



OPEN ACCESS

EDITED BY
Monirul Mirza,
Environment and Climate Change
Canada, Canada

REVIEWED BY
Jean-Thomas Bernard,
University of Ottawa, Canada
Brandon Schaufele,
Western University, Canada

*CORRESPONDENCE
Malcolm Fairbrother
✉ malcolm.fairbrother@umu.se

SPECIALTY SECTION
This article was submitted to
Climate and Decision Making,
a section of the journal
Frontiers in Climate

RECEIVED 13 September 2022
ACCEPTED 28 December 2022
PUBLISHED 18 January 2023

CITATION
Fairbrother M and Rhodes E (2023)
Climate policy in British Columbia: An
unexpected journey.
Front. Clim. 4:1043672.
doi: 10.3389/fclim.2022.1043672

COPYRIGHT
© 2023 Fairbrother and Rhodes. This is
an open-access article distributed
under the terms of the [Creative
Commons Attribution License \(CC BY\)](#).
The use, distribution or reproduction
in other forums is permitted, provided
the original author(s) and the copyright
owner(s) are credited and that the
original publication in this journal is
cited, in accordance with accepted
academic practice. No use, distribution
or reproduction is permitted which
does not comply with these terms.

Climate policy in British Columbia: An unexpected journey

Malcolm Fairbrother^{1,2,3*} and Ekaterina Rhodes⁴

¹Department of Sociology, Umeå University, Umeå, Sweden, ²Institute for Futures Studies, Stockholm, Sweden, ³Department of Sociology, University of Graz, Graz, Austria, ⁴School of Public Administration, University of Victoria, Victoria, BC, Canada

Since introducing a path-breaking carbon tax in 2008, the western Canadian province of British Columbia (BC) has attracted significant attention from climate policy scholars. The enactment of its carbon tax has made the case of BC intriguing, as Canada is a poor climate performer, BC is a fossil fuel producer, and carbon taxes are politically challenging to introduce anywhere. This paper discusses the BC tax, and what lessons it holds for other jurisdictions. We complement existing accounts with new details about key events and developments in recent years, and about climate policymaking in BC generally. While there are features of the tax's design and promotion that would be worth replicating elsewhere, we argue its survival reflects some simple good fortune. Moreover, the case of BC should not be reduced to its tax, as the province has enacted other notable climate policies, some of which have done more to reduce emissions while attracting less public criticism.

KEYWORDS

climate policy, carbon tax, British Columbia, Canada, regulation

1. Introduction

Advocates support carbon pricing for yielding the greatest environmental benefits per unit of economic cost (Baranzini et al., 2017; Carattini et al., 2019). Yet, and paradoxically, carbon taxation is the least popular and perhaps most politically challenging policy instrument by which to mitigate greenhouse gas emissions. Some commentators therefore consider carbon pricing a lost cause politically, and almost not worth bothering with as a climate policy (Cullenward and Victor, 2020; Jaccard, 2020; Stokes and Mildenerger, 2020). According to the World Bank's Carbon Pricing Dashboard, as of 2022 there are more than 60 carbon pricing systems operating worldwide, but fewer than 6% of global greenhouse gas emissions are subject to a tax.

From that perspective, the case of the western Canadian province of British Columbia (BC) is intriguing. In 2008, BC introduced a carbon tax applying a meaningful price to greenhouse gas emissions, while exempting few sources. Policy experts generally regard the tax as one of the world's most successful, and its track record has been described as "encouraging evidence" about the prospects for the introduction of similar taxes elsewhere (Carattini et al., 2018b). Even some scholars who are generally skeptical about carbon pricing acknowledge that BC has been a modest success story (Green, 2021). And BC's carbon tax was path-breaking: prior to 2008, there were few such taxes

anywhere, and none at all anywhere outside of Europe (Starting in 2007 the province of Quebec applied a very low tax, just on energy producers). BC's tax has therefore attracted significant attention both from climate policy scholars and in broader media. The *New York Times* summarized that the tax, especially given its high rate and broad coverage, "sets British Columbia apart as a leader on the cutting edge" (The Economist, 2011; Porter, 2016) enthused "we have a winner."

This article reviews the tax's conception and creation, discusses its design and promotion, and synthesizes what we know about its impacts. In particular, we ask, given the political impediments to meaningful carbon pricing generally, how did the BC tax come to be introduced? And what made its proposal, implementation, and survival possible? We identify lessons that the case of British Columbia suggests for other jurisdictions, but we caution that the tax's political survival also reflects some simple good fortune. Furthermore, while the story of the tax is undoubtedly interesting and important, we argue that the case of climate policymaking in BC should by no means be limited to the tax. To do so would be misleading, as BC has enacted other notable climate policies in the past 15 years, some of which have actually done more to reduce greenhouse gas emissions, while attracting less public opposition. We therefore provide an overall picture of BC's climate policy trajectory, in order both to set the carbon tax in clearer context, and to explain the measures that have led to the province being, as we explain, both a climate policy success and a failure. In terms of lessons for other jurisdictions, the case of BC suggests the political costs of many non-tax policies relative to their environmental benefits may be significantly lower—an important fact that could be overlooked, if the case of BC were reduced only to its tax. Though past studies and reviews of the tax have been useful, in focusing only on that policy, they have provided a somewhat partial picture.

Our paper therefore complements prior studies that have focused narrowly on BC's carbon tax (and not its other policies) and/or that have not addressed developments in more recent years. Comparing the origins and track records of different policies allows us to assess, albeit roughly, the political difficulty of enacting them relative to the benefits they have yielded, an important complement to previous studies. Methodologically, we characterize the case using secondary sources, including news articles, government reports, and academic publications that have looked at post-facto consequences as well as some causes of BC's climate policy implementation. To supplement the analysis, especially in terms of political causes of policy enactment, we rely on primary data from semi-structured interviews we conducted with six individuals who have played important roles in BC climate policymaking. Our interviewees were three former government bureaucrats and politicians; a representative of an environmental think tank; a representative of a major provincial business association; and an academic who has been closely involved in climate policymaking in BC during

the entire period we examine. Given the politically sensitive substance of the interviews and the small size of the climate action leadership group in the province, we do not further identify our interviewees and do not use direct quotes.

Though the BC tax's political survival reflects some simple good fortune, there were also features of its design and promotion that likely helped its cause. Revenue-recycling, and policymakers' strong efforts to emphasize that recycling, mitigated some opposition from business, while making it harder to repeal the tax (Removing the tax would have required re-raising other taxes and/or increasing the provincial budget deficit). State-private sector relationships that were cooperative, but not excessively pliable, plus selective concessions to specific industries, also contributed to private sector acquiescence. Endorsements by experts helped legitimate the initiative. And the tax's introduction in the middle of an election cycle gave the government some time.

While the tax has been a modest environmental, economic, and political success, however, in another sense it has been a disappointment. BC's total greenhouse gas emissions, in absolute terms, have not declined—though that fact cannot be blamed just on the carbon tax, whose impacts were never expected to be large. Since a change of government in 2017, however, and notwithstanding the province's poor performance thus far, BC has introduced a number of new climate policies which should yield important gains in the years ahead. These new measures, spanning multiple sectors, have encountered little public opposition. We therefore discuss both the tax and these recent initiatives, in order to better understand the context within which they have been possible, and to compare the various political responses to them.

