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A Distributional Analysis of the Federal Fuel Charge – Update

OFFICE OF THE PARLIAMENTARY BUDGET OFFICER
BUREAU DU DIRECTEUR PARLEMENTAIRE DU BUDGET

The Parliamentary Budget Officer (PBO) supports Parliament by providing economic and financial analysis for the purposes of raising the quality of parliamentary debate and promoting greater budget transparency and accountability.

This report provides an update of PBO's distributional analysis of the federal fuel charge.

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Responsibility for the analysis presented in this report is entirely that of the PBO analysts and senior advisor. Any errors or omissions are the responsibility of the PBO analysts and senior advisor.

Nathalie Desmarais, Marie-Eve Hamel Laberge, Martine Perreault and Rémy Vanherweghem assisted with the preparation of the report for publication.

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Highlights

Considering only the fiscal impact of the federal fuel charge, PBO estimates that the average household in each of the backstop provinces (that is, all provinces except Quebec and British Columbia) in 2030-31 will see a net gain, receiving more from the Canada Carbon Rebate than the total amount they pay in the federal fuel charge (directly and indirectly) and related Goods and Services Tax.

Relative to household disposable income, the fiscal-only impact of the federal fuel charge is progressive. That is, lower income households face lower net costs (larger net gains) compared to higher income households, reflecting the per capita nature of the Canada Carbon Rebate.

In 2030-31, taking into consideration both fiscal and economic impacts, PBO estimates that the average household in each of the backstop provinces will see a net cost, paying more in the federal fuel charge and related Goods and Services Tax, as well as receiving lower incomes (due to the fuel charge), compared to the Canada Carbon Rebate they receive and lower net taxes they pay (due to lower incomes).

PBO estimates of household net cost (fiscal and economic impacts) of the federal fuel charge show a more progressive impact compared to the fiscal-only impact estimates. Given that the fuel charge lowers employment and investment income, which makes up a larger share of total income for higher income households, their net cost is higher.

For the backstop provinces, Environment and Climate Change Canada estimates that the fuel charge will account for almost 13 million tonnes of greenhouse gas (GHG) emissions reductions in 2030 and will lower real gross domestic product (GDP) by 0.6 per cent relative to a scenario without the fuel charge, but with all other emissions-reduction measures maintained, including large-emitter trading systems.

Summary

This report provides an update of PBO's distributional analysis of the federal fuel charge to include recent policy changes and GHG emissions projections, as well as updated microsimulation data and computable general equilibrium (CGE) modelling.

To address the CGE modelling oversight in our March 2022 and March 2023 reports, our updated analysis provides estimates of household net costs that incorporate the economic impact of the fuel charge only. Moreover, given the provincial focus of our analysis, we have used estimates of the economic impact of the fuel charge provided by Environment and Climate Change Canada (ECCC) from their 10-province and 3-territory, multi-region, multi-sector CGE model of the Canadian economy, EC-PRO.

- ECCC estimates that the fuel charge rising to $170 per tonne in 2030-31 will reduce real GDP in backstop provinces (that is, all provinces except Quebec and British Columbia) by 0.6 per cent and reduce emissions by almost 13 million tonnes in 2030 relative to levels projected under a counterfactual scenario without the fuel charge.

Consistent with our previous reports, our updated analysis does not account for the benefits of reducing Canada's emissions by, for example, reducing the economic costs of climate change. Further, our updated analysis does not provide estimates of the impacts of alternative policies that would achieve an equivalent reduction in emissions.

- PBO does not provide economic, fiscal or climate policy recommendations to parliamentarians, nor does PBO provide comparative policy or cost-benefit analyses. PBO does not initiate analysis to identify policy options or optimal policy decisions.

In PBO's recent distributional analyses, the economic impact of carbon pricing was presented relative to a counterfactual scenario in which carbon pricing did not exist. Such a scenario was considered to incorporate the economic impact of carbon pricing into household incomes. PBO's counterfactual scenario should not be seen as an alternative policy option of "doing nothing". Estimates of the impact of a given policy are often measured relative to a scenario without the policy in question, with the counterfactual serving as a "control" scenario.

- The counterfactual scenario in this report, prepared by ECCC, removes only the fuel charge and maintains all other emissions-reduction measures, including output-based pricing systems (also referred to as large-emitter trading systems).

Key results

Household net cost of the federal fuel charge (fiscal impact only)

Our "fiscal impact only" estimates of household net cost include the federal fuel charge paid directly and indirectly, as well as the related Goods and Services Tax (GST) paid, less the Canada Carbon Rebate received. These estimates, however, do not incorporate the loss in employment and investment income from the fuel charge as a distinct cost to the household.

- Considering only the fiscal impact of the federal fuel charge, in 2030-31, we estimate that the average household in each of the backstop provinces will see a net gain, receiving more from the Canada Carbon Rebate than the total amount they pay in the federal fuel charge (directly and indirectly) and related GST. See Table 1 on page 13.
- Moreover, in 2030-31, for all backstop provinces, we estimate that the average household in each income quintile will see a net gain—except for the average household in the highest income quintile in Prince Edward Island, Nova Scotia and New Brunswick—when only the fiscal impact of the federal fuel charge is considered.

Relative to household disposable income, the fiscal-only impact of the federal fuel charge is progressive. That is, lower income households see larger net gains compared to higher income households, reflecting the per capita nature of the Canada Carbon Rebate.

- We estimate that the largest net gain in 2030-31 is for the average household in the lowest income quintile in Saskatchewan (4.5 per cent of disposable income); the largest net cost in 2030-31 is for the average household in the top income quintile in Prince Edward Island (0.1 per cent of disposable income).

Broadly speaking, our updated estimates (fiscal impact only) show larger net gains (lower net costs) for average households across income quintiles in backstop provinces compared to our March 2023 distributional analysis. This revision reflects changes to the projection of emissions subject to the federal fuel charge and changes to assumptions underlying our interprovincial input-output model simulations.

Household net cost of the federal fuel charge (fiscal and economic impacts)

To provide a broader measure of the net cost to households in backstop provinces, we incorporate estimates of the loss in employment and investment income from the fuel charge—the "economic impact"—as an additional cost. Estimates of the economic impact capture the loss in employment and investment income that would result from the fuel charge in a general equilibrium, or macroeconomic, setting.

When the economic impact of the federal fuel charge is combined with the fiscal impact, the net cost increases for the average household across all income quintiles, reflecting the overall negative economic impact of the fuel charge.

- In 2030-31, taking into consideration both fiscal and economic impacts, we estimate that the average household in each of the backstop provinces will see a net cost, paying more in the federal fuel charge and GST, as well as receiving lower incomes (due to the fuel charge), compared to the Canada Carbon Rebate they receive and the lower net taxes they pay (due to lower incomes). See Table 3 on page 18.
- Moreover, in 2030-31, for all backstop provinces, we estimate that the average household in the top three income quintiles will face a net cost when both fiscal and economic impacts of the federal fuel charge are considered.

That said, relative to disposable income, our estimates of household net cost (fiscal and economic impacts) of the federal fuel charge show a more progressive impact compared to the fiscal-only impact estimates. Given that the fuel charge lowers employment and investment income, which makes up a larger share of total income for higher income households, their net cost is higher.

- In 2030-31, accounting for both fiscal and economic impacts, we estimate that the largest net gain is for the average household in the lowest income quintile in Saskatchewan (4.0 per cent of disposable income); the largest net cost is for the average household in the top income quintile is also in Saskatchewan (1.8 per cent of disposable income).

Our updated estimates (fiscal and economic impacts) show lower net costs for average households across income quintiles in backstop provinces compared to our March 2023 distributional analysis. This reflects lower "fiscal" costs of the fuel charge and lower "economic" costs based on ECCC's estimates from EC-PRO that included the removal of the fuel charge only. That said, consistent with our March 2023 report, the updated

estimates continue to show that the average household across most income quintiles will face a net cost when both fiscal and economic impacts of the federal fuel charge are considered.

Given the structure of the federal fuel charge, the overall budgetary impact will be limited to the reduction in net personal income tax revenues (due to the economic impact of the fuel charge on employment and investment income), which is only partially offset by higher GST revenue. We estimate that the federal fuel charge will reduce the budgetary balance (that is, increase the budgetary deficit) by $1.5 billion in 2024-25 and ultimately by $4.0 billion in 2030-31.

GHG emissions reductions under carbon pricing – ECCC estimates

Environment and Climate Change Canada also provided the PBO with EC-PRO estimates of the reduction in GHG emissions attributable to the fuel charge, corresponding to its estimated economic impacts.

- ECCC estimates that the fuel charge in backstop provinces will account for almost 13 million tonnes (Mt) of emissions reductions in 2030 compared with what would have been emitted without the fuel charge.
- At the national level, ECCC estimates that the (equivalent) fuel charge in all provinces and territories will account for 15 Mt of emissions reductions in 2030 and will lower real GDP by 0.7 per cent relative to its level projected under the counterfactual scenario without the fuel charge.

