

November 2019

BRIDGING THE GAP: REAL OPTIONS FOR MEETING CANADA'S 2030 GHG TARGET



CANADA'S ECOFISCAL COMMISSION

WHO WE ARE

A group of independent, policy-minded Canadian economists working together to align Canada's economic and environmental aspirations. We believe this is both possible and critical for our country's continuing prosperity. Our Advisory Board comprises prominent Canadian leaders from across the political spectrum.

We represent different regions, philosophies, and perspectives from across the country. But on this we agree: ecofiscal solutions are essential to Canada's future.

OUR VISION

A thriving economy underpinned by clean air, land, and water for the benefit of all Canadians, now and in the future.

OUR MISSION

To identify and promote practical fiscal solutions for Canada that spark the innovation required for increased economic and environmental prosperity.

OUR RESEARCH THEMES



Livable Cities

Traffic congestion, overflowing landfills, and urban sprawl these are some of the biggest challenges facing Canadian cities. We look at how new policies can make urban life more livable.



Climate and Energy

From carbon pricing to energy subsidies, we analyze the policy opportunities and challenges defining Canada's climate and energy landscape today.



Water

What is the value of the services that provide clean water? We examine new Canadian policy solutions for water pollution, over-consumption, and infrastructure.

For more information about the Commission, visit Ecofiscal.ca



A REPORT AUTHORED BY CANADA'S ECOFISCAL COMMISSION

Chris Ragan, Chair McGill University

Elizabeth Beale Economist

Paul Boothe Ivey Business School, Western University

Mel Cappe University of Toronto **Bev Dahlby** University of Calgary

Don Drummond Queen's University

Stewart Elgie University of Ottawa

Glen Hodgson C.D. Howe Institute

Justin Leroux HEC Montréal **Richard Lipsey** Simon Fraser University

Nancy Olewiler Simon Fraser University

France St-Hilaire Institute for Research on Public Policy

Lindsay Tedds University of Calgary

This report is a consensus document representing the views of the Ecofiscal Commissioners. It does not necessarily reflect the views of the organizations with which they are affiliated.

ACKNOWLEDGMENTS

Canada's Ecofiscal Commission acknowledges the advice and insights provided by our Advisory Board:

| Elyse Allan | Jean Charest | Peter Gilgan | Paul Martin | Annette Verschuren |
|-----------------|-----------------------|------------------|----------------|--------------------|
| Dominic Barton | Karen Clarke-Whistler | Michael Harcourt | Peter Robinson | Steve Williams |
| Gordon Campbell | Jim Dinning | Bruce Lourie | Lorne Trottier | |

We also acknowledge the contributions to this report from the Commission's staff: Jonathan Arnold, Antonietta Ballerini, Dale Beugin, Jason Dion, Annette Dubreuil, Brendan Frank and Alexandra Gair. We thank Kathryn Harrison of the University of British Columbia and Nicholas Rivers of the University of Ottawa for valuable comments on a preliminary draft of the report. Finally, we extend our gratitude to McGill University and the University of Ottawa for their continued support of the Commission.

Canada's Ecofiscal Commission recognizes the generous contributions of the following funders and supporters:





EXECUTIVE SUMMARY

The evidence supporting climate policy is remarkably clear on three points: 1) The climate is changing as a result of human activity, imposing unprecedented risks to Canadians and the world more broadly; 2) Reducing Canada's greenhouse gas (GHG) emissions requires policy; and 3) Well-designed carbon pricing policies are the most cost-effective way to reduce emissions.

Reaching Canada's 2030 emissions target will require more stringent climate policies than those currently implemented. Canada's national price on carbon will rise to \$50/tonne by 2022, but this will be insufficient to reach the country's international climate commitments. It is unclear whether policymakers will continue to increase it beyond this level.

Continued increases in Canada's carbon price might prove politically challenging. One factor may be the visibility of the costs of carbon pricing—people can often easily observe or understand the connection between the policy and higher costs (e.g., in the form of increased prices for gasoline). This high visibility could provoke opposition to increasing the carbon price beyond planned levels.

Some have suggested that Canada should adopt an alternative climate policy approach to close the gap to its emissions target for example, one that relies on regulations with less visible costs or even options that shelter households and businesses from costs altogether. But it is often unclear what these alternatives to carbon pricing would look like in practice. For example, what specific mix of policies would be included? How stringent would they need to be to reach Canada's emissions target? And what would their cost be to the Canadian economy? Canadians must understand their options if they are to make informed climate policy choices. This report aims to inform the debate with new evidence and new economic modelling. To do so, it answers four main questions:

- 1. What are the approaches Canada has available for scaling up climate policy to meet its 2030 GHG target?
- 2. How do the costs of these distinct approaches compare?
- 3. What kind of design choices would improve their economic performance? And what are the challenges in implementing more efficiently designed policies?
- 4. In implementing climate policy, how should policymakers weigh the trade-offs that different approaches present?

