding Large Emitters Accountable: New Brunswick's Output-Based Pricing System (2019). <https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Climate-Climatiques/HoldingLargeEmittersAccountable.pdf>

<sup>6</sup> Government of Alberta, Carbon Competitiveness Incentive Regulation, Alberta Regulation 255/2017. [http://www.qp.alberta.ca/1266.cfm?page=2017\\_255.cfm&leg\\_type=Regs&isbncln=9780779803774](http://www.qp.alberta.ca/1266.cfm?page=2017_255.cfm&leg_type=Regs&isbncln=9780779803774)

<sup>7</sup> Government of Alberta, Alberta's Proposed Technology Innovation and Emissions Reduction System (2019). <https://open.alberta.ca/dataset/8c6d1e31-cd21-4d08-ba25-688c533a3cec/resource/b8ae91bf-8626-485c-a86d-9209a0a24a4c/download/discussion-document-tier-engagement.pdf>

<sup>8</sup> The Alberta government tabled Bill 19, the Technology Innovation and Emissions Reduction Implementation Act on October 29, 2019 which would pave the way for implementing TIER. [http://www.qp.alberta.ca/documents/Orders/Orders\\_in\\_Council/2019/2019\\_213.html](http://www.qp.alberta.ca/documents/Orders/Orders_in_Council/2019/2019_213.html)



British Columbia’s carbon tax has applied to industry since its inception in 2008. In 2018 the CleanBC industrial incentive program (CIIP) kicked in<sup>9</sup> to respond to industry concerns around competitiveness. Under CIIP, industrial facilities only pay annual increases above the 2017 price of carbon (\$30/t-CO<sub>2</sub>e) on a portion of their emissions.

Policy certainty and continuity are critical for investors. The policy rollbacks and cancellations observed in provincial carbon pricing policy in Alberta, Ontario, and New Brunswick are not in line with global trends that see an increased focus on climate action and pose a significant risk to investors.<sup>10</sup>

Table 1. Current state of output-based pricing systems for heavy emitting industrial sectors across four provinces

Jurisdiction	British Columbia	Alberta	Ontario	New Brunswick
Status of the proposed provincial approach for heavy emitters	The CleanBC industrial incentive program (CIIP) is in effect since 2018 with ongoing developments on certain policy elements	Alberta has released its final regulations for the Technology Innovation and Emissions Reduction system (TIER). If the federal government assesses that it meets the benchmark requirements, it would take effect in January 2020 to replace the current provincial system.	Ontario released its final regulations for its Environmental Performance Standards in July 2019	New Brunswick had released regulations for an output-based pricing system in June 2019, but announced in October that it will revise its approach to carbon pricing
Heavy pricing system currently in effect	BC CIIP	Alberta’s Carbon Competitiveness Incentive Regulation is in effect since 2018	The federal system for heavy emitters has been in effect since January 2019	The federal system for heavy emitters has been in effect since January 2019

<sup>9</sup> Government of British Columbia, *CleanBC Industrial Incentive Program: Frequently Asked Questions* (2019). [https://www2.gov.bc.ca/assets/gov/environment/climate-change/ind/cleanbc-program-for-industry/cleanbc\\_industrial\\_incentive\\_program\\_faq.pdf](https://www2.gov.bc.ca/assets/gov/environment/climate-change/ind/cleanbc-program-for-industry/cleanbc_industrial_incentive_program_faq.pdf)

<sup>10</sup> Carbon Pricing Leadership Coalition, *Report of the High-Level Commission on Carbon Pricing and Competitiveness* (2019). <https://openknowledge.worldbank.org/bitstream/handle/10986/32419/141917.pdf?isAllowed=y&sequence=4>

### 3. Comparing the provincial and federal carbon pricing systems for large industrial emitters

The federal government, British Columbia, Alberta, Ontario, and New Brunswick have all recently put forward their own proposals for pricing emissions for large industrial emitters. In this report, we assess the systems against key principles of a well-designed system, and assess whether the systems hold strong to the fundamental objectives of an OBPS: to hold polluters to account ensuring emissions reductions, while maintaining economic competitiveness.

Well-designed carbon pricing systems ensure industries and economies are more, not less, competitive in the long run. Well-designed systems should adhere to the following principles:

- **Maintain the incentive to reduce carbon pollution:** Any measures taken to address competitiveness concerns with respect to carbon pricing for emissions-intensive and trade exposed (EITE) sectors should maintain the incentive to reduce pollution.
- **Be targeted:** Measures to address competitiveness pressures should only apply to emissions-intensive and trade exposed (EITE) sectors that may have material competitiveness and/or profit impacts due to carbon pricing policies.
- **Be transparent:** Any support for EITE sectors should be justified by data and analysis.
- **Be consistent:** The broad framework for assessing and addressing EITE competitiveness issues should be consistent across sectors and firms.
- **Be temporary:** Any support should be transitional in nature and be phased out when carbon pricing and/or regulatory equivalency with other jurisdictions is achieved.