In addition, ECCC provided the PBO with EC-PRO estimates of emissions reductions from the fuel charge and large-emitter trading systems combined (that is, carbon pricing in all provinces and territories).

- ECCC estimates that carbon pricing in Canada will account for 62 Mt of emissions reductions in 2030 and will lower real GDP by 0.9 per cent relative to a scenario without carbon pricing, but with all other emissions-reduction measures maintained.

EC-PRO estimates from ECCC suggest that large-emitter trading systems will be responsible for most of the GHG emissions reductions from carbon pricing in Canada—consistent with results from the Canadian Climate Institute. Moreover, ECCC's estimates suggest that (per Mt) emissions reductions from large-emitter trading systems are significantly less costly, in terms of their impact on Canadian real GDP.

Introduction

Background

With the coming into force of the federal carbon pricing system in 2018, PBO took steps to adjust its medium-term economic and fiscal projections to reflect, based on external estimates, the impact of carbon pricing on the Canadian economy.[1] PBO then developed its analytical capacity to generate independent estimates of the impact of carbon pricing on the Canadian economy using a computable general equilibrium (CGE) model. These reports were published annually over 2019 to 2021.[2]

Over the same period, PBO also provided parliamentarians with independent estimates of the distributional impacts of federal carbon pricing that were published in separate reports.[3] These estimates, however, did not incorporate the "economic impact" of the fuel charge that is, the loss in household employment and investment income.

Prior to March 2022, following PBO reports on the economic impact of carbon pricing (showing an overall negative impact)[4] and on the distributional impacts on households of federal carbon pricing (showing most households receiving rebates in excess of the fuel charges paid), PBO received questions from parliamentarians and the media regarding the apparent inconsistency between the two streams of reports.

To address these questions, PBO's March 2022 report incorporated the economic impact of carbon pricing into its distributional analysis to reflect households' loss in employment and investment income.[5] In March 2023, PBO published an update of the March 2022 report, A Distributional Analysis of the Federal Fuel Charge under the 2030 Emissions Reduction Plan, including additional provinces where the federal fuel charge applied.

Following an April 2024 review of the CGE analysis of carbon pricing that had been conducted for PBO's March 2022 report, staff discovered that both the fuel charge and the (federal-equivalent) output-based pricing system (OBPS) had inadvertently been removed in the counterfactual scenario.[6] Consequently, estimates of household net costs incorporating "fiscal and economic impacts" published in these distributional analyses, reflected the broader economic impact of federal-equivalent carbon pricing that is, the fuel charge and the OBPS.

Updated analysis

This report provides an update of PBO's distributional analysis of the federal fuel charge to include recent policy changes, new greenhouse gas (GHG) projections and updated microsimulation data. To address the CGE modelling oversight in our March 2022 and March 2023 reports, our updated analysis provides estimates of household net costs that incorporate the economic impact of the fuel charge only.

Our updated analysis includes recent policy changes to reflect the new allocation[7] of federal fuel charge proceeds (93 per cent) returned to households and the temporary exemption of the fuel charge on light fuel oil (from November 9, 2023 to March 31, 2027).[8] In addition, this analysis includes New Brunswick, where the federal fuel charge was effective as of July 1, 2023.

Our updated analysis uses emissions projections from Environment and Climate Change Canada, based on its E3MC simulation model, that were published in December 2023.[9] We adopt ECCC's Additional Measures scenario, which includes all federal, provincial, and territorial policies and measures that were in place as of August 2023, as well as those that have been announced but have not been fully implemented. Further, we use ECCC's corresponding projections of fuel charge proceeds[10] to determine the envelope for proceeds returned to households in backstop provinces (that is, the Canada Carbon Rebate) and to derive projected emissions under the federal fuel charge.

Our updated estimates of household net costs ("fiscal impact only") are calculated using an interprovincial input-output model based on Statistics Canada's 2019 Supply and Use Tables and household spending data from Statistics Canada's microsimulation database and model SPSD/M[11] (version 30.1).

On June 13, ECCC published its estimates of the economic impacts of carbon pricing[12] (that is, the fuel charge and OBPS) based on its 10-province and 3-territory, multi-region, multi-sector CGE model of the Canadian economy (EC-PRO)[13] that had been provided to the PBO in May under Information Request IR0776.[14] In July, under Information Request IR0790, PBO requested and received from ECCC, its estimates of the economic impacts of the fuel charge only.[15]

In updating our estimates of household net costs incorporating "fiscal and economic impacts", we have used ECCC's estimates of the economic impacts of the fuel charge from EC-PRO instead of estimates from our (national) CGE model of the Canadian economy. Given the provincial focus of our distributional analysis, we judge that

EC-PRO, with its provincial structure and detailed modelling of sectoral measures, should provide more accurate estimates of the economic impacts of the fuel charge in each province under the federal backstop.[16] Moreover, at the national level, ECCC's estimates of the economic impacts of carbon pricing (that is, including both the fuel charge and OBPS) published in June, are broadly in line with PBO's estimates that were used in our March 2022 and March 2023 distributional analyses, based on the CGE model ENVISAGE.[17]

The following section highlights key limitations of PBO's carbon pricing analysis. The subsequent sections present our updated estimates of the net cost of the federal fuel charge to households in provinces under the federal backstop, incorporating the fiscal impact only and incorporating both fiscal and economic impacts, consistent with the structure in our previous reports. The next section presents PBO's estimates of the budgetary impacts of the federal fuel charge from the Government's perspective. The final section of the report provides ECCC's estimates of GHG emissions reductions under carbon pricing. Appendices A to C provide methodological detail and additional results.

Key limitations of PBO's carbon pricing analysis

Comparative policy analysis

PBO does not provide economic, fiscal or climate policy recommendations to parliamentarians. Nor does PBO provide comparative policy or cost-benefit analyses. PBO produces a baseline economic and fiscal projection to provide parliamentarians with an independent outlook for the Canadian economy and the Government's finances. The projection also serves as the basis for costing proposals under the PBO's legislative mandate.

PBO's distributional analyses of the federal fuel charge do not provide estimates of the impacts of alternative policies or measures that would achieve an equivalent reduction in GHG emissions. In recent reports, aside from mentioning that "[t]he general consensus among economists is that explicit carbon pricing is the most cost-effective approach to reducing GHG emissions",[18] PBO has not assessed the policy merits of carbon pricing or alternative approaches to reducing GHG emissions.

Providing comparative policy analysis is outside the scope of the PBO's mandate. Further, in supporting parliamentarians, PBO does not initiate analysis to identify policy options or optimal policy decisions.

Counterfactual scenarios

In PBO's recent distributional analyses, the economic impact of carbon pricing was presented relative to a counterfactual scenario in which carbon pricing did not exist. Such a scenario was considered to incorporate the economic impact of carbon pricing into household incomes.

PBO's counterfactual scenario without carbon pricing should not be seen as an alternative policy option of "doing nothing" such that if the economic impact of carbon pricing is negative then it should be jettisoned, and the Government should adopt a do-nothing approach to reduce Canada's GHG emissions.

Estimates of the impact of a given policy are often measured, or illustrated, relative to a scenario without the policy in question, with the counterfactual serving as a "control" scenario. For example, in its analysis of the impact of carbon pricing on reducing Canada's emissions, Environment and Climate Change Canada also considered a counterfactual scenario without carbon pricing.[19]

In addition, the counterfactual scenario in PBO's March 2022 and 2023 distributional analysis was not a scenario in which all countries "did nothing" in terms of policies to reduce global GHG emissions. Rather, it was a scenario without carbon pricing in Canada only—similar to ECCC's analysis of emissions reduction—which would have resulted in higher-than-projected GHG emissions from Canada only.

Benefits of reducing Canada's GHG emissions

In its March 2022 and 2023 distributional analysis—and indeed in all its reports on carbon pricing since 2018—PBO clearly indicated that it did not account for the benefits of reducing Canada's GHG emissions.

However, as PBO has noted, Canada's own emissions are not large enough to materially impact climate change and therefore their reduction would not materially affect the Canadian economy.[20] Of course, significant reductions in global emissions would help to lower the economic costs of climate change in Canada and elsewhere.

PBO has also noted that Canada's primary means of limiting the economic costs of climate change are through participation in a globally coordinated emissions reduction regime. This does not mean that Canada should be a "free rider" and "do nothing" to reduce its own emissions. Rather, by significantly reducing its own GHG emissions, Canada will actively contribute to the collective effort to limit the impacts of climate change.