We explore each of these questions in turn.

What are the approaches Canada has available for scaling up climate policy to meet its 2030 GHG target?

Canada has a limited number of tools available to reach its 2030 target: carbon pricing, regulations, and subsidies. While other policy tools can complement these three, they cannot—on their own—drive the required emissions reductions.

| Available approaches | Description | Policy example(s) | |
|--|---|---|--|
| APPROACH #1: Carbon pricing with dividends | Governments close the gap to Canada's 2030 target by primarily using carbon pricing to reduce emissions. | Canada's national price on carbon rises year over year. All revenues from the carbon price remain in the province they originate in and are fully recycled back to households in the form of a rebate. Output-based pricing applies in emissions-intensive and trade-exposed sectors as a way of protecting industry competitiveness and avoiding GHG leakage—where production and emissions relocate to jurisdictions with weaker climate policy. | |
| APPROACH #2: Economy-wide regulations with subsidies | Governments close the gap to Canada's 2030 target using regulations and subsidies (instead of increasing carbon prices). | As of 2020, all new equipment installed in buildings is required to be zero emissions. Industry is required to nearly halve the GHG emissions intensity of production by 2030, relative to 2010 levels. By 2030, governments fund nearly half the purchase costs of electric vehicles, low-emitting heating and cooling equipment, energy-saving lighting, efficient appliances, and carbon capture and storage (CCS). To pay for these subsidies, provinces raise their personal and corporate income taxes. | |
| APPROACH #3: Industry-focused regulations with subsidies | Governments close the gap to Canada's 2030 target using subsidies and industry-focused regulations, leaving households untouched by direct costs. | The GHG intensity of freight trucks is required to fall by half by 2030, relative to 2010 levels. Industry is required to reduce the GHG emissions intensity of production by two-thirds by 2030, relative to 2010 levels. By 2030, governments fund nearly two-thirds of the purchase costs of various low-carbon alternatives. To pay for these subsidies, provinces raise their personal and corporate income taxes. | |

Table ES-1: Three policy approaches to meet Canada's 2030 emissions target

Each of these tools uses a different mechanism to reduce GHGs. Carbon pricing creates market incentives for reducing GHG emissions. Regulations compel actions that reduce emissions. And subsidies financially reward them.

All three tools have costs, but the visibility of these costs can be very different:

- Carbon pricing attaches an explicit price to emitting GHGs. As a result, households and businesses can often easily connect rising fossil fuel costs to carbon pricing.
- Regulations impose costs on emitters by requiring actions they would not otherwise have taken. But households may not easily connect regulations to increasing costs.
- Subsidies require public funds, but their costs are hidden when they are broadly borne by taxpayers (now or in the future).

In this report, we consider three policy approaches that combine these policy tools in different ways. Each approach scales up policies that have, to varying extents, been implemented or proposed across Canada. Table ES-1 summarizes the three approaches. Together, these approaches span the spectrum of options available to Canadian policymakers looking to meet Canada's 2030 target. Each represents a distinct approach, although in reality approaches that blend and combine these three approaches are also possible.

How do the costs of these distinct approaches compare?

Any of the three approaches can meet Canada's 2030 GHG target, provided they are sufficiently stringent. But they do at different costs to the economy.

We estimate the costs of different approaches using Navius Research's GTECH model. GTECH combines a detailed representation of energy-related technologies (from vehicles, to fridges, to crude oil extraction) with a detailed representation of the Canadian economy. Its technological detail and macroeconomic completeness allow us to simulate the impact of climate policies on technology adoption, energy consumption, greenhouse gas emissions, and the broader economy.

Figure ES-1 shows projected gross domestic product (GDP) per capita (i.e., average income per person) between 2015 and 2030 under each approach's policy package.



This figure illustrates past and projected GDP per capita (GDP divided by population) under the three policy approaches. Projections are developed using the GTECH computable general-equilibrium model.

Three main factors explain the relative performance of the three approaches: flexibility, overlap, and coverage.

First, a policy that provides *flexibility* in terms of how households and businesses reduce their GHG emissions has a lower cost to the economy than a more prescriptive one. Carbon pricing leads to the highest average incomes in part because it is the most flexible of the three approaches. In responding to a carbon price policy, households can, for example, make their driving more efficient, take public transit, switch to a more fuel-efficient vehicle, or alternatively—make no changes at all. In contrast, the other two policy approaches contain policies that *prescribe* particular actions. This lack of flexibility raises their overall costs to the economy.