- Be simple: Any EITE mechanism should be simple to implement, administer, and comply with.<sup>11,12</sup>

For each jurisdiction we consider whether the policy reflects the principles stated above and achieves the two fundamental objectives of an OBPS:

1. Effectively reduce emissions, drive innovation and create a market signal for the shift to low carbon industrial processes
2. Address competitiveness concerns without overstating the impact of competitive pressures and limiting the effectiveness of the policy to reduce emissions

We describe the principles used to assess systems' effectiveness at reducing emissions and appropriateness at addressing competitiveness risks in the next two sections.

### 3.1 Do systems effectively reduce emissions, drive innovation and create a market signal for the shift to low carbon industrial processes?

We assess the different systems effectiveness by examining the following criteria: the schedule of price increase; the type of standard used; and the emission sources covered by the system.<sup>13</sup> We note that the effectiveness of the system will also be influenced by the way the revenues will be used to further incentivize innovation and emissions reductions. However, given that numerous jurisdictions are still developing their approach to revenue use at the time of writing this report, we did not include this factor in our analysis.

Table 2 summarizes the three criteria used to assess the systems against the first objective. Note that as part of the national carbon price backstop, all jurisdictions that

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<sup>11</sup> Climate Leadership Team, *Recommendations to Government* (2015).

[https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/clp/clt-recommendations-to-government\\_final.pdf](https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/clp/clt-recommendations-to-government_final.pdf)

<sup>12</sup> Canada's Ecofiscal Commission, *Provincial Carbon Pricing and Competitiveness* (2015).

<https://ecofiscal.ca/wp-content/uploads/2015/11/Ecofiscal-Commission-Carbon-Pricing-Competitiveness-Report-November-2015.pdf>

<sup>13</sup> Canada's Ecofiscal Commission, *Comparing Stringency of Carbon Pricing Policies* (2016).

<http://ecofiscal.ca/wp-content/uploads/2016/07/Ecofiscal-Commission-Comparing-Stringency-Carbon-Pricing-Report-July-2016.pdf>

design their own heavy-emitter pricing system must meet the requirements set by the federal backstop (referred to as “benchmark” in Table 2).<sup>14</sup>

Table 2. Assessing systems’ ability to effectively reduce emissions, drive innovation, and create a market signal for the shift to low carbon industrial processes

Criteria	BC CIIP	Alberta CCIR	Alberta TIER	Ontario EPS	New Brunswick OBPS	Federal OBPS
Schedule of price increase (\$/tCO <sub>2</sub> e)	40 in 2019 45 in 2020 50 in 2021 50 in 2022	30 in 2019 30 in 2020 40 in 2021 50 in 2022	\$30 in 2020 No commitment to increase above \$30	20 in 2019 30 in 2020 40 in 2021 50 in 2022	20 in 2019 30 in 2020 40 in 2021 50 in 2022	20 in 2019 30 in 2020 40 in 2021 50 in 2022
	Strength of the price signal					
	stronger than benchmark in 2019–2021	stronger than benchmark in 2019, equal to benchmark 2020–2022	equal to benchmark in 2020, weaker than benchmark 2021–2022	equal to benchmark	equal to benchmark	benchmark
Type of emissions-intensity standard	Product	Mostly product	Facility + best in class benchmarks for all except electricity	Product and facility	Facility, except for the electricity sector	Mostly product
	Power to drive towards best in class performance					
	very strong	strong	weak	mixed	weak	strong
Emission sources covered	Combustion TBD whether other emissions are included	Combustion Process Indirect Fugitives	Combustion Indirect Process No fugitives	Combustion Process Indirect (except electricity) Fugitives	Combustion Process, Indirect (except electricity) Fugitives	Combustion Some process Some indirect Some fugitives
	Potential to incentivize reductions across the board at the facility level					
	weak	strong	mixed	strong	strong	mixed

<sup>14</sup> The carbon pollution price (...) must be at least equal to the Benchmark carbon pollution price. Jurisdictions may tailor the emission intensity standards (...) to the circumstances of their sectors. These standards should be at levels that drive improved performance in carbon intensity over the 2018 to 2022 period, and should account for best-in-class performance. The reviews of carbon pricing committed to in the Pan-Canadian Framework will consider the adequacy of these emission intensity standards, accounting for their impacts on emissions, innovation, competitiveness and carbon leakage. See Government of Canada, *Guidance on the pan-Canadian carbon pollution pricing benchmark* (2018), <https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/guidance-carbon-pollution-pricing-benchmark.html>

### 3.1.1 Schedule of price increase

Pricing carbon pollution is effective at reducing greenhouse gas emissions because by increasing the price of fossil fuels, it increases the demand for low-carbon alternatives. In turn, this promotes innovation and emissions reductions. The higher the price, the stronger the signal, or incentive, to use less fossil fuels. To provide a level playing field for heavy emitters across the country, the federal benchmark sets a price floor of \$20/t in 2019 increasing by \$10 per year to \$50/t in 2022.