In November 2022, PBO published its report, Global greenhouse gas emissions and Canadian GDP, which was a first step in reporting the economic impacts of climate change to parliamentarians.[21] This report focused on changing weather patterns (in terms of temperature and precipitation) and estimated the impact on Canada's real GDP over the long term if current changes in weather patterns persisted along with future changes to weather patterns (higher-still temperature and precipitation). The baseline scenario assumed that all climate commitments made by governments around the world (even if the required policies were not yet fully specified) would "be met in full and on time".

To provide an illustrative estimate of the economic impact of reducing global emissions under our baseline scenario, we considered an alternative scenario in which global policies remained closer to current settings and global climate commitments were not met. We estimated that the level of Canadian real GDP in 2100 would be approximately three-quarters of a percentage point lower compared to the baseline scenario in which all countries fully met their climate commitments. The report, however, noted that our estimate likely understates the negative impact on GDP "given that it does not capture exceptional increases in severe climate events that scientists warn would occur as global temperatures rise significantly above key thresholds."

In its June 2024 publication of carbon pricing data, ECCC noted that "[a] full economic assessment of carbon pricing cannot be done without considering the benefits of reducing emissions and the costs of not taking action."[22] To quantify the economic benefit of GHG emissions reduction under carbon pricing in Canada, ECCC used the social cost of carbon, which "is an estimate of the *global* damages associated with one tonne of carbon emitted".[23] In PBO's view, the potential economic benefits of reducing Canada's emissions based on the social cost of carbon would largely accrue to residents in other countries. That is not to say that these economic benefits should be dismissed rather, they could be considered in a cost-benefit analysis of carbon pricing, which is beyond the scope of our report and PBO's mandate.[24]

Household net cost of the federal fuel charge – fiscal impact

Consistent with our previous reports, the scope of our analysis is limited to estimating the distributional impact of the federal fuel charge. Recall that the federal fuel charge increased from $20 per tonne in 2019-20 to $80 per tonne in 2024-25 and is set to increase further to $170 per tonne in 2030-31.

Appendix A provides an overview of our methodology and key assumptions.

Distribution of household net costs (fiscal impact only)

Considering only the fiscal impact of the federal fuel charge, we estimate that the average household in each of the backstop provinces in 2030-31 will see a net gain (Table 1), receiving more from the Canada Carbon Rebate (CCR) than the total amount they pay in the federal fuel charge (directly and indirectly)[25] and related Goods and Services Tax (GST). In 2030-31, the net gain for the average household in a backstop province ranges from 0.2 per cent of disposable income in Prince Edward Island to 1.0 per cent of disposable income in Saskatchewan.

Moreover, in 2030-31, for all backstop provinces, we estimate that the average household in each income quintile will see a net gain—except for the average household in the highest income quintile in Prince Edward Island, Nova Scotia and New Brunswick—when only the fiscal impact of the federal fuel charge is considered. It is important to note that our estimates for each income quintile represent the average household within an income group—there are households within the same group that will face higher or lower net costs.

Our finding that there is a net gain for the average household across almost all income quintiles in backstop provinces—when only the fiscal impact is considered—reflects the fuel charges paid by firms (producing for domestic and foreign markets), of which 93 per cent are recycled to households through the CCR.[26]

Relative to household disposable income, the fiscal-only impact of the federal fuel charge is progressive. That is, lower income households face lower net costs (larger net gains) compared to higher income households, reflecting the per capita nature of the CCR.[27] With the federal fuel charge at $170 per tonne in 2030-31, the largest net gain is for the average household in the lowest income quintile in Saskatchewan (4.5 per cent of disposable income); the largest net cost is for the average household in the top income quintile in Prince Edward Island (0.1 per cent of disposable income).

Table 1

Average household net cost of the federal fuel charge in 2030-31 by income quintile in dollars and as a percentage of disposable income (fiscal impact only)

Backstop province	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile	Average
Newfoundland and Labrador	-$893	-$971	-$642	-$606	-$467	-$713
	-2.8%	-1.8%	-0.8%	-0.5%	-0.2%	-0.7%
Prince Edward Island	-$491	-$404	-$317	-$123	$302	-$204
	-1.6%	-0.7%	-0.4%	-0.1%	0.1%	-0.2%
Nova Scotia	-$598	-$549	-$222	-$249	$50	-$313
	-2.0%	-1.0%	-0.3%	-0.2%	0.0%	-0.3%
New Brunswick	-$472	-$336	-$240	-$178	$22	-$241
	-1.5%	-0.6%	-0.3%	-0.2%	0.0%	-0.2%
Ontario	-$642	-$472	-$243	-$277	-$28	-$331
	-1.9%	-0.7%	-0.2%	-0.2%	-0.0%	-0.3%
Manitoba	-$793	-$636	-$611	-$537	-$126	-$537
	-2.5%	-1.1%	-0.7%	-0.4%	-0.1%	-0.5%
Saskatchewan	-$1,424	-$1,385	-$1,298	-$1,185	-$733	-$1,205
	-4.5%	-2.2%	-1.4%	-0.9%	-0.3%	-1.0%
Alberta	-$768	-$888	-$856	-$339	-$782	-$725
	-2.1%	-1.3%	-0.8%	-0.2%	-0.2%	-0.5%

Source:
Office of the Parliamentary Budget Officer.

Note:
Net cost (fiscal impact only) is calculated as the federal fuel charge and related GST paid (that is the gross cost), less the Canada Carbon Rebate received. A negative cost is a "net gain", meaning the amount of the

Canada Carbon Rebate received exceeds the gross cost to the household. The 1st quintile represents the lowest household income quintile; the 5th quintile represents the highest household income quintile.

Broadly speaking, our updated estimates (fiscal impact only) show larger net gains (lower net costs) for average households across income quintiles in backstop provinces compared to our March 2023 distributional analysis. This revision reflects changes to the projection of emissions subject to the federal fuel charge and changes to assumptions underlying our interprovincial input-output model simulations.[28] On balance, these changes resulted in downward revisions to our estimates of the cost of the federal fuel charge (fiscal impact only).

Appendix C provides our estimates of average household net cost (fiscal impact only) by income quintile over 2024-25 to 2030-31 for backstop provinces.

Household net cost of the federal fuel charge – fiscal and economic impacts

Our "fiscal impact only" estimates of household net cost include the federal fuel charge paid directly and indirectly, as well as the related Goods and Services Tax (GST) paid, less the Canada Carbon Rebate received. These estimates, however, do not incorporate the loss in employment and investment income from the fuel charge as a distinct cost to the household. Adding the economic ("source-side") impact of the federal fuel charge to our fiscal-only impact ("use-side") estimates provides a broader measure of the net cost to households in backstop provinces.[29]

Economic impacts of the fuel charge – ECCC estimates

Estimates of the economic impacts of the fuel charge only are based on ECCC's multi-region, multi-sector CGE model of the Canadian economy, EC-PRO, and were provided to the PBO under Information Request IR0790. To produce these estimates, ECCC simulated a reference scenario that included all announced measures[30] and a counterfactual scenario in which only the fuel charge was removed, and all other emissions-reduction measures were maintained, including output-based pricing systems (also referred to as large-emitter trading systems (LETS)).[31]

Table 2 presents ECCC's estimates of the economic impacts of the fuel charge in backstop provinces in 2030. Appendix B provides the annual impacts over 2024 to 2030 for backstop provinces.

Table 2
ECCC estimates of the economic impacts of the fuel charge in 2030, per cent

Backstop province	Real GDP	Labour income	Capital income
Newfoundland and Labrador	-0.9	-1.8	-2.0
Prince Edward Island	-0.5	-1.2	-2.1
Nova Scotia	-0.5	-1.5	-2.4
New Brunswick	-0.5	-1.2	-2.1
Ontario	-0.7	-1.3	-2.1
Manitoba	-0.5	-1.6	-2.5
Saskatchewan	-0.5	-2.2	-3.3
Alberta	-0.6	-1.3	-2.4
Total – backstop provinces	-0.6	-1.4	-2.3

Source:
Environment and Climate Change Canada.

Note:
Impacts are measured as the percentage difference between the projected level of the economic indicator in 2030 under a scenario with the fuel charge and its projected level in 2030 under a scenario without the fuel charge. Labour income and capital income are expressed in real (inflation-adjusted) terms.

ECCC's estimated impact of the fuel charge on real GDP in 2030 in backstop provinces is broadly uniform, averaging 0.6 per cent. The impact in Newfoundland and Labrador (in absolute terms) is somewhat larger, reflecting sharper reductions in output (gross value added) in the buildings and electricity sectors. ECCC's estimated impacts on economy-wide labour and capital incomes are also broadly uniform, with the exception of Saskatchewan (due in part to larger reductions in the agriculture and transportation sectors).