2. Background and non-tax policies

British Columbia is in some ways an unlikely climate policy vanguard. First, BC has a large natural resources sector, and is a fossil fuel (mostly natural gas) producer. It is home to the largest coal export terminal on North America's west coast, and as of 2022 two new fossil fuel pipelines—one each for diluted bitumen and natural gas—are being built in the province. The literature suggests that polities in regions with large fossil fuel industries are less likely to introduce strong climate policies (Lamb and Minx, 2020). Second, Canada as a whole has been a poor climate policy performer, with the latest Climate Change Performance Index ranking it fourth-worst out of 61 countries (Burck et al., 2022). Though BC specifically has fared slightly differently than the country as a whole, and Canada's federal system devolves substantial power to the provinces, BC shares Canada's high per capita emissions and is subject to federal laws and institutions consistent with its carbon-intensive political economy (Canadian Climate Institute, 2020). Third, the government that proposed and implemented some of BC's

most significant early climate policies (including the carbon tax) was right-of-center, and many take it as given that there is a disaffinity between the political right and climate action. Fourth, though in many places electricity generation from fossil fuels has been an impediment to climate action, jurisdictions that have achieved significant emissions reductions have often done so specifically by decarbonizing their electricity sectors (Dolphin et al., 2020). Electricity generation in BC, however, has never produced much in the way of greenhouse gas emissions, as it has long relied predominantly on hydroelectric dams. BC therefore had no emission reductions to achieve from the decarbonization of this sector. For all these reasons, and given that even as of 2022 carbon taxes apply to <6% of the world's total greenhouse gas emissions, the case of BC and its carbon tax is unexpected. As one recent paper puts it, “governments have been reluctant to introduce carbon taxes, proposals have been rejected by citizens in referenda and, even when adopted, carbon taxes have sometimes been reversed” (Mildenberger et al., 2022, p. 121).

Moreover, British Columbians consume huge amounts of gasoline, with transportation therefore accounting for the largest share of total greenhouse gas emissions. Canada's light-duty vehicle fleet is one of the world's least fuel-efficient (International Energy Agency, 2019), and Canadians routinely compare the gasoline prices they pay to those in the U.S., where exceptionally low taxation means prices are lower. Measures that increase the price of vehicle fuels, such as a carbon tax, are therefore quite controversial in Canada. Overall, BC residents emitted 15.3 tons of carbon dioxide equivalent (tCO₂e) greenhouse gases on average in 2007—well above many countries with similar levels of GDP/capita. This was somewhat lower than the Canadian average, however, insofar as emissions from the prairie provinces of Saskatchewan and (above all) Alberta were extremely high, due to their large fossil fuel industries. BC's more modest but still significant fossil fuel industry, focused on natural gas, accounted for 3.7 tCO₂e/capita, or 24% of total provincial emissions (BC Government, 2021).

This was the backdrop for the introduction of the BC carbon tax in 2008. The Liberal Party that introduced the tax, in power after 2001, is classically “liberal” in the European rather than American sense. It sits on the right of the political spectrum, is close to business, and for several years after 2001 much of its agenda consisted of cutting taxes, reducing the size of government, and making labor laws less friendly to unions (Lacharite and Summerville, 2017). The Liberals were not generally focused on environmental issues, or particularly close to environmentalists. In their first 5 years, perhaps their only notable environmental initiative was reaching an agreement in 2006 to protect a large tract of temperate rainforest.

In 2007, after previously showing little interest, the Liberals began to focus on the issue of climate change, and announced that they would make mitigation of the province's greenhouse gas emissions a priority in the years to come. Codifying that goal in law, that year they passed a Greenhouse Gas Reduction

Targets Act, according to which BC would seek to reduce total provincial emissions by at least 33% by 2020, and 80% by 2050. Looking for ways to meet that goal, the finance minister suggested the government might consider introducing some kind of carbon tax. She made no definitive commitment to the idea, however, and her statement did not attract a great deal of attention—apart from policy experts, academic economists, and environmental researchers, who responded with a flurry of encouraging letters (Green, 2007), providing the idea with technical legitimacy.

Besides the carbon tax, the Liberal government introduced some other important regulatory policies around the same time. These were mostly aimed at emissions from specific sectors, and the most notable were a clean electricity standard (CES) and low-carbon fuel standard (LCFS). Model-based projections suggested that these two regulations would reduce emissions more than the carbon tax, yet they attracted less opposition (Rhodes and Jaccard, 2013; Rhodes et al., 2014). This is likely due to the relative invisibility of these regulatory measures' costs (Chetty et al., 2009). Consumers can see the costs of a carbon tax when filling their car or paying their home heating bill, whereas the costs of regulatory policies are generally hidden.

The CES required that 90% of new electricity generation come from zero-emissions sources, though without specifying any specific sources (BC Ministry of Mines, Energy, and Petroleum Resources, 2007). The CES targeted greenhouse gas emissions from electricity generation, while allowing for a wide range of means, rather than only zero-emission supply. For example, fossil fuel generation with carbon capture and storage could be a compliance pathway (a flexibility which made the CES similar to the renewable portfolio standards common in U.S. states). The CES immediately led to the cancellation of contracts that the provincial electricity monopoly had recently signed for the construction of two new coal-fired and one new gas-fired electricity plants. The cancellation of these projects, relative to a counterfactual scenario in which they were built and used to their expected full capacity, reduced provincial emissions by 10.8–16.6 Mt CO₂e annually—meaning the CES had the largest impact on total emissions of any policy introduced around that time (Rhodes and Jaccard, 2013).

The LCFS, implemented in 2010 and inspired by a similar policy previously introduced in California, consisted of two parts: a Renewable Fuel Requirement establishing a 5% renewables target for gasoline and 3% for diesel starting in 2010, and a Low Carbon Fuel Requirement, obligating that providers of liquid and gaseous transportation fuels reduce their average life-cycle carbon intensity by 10% by 2020 (BC Ministry of Energy Mines, 2014). Similar to the CES, the LCFS did not prescribe the use of any specific technology, giving fuel providers the freedom to choose the lowest-cost low-carbon alternatives, such as biofuel, electricity, or hydrogen. LCFS also offered credit trading between fuel suppliers, such that high carbon intensity suppliers cross-subsidized those with low carbon intensity fuels.

The original LCFS was estimated to reduce total transportation emissions by 13% by 2050, relative to a business as usual scenario without this policy (Lepitzki and Axsen, 2018).

In specifying performance goals rather than specific compliance pathways, both the CES and the LCFS offered regulated agents the flexibility to choose the lowest-cost technologies. Agents could also trade compliance credits to decrease marginal abatement costs, with under-performing agents purchasing credits from over-performing ones. These types of regulations mimic the key principles of carbon pricing, achieving nearly the same cost-efficiencies, and are known as “flexible regulations” (Rhodes et al., 2021). In contrast to prescriptive command-and-control regulations, flexible regulations do not specify compliance pathways. Instead, they give flexibility to regulated entities to achieve a mandated performance standard using means of their own choosing. For those who find any given technology or fuel too expensive, flexible regulations often allow for the purchase of surplus compliance credits from entities who over-achieve, as long as the regulation’s aggregate requirement is met. Flexible regulations can therefore be effective in reducing emissions, at low cost (Goulder and Parry, 2008).

The Liberals’ next major climate policy initiative, announced with little prior warning in early 2008, was the carbon tax. We discuss the tax’s design, promotion, and effects, and the reactions to it, further below.

All of these initiatives reflected the goal of the BC Liberal Party leader, Gordon Campbell, to reduce the province’s greenhouse gas emissions. In later interviews, he identified a number of experiences and ideas that were motivating him. Among others, he had become concerned about the impact of climate change on BC’s forests, with mountain pine beetles—whose populations were previously limited by cold winter weather—growing more prevalent with global warming. Logging is a significant part of BC’s economy, and the degradation of the forests that cover most of the province, with the beetles infesting larger and larger areas and killing off more trees in the process, meant not just environmental but also substantial economic costs. To understand his choices, it is also worth considering Campbell’s background. Born and raised in Vancouver, BC’s largest city by far, he served as its mayor from 1986 to 1993, after previously pursuing a successful career in real estate development. Though an economic conservative, Campbell was a centrist on social issues, fairly international in his worldview, and perhaps less like other business leaders in the province—notably those in the resource, including fossil fuel, sector. Campbell’s thinking was also much influenced by the example of California, and its governor at the time, Arnold Schwarzenegger. By the time the Liberals introduced a carbon tax in BC, Schwarzenegger had signed an executive order requiring substantial emissions reductions by 2020, and California had also passed a Global Warming Solutions Act mandating the state’s Air Resources Board to identify clean

energy policies to achieve that end. After Schwarzenegger’s re-election in 2006, he and Campbell spoke on the telephone, arranged for their officials to meet, and then eventually discussed climate change in their own face-to-face meetings (Harrison, 2012).