With a price of \$40 in 2019 and increasing by \$5 annual increments, B.C.'s carbon price for heavy emitters exceeds the federal price floor from 2019 to 2021 and remains aligned with the benchmark through 2022. Ontario and New Brunswick set their proposed carbon price for heavy emitters to align with the federal floor. Alberta's proposed TIER system sets a price of \$30/t in 2020 but doesn't commit to further increases to match the federal backstop. Each of the systems under evaluation, with the exception of Alberta's TIER, reflects the notion that the carbon price should increase over time to give companies time to adapt while maintaining a clear incentive to increasingly reduce pollution and drive innovation.

### 3.1.2 Types of emissions-intensity standard

In an output-based pricing system, regulated facilities pay the carbon price only on the portion of their emissions above a certain emissions-intensity level, or standard. There are two types of standards:

- 1) Sector-specific standards are expressed as a percentage of the average emissions intensity for a sector.
- 2) Facility-based standards are expressed as a percentage of historical emission intensity of individual facilities.

By setting the standard as a percentage of the average, the system seeks to drive emissions intensity down to that level (e.g. a standard set at 80% of a sector's average emissions intensity seeks to drive the sectors' average emissions intensity down to that level), and therefore the lower the number is, the higher the ambition for achieving emissions reductions.

Sector-specific standards incentivize all facilities in a given sector to meet or exceed a common emissions intensity. This creates an incentive for all facilities to increase their environmental performance, while rewarding facilities that are below or meet the emissions-intensity standard, because they will not incur extra costs.

Conversely, facility-based standards are based on an individual facility's average emissions intensity over a given time period, resulting in the same average cost of carbon per emissions across facilities, regardless of their relative emissions intensity. This reduces the comparative advantage for lower emissions-intensity facilities, thereby weakening the incentive to reduce emissions. Therefore, sector-specific standards are more effective at reducing emissions and incentivizing innovation than facility-based standards. Facility-based standards should be avoided because they are unfair and inefficient at driving sector wide shifts. Effectively, facility based standards penalize facilities that have taken steps to reduce their emissions, while rewarding laggards.

While facility-based standards might be appropriate in some cases, using sector-specific standards based on global best practices, as seen in B.C.'s system, or national average emission intensity, as seen with the federal system, is preferable to create a level playing field among facilities and drive towards emissions reductions.

The currently applied Alberta CCIR uses product-sector standards for most sectors, with facility specific standards used for sectors that only have one facility.<sup>15</sup> Conversely, the newly proposed TIER would use a hybrid system consisting of facility based standards and *high performance standards* for all sectors except electricity, where a sector wide standard is maintained. The *high performance standards* reward new and existing facilities for best-in-class performance, maintaining some incentive for top performers. Under the federal system, sector-specific standards were used for 193 of the regulated facilities under the system, while facility based standards were used for 24 facilities.<sup>16</sup> Environment and Climate Change Canada specified that facility standards are used “when a sector has only one or very few facilities and where publication of a (standard) may pose confidentiality concerns.”<sup>17</sup> By contrast, Ontario has proposed to use sector-

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<sup>15</sup> Government of Alberta, *Standard for Establishing and Assigning Benchmarks v2.3* (2019). <https://open.alberta.ca/dataset/c7d90ca6-88b3-4b71-9ba8-0ebe6d70c065/resource/97ba67a2-caa1-42a7-9d9f-28d60b65e5ea/download/standard-for-establishing-and-assigning-benchmarks-v2.3.pdf>

<sup>16</sup> Communications with Environment and Climate Change Canada (Note: numbers may change over time as new facilities join the OBPS).

<sup>17</sup> Environment and Climate Change Canada, *Regulatory Proposal for the Output-Based Pricing System Regulations under the Greenhouse Gas Pollution Pricing Act* (2018), 22. <https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/pricing-pollution/obps-regulatory-proposal-en.pdf>

specific standards for 13 industrial activities<sup>18</sup> and to use facility-based standards for about 80 facilities.<sup>19</sup>

According to New Brunswick, facility specific standards were proposed because “the province generally does not have multiple facilities belonging to the same industrial sector, and (where it does) the facilities’ industrial processes and products produced are so distinct (...) that adopting a sectoral approach is not suitable.”<sup>20</sup>

### 3.1.3 Emissions sources covered

There are four key sources of industry emissions that can be included under a pollution pricing system:

1. Combustion (e.g. burning of fossil fuels for industry operations and transport)
2. Fugitive (e.g. venting or leaking of methane)
3. Process (e.g. cement and fertilizer production)
4. Indirect emissions (e.g. imported electricity, heat, and hydrogen).

All sources of emissions should be included to maximize every opportunity to reduce emissions. Competitiveness concerns should not be used as a rationale to exclude certain emission sources. Instead, competitiveness concerns can be addressed through the emissions-intensity standards.