While not strictly comparable to our March 2022 estimates of economic impacts from the CGE model ENVISAGE (which included the fuel charge and federal-equivalent OBPS), ECCC's estimates of the impact of the fuel charge on labour and capital incomes in backstop provinces in 2030 are roughly 40 per cent smaller compared to our March 2022 estimates at the national level.[32]

Distribution of household net costs (fiscal and economic impacts)

Estimates of the economic impact capture the loss in employment and investment income that would result from the federal fuel charge in a general equilibrium, or macroeconomic, setting. Differential impacts on employment and capital income, combined with differences in the distribution of employment and investment income drive the variation across income groups.

In 2030-31, taking into consideration both fiscal and economic impacts, we estimate that the average household in each of the backstop provinces will see a net cost (Table 3), paying more in the federal fuel charge and GST, as well as receiving lower incomes (due to the fuel charge), compared to the CCR payments they receive and lower net taxes they pay (due to lower incomes).[33] In 2030-31, the net cost for the average household in a backstop province ranges from 0.5 per cent of disposable income in New Brunswick to 0.7 per cent of disposable income in Saskatchewan.

Moreover, for all backstop provinces, we estimate that the average household in the top three income quintiles will face a net cost. Compared to the fiscal-only impact estimates, the net cost increases for the average household across all income quintiles, reflecting the overall negative economic impact of the fuel charge.

That said, relative to disposable income, our estimates of household net cost (fiscal and economic impacts) of the federal fuel charge show a more progressive impact compared to the fiscal-only impact estimates. Given that the fuel charge lowers employment and investment income, which makes up a larger share of total income for higher income households, their net cost is higher.

In 2030-31, accounting for both fiscal and economic impacts, we estimate that the largest net gain is for the average household in the lowest income quintile in Saskatchewan (4.0 per cent of disposable income); the largest net cost is for the average household in the top income quintile is also in Saskatchewan (1.8 per cent of disposable income).

Our updated estimates (fiscal and economic impacts) show lower net costs for average households across income quintiles in backstop provinces compared to our March 2023 distributional analysis. This reflects lower “fiscal” costs of the fuel charge and lower

"economic" costs based on ECCC's estimates from EC-PRO that included the removal of the fuel charge only.

That said, consistent with our March 2023 report, the updated estimates continue to show that the average household across most income quintiles will face a net cost when both fiscal and economic impacts of the federal fuel charge are considered.

Table 3

Average household net cost of the federal fuel charge in 2030-31 by income quintile in dollars and as a percentage of disposable income (fiscal and economic impacts)

Backstop province	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile	Average
Newfoundland and Labrador	-$798	-$612	$183	$1,164	$3,314	$652
	-2.5%	-1.1%	0.2%	1.0%	1.5%	0.6%
Prince Edward Island	-$443	-$137	$202	$753	$2,488	$575
	-1.5%	-0.2%	0.2%	0.6%	1.1%	0.6%
Nova Scotia	-$500	-$218	$370	$654	$2,593	$580
	-1.6%	-0.4%	0.5%	0.6%	1.2%	0.6%
New Brunswick	-$410	-$120	$214	$609	$1,991	$457
	-1.3%	-0.2%	0.3%	0.5%	0.9%	0.5%
Ontario	-$540	-$87	$588	$1,085	$3,467	$903
	-1.6%	-0.1%	0.6%	0.7%	1.1%	0.7%
Manitoba	-$670	-$211	$218	$817	$3,295	$693
	-2.1%	-0.4%	0.3%	0.7%	1.3%	0.6%
Saskatchewan	-$1,275	-$698	$155	$1,316	$4,970	$894
	-4.0%	-1.1%	0.2%	1.0%	1.8%	0.7%
Alberta	-$641	-$400	$130	$1,265	$3,122	$697
	-1.8%	-0.6%	0.1%	0.8%	1.0%	0.5%

Source:
Office of the Parliamentary Budget Officer.

Note:
Net cost (fiscal and economic impacts) is calculated as the federal fuel charge and related GST paid, plus the income loss due to the economic impact of the fuel charge (that is the gross cost), less the Canada Carbon Rebate received and the reduction in net taxes paid (due to lower incomes). A negative cost is a

"net gain", meaning the amount of Canada Carbon Rebate received and reduction in net taxes paid exceeds the gross cost to the household. The 1st quintile represents the lowest household income quintile; the 5th quintile represents the highest household income quintile.

Appendix C provides our estimates of average household net cost (fiscal and economic impacts) by income quintile over 2024-25 to 2030-31 for backstop provinces.

Budgetary impacts of the federal fuel charge

Table 4 presents updated estimates of the impact of the federal fuel charge on federal budgetary revenues and program spending over 2024-25 to 2030-31. Our estimates are partial in nature. They include federal fuel charge proceeds and GST revenues from the backstop provinces (that is, all provinces except Quebec and British Columbia) and they incorporate only reductions in net personal income taxes[34] that arise from the economic impact of lower household employment and investment income in backstop provinces.

Based on projections from ECCC, with the federal fuel charge set at $80 per tonne in 2024-25, the Government will collect $13.0 billion from backstop provinces. With the fuel charge rising to $170 per tonne in 2030-31, we project that the Government will collect $24.4 billion in proceeds from backstop provinces.

Table 4

Budgetary impacts of the federal fuel charge, billions of dollars

	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Fuel charge proceeds	13.0	15.2	17.2	19.3	21.1	22.9	24.4
Goods and Services Tax	0.4	0.5	0.5	0.6	0.6	0.7	0.7
Net personal income tax*	-1.9	-2.3	-2.8	-3.3	-3.8	-4.4	-4.8
Fuel charge proceeds returned	-13.0	-15.2	-17.2	-19.3	-21.1	-22.9	-24.4
Budgetary balance	-1.5	-1.9	-2.3	-2.7	-3.2	-3.7	-4.0

Source:
Office of the Parliamentary Budget Officer.

Note:
* Net personal income tax is defined as personal income taxes plus Employment Insurance contributions, less federal transfers to households.

A negative number implies a deterioration in the budgetary balance (lower revenues or higher spending). A positive number implies an improvement in the budgetary balance (higher revenues or lower spending). Budgetary impacts include only the revenues and spending in provinces under the federal backstop. Totals may not add due to rounding.

With the return of fuel charge proceeds to households and provincial governments through higher program spending, there is no direct impact on the budgetary balance.[35]

However, the Government will also collect revenue from the GST on its fuel charge. We estimate that $0.4 billion in GST from the fuel charge will be collected in 2024-25, rising to $0.7 billion in 2030-31.

When the economic impact of the fuel charge is incorporated, we observe a decrease in employment and investment income, which leads to a reduction in net federal personal income tax (PIT) revenues in the backstop provinces. In 2024-25, we estimate that the federal fuel charge will reduce net PIT revenues by $1.9 billion. The impact on net PIT revenues is projected to reach $4.8 billion in 2030-31.

Given the structure of the federal fuel charge, the overall budgetary impact will be limited to the reduction in net personal income tax revenues (due to the economic impact of the fuel charge on employment and investment income), which is only partially offset by higher GST revenue. We estimate that the federal fuel charge will reduce the budgetary balance (that is, increase the budgetary deficit) by $1.5 billion in 2024-25 and ultimately by $4.0 billion in 2030-31.

GHG emissions reductions under carbon pricing – ECCC estimates

In response to Information Request IR0790, ECCC also provided estimates of the reduction in GHG emissions attributable to the fuel charge based on its EC-PRO reference (all announced measures) and counterfactual scenario simulations. ECCC estimates that the fuel charge in backstop provinces will account for almost 13 million tonnes (Mt) of GHG emissions reductions in 2030 compared with what would have been emitted without the fuel charge (Table 5).

Table 5

ECCC estimates of GHG emissions reductions and real GDP impacts from the federal fuel charge in 2030

Backstop province	Emissions reduction in 2030 (Mt)	Impact on real GDP in 2030 (%)
Newfoundland and Labrador	0.7	-0.9
Prince Edward Island	0.2	-0.5
Nova Scotia	0.3	-0.5
New Brunswick	0.1	-0.5
Ontario	5.3	-0.7
Manitoba	0.8	-0.5
Saskatchewan	2.0	-0.5
Alberta	3.5	-0.6
Total – backstop provinces	12.8	-0.6

Source:
Environment and Climate Change Canada.

Note:
Totals may not add up due to rounding.