Contextually, 2007 was perhaps an auspicious time to introduce new environmental initiatives, in that the provincial economy was growing and the unemployment rate hit its lowest level in 32 years. At that time, moreover, Al Gore’s film *The Inconvenient Truth* was generating substantial public interest and concern about climate change, as was (in policy circles) the recently released UK Stern Review. And British Columbians were further reminded of the power and costs of extreme weather events, when an exceptionally strong and damaging wind- and rain-storm swept through the southwestern part of the province in December 2006. Downed electricity lines left some areas without power for days (CBC, 2016).

3. The carbon tax’s design and effects

The tax rate was initially set at C\$10/ton CO₂ equivalent, and the Liberals said they would increase the rate annually by C\$5/ton through 2012, by which time it would reach C\$30/ton. With the Canadian dollar roughly equal to the U.S. dollar in 2008, this was quite a high rate (Levi et al., 2020). The tax was also broad, applying to more than 70% of greenhouse gas emissions, calculated in terms of CO₂ equivalents; as of 2019, this was still the highest share of any carbon tax in the world with a price per ton at least as high (Steenkamp, 2021). The main exemptions were: fuel exports; fuel consumed by planes or ships traveling to or from the province; emissions from farms, forestry, landfills, and some industrial processes; and methane from the production and transmission of fossil fuels.

The tax’s impacts on typical consumers were small. For example, the initial level of C\$10/ton meant a 2.41 cents per liter (9 cents per gallon) increase in the price of gasoline (Ministry of Finance, 2008a,b). By 2014, the tax still only accounted for 4.4% of gasoline’s retail price (Murray and Rivers, 2015). From the point of view of the provincial government budget, by the time the tax was phased in fully to C\$30/ton, it was expected to raise about 4.3% of total annual tax revenues. In the 2010–2011 fiscal year, the carbon tax raised C\$741 million, or C\$168 per provincial resident.

The Liberals emphasized from the beginning that the tax would be completely revenue-neutral. That is, in a tax shift, all new revenues generated by the tax would be recycled as cuts to other taxes payable by businesses and individuals. It would specifically not fund new government programs or spending. During the carbon tax’s implementation, the general corporate tax rate therefore shrank from 12 to 10% (tied for the lowest provincial rate in Canada), and the small business rate from

4.5 to 2.5%. Provincial personal income tax rates were reduced (for the lowest two of five brackets only, covering up to about C\$70,000 in taxable income) from 5.35 and 8.15 to 5.06 and 7.70%. To address distributional concerns, the legislation also provided for a Low Income Climate Action Credit, a recurring payment combined with an existing quarterly payment to low-income taxpayers as compensation for the federal (and otherwise regressive) Goods and Services Tax.

Finally, the government also paid out a one-time “Climate Action Dividend” to every British Columbian in June 2008, the month before the carbon tax first went into effect. The C\$100 “dividend” was literally a paper check in the mail, with Gordon Campbell’s name on it. This was a blunt effort by the government to stress the financial benefits of the carbon tax in tandem with the offsetting cuts to other taxes. It was also an inversion of the usual goal of tax policy, which is invisibility (Martin and Gabay, 2018). Here the policymakers wanted a tax credit to be as visible as possible.

Turning to its effects, several studies have concluded that the tax helped reduce some of BC’s greenhouse gas emissions, mostly in transportation. By 2011, per capita emissions from sources subject to the tax were down 2.4% in BC, whereas in the rest of Canada they were up 3.9% (Elgie and McClay, 2013). Estimates suggest the tax reduced greenhouse gas emissions in the province by between 5 and 15%, with much of the impact operating through gasoline consumption (Rivers and Schaufele, 2015). The added gasoline price of 7.78 cents per liter (given the C\$30/ton rate as of 2012) led to a 12% reduction in overall consumption (Antweiler and Gulati, 2016; Lawley and Thivierge, 2018). The price of diesel also rose marginally (Bernard and Kichian, 2019). And the tax reduced residential natural gas consumption, a common source of heat for BC households, by between 7 and 10% (Xiang and Lawley, 2019). One recent study, though, suggests that the carbon tax’s aggregate effect on economy-wide emissions has thus far been negligible, primarily due to low and slow-rising levels of the carbon price (Pretis, 2022).

The economic cost of the tax to the provincial economy or to individual households, studies agree, was minimal. The tax had negligible to no effect on overall economic growth (Murray and Rivers, 2015; Bernard and Kichian, 2021). This is perhaps unsurprising given that the tax package was in fact revenue-negative, with the government paying out slightly more in tax cuts than it received in additional revenues from the new tax (World Bank, 2015). While emissions reductions were achieved at very little financial cost, some emissions-intensive sectors did admittedly suffer (e.g., cement). Still, positive impacts in other sectors compensated for those costs. Based on figures from Statistics Canada (CANSIM series 36-10-0222-01 and 17-10-0005-01), and despite the financial crisis, BC’s real GDP per capita was 14.5% higher in 2017 compared to 2007. This was higher than for Canada as a whole (+11%).

In terms of distribution, in the absence of any compensatory measures, carbon taxes can be regressive—representing a larger share of poorer people’s incomes. In the case of the BC tax, because of the compensatory measures introduced alongside the tax, studies indicate that any distributional effect was small, and that effect was as likely to be progressive as regressive (Lee and Sanger, 2008; Beck et al., 2015; Murray and Rivers, 2015). That is true even though more than half of the cuts to other taxes funded by the new carbon tax accrued to business, and those cuts were larger than the revenues of the carbon tax itself—such that its net impact was (very slightly) to reduce the overall size of the provincial government. There is little evidence that the Liberal government was especially concerned about the distributional consequences of the tax (perhaps not surprisingly given that the Liberals are right of center). But the distributional implications of the income-tested cuts to other taxes and the flat “Climate Action Dividend” were clearly progressive, which the Liberals would have anticipated.

4. Political reactions and survival

The Liberal government worked hard to promote the tax, including after it was implemented, with communications from the government strongly emphasizing the tax’s revenue-neutrality. One document for example explained that the tax’s costs could “be offset by income tax reductions. And those who choose to reduce their carbon footprints can save enough on their household expenses to come out ahead financially” (Government of British Columbia, 2008). Likewise, as a consequence of the cuts to business taxes: “B.C. will have one of the most competitive tax environments of any major industrialized economy” (ibid.). At the same time, establishing a clear link between the carbon tax and cuts to other taxes served the purpose of helping to lock in the former: any future government choosing to repeal the carbon tax would either have to re-raise other taxes, or run a deficit, either of which would be politically awkward.

The business community was wary of the tax, though the revenue-neutrality of the package, and the fact that the Liberals had good relations with the private sector generally, meant that ultimately few businesspeople objected. The Vancouver Board of Trade business association, for example, lauded what they called the “very smart carbon tax” (Harrison, 2012). That said, some specific industries and firms were not happy, such as cement producers and other high-emissions firms competing directly with counterparts immediately across the U.S. border. Later on, in the face of such criticism, the government exempted emissions from both greenhouses and fuel used in agriculture, starting in 2012. These concessions appear to have effectively mollified some otherwise vehement critics of the tax, and thereby blunted objections from the provincial business community as a whole—elements of which have long played an obstructive

role with respect to climate action. Putting industries in a position where they risk getting a worse settlement—i.e., one without concessions—gives them an incentive not to criticize too strongly the general direction of a policy initiative they dislike (Fairbrother, 2019). The fact that the tax was proposed by a center-right government friendly with and well-connected to the provincial business community allayed concerns somewhat on the part of the private sector. Moreover, even had business wanted to part ways with the Liberals, they would have had no other party with which to ally—given the NDP's close ties to organized labor (Harrison, 2012). The balance of power between the state and the private sector was therefore constructive.

Public opinion was lukewarm. Though some prior polling suggested that offsetting cuts to other taxes would reduce public opposition (Peet and Harrison, 2012), and the Liberals emphasized it abundantly, it is not clear that revenue-neutrality really helped much with voters (Clean Energy Canada, 2015; Rivers and Stokes, 2018). The dividend in particular appears to have been ineffective in winning greater public support, consistent with recent research suggesting that rebates do not work to shift public attitudes toward carbon taxes (Duff, 2008; Karapin, 2020; Mildenberger et al., 2022). Voters doubted the government's promises to make the tax change revenue-neutral (Jaccard, 2012).