B.C.’s system is still under development, but currently only covers combustion sources, foregoing emissions reduction potential from process, indirect, and fugitive emissions. Alberta’s CCIR (the system that will be replaced) features the strongest potential to incentivize emissions reductions by covering all emissions sources. TIER covers emissions from combustion, industrial processes, and indirect sources, while fugitives are excluded. Ontario, New Brunswick and the federal systems are relatively comparable in terms of coverage. An important caveat is that the incentive to reduce for each type of emissions is also a factor of the emissions-intensity standard set for each sector. As

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<sup>18</sup> Government of Ontario, *GHG Emissions Performance Standards and Methodology for the Determination of the Total Annual Emissions Limit* (2019), Table A. [https://prod-environmental-registry.s3.amazonaws.com/2019-07/GHG EPS and Methodology for the Determination of the TAE July 2019 %28EN%29.pdf](https://prod-environmental-registry.s3.amazonaws.com/2019-07/GHG%20EPS%20and%20Methodology%20for%20the%20Determination%20of%20the%20TAE%20July%202019%28EN%29.pdf)

<sup>19</sup> Government of Ontario, *GHG Emissions Performance Standards and Methodology for the Determination of the Total Annual Emissions Limit* (2019), Table E.

<sup>20</sup> Government of New Brunswick, *Holding Large Emitters Accountable: New Brunswick’s Output-Based Pricing System* (2019), 6. <https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Climate-Climatiques/HoldingLargeEmittersAccountable.pdf>

will be discussed in the next section, under the proposed Ontario and New Brunswick systems, the incentive is weakened by the decision to set significantly less stringent standards for process emissions in Ontario and for all emissions in New Brunswick.

### 3.2 Do systems address competitiveness concerns without overstating the impact of competitiveness pressures and limiting the effectiveness of the policy to reduce emissions?

A well-designed pricing system for heavy emitters is meant to minimize the risk of industry shutting down production and moving to a jurisdiction with no carbon pricing, also known as leakage. This concern is mitigated by providing a subsidy to production, incentivizing emissions-intensive and trade exposed facilities to maintain production even as input costs go up. Therefore, any such system should target only those sectors that can demonstrate material competitiveness pressures through both emissions intensity and trade exposure. It would otherwise be unfair to other regulated entities within the system and to all parties participating in climate programs more broadly. For all the attention given to these concerns, it is important to note that the risk of leakage as a result of competitiveness pressures is often overstated. Indeed, the Ecofiscal Commission found that competitiveness pressures for British Columbia, Alberta, and Ontario are “significant for only a few sectors, representing only a small share of total provincial economic activity.”<sup>21</sup> Nationally, only 5% of the economy is “more exposed.”<sup>22</sup> In B.C. only 2% of provincial GDP is more exposed. This figure is 18% in Alberta and 2% in Ontario. Further, a September 2019 report of the High-Level Commission on Carbon Pricing and Competitiveness found that “there is little evidence

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<sup>21</sup> Elizabeth Beale, Dale Beugin, Bev Dahlby, Don Drummond, Nancy Olewiler, and Christopher Ragan, *Provincial Carbon Pricing and Competitiveness Pressures- Guidelines for Business and Policy Makers* (November 2015), 2. <http://ecofiscal.ca/wp-content/uploads/2015/11/Ecofiscal-Commission-Carbon-Pricing-Competitiveness-Report-November-2015.pdf>

<sup>22</sup> Categorized in the report as having both a carbon cost greater than 5% of GDP (measured based on a \$30 carbon price) and a trade exposure greater than 15%.



to date that carbon pricing has resulted in the relocation of the production of goods and services or investment.”<sup>25</sup>

In this analysis, we avoid comparing the methods used by the different jurisdictions to assess the risk of competitiveness. However, we note that prescribing a competitiveness risk assessment framework to evaluate leakage risks and thresholds for providing the appropriate level of relief would provide more clarity on how to meet benchmark requirements for an OBPS. We also note the importance of these two principles for an effective system that does not overstate competitiveness risks:

- Competitiveness risk frameworks should only consider the difference between the Canadian carbon price and the price in outside jurisdictions, and not consider the pressures caused by the array of other economic and policy factors that influence firm performance, including corporate income tax rates, foreign exchange rates, the prices of locally supplied inputs, wage rates, etc.
- Additional relief (i.e. subsidies) from the starting emissions-intensity standard should only be provided if analysis demonstrates that the initial level of relief does not adequately protect against competitiveness risks.

Two criteria are used to evaluate if the proposed heavy-emitter pricing systems appropriately address competitiveness: range of standards used and the tightening rate. The table below summarizes these criteria.