At the national level, ECCC estimates that the (equivalent) fuel charge in all provinces and territories will account for 15 Mt of GHG emissions reductions in 2030 and will lower real GDP by 0.7 per cent relative to a scenario without the fuel charge, but with all other measures maintained, including large-emitter trading systems (Table 6). ECCC's estimate of 15 Mt of GHG emissions reductions in 2030 from the fuel charge is somewhat lower

than the 19 to 22 Mt range estimated by the Canadian Climate Institute in its March 2024 analysis.[36]

In addition, under Information request IR0790, ECCC provided estimates of emissions reductions from the fuel charge and LETS combined (that is, carbon pricing in all provinces and territories) based on the EC-PRO reference scenario (all announced measures) and a separate counterfactual scenario that excluded both the fuel charge and LETS, but included all other emissions-reduction measures. ECCC estimates that carbon pricing in Canada will account for 62 Mt of GHG emissions reductions in 2030 and will lower real GDP by 0.9 per cent relative to a scenario without carbon pricing, but with all other emissions-reduction measures maintained.[37]

EC-PRO estimates from ECCC suggest that LETS will be responsible for most of the GHG emissions reductions from carbon pricing in Canada—consistent with the Canadian Climate Institute's March 2024 analysis. Moreover, ECCC's estimates suggest that (per Mt) emissions reductions from LETS are significantly less costly, in terms of their impact on Canadian real GDP, compared to the fuel charge.

Table 6
ECCC estimates of GHG emissions reductions and real GDP impacts from carbon pricing in 2030

Canada	Emissions reduction in 2030 (Mt)	Impact on real GDP in 2030 (%)
Fuel charge only (ECCC, March 2024)	15	-0.7
Fuel charge and large-emitter trading systems (ECCC, March 2024)	62	-0.9
Fuel charge and large-emitter trading systems (ECCC, Fall 2023)	78	-0.9

Source:
Environment and Climate Change Canada.

In its June 2024 publication of carbon pricing data, which was based on analysis undertaken in the fall of 2023 (and provided to the PBO under Information Request IR0776), ECCC estimated the reduction in GHG emissions from carbon pricing (fuel charge and LETS) in Canada to be 78 Mt in 2030. ECCC's estimate (prepared in March 2024) of 62 Mt was based on updated projection scenarios and supply and use tables.

Moreover, ECCC's March 2024 counterfactual scenario without carbon pricing included 13 Mt in flexible credit purchases permitted under the cap on oil and gas sector emissions, which was not reflected in ECCC's fall 2023 analysis. Adjusting ECCC's March 2024 counterfactual scenario by 13 Mt to account for these credits would increase the emissions reduction from carbon pricing from 62 Mt to 75 Mt—in line with the estimate of 78 Mt in ECCC's fall 2023 analysis. The impact of carbon pricing on Canadian real GDP in 2030 is similar in both vintages of ECCC's estimates (0.9 per cent).

Appendix A: Methodology and key assumptions

Our "fiscal impact only" estimates of household net cost of the federal fuel charge in backstop provinces[38] include:

- direct costs (from the consumption of fuel for private transportation and residential use);
- indirect costs (from the consumption of non-energy goods and services with the fuel charge embedded);
- Goods and Services Tax paid on the federal fuel charge for household consumption of both energy and non-energy goods and services; and,
- the Canada Carbon Rebate.

The direct cost of the federal fuel charge for households in a backstop province is taken directly from ECCC's 2023 Additional Measures projection, based on its E3MC simulation model.[39] The direct cost related to fuel consumption for private transportation and residential use incorporates full passthrough of the federal fuel charge to households. In addition, ECCC's projection includes all federal, provincial, and territorial policies and measures that were in place as of August 2023, as well as those that have been announced but have not been fully implemented. In principle, ECCC's 2023 Additional Measures projection (based on its E3MC model) reflects, to some degree, changes in household behaviour in response to the fuel charge, as well as changes due to other policies and measures. Direct costs in each province are allocated to household income quintiles using Statistics Canada's 2019 data on household spending by household income quintile.[40] Over the projection horizon, this imposes proportional changes in fuel consumption across income quintiles in response to the fuel charge.[41]

The indirect cost to households captures the federal fuel charge that is passed through by firms to the prices of non-energy goods and services that households consume. We use an interprovincial input-output (I-O) model[42] based on Statistics Canada's 2019 Supply and Use Tables (SUT).[43] To calculate the indirect cost to households, we use the interprovincial I-O model to estimate (by industry) the share of gross provincial output from household consumption in 2019.[44] For each province under the backstop, these shares are then applied to the projection of fuel charge revenues by industry. Indirect costs from interprovincial imports of non-energy goods and services (corresponding to

household consumption) from backstop provinces are calculated in a similar manner. To allocate indirect costs to household income quintiles, we use household spending data from Statistics Canada's Social Policy Simulation Database and Model (SPSD/M).

The 5 per cent GST rate is applied to the price of most goods and services that households consume with the fuel charge included (directly and indirectly). Using Statistics Canada's 2019 SUT we calculate effective GST rates for each commodity category, which are then applied to the federal fuel charge paid by households by commodity.

The projection of fuel charge proceeds collected in each backstop province is taken directly from ECCC's 2023 Additional Measures projection.[45] All federal fuel charge proceeds collected in a backstop province are returned (or "recycled") to that province: 93 per cent are returned to households through the Canada Carbon Rebate, 5 per cent to small- and medium-sized enterprises and 2 per cent to Indigenous governments. Canada Carbon Rebate amounts are based on household composition. To calculate average rebate amounts by income quintile in each backstop province, we use the average household composition structure (by income quintile) from Statistics Canada's SPSD/M.

Our "fiscal impact only" estimates of household net cost include the federal fuel charge paid directly and indirectly, as well as the related Goods and Tax (GST) paid, less the Canada Carbon Rebate received. These estimates, however, do not incorporate the loss in employment and investment income from the fuel charge as a distinct cost to the household.

Our "fiscal and economic impacts" estimates of household net cost of the federal fuel charge include, in addition to the above components:

- the economic impact of the fuel charge on household employment and investment income; and,
- the reduction in net taxes[46] paid resulting from lower household employment and investment income.

We use ECCC's estimates of the impact of the fuel charge on labour and capital income from its CGE model EC-PRO. In the case of employment income, for each year of the projection, we apply the percentage change in (constant dollar) labour income by industrial sector from the EC-PRO results to the baseline level of employment income (under current policy) in the corresponding sector in SPSD/M to determine the associated cost. In the case of investment income, for each year of the projection, we

apply the percentage change in (constant dollar) capital income from the EC-PRO results to the baseline level of investment income (under current policy) in SPSD/M to determine the associated cost.[47]

Based on ECCC's EC-PRO estimates, the economic impact of the federal fuel charge will result in lower employment and investment income for households in backstop provinces, which in turn will reduce their net taxes paid. We estimate the reduction in net taxes due to lower employment income and investment income using SPSD/M.

Appendix B: Economic impacts of the fuel charge – ECCC estimates

Table B-1

Estimates of the economic impacts of the fuel charge, per cent

Province	Indicator	2024	2025	2026	2027	2028	2029	2030
NL	Real GDP	-0.5	-0.5	-1.5	-0.8	-3.3	-2.4	-0.9
	Labour income	-0.7	-0.9	-2.2	-1.5	-4.6	-3.9	-1.8
	Capital income	-1.8	-1.8	-2.6	-2.0	-4.3	-3.2	-2.0
PE	Real GDP	-0.2	-0.3	-0.3	-0.4	-0.5	-0.7	-0.5
	Labour income	-0.5	-0.6	-0.8	-0.9	-1.1	-1.3	-1.2
	Capital income	-1.7	-1.8	-1.8	-1.9	-2.0	-2.0	-2.1
NS	Real GDP	-0.2	-0.3	-0.4	-0.3	-0.5	-0.6	-0.5
	Labour income	-0.6	-0.8	-1.2	-1.1	-1.4	-1.5	-1.5
	Capital income	-1.8	-2.0	-1.9	-2.1	-2.5	-2.5	-2.4
NB	Real GDP	-0.4	-0.4	-0.5	-0.4	-0.7	-0.7	-0.5
	Labour income	-0.5	-0.7	-0.8	-0.9	-1.1	-1.2	-1.2
	Capital income	-1.8	-2.0	-2.0	-2.0	-2.4	-2.5	-2.1
ON	Real GDP	-0.4	-0.4	-0.5	-0.5	-0.6	-0.6	-0.7
	Labour income	-0.6	-0.8	-0.8	-1.0	-1.1	-1.2	-1.3
	Capital income	-1.6	-1.7	-1.9	-1.9	-2.0	-2.0	-2.1
MB	Real GDP	-0.2	-0.3	-0.3	-0.4	-0.3	-0.4	-0.5
	Labour income	-0.7	-0.9	-1.0	-1.2	-1.2	-1.4	-1.6
	Capital income	-1.8	-2.0	-2.1	-2.2	-2.2	-2.3	-2.5
SK	Real GDP	-0.2	-0.3	-0.2	-0.4	-0.3	-0.5	-0.5
	Labour income	-0.7	-0.7	-1.1	-1.4	-1.5	-2.0	-2.2
	Capital income	-2.4	-2.9	-2.7	-3.0	-2.9	-3.3	-3.3
AB	Real GDP	-0.4	-0.4	-0.5	-0.6	-0.5	-0.6	-0.6
	Labour income	-0.6	-0.7	-1.1	-1.0	-1.0	-1.2	-1.3
	Capital income	-1.8	-2.0	-1.9	-2.2	-2.2	-2.3	-2.4

Source:

Environment and Climate Change Canada.