Rural residents were especially opposed to the tax. They argued they were forced to deal with colder climates, needed bigger vehicles for driving longer distances, and had fewer low-carbon lifestyle options, like taking public transit or cycling. Yet the government's own analyses, and other studies, showed that rural residents in fact paid less than average for the tax, such that it in fact amounted to a subsidy for them from urban residents; suburbanites around Vancouver drove and so paid more than residents of more remote rural areas (Sustainable Prosperity, 2012). Nevertheless, over time the government attempted to use targeted tax measures to address the criticisms of rural residents, by providing them with a flat C\$200 annual benefit, starting in 2011. This Northern and Rural Homeowner Benefit does not appear to have won people over, and so politically was ineffective, and the revenue recycling introduced with the new tax from the beginning was already sufficient to address the tax's disproportionate burden on rural residents (Beck et al., 2016).

In an attempt to take advantage of public skepticism about the tax, the other major political party in BC—the labor-allied New Democratic Party, who had been in power for a decade before 2001—announced their opposition. This position was not a given, as historically the NDP was closer than the Liberals to the province's environmental movement. On the other hand, the NDP represents organized labor, and resource sector unions in BC have often opposed environmental protection initiatives (Hackett, 2021)—a form of the “double representation” that often impedes climate action (Mildenberger, 2020). The NDP voted against the carbon tax legislation in the provincial

legislature in 2008, and continued campaigning against the tax, with a provincial election coming up in 2009.

Immediately after the Liberals announced their intention to introduce the tax, in early 2008, polls found more support than opposition. That changed over the course of the next several months, however, as public support for the carbon tax declined by 7 percentage points (Ipsos Reid, 2008; Peet and Harrison, 2012). By the time the tax went into effect at the start of July, public opinion was more hostile than supportive. Given the election on the horizon, the NDP efforts to repeal the tax, and rising public opposition, in hindsight the tax's political survival beyond 2009 was not a given.

As it turned out, world events helped out. With the onset of the global financial crisis in mid-2008, public attention shifted to pocketbook concerns, and the Liberals were widely perceived as more reliable handlers of the economy than the NDP (Rivers and Stokes, 2018). The NDP therefore lost the mid-2009 election, and remained in opposition, despite voters' antipathy toward the carbon tax. Counterfactually, if the financial crisis had not struck, the NDP might have been elected, and the BC carbon tax—like Australia's for example—would have been consigned to history. In that sense, the tax's political fortunes depended on a measure of simple good luck (The Liberals also won re-election in 2013, and the NDP eventually stopped opposing the carbon tax. Only fringe conservative parties continued campaigning to repeal it after that).

What led to the tax's declining popularity in the first half of 2008? The provincial unemployment rate did not begin rising until the fall, so macroeconomic circumstances do not appear to have played a role. On the other hand, there was a marked rise in the consumer price of gasoline, with the average price of a liter in Vancouver Metropolitan Area increasing from \$1.058 to \$1.464 between January and July 2008. Voters may have thought (erroneously) that the rising prices they were seeing at the pump were related to the introduction of the carbon tax. If so, however, they did not correct themselves in the second half of the year, when the price of gasoline dropped significantly, reaching \$0.843 by December. In this period, support for the tax did not change.

Over the course of subsequent years, however, public support for the tax gradually increased (Murray and Rivers, 2015), even if surveys suggest that support for it remained lower than for other climate policies (Rhodes et al., 2014). The modestly growing acceptance of the BC tax is consistent with findings from studies elsewhere suggesting that voters tend to grow more accepting of new environmental taxes as they get used to them (Carattini et al., 2018a; Janusch et al., 2021).

Overall, the political viability of the carbon tax was by no means a given. Though the Liberal government strongly emphasized its revenue-neutrality, it is not clear that this feature of the tax did much to enhance (or reduce) public support. That said, the provincial private sector did not oppose the tax's introduction as strongly as it could have, and public opinion about the tax has become somewhat more positive as years went

by. In the short term, in 2008–2009, the tax may have survived politically only because of a measure of good fortune, as public opinion was hostile, but the Liberals were nonetheless returned to power, in the context of a historical financial crisis.

5. Newer developments

Despite the carbon tax, CES, LCFS, and other policies, greenhouse gas emissions rose in BC after 2012. One reason is that the tax rate stopped rising beyond \$30/ton, and was not indexed to inflation. Furthermore, when Gordon Campbell stepped down in 2013, the new Liberal Party leader who replaced him, Christy Clark, did not introduce any notable new climate policies. She said that other jurisdictions needed to catch up on climate policy, and that she wanted to avoid the “leakage” of BC industries. The only notable action taken by Clark’s government was to introduce performance-based energy efficiency requirements for new buildings, which local governments could choose to adopt in their bylaws on a voluntary basis. The most ambitious such rules could require net-zero-ready buildings so efficient as to generate their own energy *via* renewable technologies. Currently, 52 communities have implemented some form of bylaws along these lines (Government of British Columbia, 2021).

Climate policy has changed dramatically in the province in recent years. In 2017, Liberal government in BC came to an end and a New Democratic Party (NDP) government replaced them. Crucially, the NDP’s control depended on the Green Party, as the 2017 election returned no single party with a majority. The Green Party, with three seats in the legislature, quickly began speaking to both the NDP (with 41 seats) and the Liberals (43). Eventually the Greens and NDP negotiated a Confidence and Supply Agreement (CASA). Given clear initial differences in the parties’ election platforms, the CASA ended up having a major impact—magnifying the Greens’ influence over the climate policies that the coalition, which lasted until 2020, ultimately adopted.

The center-left NDP, traditionally focused on job creation, labor rights, and social democratic priorities such as health care, had said they would pursue climate action, but had not specified many concrete policy measures (BC NDP, 2017). Their only explicit commitments included matching the carbon tax with the newly announced federal carbon price (discussed below), sending more carbon tax rebate cheques to low- and middle-income households, and enabling energy efficiency retrofits to public buildings and residential homes. Their platform also stated that the government would invest in existing (in many cases polluting) industries, raising doubts about whether the NDP really cared much about climate change.

The Green Party was led, on the other hand, by Andrew Weaver, a successful climate scientist at the University of Victoria, in BC’s capital city. And the Greens’ platform had

spelled out a range of ambitious and specific policy measures, including the legislation of a binding target of reducing emissions 40% by 2030 relative to 2007 levels; annual C\$10 increases to the carbon tax rate; higher energy efficiency requirements and supports for existing building retrofits; increasing stringency for the clean electricity standard and the low carbon fuel standard; several forest carbon management and community-level climate promises; and a commitment to stop the construction of a new pipeline meant to transport oil from Alberta to the BC coast.

The CASA reconciling the NDP and Green priorities specified tax rate increases of C\$5 per ton, carbon rebate cheques, and most importantly, to implement a climate plan credibly capable of meeting the provincial targets. In addition, the government committed to try to stop the development of the new pipeline project being planned for the province. The BC government proceeded to fight the project in court, arguing there were insufficient oil spill response measures in place (BC NDP, 2017). The federal government eventually purchased the project outright, however, and overruled the opposition from the province, which in this conflict was allied with environmental organizations and Indigenous communities (CBC, 2022).

In early 2018, the NDP announced an increase in the carbon tax rate to C\$35/ton, and a plan to raise the rate each year by \$5 per ton until reaching the level of \$50 per tCO₂e in 2021. (Due to Covid, the increase was frozen in 2020, so the rate only rose from \$40 to \$45 in spring 2021, and reached \$50 in 2022.) That brought the tax into line with a federal law, introduced by the Liberal government of Prime Minister Justin Trudeau in 2018, that requires the provinces all to put a minimum price on greenhouse gas emissions. The NDP dedicated new tax revenues to a combination of the general government budget, business, and industry, *via* an administratively complex system of grants. The tax is thus no longer revenue-neutral.

6. CleanBC 2018

Soon after the conclusion of the CASA in late 2018, the NDP-Green government implemented a new climate plan, known as CleanBC. The plan built on past policies while introducing several new ones, including a newly legislated target of 40% GHG reductions by 2030, as in the original Green Party election platform, and governance mechanisms designed to make the government accountable for meeting the target.