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<sup>25</sup> Carbon Pricing Leadership Coalition, *Report of the High-Level Commission on Carbon Pricing and Competitiveness* (2019).  
<https://openknowledge.worldbank.org/bitstream/handle/10986/32419/141917.pdf?isAllowed=y&sequence=4>

Table 3. Assessing systems’ ability to address competitiveness concerns without overstating the impact of competitive pressures and limiting the effectiveness of the policy to reduce emissions

Criteria	BC CIIP		Alberta CCIR	Alberta TIER	Ontario EPS	New Brunswick OBPS	Federal OBPS
Emissions-intensity standard range	Applied at \$30/t: 0%	Applied to annual increases above \$30/t: 75% in 2019; “best in class” (TBD) in subsequent years	80%–100%	90%	95%–100%	100%	80%–95%
	% of sector emissions that are priced						
	100%	25%	0–20%	10%	0–5%	0%	5–20%
	strength of system						
	much stronger than benchmark		as strong as benchmark	weaker than benchmark	much weaker than benchmark	much weaker than benchmark	benchmark
Tightening rate	0%		1%	1%, capped at best in class standard	0% to 5%	0.84%	0%
	Phasing out subsidies for industries by:						
	never		after 2100	after 2100	after 2100	after 2100	never, except for electricity sector

### 3.2.1 Emissions-intensity standard range

As explained in the “type of standard” criteria, in an OBPS, the emissions-intensity standard is used to determine the portion of emissions subject to the price for a given facility. By pricing only a portion of a facility’s emissions, the carbon cost burden is reduced while still providing incentive for heavy emitters to reduce their emissions. This protects against the risk of carbon leakage. However, as mentioned above, determining the appropriate degree of relief is key to the system’s ability to appropriately state and address leakage risks.

For illustrative purposes, let’s consider a hypothetical Canadian sector consisting of 19 facilities for which the national average emissions intensity is 71 tCO<sub>2</sub>e per tonne of product (represented by the blue line in Figure 1). A 70% standard means that the emissions-intensity standard is set at 70% of the national average emissions intensity, 50 t CO<sub>2</sub>e per tonne of product (represented by the orange line). Somewhat counterintuitively, the lower the standard, the higher the portion of emissions priced on average. For example, a 70% standard would mean that on average, the sector pays a carbon price on 30% of its emissions. At the facility level, there will be variability within a sector in terms of the portion of emissions that are priced because some facilities have higher emissions intensities than others and will find themselves above while others are below the standard.

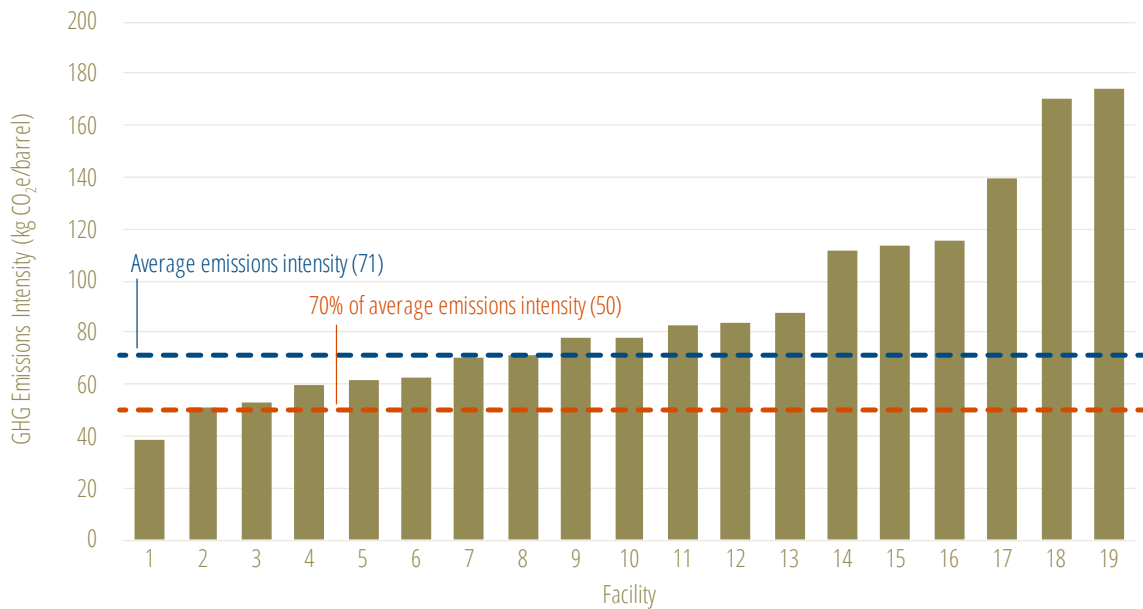


Figure 1. Hypothetical distribution of emissions intensities within a given sector

Under this standard range criteria, B.C’s system is the most ambitious, by proposing to use global best in class emissions-intensity standards. While standards are still under development, 75% standards were provisionally applied in 2019. As stated above, industrial facilities in B.C pay the \$30/t-CO<sub>2</sub>e price of carbon on all emissions. The emissions-intensity standard only applies to price increase beyond \$30, resulting in a significantly larger percentage of emissions priced in each sector than in other systems.