Note:

Impacts are measured as the percentage difference between the projected level of the economic indicator under a scenario with the fuel charge and its projected level in the same year under a scenario without the fuel charge. Labour and capital income are expressed in real (inflation-adjusted) terms.

Appendix C: Household net costs by province, 2024-25 to 2030-31

Table C-1

Newfoundland and Labrador, dollars per household

		2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Canada Carbon Rebate (CCR)	Q1	894	1,038	1,165	1,362	1,474	1,586	1,690
	Q2	1,075	1,251	1,407	1,647	1,790	1,926	2,052
	Q3	1,151	1,342	1,498	1,754	1,900	2,044	2,178
	Q4	1,250	1,455	1,650	1,938	2,100	2,259	2,407
	Q5	1,368	1,609	1,811	2,131	2,313	2,488	2,651
	Average	1,148	1,339	1,506	1,766	1,916	2,061	2,196
Net cost (fiscal impact only)	Q1	-472	-549	-619	-697	-761	-829	-893
	Q2	-494	-578	-656	-744	-823	-898	-971
	Q3	-305	-361	-403	-472	-526	-584	-642
	Q4	-261	-310	-372	-430	-485	-546	-606
	Q5	-166	-215	-253	-317	-366	-416	-467
	Average	-338	-401	-458	-530	-589	-652	-713
Net cost (fiscal and economic impacts)	Q1	-435	-504	-522	-623	-566	-643	-798
	Q2	-361	-410	-313	-476	-124	-240	-612
	Q3	18	41	450	171	1,163	961	183
	Q4	364	472	1,312	887	3,108	2,788	1,164
	Q5	1,253	1,546	3,439	2,543	7,434	6,691	3,314
	Average	170	232	876	504	2,203	1,913	652

Source:
Office of the Parliamentary Budget Officer.

Note:
Net cost (fiscal impact only) is calculated as the federal fuel charge and related GST paid less the CCR. Net cost (fiscal and economic impacts) is calculated as the federal fuel charge and related GST paid, plus the income loss due to the economic impact of the fuel charge less the CCR and the reduction in net taxes paid (due to lower incomes). Q1 (Q5) corresponds to the lowest (highest) household income quintile.

Table C-2

Prince Edward Island, dollars per household

		2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Canada Carbon Rebate (CCR)	**Q1**	553	630	707	910	973	1,032	1,082
	Q2	682	782	875	1,123	1,201	1,273	1,335
	Q3	795	918	1,030	1,314	1,403	1,487	1,559
	Q4	878	1,006	1,127	1,438	1,538	1,631	1,710
	Q5	925	1,070	1,192	1,531	1,637	1,735	1,819
	Average	767	881	986	1,263	1,350	1,432	1,501
Net cost (fiscal impact only)	**Q1**	-279	-317	-358	-400	-433	-464	-491
	Q2	-211	-244	-275	-319	-349	-378	-404
	Q3	-146	-174	-201	-241	-266	-293	-317
	Q4	-42	-48	-60	-65	-84	-105	-123
	Q5	182	198	219	302	304	304	302
	Average	-98	-116	-133	-143	-163	-185	-204
Net cost (fiscal and economic impacts)	**Q1**	-252	-291	-326	-361	-395	-418	-443
	Q2	-104	-113	-107	-128	-123	-116	-137
	Q3	41	55	94	116	168	212	202
	Q4	285	350	456	533	647	749	753
	Q5	1,222	1,394	1,632	1,907	2,147	2,375	2,488
	Average	240	282	353	413	490	563	575

Source:
Office of the Parliamentary Budget Officer.

Note:
Net cost (fiscal impact only) is calculated as the federal fuel charge and related GST paid less the CCR. Net cost (fiscal and economic impacts) is calculated as the federal fuel charge and related GST paid, plus the income loss due to the economic impact of the fuel charge less the CCR and the reduction in net taxes paid (due to lower incomes). Q1 (Q5) corresponds to the lowest (highest) household income quintile.

Table C-3

Nova Scotia, dollars per household

		2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Canada Carbon Rebate (CCR)	**Q1**	666	771	862	1,077	1,164	1,246	1,316
	Q2	753	868	985	1,226	1,312	1,404	1,484
	Q3	851	976	1,097	1,365	1,475	1,578	1,668
	Q4	954	1,104	1,241	1,549	1,672	1,789	1,890
	Q5	1,017	1,177	1,331	1,651	1,786	1,911	2,019
	Average	848	979	1,103	1,374	1,482	1,586	1,675
Net cost (fiscal impact only)	**Q1**	-317	-370	-413	-475	-520	-561	-598
	Q2	-293	-340	-393	-444	-476	-515	-549
	Q3	-103	-117	-135	-151	-176	-201	-222
	Q4	-108	-132	-152	-172	-198	-225	-249
	Q5	41	38	31	81	68	59	50
	Average	-156	-184	-212	-232	-260	-288	-313
Net cost (fiscal and economic impacts)	**Q1**	-277	-321	-342	-409	-434	-465	-500
	Q2	-144	-158	-151	-214	-178	-182	-218
	Q3	121	172	287	247	322	381	370
	Q4	252	303	481	431	558	659	654
	Q5	1,237	1,460	1,827	1,878	2,289	2,575	2,593
	Average	238	291	421	387	511	594	580

Source:
Office of the Parliamentary Budget Officer.

Note:
Net cost (fiscal impact only) is calculated as the federal fuel charge and related GST paid less the CCR. Net cost (fiscal and economic impacts) is calculated as the federal fuel charge and related GST paid, plus the income loss due to the economic impact of the fuel charge less the CCR and the reduction in net taxes paid (due to lower incomes). Q1 (Q5) corresponds to the lowest (highest) household income quintile.

Table C-4

New Brunswick, dollars per household

		2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Canada Carbon Rebate (CCR)	**Q1**	531	606	675	790	842	895	941
	Q2	662	759	846	990	1,057	1,123	1,182
	Q3	716	822	910	1,064	1,142	1,214	1,277
	Q4	774	889	1,002	1,172	1,257	1,336	1,406
	Q5	842	968	1,085	1,270	1,362	1,448	1,524
	Average	705	809	903	1,057	1,132	1,203	1,266
Net cost (fiscal impact only)	**Q1**	-271	-308	-343	-387	-414	-445	-472
	Q2	-191	-220	-246	-261	-284	-311	-336
	Q3	-118	-137	-148	-172	-195	-219	-240
	Q4	-56	-67	-87	-119	-139	-160	-178
	Q5	56	61	61	54	44	33	22
	Average	-116	-134	-152	-177	-198	-220	-241
Net cost (fiscal and economic impacts)	**Q1**	-242	-274	-302	-342	-357	-384	-410
	Q2	-98	-108	-110	-110	-94	-102	-120
	Q3	73	95	132	139	215	224	214
	Q4	264	327	398	426	560	607	609
	Q5	988	1,172	1,365	1,477	1,863	2,024	1,991
	Average	197	243	296	318	437	474	457

Source:

Office of the Parliamentary Budget Officer.

Note:

Net cost (fiscal impact only) is calculated as the federal fuel charge and related GST paid less the CCR. Net cost (fiscal and economic impacts) is calculated as the federal fuel charge and related GST paid, plus the income loss due to the economic impact of the fuel charge less the CCR and the reduction in net taxes paid (due to lower incomes). Q1 (Q5) corresponds to the lowest (highest) household income quintile.

Table C-5
Ontario, dollars per household

		2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Canada Carbon Rebate (CCR)	**Q1**	773	886	984	1,081	1,168	1,248	1,312
	Q2	874	1,002	1,120	1,231	1,329	1,420	1,493
	Q3	968	1,112	1,239	1,363	1,470	1,571	1,652
	Q4	1,113	1,265	1,413	1,547	1,671	1,785	1,877
	Q5	1,194	1,372	1,532	1,688	1,830	1,955	2,056
	Average	984	1,127	1,258	1,382	1,493	1,596	1,678
Net cost (fiscal impact only)	**Q1**	-369	-425	-471	-519	-566	-608	-642
	Q2	-260	-300	-339	-375	-413	-447	-472
	Q3	-117	-138	-155	-178	-202	-226	-243
	Q4	-147	-159	-183	-202	-231	-258	-277
	Q5	26	24	22	13	-9	-21	-28
	Average	-173	-199	-225	-251	-283	-311	-331
Net cost (fiscal and economic impacts)	**Q1**	-322	-368	-409	-447	-487	-519	-540
	Q2	-88	-96	-119	-105	-115	-109	-87
	Q3	241	293	316	401	439	501	588
	Q4	432	541	580	744	817	933	1,085
	Q5	1,729	2,013	2,208	2,554	2,778	3,071	3,467
	Average	399	477	516	630	687	776	903

Source:
Office of the Parliamentary Budget Officer.