The stringency of existing policies was increased. Aside from increases in the carbon tax rate, outlined above, the transportation emissions intensity reductions required under the low carbon fuel standard were increased from 10 to 20% in by 2030, and additional energy efficiency requirements were added to the building code—with net-zero-ready buildings being mandatory by 2032. The resumption of BC’s carbon tax increases coincided with the introduction of the first federal

carbon price at C\$20/ton starting January 1, 2019, growing in C\$10 annual increments to reach C\$50 in 2022.

In terms of new policies, the BC government introduced a zero-emission vehicle (ZEV) sales mandate requiring a 10% ZEV market share by 2025, rising to 100% by 2040 for light-duty vehicles. Similar to the LCFS, the ZEV sales mandate did not prescribe a particular vehicle type, allowing fully battery electric vehicles, extended range electric vehicles, hydrogen fuel-cell electric vehicles, and plug-in hybrids to be used as compliance technologies with higher-range all-electric ZEVs receiving more credits that are used to ensure compliance with sectoral market share targets each year. Being a flexible regulation, the ZEV sales mandate also permitted credit trading, allowing under-performing vehicle sellers to purchase credits from sellers who over-perform—thereby essentially cross-subsidizing EV sales.

CleanBC also announced new subsidies and loan programs for energy efficiency home retrofits, purchases of heat pumps, and funding for community climate action and public housing. And it introduced new policies for the industrial sector. Industry in BC, like other heavily extraction-focused, economies, is emissions-intensive. Long-lived capital assets mean the transition to low-carbon technologies is expensive. Moreover, the sector is heavily exposed to trade-based competition, such that firms are quick to complain about other jurisdictions' (supposedly or genuinely) weaker climate policies. For these reasons, industry-focused climate policies are politically difficult to implement (Jaccard, 2020). Nevertheless, the NDP-Green government attempted to address industrial emissions, such as by requiring methane emissions reductions in the upstream natural gas production by 45% by 2025, using leak detection, repair, and methane capture technologies. In addition, the government launched its CleanBC Program for Industry, supported by changes to the carbon tax' revenue-recycling mechanism. Specifically, the carbon tax's former revenue-recycling was changed to preserve income tax reductions only for revenues collected only under the C\$30/ton rate. All non-industry revenues above that rate were now to be used for general government spending. And industrial carbon tax payments above C\$30 were returned to large emitters *via* the CleanBC Industrial Incentive Program and CleanBC Industry Fund. Under the incentive program, carbon tax revenues above C\$30/ton are returned to those industrial facilities that reduce their emissions intensity relative to an established "best-in-class" worldwide industry benchmark. The industry fund invests a part of carbon tax revenue into emissions-reduction projects targeting energy efficiency, fuel switching, and carbon capture projects.

The full set of CleanBC policies was expected to meet 75% of BC's 2030 emissions reduction target according to the BC government's modeling (Government of British Columbia, 2021). The plan also outlined that the government would develop additional measures in the following 18–24 months to meet the other 25%. Notably, out of the total 18.9 Mt CO₂e

projected to be reduced by CleanBC measures, the carbon tax (at \$50/ton) would reduce emissions by only 1.8 Mt, or <10%. BC's projected emissions therefore mostly rest on regulatory policies with flexibility mechanisms, such as the LCFS, ZEV sales mandate, and the clean electricity policy. Modeling suggests that BC's climate targets could in fact be met *via* primary reliance on flexible climate regulations with a smaller contribution from the carbon tax, supporting the provincial modeling conclusions (Doan, 2020). Similar ex-ante findings exist for already implemented or announced flexible climate regulations in Canada's federal policy mix (Canadian Climate Institute, 2022) and California's state-level policy portfolio (California Air Resources Board, 2017), suggesting that carbon taxation does not have to be the main or only policy tool for emission reductions.¹ Emerging literature into climate policy mixes also highlights the importance of complementary pricing and non-pricing measures in policy mixes to maximize GHG reductions (Koch et al., 2022).

One reason why the CleanBC target could not be met was the planned development of the supposed "cleanest" in the world export-oriented liquefied natural gas (LNG) industry. This was expected to add up to 3.5 Mt of emissions by 2030. The Green Party leader, Andrew Weaver, strongly opposed to the proposed LNG industry, and an analysis by the left-leaning think tank Canadian Center for Policy Alternatives suggested that LNG-related emissions were being under-estimated (Canadian Press, 2018; Lee, 2019).

Our interviews with former government bureaucrats also suggest that the content of CleanBC reflected concerns among the leadership and staff of certain ministries about the consequences of climate policies for the cost of energy to consumers; the potentially unfair distribution of policies' costs and benefits; and/or the supposedly uncompetitive position that climate action might impose on major industries. Bureaucrats cautioned legislators that BC was too small to invest in breakthrough technologies alone, or to undertake major green infrastructure projects. It would appear then that a mix of bureaucratic considerations—about affordability, competitiveness, and distribution—placed some intra-governmental constraint on policy policymaking at that time, even if the research literature does not suggest the concerns were generally warranted.

On the other hand, in addition to the new policies, CleanBC introduced new accountability mechanisms ensuring the effectiveness and long-term endurance of stringent climate

¹ Ex-ante modeling assessments seem to be the dominant source of emissions reduction information for regulatory climate policy measures. The implicit prices of climate regulations, accompanied with early emergence of data on accountability for each regulation under the BC Climate Change Accountability Act, make it difficult to isolate past emissions impacts of regulations in ex-post studies.

policies. The government committed to issue annual reports on GHG emissions progress under each policy along with emissions forecast for the next three years in the new Climate Change Accountability Act. More importantly, the government formed a Climate Solutions Council, to provide strategic advice on climate policy, including review and public reporting on the effect of ongoing and new policies against climate targets. The Council's mandate was later legislated in February 2020 as a formal independent advisory group providing advice to the Minister of Environment and Climate Change Strategy on climate policy and clean growth. These accountability measures were inspired by the UK's models of the Climate Change Act and Climate Change Committee, a non-departmental public body advising on climate policy. Unlike the UK-originated expert-based advisory group, the BC Climate Solutions Council consisted of sector members from First Nations, environmental organizations, industry, academia, youth, labor, and local government, encouraging collaboration and agreement on climate policy among different sectors. These accountability measures, served as the first governance mechanisms to assess the effectiveness of existing climate policy and provide advice on policy developments.

7. Further measures, and the CleanBC roadmap

In late 2020, after 3 years of NDP-Green government in BC, the leader of the NDP called a snap election. The NDP was enjoying high levels of public support, due to competent handling of the COVID-19 pandemic, and as they hoped the result of the election was an NDP majority government. The NDP were therefore no longer dependent on support from the Greens in the legislature. Even without the Greens, however, the NDP maintained a high level of climate action ambition, perhaps due in part to the lasting influence of the Greens on the thinking of the NDP itself. But this was also compelled by the new climate governance mechanisms described above.

Based on updated modeling and GHG emissions data, the Climate Solution Council warned that existing CleanBC policies would not meet the earlier modeled 75% of the 2030 emissions reduction target, primarily due to changes in historical GHG inventory data (Climate Solutions Council, 2021). Recognizing the inadequacy of existing policies, the Climate Solutions Council (2021) called for a number of additions and improvements to the CleanBC climate plan. These included meeting or exceeding the federal carbon price while protecting emissions-intensive trade-exposed (EITE) industries and low-income households; increasing the stringency of the LCFS and ZEV sales targets; a new program to support local governments; and designing a standard to cap gas utilities' emissions. All of this, moreover, would be accomplished while better including the voices of Indigenous peoples, taking action

on adaptation, and considering CleanBC objectives in an "all of government" way.

Pressure from the Council, in combination with the accountability and reporting commitments, and engagement with multiple stakeholders, led to the implementation of a more stringent climate plan in 2021, the CleanBC Roadmap to 2030. The plan adopted most of the Climate Solutions Council's recommendations, including matching the federal carbon pricing schedule, and more stringent transportation, building, and industry policies. These changes also followed after extensive meetings with representatives of Indigenous communities, the private sector, and other levels of government (Government of British Columbia, 2022).