The federal system has set 80% standards for 42 sectors, 90% standards for 19 sectors, and 95% standards for 14 sectors. This means that the majority of sectors under the system will pay the price on pollution on 20% of their emissions. Alberta’s CCIR standards are at a similar range. An 80% standard applies for most activities (notable

exceptions include a good as best for electricity, top quartile or better for oil sands in-situ and mining). Only two sectors — cement and forestry — have received a 100% standard. The proposed TIER system in Alberta would set a weaker starting standard of 90% for all sectors resulting in sectors paying the price on pollution on 10% of emissions. Ontario's proposed system would set a 95% standard for natural gas, and a 98% standard for most activities applicable to combustion emissions, and a 100% standard for all process emissions. This decision speaks to the difficulty of reducing emissions in hard to abate sectors for which process emissions represent a larger percentage of total emissions. While measures like energy efficiency and fuel switching can be readily deployed to reduce combustion emissions and increase facilities' economic performance, reducing emissions from chemical and physical reactions, however, requires innovations and new approaches that are only starting to emerge. By setting a weaker standard for process emissions, the Ontario system would reduce the incentive to promote the necessary innovation to reduce emissions in hard to abate sectors. Finally, New Brunswick's proposed system sets 100% standards for all facilities.

It is important to mention that the federal, Alberta, Ontario and New Brunswick systems maintain an incentive to reduce emissions on facilities whose emission intensity might be below the standard, by giving them the opportunity to generate and trade credits for additional reductions.

### 3.2.2 Tightening rate

OBPSs should act as a transition policy to reach an economy-wide carbon price applied to all greenhouse gas emissions. As more and more international carbon pricing (or alternate climate policy approaches) align with Canadian pricing stringency, any competitiveness pressures over the medium to long term will be alleviated — rendering the OBPS unnecessary. As such, relief from the price on carbon should decrease over time through ongoing application of systemic ramp-down rates. Best practice is to set the decrease in the standard, known as the tightening rate, to align with Canada's long term decarbonization goal of reducing emissions by 80% by 2050.<sup>24</sup> Matching this goal would require a reduction in the standard of at least 2% to 3% per year.

B.C. and the federal systems currently do not feature a tightening rate. However, both systems are subject to review on a cyclical basis, including the tightening rate. Alberta

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<sup>24</sup> Government of Canada, Canada's Mid-Century Long-Term Low-Greenhouse Gas Development Strategy (2016). [https://unfccc.int/files/focus/long-term\\_strategies/application/pdf/canadas\\_mid-century\\_long-term\\_strategy.pdf](https://unfccc.int/files/focus/long-term_strategies/application/pdf/canadas_mid-century_long-term_strategy.pdf)

CCIR<sup>25</sup> and TIER systems both feature a 1% tightening rate, but under TIER the tightening rate is capped when the facility standard reaches the intensity of 10% of the facilities with the best performance (known as the high performance standard). Ontario proposes a tightening rate between 0-5%. New Brunswick proposes a tightening rate of 0.84%. In all cases, full pricing of sectoral emissions would not be achieved until after 2100.

### 3.3 Treatment of the electricity sector

Electrification will play a large role in decarbonizing our economy, and the first step must be to reduce the emissions from our electricity systems. Treating electricity appropriately under carbon pricing policy will go a long way in making the necessary electricity emissions reductions.

The electricity sector is not by necessity emissions-intensive or trade exposed and hence does not meet the criteria for inclusion in a heavy emitters carbon pricing system. Yet, in response to the diversity of electricity markets and perceived concerns around electricity costs to trade exposed industries, jurisdictions have included electricity in their systems. The treatment of electricity should ideally take advantage of carbon pricing as an opportunity to accelerate the phase out of coal and increase penetration of innovative grid solutions. At a minimum, the system should be designed to avoid locking in new natural gas infrastructure and focus on the continued growth of renewables to contribute to the federal government target of a 90% zero-emission grid by 2030.<sup>26</sup> A rapid transition of the grid to non-emitting sources such as renewables, storage, energy efficiency and demand side management is required to assist with decarbonization of the economy as different sectors such as transport and heating become further electrified.

The table below compares standards and tightening rate in the electricity sector for all jurisdictions.

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<sup>25</sup> The tightening rate does not apply to process emissions.

<sup>26</sup> Government of Canada, *Powering our future with clean energy*, December 9, 2016.

<https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/clean-energy.html>

Table 4. Assessing systems' treatment of the electricity sector

Criteria	BC CIIP	Alberta CCIR	Alberta TIER	Ontario EPS	New Brunswick OBPS	Federal OBPS
Standard (t of CO <sub>2</sub> e/GWh)	0 for all types of generation	370 for all types of generation	370 for all types of generation	420 for all types of generation	820 for coal 420 for gas 800 for liquids	800 for coal and coal to gas units 370 for gas 550 for liquids
Tightening rate	0	1%	0%	0%	1% for coal 0% for gas 0.6% or liquids	5% for coal <sup>27</sup> 11% for new gas 0% for existing gas and liquids
Electricity grid	Mostly non-emitting with a bit of gas	Coal and gas heavy grid	Coal and gas heavy grid	Mostly non-emitting grid	Some coal and gas	Varied mix of coal, gas, and non-emitting

Ideally, electricity should be subject to the full price on pollution, like in B.C., because it isn't trade exposed or emissions intensive.