Second, a policy approach where policies *overlap* with each other tends to have higher overall costs. The package of economywide regulations and subsidies contains a large total number of policies, which sometimes—mirroring policy experience in Canada—overlap in the GHG emissions they cover and the actions that they drive. For example, automakers in this policy package must meet requirements for the total share that electric vehicles comprise of total vehicle sales. But the policy package also offers subsidies toward the purchase of these vehicles. This redundancy raises overall costs. Third, the broader the *coverage* of a policy the lower its economic costs. A policy approach that avoids imposing direct costs on households requires regulations to be focused only on sectors like industry, commercial buildings, and freight. To compensate for this narrow coverage, policymakers must make their regulatory policies extremely stringent. And they must also make their subsidies more generous. Both of these actions raise the overall costs of meeting Canada's GHG target.

What kind of design choices would improve these approaches' economic performance? And what are the challenges in implementing more efficiently designed policy?

Our modelling analysis finds that policymakers can improve the economic performance of climate policies—relative to the way they have been implemented to date—by:

- recycling the revenues from carbon pricing toward corporate and personal income tax reductions
- incorporating flexibility into their regulations by, for example, focusing on a desired level of performance instead of the means of achieving it or by allowing inter-firm compliance trading
- avoiding the use of subsidies, since using taxes to fund them can reduce investment and result in lower economic growth



| Policy package | Approach | Cost visibility | Cost-effectiveness |
|---|--|-----------------|-----------------------------------|
| Policy packages based on policies already in place in Canada | Approach #1: Carbon pricing with revenues recycled toward per- capita dividends and output-based pricing for EITE sectors | High | High |
| | Approach #2: A range of regulations and subsidies applied across the entire economy | Moderate | Low |
| | Approach #3: A range of regulations and subsidies, excluding those that would result in direct costs for households | Low | Very Low |
| Policy packages based on maximizing overall economic efficiency | Approach #1: Carbon pricing with revenues recycled toward low- income rebates and tax cuts and carefully calibrated output-based pricing benchmarks | High | Very high |
| | Approach #2: A select number of flexible regulations with broad coverage across sources of emissions and limited overlap | Moderate | High |
| | Approach #3: A select number of flexible regulations applied only where they will not increase direct costs for households | Low | N/A (could not achieve target) |

Table ES-2: Visibility and cost-effectiveness of available climate policy approaches

- broadening the coverage of climate policies while at the same time avoiding overlap and duplication
- coordinating individual policies to provide a consistent GHGreduction incentive across the entire economy

Incorporating these features reduces the costs of the three policy approaches we considered—in some cases significantly. Broad, flexible, coordinated regulations, for example, can approach the cost-effectiveness of carbon pricing.

Yet implementing more-efficient policy design also presents policymakers with implementation challenges. Stakeholder influence and pressure may, for example, pull governments toward more carbon pricing rebates for households and support for industry, and away from tax reductions. Similarly, stakeholders may call for flexible regulations with more exemptions, weaker performance standards, or slower increases in stringency. Yielding to this pressure will tend to increase the cost of policy for the economy overall.

These compromises also have implications for the effectiveness of flexible regulations. To offset lost GHG reductions from weakening an individual flexible regulation, the stringency of *other* climate policies must rise accordingly. Where this does not occur, the result can be an overall policy package that does not add up to the total GHG reductions required to reach Canada's targets.

Administrative issues can also pose challenges for the design of efficient regulatory approaches in particular. To provide a consistent incentive for GHG reductions, policymakers must coordinate and calibrate the stringency of individual regulations. Yet insufficient information about the details of industry and the uncertainty of future technological change inherently limit their ability to effectively do so.

In implementing climate policy, how should policymakers weigh the trade-offs that different approaches present?

Elected politicians must balance the need for climate policy to be cost effective with the need for it to be politically viable. Their choice of policy approach can depend on a number of factors: How strong is the societal consensus that climate change is urgent and that governments need to ramp up policy action? What is the public's knowledge of the mechanics and costs of available policy tools? What kind of political coalitions and inter-party consensus exist behind them? How—and how successfully—are proposed or enacted policies communicated to the public? Is the fate of a given policy option tied to that of a political party that may be elected (or not) for unrelated reasons?

The visibility of different policy instruments' costs may also be a key factor. As Table ES-2 illustrates, approaches with lower cost visibility tend to correlate with higher overall costs to the economy. But where households mistakenly link high visibility to high costs, they may prefer alternatives to carbon pricing—even though these alternatives in fact cost more. (The table includes two versions of each approach—one based on policies as they have been implemented to date, the other on a more economically efficient design.) Policymakers seeking to implement stringent climate policy must balance trade-offs. Where governments believe the perceived costs of carbon pricing are too high for the public to accept, it is their prerogative to explore and pursue alternatives. This report seeks to inform their policy choices by providing analysis of their available options' relative environmental and economic performance. Our recommendations, consistent with our mandate, follow from the desire to make Canadian climate policy both effective *and* cost-effective.