Note:
Net cost (fiscal impact only) is calculated as the federal fuel charge and related GST paid less the CCR. Net cost (fiscal and economic impacts) is calculated as the federal fuel charge and related GST paid, plus the income loss due to the economic impact of the fuel charge less the CCR and the reduction in net taxes paid (due to lower incomes). Q1 (Q5) corresponds to the lowest (highest) household income quintile.

Table C-6
Manitoba, dollars per household

		2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Canada Carbon Rebate (CCR)	**Q1**	820	934	1,035	1,123	1,205	1,287	1,356
	Q2	905	1,030	1,139	1,248	1,336	1,428	1,504
	Q3	1,046	1,194	1,326	1,445	1,549	1,654	1,743
	Q4	1,178	1,346	1,502	1,640	1,761	1,881	1,982
	Q5	1,253	1,430	1,587	1,733	1,863	1,990	2,097
	Average	1,040	1,187	1,318	1,438	1,543	1,648	1,736
Net cost (fiscal impact only)	**Q1**	-472	-539	-599	-648	-697	-749	-793
	Q2	-367	-417	-462	-511	-550	-596	-636
	Q3	-342	-393	-440	-481	-521	-569	-611
	Q4	-280	-324	-373	-411	-450	-496	-537
	Q5	-30	-37	-48	-57	-76	-102	-126
	Average	-296	-340	-382	-419	-456	-499	-537
Net cost (fiscal and economic impacts)	**Q1**	-427	-475	-526	-565	-610	-645	-670
	Q2	-228	-214	-229	-239	-250	-243	-211
	Q3	-82	-2	14	50	55	116	218
	Q4	126	308	358	446	473	613	817
	Q5	1,360	1,742	1,955	2,219	2,347	2,725	3,295
	Average	152	274	317	385	406	516	693

Source:
Office of the Parliamentary Budget Officer.

Note:
Net cost (fiscal impact only) is calculated as the federal fuel charge and related GST paid less the CCR. Net cost (fiscal and economic impacts) is calculated as the federal fuel charge and related GST paid, plus the income loss due to the economic impact of the fuel charge less the CCR and the reduction in net taxes paid (due to lower incomes). Q1 (Q5) corresponds to the lowest (highest) household income quintile.

Table C-7

Saskatchewan, dollars per household

		2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Canada Carbon Rebate (CCR)	**Q1**	1,459	1,669	1,842	2,029	2,184	2,336	2,482
	Q2	1,682	1,924	2,145	2,335	2,505	2,680	2,847
	Q3	1,854	2,118	2,354	2,571	2,773	2,967	3,151
	Q4	2,121	2,431	2,710	2,948	3,180	3,402	3,613
	Q5	2,287	2,621	2,922	3,192	3,443	3,683	3,913
	Average	1,881	2,153	2,395	2,615	2,817	3,014	3,201
Net cost (fiscal impact only)	**Q1**	-819	-937	-1,032	-1,147	-1,238	-1,331	-1,424
	Q2	-794	-908	-1,021	-1,112	-1,194	-1,288	-1,385
	Q3	-726	-827	-925	-1,018	-1,109	-1,201	-1,298
	Q4	-640	-736	-834	-909	-996	-1,087	-1,185
	Q5	-342	-393	-455	-514	-578	-649	-733
	Average	-664	-760	-853	-940	-1,023	-1,111	-1,205
Net cost (fiscal and economic impacts)	**Q1**	-759	-873	-950	-1,048	-1,135	-1,199	-1,275
	Q2	-551	-660	-669	-723	-737	-693	-698
	Q3	-212	-301	-193	-218	-138	62	155
	Q4	209	168	436	486	685	1,091	1,316
	Q5	2,080	2,333	2,785	3,010	3,495	4,462	4,970
	Average	154	133	282	302	434	745	894

Source:
Office of the Parliamentary Budget Officer.

Note:
Net cost (fiscal impact only) is calculated as the federal fuel charge and related GST paid less the CCR. Net cost (fiscal and economic impacts) is calculated as the federal fuel charge and related GST paid, plus the income loss due to the economic impact of the fuel charge less the CCR and the reduction in net taxes paid (due to lower incomes). Q1 (Q5) corresponds to the lowest (highest) household income quintile.

Table C-8
Alberta, dollars per household

		2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
Canada Carbon Rebate (CCR)	**Q1**	1,179	1,323	1,472	1,605	1,730	1,842	1,950
	Q2	1,444	1,652	1,844	2,011	2,167	2,308	2,443
	Q3	1,607	1,834	2,041	2,225	2,398	2,553	2,703
	Q4	1,829	2,051	2,283	2,489	2,682	2,856	3,024
	Q5	1,937	2,230	2,482	2,706	2,916	3,106	3,288
	Average	1,599	1,825	2,023	2,205	2,376	2,531	2,679
Net cost (fiscal impact only)	**Q1**	-475	-516	-575	-624	-673	-717	-768
	Q2	-511	-583	-657	-714	-772	-826	-888
	Q3	-498	-563	-628	-683	-740	-793	-856
	Q4	-198	-183	-206	-227	-258	-290	-339
	Q5	-443	-519	-581	-628	-678	-723	-782
	Average	-425	-481	-528	-573	-622	-668	-725
Net cost (fiscal and economic impacts)	**Q1**	-415	-444	-483	-532	-576	-603	-641
	Q2	-293	-316	-299	-369	-404	-388	-400
	Q3	-79	-51	62	3	-11	92	130
	Q4	471	646	911	876	925	1,158	1,265
	Q5	1,379	1,656	2,131	2,195	2,287	2,805	3,122
	Average	213	290	466	436	446	614	697

Source:
Office of the Parliamentary Budget Officer.

Note:
Net cost (fiscal impact only) is calculated as the federal fuel charge and related GST paid less the CCR. Net cost (fiscal and economic impacts) is calculated as the federal fuel charge and related GST paid, plus the income loss due to the economic impact of the fuel charge less the CCR and the reduction in net taxes paid (due to lower incomes). Q1 (Q5) corresponds to the lowest (highest) household income quintile.

Notes

[1] See PBO's May 2018 report, The Impact of a Pan-Canadian Carbon Pricing Levy on PBO's GDP Projection.

[2] See the following PBO reports: Closing the gap: carbon pricing for the Paris target (June 2019); Carbon pricing for the Paris target: Closing the gap with output-based pricing (October 2020); and Beyond Paris: Reducing Canada's GHG Emissions by 2030 (June 2021).

[3] See PBO's April 2019 report, Fiscal and Distributional Analysis of the Federal Carbon Pricing System and February 2020 report, Reviewing the Fiscal and Distributional Analysis of the Federal Carbon Pricing System.

[4] PBO's analysis showing that carbon pricing will have a negative impact on real GDP is consistent with results from Environment and Climate Change Canada (for example, see Modelling and analysis of A Healthy Environment and a Healthy Economy, December 2020) and Canada's Ecofiscal Commision (Choose Wisely: Options and Trade-offs in Recycling Carbon Pricing Revenues, April 2016).

In our carbon pricing analysis since 2018, we did not include "technological breakthroughs" in response to carbon pricing that could mitigate the negative effect on GDP. That said, in our June 2021 report (see Note 18), we acknowledged that there is a nascent literature that suggests carbon pricing may have less of a negative economic impact. These model-based results rely on endogenous technological change where new technologies appear—in response to carbon taxes—that are more productive than existing technologies. While such a scenario is possible (numerous past technological changes have transformed economies and societies because they were so much cheaper than their predecessors), it is not predictable. The negative impact of a policy relying on transformative technological change could persist for a long time before gains are realized. Recall that the time horizon examined in recent PBO reports related to carbon pricing extended only to 2030.

[5] In an extensive review of trends in climate and environmental policy research in Canada, Winter (2024) notes the contribution of PBO and others to incorporate the dynamic effect of emissions pricing on income growth and returns to capital for households. Exploring the Landscape of Canadian Climate Policy. Canadian Public Policy.

[6] Distributional analysis of carbon pricing (April 2024).

[7] For additional detail regarding the new allocation structure of federal fuel charge proceeds, see PBO's March 2024 costing note, Doubling the rural top-up rate for fuel charge rebates – Update.

[8] For additional detail regarding the temporary exemption of home heating oil, see PBO's November 2023 costing note, Pausing the fuel charge on heating oil and doubling the rural top-up rate for fuel charge rebates.