In the meantime, the federal government introduced a more stringent carbon price, rising by C\$15/ton annually (rather than the existing C\$10) starting in 2023. However, independent analysis showed that even the C\$170 carbon price to be achieved by 2030 would not be sufficient to meet BC's 2030 emissions reductions target, especially if the province expands liquefied natural gas (LNG) production (Climate Solutions Council, 2021). In response, the BC government committed to following the federal government's carbon pricing schedule, and increased the clean electricity standard from 93 to 100% of new zero-emissions electricity generation. In transportation, the CleanBC Roadmap proposed to increase the stringency of the ZEV sales mandate to 26% ZEV new market share by 2026, 90% by 2030 and 100% by 2035, and mentioned the intention to expand the application of the mandate to medium- and heavy-duty vehicles similar to California's ZEV sales mandate. Similarly, the stringency of the existing LCFS was increased to a 30% carbon intensity reduction target for all transportation fuels replacing the previous 20% target by 2030. At a local government level, the plan aims to develop transportation network and land use policies to reduce travel demand and switch from driving to cycling, walking, and public transit.

With respect to buildings, the Roadmap applied an emissions standard to the provincial building code, with a requirement that all constructions be zero-emission by 2030. In existing buildings, the province will implement a 100% energy efficiency standard for space and water heating technology, effectively prohibiting the sale of natural gas and oil furnaces, water heaters, and boilers. However, similar to the non-implemented home-heating renewable natural gas regulation announced in the 2018 CleanBC, the newly proposed building emissions policies are yet to be designed and legislated. To ensure these policies do not create affordability concerns, the new plan proposed substantial funding for building energy switching and efficiency retrofit projects, with a specific portion of the funding allocated for First Nations communities.

In industry, the Roadmap's additional policies continue to lack certainty and stringency. According to the new plan,

additional revenues from the carbon tax would be spent, *via* the CleanBC Industry Fund, on innovative low-carbon technologies and programs determined by government. New funding was also announced for industrial electrification projects, along with a requirement for new large industrial facilities to have plans for achieving net-zero emissions by 2050. Perhaps the most stringent newly proposed policy is an emissions cap for natural gas utilities; however, the details of the cap are still uncertain.

8. Conclusions

In 2007, BC adopted the goal of reducing total emissions 33% by 2020, yet as of 2019 emissions had actually increased 5% (BC Government, 2021). Enacting a carbon tax, and the political achievement of defending it from critics, have therefore not made the province a success overall in what matters most: getting on a path to real climate sustainability. In this specific sense, the case validates the negative assessments of carbon pricing skeptics. In particular, emissions from the expansion of the province's natural gas industry have presented a challenge (Houle et al., 2015), and by some criteria other provinces in Canada have even performed better (Canadian Climate Institute, 2020).

On the other hand, counter-factually, emissions would have been even higher without the tax. And in some ways, the case of BC is encouraging: It shows that carbon taxes can be a useful means of reducing greenhouse gas emissions, and at low cost. In per capita terms, emissions declined about 12% from 2008 to 2019—a notable achievement. Moreover, contrary to fears that carbon taxes hit the poor hardest, analyses suggest that the BC tax (coupled with compensatory measures) had negligible impact on distribution; if anything the impacts were progressive. Politically, Campbell and the Liberals' conversion to the cause of climate change, and subsequent policy achievements, show that policymakers can take action on climate change, if they become convinced it is the right thing to do—even if they are on the center-right. Finally, and perhaps most importantly of all, BC's carbon tax has survived. Though by no means all friendly toward the tax, businesspeople have ultimately accepted it—which has been important, given that past experience suggests the province's private sector has substantial power to block legislation it dislikes (Fairbrother, 2003). Public opinion, if not enthusiastic, has also been accepting enough for the tax to endure. Moreover, arguably, without the encouraging precedent of the BC tax, the Canadian federal government of Justin Trudeau might not have been willing or motivated to introduce a national carbon pricing policy a decade later. Paving the way for the federal carbon price was a major achievement of the British Columbia carbon tax.

Yet BC's tax has never particularly popular, and, as we have shown, its political fortunes might easily have turned out very differently. Had the NDP been elected in 2009, which was a real possibility, a new provincial government would probably have eliminated the tax. Arguably, then, all the features that have led the BC tax to be described as a “textbook policy,” perhaps “the purest example of the economist's carbon tax prescription in practice” (Carl and Fedor, 2012; Murray and Rivers, 2015), may have had little or nothing to do with its survival. Carbon taxes have become more common around the world in the years since 2008—there are now more than 30, according to the World Bank (2022). But the lukewarm public support for BC's tax suggests why many governments remain reluctant to introduce them (Mildenberger et al., 2022).

Because of its carbon tax, BC has been a focus of climate policy scholars, and to some extent broader media coverage of climate policymaking, for more than a decade. As the title of an article in the activist magazine *Mother Jones* shows, BC's tax has drawn significant attention “British Columbia Enacted the Most Significant Carbon Tax in the Western Hemisphere. What Happened Next Is It Worked” (Mooney, 2014). Yet there is a risk that interest in the tax specifically overshadows the fact that the province has also enacted a number of other notable policies, some of which other jurisdictions would do well to follow. Policies like the clean electricity standard, low-carbon fuel standard, zero-emissions vehicle sales mandate, and building efficiency regulations have all led to significant emissions reductions (more than the carbon tax in some cases), and they have done so without much political opposition. The CES and LCFS in particular achieved substantial emissions reductions, yet generated little public debate, unlike the carbon tax.

The recent shift to stringent climate regulations largely reflects the influence of the Green Party over the NDP-led government between 2017 and 2020. That influence was fortuitous, however, and conflicting government objectives and interest group pressure may undermine the introduction or effectiveness of the new policies. Particular pressures might be experienced in the industrial sector where adequate caps and regulatory measures have not yet been designed and implemented. It will be important that (a) the existing policies continue to increase in stringency over time, (b) the announced industrial policies have explicitly defined caps and stringency targets, and (c) governance mechanisms, such as the Climate Advisory Council and annual performance reports, hold the government accountable for policy implementation and ultimately policies' effectiveness. Still, with the recent emergence of new governance mechanisms (the council and accountability reports) the prospects for reductions in the province's emissions are promising.

Author contributions

MF and ER collected, analyzed data, prepared drafts, developed the methodology, and reviewed and edited drafts. MF conceived the idea. All authors contributed to the article and approved the submitted version.

Funding

This research was funded by the Swedish Research Council (Grant VR 2020-04725).

Acknowledgments

Thanks to Jean Boucher and Donald Celmer for useful comments on earlier versions of this article.