RECOMMENDATION #1: Governments should evaluate whether their policies are stringent enough to meet targets, and close any gaps

Canadian governments should assess how deeply their GHG policies will cut emissions and, where a gap to Canada's target remains, implement climate policy that is stringent enough to close it. If we are serious about meeting the emissions targets that successive Canadian governments have pledged in international forums, we must enact policy commensurate with the scale of the challenge.

Meeting our GHG targets is more than a matter of living up to our commitments. Meaningful action is in Canada's interest. Climate change is a monumental problem; it threatens our economy, our livelihoods, and the ecosystems we depend on for our survival. Its effects on Canada will be significant. Extreme climate events—such as heatwaves, flooding, wildfires, drought, and sea-level rise—are becoming more frequent and are already negatively affecting the health and wellbeing of Canadians. Absent policy action in both Canada and abroad, these effects will only get worse.

RECOMMENDATION #2:

If governments wish to meet their climate goals at least cost, they should rely on increasingly stringent carbon pricing

The evidence from this report is consistent with numerous other studies: carbon pricing is the most cost-effective way to reduce GHG emissions. A stringent, rising carbon price can get Canada to its 2030 target at the lowest possible cost to the economy.

To make revenue recycling economically efficient, provincial governments should consider using increasing shares of revenue to reduce corporate and personal income taxes, especially as carbon prices increase over time. Doing so encourages investment and helps bolster economic growth. However, other priorities can also be legitimate, such as rebating households, funding infrastructure, paying down public debt, or investing in emissions-reducing innovation and technology. Revenue-recycling priorities will rightly vary depending on a jurisdiction's unique context and policy goals.

To create an economically efficient overall climate policy package, governments should support carbon pricing by implementing complementary climate policies that do things carbon pricing cannot. However, to be truly complementary, these supporting policies must have a clear rationale, be well designed, and be well integrated into the broader policy package.

RECOMMENDATION #3:

If policymakers choose not to close the gap to Canada's emissions target using carbon pricing, they should rely on increasingly stringent flexible regulations instead

If policymakers are unwilling to increase carbon prices in line with the stringency required to reach Canada's emissions target, other, supportive policy measures will be required.

Flexible regulations can be combined with carbon pricing policies so that they collectively achieve Canada's target. To meet Canada's emissions targets using this kind of approach, carbon prices and flexible regulations must together be sufficiently stringent. The stringency required of flexible regulations will depend on how high carbon prices rise. If policymakers keep carbon prices low, flexible regulations will have to drive deeper emission cuts, which will raise the overall cost of meeting Canada's GHG target (since flexible regulations are less cost-effective than carbon pricing). We therefore recommend that policymakers adopting this approach rely on carbon pricing to drive as much GHG mitigation as possible, with flexible regulations playing a supporting role.

If policymakers choose not to use carbon pricing at all, they should use stringent, coordinated, economy-wide flexible regulations. Historically, however, climate policy approaches in Canada have relied on a mix of flexible regulations, prescriptive regulations, and subsidies that commonly overlap in coverage, creating duplication and higher costs. If climate policy is to be costeffective, policymakers choosing not to use carbon pricing must implement the type of *efficient* flexible regulation policy package we describe in this report.

Doing so will not be easy. Developing efficient flexible regulations presents significant administrative and implementation challenges. Perhaps even more significantly, achieving the 2030 target will require regulations that are much stricter than those seen to date. This will make their costs considerably more visible to households and businesses. It is an open question how regulations' costs will be perceived by households when they are implemented at much higher levels of stringency.



A final word on cost-effectiveness

Policymakers who believe that achieving Canada's GHG targets requires compromise on climate policy cost-effectiveness should proceed with caution. While cost-effectiveness is not the only criterion they should consider, it is far from immaterial. All the approaches we assess in this report impose costs on the economy, so minimizing their costs to households and businesses is a worthwhile goal.

Compromising too much on climate policies' cost-effectiveness also presents its own risks. The more that policymakers do so, the greater the risk that the public will ultimately reject these policies and even climate policies in general—due to their costs. This is especially significant given that stringency will need to rise under *any* policy approach. While low-visibility, high-cost policies may be easier to implement at the outset, they may prove less durable over time as stringency and costs rise. Canada's Ecofiscal Commission has long argued for cost-effective policy to achieve environmental objectives. Cost-effectiveness may also prove critical to a politically viable climate policy approach.

We may be more likely to get effective climate policy that is durable over the long term—and consequently, achieve greater GHG reductions—if that policy also minimizes costs. The costs of climate policy are not an abstract concept. They have real implications for jobs, standards of living, and the country's economic prospects. Careful policy design may make households and businesses less resistant to meaningful, increasingly stringent climate policy.

Higher-visibility policies such as carbon pricing may be more difficult to implement at their outset. But in the end, they may be the best way forward.