Alberta CCIR treats all sources of electricity fairly with an ambitious standard, but does not have an ambitious phase out of subsidies. However it allows renewables to opt-in, allowing them to be treated fairly. The Alberta TIER system is the same as CCIR for the electricity sector except that there is no tightening rate on electricity. In Alberta the existing industrial carbon pricing system played a large role in reducing emissions from electricity generation in its first year; emissions from the sector decreased by over 7 Mt CO<sub>2</sub>e from 2017 to 2018.<sup>28</sup> This exemplifies the impact of a well-designed carbon pricing system on emissions.

As a result of Ontario's successful coal phase out in 2014, the grid is now predominantly powered by non-emitting sources with natural gas representing only 10% of

<sup>27</sup> The coal benchmark decreases from 800 to 600 t CO<sub>2</sub>e/GWh in the first year and then decreases by 28 t/GWh each year after, reaching 370 t/GWh in 2030. The benchmark for new gas begins to decrease in 2021, reaching zero in 2030.

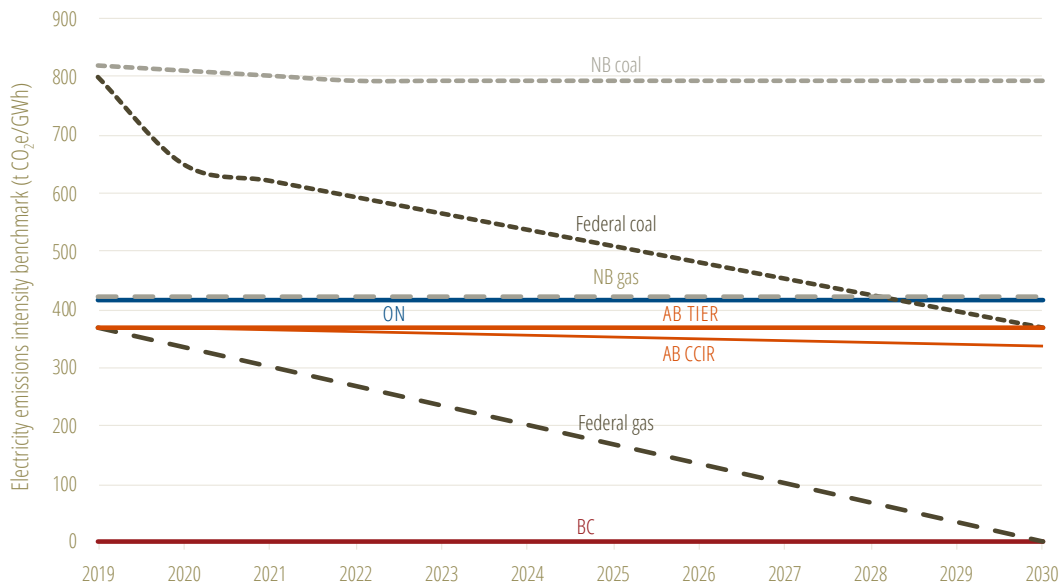
<sup>28</sup> Alastair Sharp, "Alberta's NDP government says emissions reductions prove carbon pricing works," National Observer, February 20, 2019. [https://www.nationalobserver.com/2019/02/20/news/albertas-ndp-government-says-emissions-reductions-prove-carbon-pricing-works?fbclid=IwAR2GazM\\_h4sjPBJ1haaEBZ8F-b2g8oGCjnYfqYsDmL3KOBUDStu4EP8nXks](https://www.nationalobserver.com/2019/02/20/news/albertas-ndp-government-says-emissions-reductions-prove-carbon-pricing-works?fbclid=IwAR2GazM_h4sjPBJ1haaEBZ8F-b2g8oGCjnYfqYsDmL3KOBUDStu4EP8nXks)

production.<sup>29</sup> Unfortunately, the proposed fixed 420 t of CO<sub>2</sub>e/GWh standard for electricity does not build on previous efforts to decarbonize the grid and heavily subsidizes polluting sources of electricity over renewables. A more ambitious approach would be to set a standard that reflects the emission intensity of best in class natural gas plants (370 t of CO<sub>2</sub>e/GWh) to drive existing production of electricity, both by utilities and industrial facilities, from natural gas towards this level of achievable environmental performance.

New Brunswick has given each fuel source a separate unambitious standard with very little change in stringency over time. This system is the weakest and provides very little incentive to shift towards cleaner sources of electricity.

The declining standard set for new natural gas plants means that by 2030 all emissions from these new plants will be priced (not just those over a certain level). This natural gas standard will boost Canada’s ability to decarbonize our grids. The treatment of coal (and coal to gas), however, misses an opportunity to build on the coal phase out regulations and further speed up the transition from coal to cleaner sources.