[9] Greenhouse gas and air pollutant emissions projections – 2023. Environment and Climate Change Canada. According to ECCC, E3MC is "a modelling framework that combines ENERGY2020 and a macroeconomic model working in tandem. ENERGY2020 is a 10-province and 3-territory bottom-up energy technology simulation model."

[10] With the exception of crop and animal production and air transportation, the projections of fuel charge proceeds collected in each backstop province (by industry) are taken directly from ECCC's 2023 Additional Measures projection that was provided to the PBO under Information Request IR0755. In the case of crop and animal production and air transportation, we have applied our estimates of fuel charge coverage for that industry (used in our cost estimates of Pausing the fuel charge on heating oil and doubling the rural top-up rate for fuel charge rebates) to ECCC's 2023 Additional Measures emissions projections for crop and animal production and air transportation to more accurately reflect the exemptions for these industries.

We have also adjusted ECCC's projection of fuel charge revenues over 2023-24 to 2026-27 to account for the temporary exemption of light fuel oil.

[11] The assumptions and calculations underlying the SPSD/M simulation results were prepared by PBO analysts; the responsibility for the use and interpretation of these data is entirely that of PBO analysts.

[12] Environment and Climate Change Canada carbon pollution pricing data. Environment and Climate Change Canada.

[13] According to ECCC, EC-PRO is one in a suite of its models that "support evidence-based analysis and policy decisions regarding the energy sector and its impact on the economy and the environment. The modeling capacity is robust and has been peer

reviewed domestically and internationally." Assessing the impact of the plan for *A Healthy Environment and a Healthy Economy*. Environment and Climate Change Canada.

For a critical assessment of EC-PRO modelling at the provincial level see, Assessing the Validity of CGE Modelled Impacts of the Federal Climate Policies on the Saskatchewan Economy by Emery and Fellows (2022). Canada West Foundation.

[14] Information Request IR0776.

[15] Information Request IR0790.

[16] PBO has previously used estimated impacts on provincial labour and capital income from ECCC's EC-PRO model in its distributional analysis. See PBO's May 2023 report, A Distributional Analysis of the Clean Fuel Regulations.

[17] PBO's estimates of the economic impact of carbon pricing (that is, including the fuel charge and federal-equivalent OBPS) published in Table 3-1 in our March 2022 report, showed a reduction in real GDP of 1.3 per cent in 2030, which is a larger reduction compared to ECCC's estimate of 0.9 per cent. PBO's estimates of the reduction in (inflation-adjusted) factor incomes in 2030 (of 2.3 per cent for labour income and 3.6 per cent for capital income) are also larger than ECCC's estimates (of 1.5 per cent for labour income and 3.0 per cent for capital income).

[18] Closing the gap: carbon pricing for the Paris target (June 2019).

[19] See ECCC's June 2024 release, Environment and Climate Change Canada publishes carbon pollution pricing data.

[20] See PBO's May 2023 report, A Distributional Analysis of the Clean Fuel Regulations, and November 2022 report, Global greenhouse gas emissions and Canadian GDP.

[21] The report cautioned that, "Given that our analysis draws from a literature still in the early stages of development, our results are best seen as reflecting some of the major factors linking climate change and the economy, with more refinement to come in future work."

[22] Environment and Climate Change Canada publishes carbon pollution pricing data. Environment and Climate Change Canada.

[23] For additional detail on the social cost of carbon, see Social cost of greenhouse gas emissions. Environment and Climate Change Canada.

[24] For a discussion of issues related to the inclusion of benefits to foreign residents of GHG emissions reductions from Canadian policy (regulatory) measures, see Heyes, Morgan and Rivers (2013), The Use of a Social Cost of Carbon in Canadian Cost-Benefit Analysis. Canadian Public Policy.

According to the cost-benefit guide prepared by Treasury Board of Canada Secretariat for departments and agencies, under normal circumstances "global benefits are not typically included in cost-benefit analysis". However, given the nature of climate change, the guide states that "including costs and benefits of GHG emissions reduction, calculated using the social cost of GHG, is appropriate in cost-benefit analysis." Canada's Cost-Benefit Analysis Guide for Regulatory Proposals. Treasury Board of Canada Secretariat.

[25] Direct costs to households include the federal fuel charge applied to their consumption of heating fuel (adjusted to account for the temporary exemption of light fuel oil) and private transportation (such as motor gasoline, diesel and lubricants). Indirect costs capture the federal fuel charge that is passed through by firms to the prices of non-energy goods and services that households consume.

[26] Based on projections of fuel charge revenues and our cost calculations, household direct and indirect costs of the federal fuel charge, on average, account for approximately 68 per cent of all federal fuel charge proceeds collected in backstop provinces.

[27] Recall that Canada Carbon Rebate payments to households reflect their size and composition. Within a province, the per person amounts (that is, for the first and second adults, as well as each child) are the same across income quintiles. The variation across income quintiles within a province reflects differences in family size and composition.

[28] We calculated the indirect cost to households in a given province by simulating our interprovincial input-output model with exogenous shocks to consumer expenditures in that province only. In our March 2023 analysis, we had assumed that indirect costs in a given province were influenced by consumer expenditures in all backstop provinces. This change resulted in modest downward revisions to our estimates of the federal fuel charge passed through by firms to the prices of non-energy goods and service that households consume.

[29] In academic research, "use-side" and "source-side" impacts typically refer to impacts arising from changes to product prices and from changes to factor prices, respectively.

[30] ECCC notes that its EC-PRO reference scenario included all announced measures except the Clean Fuel Regulations (CFR) and investment tax credits (ITC). ECCC provided this reference scenario to better align with PBO's use of ECCC's 2023 Additional Measures projection based on its E3MC simulation model.

[31] In ECCC's counterfactual scenario excluding the fuel charge, the federal fuel charge and its equivalent were removed in all provinces and territories.

[32] In our March 2022 report (Table 3-1), we estimated the impact of carbon pricing (that is, the fuel charge and federal-equivalent OBPS) in 2030 to be -2.3 per cent and -3.6 per cent for labour and capital income, respectively. For provinces under the backstop, ECCC's estimates of the impact of the fuel charge only are -1.4 per cent and -2.3 per cent for labour and capital income, respectively.

[33] For households in backstop provinces, we calculate net taxes paid as federal and provincial personal income taxes paid plus Employment Insurance and Canada Pension Plan contributions, less federal and provincial transfers received.

[34] Net personal income taxes are defined as federal personal income taxes plus Employment Insurance contributions less federal transfers paid to households.

[35] On a cash basis all proceeds raised are returned to the jurisdiction of origin. However, on a fiscal-year basis there are timing (or accounting) differences between when proceeds are received and when they are returned, resulting in an impact on the budgetary balance. For simplicity, in this report we have assumed that there is no impact on the budgetary balance from differences. Our March 2024 Economic and Fiscal Outlook accounts for these timing differences.

[36] Which Canadian Climate Policies Will Have The Biggest Climate Impact By 2030?. Canadian Climate Institute.

[37] ECCC's estimate of 62 Mt of GHG emissions reductions in 2030 from carbon pricing in Canada is somewhat lower than the range of 72 to 112 Mt implied by estimates from the Canadian Climate Institute's analysis: 19 to 22 Mt for the fuel charge and 53 to 90 Mt for LETS. However, adjusting ECCC's counterfactual scenario by 13 Mt to account for the purchase of flexible credits permitted under the cap on oil and gas sector emissions (in the absence of carbon pricing) would increase the reduction in

emissions from carbon pricing to 75 Mt, which would fall within the range implied by the Canadian Climate Institute's estimates.

[38] We exclude Yukon and Nunavut (the territories under the federal fuel charge backstop) from our distributional analysis due to a lack of data.

[39] See Note 10.

[40] See Statistics Canada table 11-10-0223-01.

[41] It could be the case that higher (lower) income groups are more (less) responsive to the fuel charge in reducing their fuel consumption. All else equal, this would imply smaller (larger) direct costs for households in higher (lower) income quintiles.

[42] The model structure and reduced-form equations are taken from Ghanem (2010), The Canadian and Inter-Provincial Input-Output Models: The Mathematical Framework. Statistics Canada.

[43] See Statistics Canada catalogue 15-602-X.

[44] For a critique of input-output models see, Getting to Know Models: A primer and critique on Input-Output and Computable General Equilibrium Models and their uses for policy and project analysis by Fellows and Winter (2018). The School of Public Policy, University of Calgary.

[45] See Note 10.

[46] See Note 33.

[47] Investment income in SPSD/M is comprised of dividend income received, capital gains received, interest and other investment income. Based on data from SPSD/M, investment income is highly concentrated in the highest income quintile; approximately 80 per cent of all investment income in backstop provinces is earned by households in the 5th income quintile.

Unlike employment income, investment income in SPSD/M is not differentiated by industrial sector. Consequently, we apply the capital income impact from the EC-PRO results at the provincial level to household investment income levels in each backstop province.

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