References

- Antweiler, W., and Gulati, S. (2016). Frugal cars or frugal drivers? How carbon and fuel taxes influence the choice and use of cars. SSRN. Available online at: <https://ssrn.com/abstract=2778868>
- Baranzini, A., Van den Bergh, J. C., Carattini, S., Howarth, R. B., Padilla, E., and Roca, J. (2017). Carbon pricing in climate policy: seven reasons, complementary instruments, and political economy considerations. *WIREs Clim. Change* 8, e462. doi: 10.1002/wcc.462
- BC Government (2021). *Provincial Greenhouse Gas Emissions Inventory*. Victoria, BC: BC Government. Available online at: <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory> (accessed September 1, 2022).
- BC Ministry of Energy and Mines (2014). *Renewable and Low Carbon Fuel Requirements Regulation: Summary for 2012. Information Bulletin RLCF-007-2012*. Victoria, BC: BC Ministry of Energy and Mines.
- BC Ministry of Mines, Energy, and Petroleum Resources (2007). *BC Energy Plan*. Victoria, BC: BC Ministry of Mines, Energy, and Petroleum Resources.
- BC NDP (2017). *Working for You: Our Commitments to Build a Better BC. 2017 BC NDP Platform*. Victoria, BC: BC NDP. Available online at: <https://www.bcdnp.ca/sites/default/files/platform-book-v2-updated.pdf> (accessed September 1, 2022).
- Beck, M., Rivers, N., Wigle, R., and Yonezawa, H. (2015). Carbon tax and revenue recycling: impacts on households in British Columbia. *Resour. Energy Econ.* 41, 40–69. doi: 10.1016/j.reseneeco.2015.04.005
- Beck, M., Rivers, N., and Yonezawa, H. (2016). A rural myth? Sources and implications of the perceived unfairness of carbon taxes in rural communities. *Ecol. Econ.* 124, 124–134. doi: 10.1016/j.ecolecon.2016.01.017
- Bernard, J.-T., and Kichian, M. (2019). The long and the short run effects of British Columbia's carbon tax on diesel demand. *Energy Policy* 131, 380–389. doi: 10.1016/j.enpol.2019.04.021
- Bernard, J. T., and Kichian, M. (2021). The impact of a revenue-neutral carbon tax on gdp dynamics: the case of British Columbia. *Energy J.* 42, 213–231. doi: 10.5547/01956574.42.3.jber
- Burck, J., Uhlich, T., Bals, C., Höhne, N., Nascimento, L., Tamblyn, A., et al. (2022). *Climate Change Performance Index*. Available online at: https://ccpi.org/wp-content/uploads/CCPI-2022-Results_2021-11-10_A4-1.pdf (accessed September 1, 2022).
- California Air Resources Board (2017). *California's 2017 Climate Change Scoping Plan*. Sacramento, CA: California Air Resources Board. Available online at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf (accessed September 1, 2022).
- Canadian Climate Institute (2020). *11 Ways to Measure Clean Growth*. Toronto: Canadian Climate Institute. Available online at: <https://climateinstitute.ca/reports/clean-growth/1-low-carbon-growth/> (accessed September 1, 2022).
- Canadian Climate Institute (2022). *Independent Assessment: 2030 Emissions Reduction Plan*. Toronto: Canadian Climate Institute. Available online at: <https://climateinstitute.ca/wp-content/uploads/2022/04/ERP-Volume-2-FINAL.pdf> (accessed September 1, 2022).
- Canadian Press (2018). *Weaver, Horgan talk LNG Strategy After Tweet Threatening to Bring Down NDP Minority*. Toronto: Canadian Press. Available online at: <https://bc.ctvnews.ca/weaver-horgan-talk-lng-strategy-after-tweet-threatening-to-bring-down-ndp-minority-1.3775268> (accessed September 1, 2022).
- Carattini, S., Baranzini, A., and Lalive, R. (2018a). Is taxing waste a waste of time? Evidence from a supreme court decision. *Ecol. Econ.* 148, 131–151. doi: 10.1016/j.ecolecon.2018.02.001
- Carattini, S., Carvalho, M., and Fankhauser, S. (2018b). Overcoming public resistance to carbon taxes. *WIREs Clim. Change* 9, e531. doi: 10.1002/wcc.531
- Carattini, S., Kallbekken, S., and Orlov, A. (2019). How to win public support for a global carbon tax. *Nature* 565, 289–291. doi: 10.1038/d41586-019-00124-x
- Carl, J., and Fedor, D. (2012). *Revenue-Neutral Carbon Taxes in the Real World: Insights from British Columbia and Australia*. Stanford: Hoover Institution, Stanford University. Available online at: <https://www.hoover.org/sites/default/files/research/docs/117649691-revenue-neutral-carbon-taxes-in-the-real-world-insights-from-british-columbia-and-australia.pdf> (accessed September 1, 2022).
- CBC (2016). *Remembering the B.C. Windstorm of 2006*. Toronto: CBC. Available online at: <https://www.cbc.ca/news/canada/british-columbia/bc-windstorm-2006-1.3897226> (accessed September 1, 2022).
- CBC (2022). *Indigenous Leaders, Protesters Gather in Vancouver to Oppose Trans Mountain Pipeline*. Toronto: CBC. Available online at: <https://www.cbc.ca/news/canada/british-columbia/vancouver-art-gallery-trans-mountain-pipeline-protest-1.6414845> (accessed September 1, 2022).
- Chetty, R., Looney, A., and Kroft, K. (2009). Salience and taxation: theory and evidence. *Am. Econ. Rev.* 99, 1145–1177. doi: 10.1257/aer.99.4.1145
- Clean Energy Canada (2015). *How to Adopt a Winning Carbon Price: Top Ten Takeaways from Interviews with the Architects of British Columbia's Carbon Tax*. Leesburg: Clean Energy Canada. Available online at: <http://cleanenergycanada.org/adopt-a-winning-carbon-price/> (accessed September 1, 2022).
- Climate Solutions Council (2021). *The Challenge of Our Times. 2021 Annual Report to the Government of British Columbia*. Victoria, BC: Climate Solutions