Figure 2 below compares standards across jurisdiction along with their tightening rates over time.



<sup>29</sup> Government of Ontario, “Ontario’s energy mix at the end of 2015,” March 29, 2019. <https://www.ontario.ca/document/2017-long-term-energy-plan-discussion-guide/ontarios-energy-mix-end-2015>

Figure 2. Emissions-intensity standards for electricity production in CCIR, TIER, ON EPS, NB OBPS, and Federal OBPS



## 4. Conclusion

Our examination of carbon pricing systems for heavy emitters in B.C., Alberta, Ontario, New Brunswick and federally highlight key differences in each system's ability to promote investments in innovation and ensure Canada's heavy emitters have credible, appropriate signals to do their fair share to reduce emissions and build a strong, low carbon economy.

We considered each system's ability to achieve the two fundamental objectives of a pricing system:

*1) Effectively reduce emissions, drive innovation and create a market signal for the shift to low carbon industrial processes*

Considering the schedule of price increase, the type of standard used and emissions sources covered for each system, B.C. has the strongest system. B.C.'s carbon price exceeds the federally established floor from 2019–2021 and uses product-based standards to drive towards global best in class performance. In stark contrast, New Brunswick proposed a significantly weaker system by using only facility-based standards, missing an opportunity to drive high-emitting facilities towards best in class performance for their sectors. Although Ontario's system also uses product benchmarks, its broad use of facility benchmarks similarly misses this opportunity. Finally, with a fixed price at \$30 and an increased use of facility benchmarks, Alberta's proposed TIER system would be less effective as proposed, and weaker than the system currently in place, CCIR.

*2) Address competitiveness concerns without overstating the impact of competitive pressures and limiting the effectiveness of the policy to reduce emissions*

Considering the standard ranges and tightening rate, B.C., once again, has the strongest system. By pricing all industrial emissions on the \$30 portion of the carbon tax and adopting global best in class standards for the portion above, B.C. has again put forward the most ambitious system for addressing competitiveness concerns without limiting the effectiveness of the policy. All industrial emissions in B.C. are subject to the first \$30 t-CO<sub>2</sub>e carbon tax, while the OBPSs in all other jurisdictions apply to the whole tax, a greater portion of industrial emissions in B.C. are covered under the carbon price than in any other system.

The emissions-intensity standards proposed by Ontario and New Brunswick are weaker than the standards put forward in other jurisdictions. This lenient approach where only 5% of emissions will be priced on average in Ontario and 0% of emissions will be priced in New Brunswick sacrifices the effectiveness of the policy to reduce emissions. While legitimate competitiveness concerns may exist in some cases, if the policy overstates those concerns, it will not be effective. The federal and Alberta CCIR systems address competitiveness appropriately with standards that are strong but measured under which 20% of emissions will be priced for a majority of sectors. The newly proposed Alberta TIER system sets weaker standards than the CCIR and the federal system. Finally, none of the systems feature an ambitious enough decline rate in the intensity standards to phase out carbon subsidies in line with Canada's long term decarbonization goal.

Because greening the grid is a fundamental building block to decarbonize our economy, we paid special attention to each system's ability to promote cleaner, more efficient electricity systems. B.C. leads the way by pricing all emissions from the electricity to sector. The Alberta CCIR system is also strong and will create incentives to green the electricity grid. The newly proposed Alberta TIER system conserves CCIR's strong approach to electricity. Despite a fuel differentiated approach at the federal level which is inconsistent with an OBPS, the declining standard for new natural gas will play a key role in avoiding gas lock-in. Meanwhile, Ontario and New Brunswick are too lenient on fossil fuel sources of electricity and have yet to put forward appropriate incentives to green the electricity grid and unlock further mitigation potential in other sectors.

The summary table below grades the system's ability to 1) effectively reduce emissions; 2) appropriately address economic competitiveness risks; and 3) green the grid towards deep carbonization, and captures the most significant strengths and weaknesses for each category.

Table 5. Comparison summary of six provincial and federal industrial carbon pricing systems (4 being the highest grade)

	Effectively reduces emissions	Appropriately addresses economic competitiveness risks	Greens the grid towards deep carbonization
BC CIIP	4 Biggest strength: strongest signal to reduce pollution	4 Biggest strength: drives towards global best in class performance	4 Biggest strength: prices all emissions from electricity
Alberta CCIR	3	3	3
Alberta TIER	2 Biggest weakness: strength of signal to reduce pollution does not increase annually	2	3
Ontario EPS	3	1 Biggest weakness: provides a subsidy on the price on pollution for 95–100% of emissions	1 Biggest weakness: very weak signal to promote renewables
New Brunswick OBPS	2	0 Biggest weakness: provides a subsidy on the price on pollution 100% of emissions	0 Biggest weakness: weakest signal to promote renewables
Federal OBPS	3	3	2