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

- Council. Available online at: https://www2.gov.bc.ca/assets/gov/environment/climate-change/advisory-council/bc_climate_solutions_council_2021_annual_report.pdf (accessed September 1, 2022).
- Cullenward, D., and Victor, D. G. (2020). *Making Climate Policy Work*. Polity. Hoboken: John Wiley & Sons.
- Doan, E. (2020). *In search of politically achievable decarbonization pathways for British Columbia* (MRM thesis). Simon Fraser University. Available online at: <https://summit.sfu.ca/item/34379> (accessed September 1, 2022).
- Dolphin, G., Pollitt, M. G., and Newbery, D. M. (2020). The political economy of carbon pricing: a panel analysis. *Oxf. Econ. Papers* 72, 472–500. doi: 10.1093/oeq/gp2042
- Duff, D. G. (2008). Carbon taxation in British Columbia. *Vermont J. Environ. Law* 10, 87–107. doi: 10.2307/vermjenvilaw.10.1.87
- Elgie, S., and McClay, J. (2013). BC's carbon tax shift is working well after four years (attention Ottawa). *Can. Public Policy* 39, S1–S10. doi: 10.3138/CPP.39.Supplement2.S1
- Fairbrother, M. (2003). The freedom of the state? Recent NDP governments and a reply to the globalization sceptics. *Can. Rev. Sociol. Anthropol.* 40, 311–329. doi: 10.1111/j.1755-618X.2003.tb00249.x
- Fairbrother, M. (2019). *Free Traders: Elites, Democracy, and the Rise of Globalization*. New York, NY: Oxford University Press. doi: 10.1093/oso/9780190635459.001.0001
- Goulder, L. H., and Parry, I. W. H. (2008). Instrument choice in environmental policy. *Rev. Environ. Econ. Policy*, 2, 152–174. doi: 10.1093/reep/ren005
- Government of British Columbia (2008). *Turning to the Future, Meeting the Challenge: Balanced Budget 2008 Highlights*. Victoria, BC: Government of British Columbia. Available online at: <https://www.bcbudget.gov.bc.ca/2008/highlights/> (accessed November 11, 2022).
- Government of British Columbia (2021). *CleanBC 2021 Climate Change Accountability Report*. Victoria, BC: Government of British Columbia. Available online at: https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/2021_climate_change_accountability_report.pdf (accessed September 1, 2022).
- Government of British Columbia (2022). *Climate Action and Accountability: Collaboration*. Victoria, BC: Government of British Columbia. Available online at: <https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/government-collaboration> (accessed September 1, 2022).
- Green, D. (2007). *Why 70 Economists Urge BC Carbon Tax*. Vancouver: The Tyee. Available online at: <https://theyee.ca/Views/2007/11/01/CarbonTax/> (accessed November 1, 2007).
- Green, J. F. (2021). Beyond carbon pricing: tax reform is climate policy. *Global Policy* 12, 372–379. doi: 10.1111/1758-5899.12920
- Hackett, R. A. (2021). *Why It's Hard for BC's NDP to Be Greener*. Vancouver: The Tyee. Available online at: <https://theyee.ca/Analysis/2021/10/19/Why-Its-Hard-BC-NDP-Be-Greener/> (accessed September 1, 2022).
- Harrison, K. (2012). A tale of two taxes: the fate of environmental tax reform. *Rev. Policy Res.* 29, 383–407. doi: 10.1111/j.1541-1338.2012.00565.x
- Houle, D., Lachapelle, E., and Purdon, M. (2015). Comparative politics of sub-federal cap-and-trade: implementing the western climate initiative. *Glob. Environ. Polit.* 15, 49–73. doi: 10.1162/GLEP_a_00311
- International Energy Agency (2019). *Fuel Economy in Major Car Markets: Technology and Policy Drivers 2005–2017*. Paris: International Energy Agency. Available online at: https://iea.blob.core.windows.net/assets/66965fb0-87c9-4bc7-990d-a509a1646956/Fuel_Economy_in_Major_Car_Markets.pdf (accessed September 1, 2022).
- Ipsos Reid (2008). *BC Liberals Maintain Lead*. Press Release. Available online at: <https://www.ipsos.com/sites/default/files/publication/2008-06/mr080618-1.pdf> (accessed September 1, 2022).
- Jaccard, M. (2012). “The political acceptability of carbon taxes: lessons from British Columbia,” in *Handbook of Research on Environmental Taxation*, eds J. E. Milne, and M. Skou Andersen (Cheltenham: Edward Elgar), 175–191. doi: 10.4337/9781781952146.00019
- Jaccard, M. (2020). *The Citizen's Guide to Climate Success: Overcoming Myths that Hinder Progress*. New York, NY: Cambridge University Press. doi: 10.1017/9781108783453
- Janusch, N., Kroll, S., Goemans, C., Cherry, T. L., and Kallbekken, S. (2021). Learning to accept welfare-enhancing policies: an experimental investigation of congestion pricing. *Exp. Econ.* 24, 59–86. doi: 10.1007/s10683-020-09650-2
- Karapin, R. (2020). The political viability of carbon pricing: policy design and framing in British Columbia and California. *Rev. Policy Res.* 37, 140–173. doi: 10.1111/ropr.12373
- Koch, N., Naumann, L., Pretis, F., Ritter, N., and Schwarz, M. (2022). Attributing agnostically detected large reductions in road CO₂ emissions to policy mixes. *Nat. Energy* 7, 844–853. doi: 10.1038/s41560-022-01095-6
- Lacharite, J. R., and Summerville, T. (eds). (2017). *The Campbell Revolution? Power, Politics, and Policy in British Columbia*. Montreal and Kingston: McGill-Queen's University Press.
- Lamb, W. F., and Minx, J. C. (2020). The political economy of national climate policy: architectures of constraint and a typology of countries. *Energy Res. Soc. Sci.* 64, 101429. doi: 10.1016/j.erss.2020.101429
- Lawley, C., and Thivierge, V. (2018). Refining the evidence: British Columbia's carbon tax and household gasoline consumption. *Energy J.* 39, 147–171. doi: 10.5547/01956574.39.2.claw
- Lee, M. (2019). *BC's LNG Tax Breaks and Subsidies Offside with the Need for Climate Action*. Available online at: <https://www.straight.com/news/1238646/marc-lee-bcs-ling-tax-breaks-and-subsidies-offside-need-climate-action> (accessed September 1, 2022).
- Lee, M., and Sanger, T. (2008). *Is BC's Carbon Tax Fair? An Impact Analysis for Different Income Levels*. Ontario: Canadian Centre for Policy Alternatives. Available online at: <https://www.policyalternatives.ca/publications/reports/bcs-carbon-tax-fair> (accessed September 1, 2022).
- Lepitzki, J., and Axsen, J. (2018). The role of a low carbon fuel standard in achieving long-term GHG reduction targets. *Energy Policy* 119, 423–440. doi: 10.1016/j.enpol.2018.03.067
- Levi, S., Flachsland, C., and Jakob, M. (2020). Political economy determinants of carbon pricing. *Global Environ. Polit.* 20, 128–156. doi: 10.1162/glep_a_00549
- Martin, I. W., and Gabay, N. (2018). Tax policy and tax protest in 20 rich democracies, 1980–2010. *Br. J. Sociol.* 69, 647–669. doi: 10.1111/1468-4446.12290
- Mildenberger, M. (2020). *Carbon Captured: How Business and Labor Control Climate Politics*. New York, NY: MIT Press. doi: 10.7551/mitpress/12393.001.0001
- Mildenberger, M., Lachapelle, E., Harrison, K., and Stadelmann-Steffen, I. (2022). Limited evidence that carbon tax rebates have increased public support for carbon pricing. *Nat. Clim. Change* 12, 121–122. doi: 10.1038/s41558-021-01270-9
- Ministry of Finance (2008a). *Backgrounder: B.C.'s Revenue-neutral Carbon Tax*. New Delhi: Ministry of Finance. Available online at: <https://www.bcbudget.gov.bc.ca/2008/default.htm> (accessed September 1, 2022).
- Ministry of Finance (2008b). *Balanced Budget 2008 Highlights*. New Delhi: Ministry of Finance. Available online at: <https://www.bcbudget.gov.bc.ca/2008/default.htm> (accessed September 1, 2022).
- Mooney, C. (2014). *British Columbia Enacted the Most Significant Carbon Tax in the Western Hemisphere. What Happened Next Is It Worked*. San Francisco: Mother Jones. Available online at: <https://www.motherjones.com/environment/2014/03/british-columbia-carbon-tax-sanity/> (accessed March 26, 2014).
- Murray, B., and Rivers, N. (2015). British Columbia's revenue-neutral carbon tax: a review of the latest 'grand experiment' in environmental policy. *Energy Policy* 86, 674–683. doi: 10.1016/j.enpol.2015.08.011
- Peet, C., and Harrison, K. (2012). Historical legacies and policy reform: diverse regional reactions to British Columbia's carbon tax. *BC Stud.* 173, 97–122. doi: 10.14288/BCS.V01173.2431
- Porter, E. (2016). *Does a Carbon Tax Work? Ask British Columbia*. New York, NY: New York Times. Available online at: <https://www.nytimes.com/2016/03/02/business/does-a-carbon-tax-work-ask-british-columbia.html> (accessed March 1, 2016).
- Pretis, F. (2022). Does a carbon tax reduce CO₂ emissions? Evidence from British Columbia. *Environ. Resour. Econ.* 83, 1–30. doi: 10.1007/s10640-022-00679-w
- Rhodes, E., Axsen, J., and Jaccard, M. (2014). Does effective climate policy require well-informed citizen support? *Global Environ. Change* 29, 92–104. doi: 10.1016/j.gloenvcha.2014.09.001
- Rhodes, E., and Jaccard, M. (2013). A tale of two climate policies: political economy of British Columbia's carbon tax and clean electricity standard. *Can. Public Policy* 39, S37–S51. doi: 10.3138/CPP.39.Supplement2.S37
- Rhodes, E., Scott, W. A., and Jaccard, M. (2021). Designing flexible regulations to mitigate climate change: a cross-country comparative policy analysis. *Energy Policy* 156, 112419. doi: 10.1016/j.enpol.2021.112419
- Rivers, N., and Schaufele, B. (2015). Saliency of carbon taxes in the gasoline market. *J. Environ. Econ. Manag.* 74: 23–36. doi: 10.1016/j.jeem.2015.07.002
- Rivers, N., and Stokes, L. C. (2018). *Will Household Rebates Really Make Canadians Warm to a Carbon Price?* Toronto: Maclean's. Available online at: <https://www.macleans.ca/opinion/will-household-rebates->

[really-make-canadians-warm-to-a-carbon-price/](#) (accessed September 1, 2022).

Steenkamp, L.-A. (2021). A classification framework for carbon tax revenue use. *Clim. Policy* 21, 897–911. doi: 10.1080/14693062.2021.1946381

Stokes, L. C., and Mildenerger, M. (2020). *The Trouble with Carbon Pricing*. Cambridge: Boston Review. Available online at: <https://bostonreview.net/articles/leah-c-stokes-matto-mildenerger-tk/> (accessed September 1, 2022).

Sustainable Prosperity (2012). *British Columbia's Carbon Tax Shift: The First Four Years*. Pittsboro: Sustainable Prosperity. Available online at: <https://institute.smartprosperity.ca/sites/default/files/publications/files/British%20Columbia's%20Carbon%20Tax%20Shift.pdf> (accessed September 1, 2022).

The Economist (2011). *We have a Winner: British Columbia's Carbon Tax Woos Sceptics*. Available online at: <https://www.economist.com/the-americas/2011/07/21/we-have-a-winner> (accessed July 21, 2011).

World Bank (2015). *State and Trends of Carbon Pricing*. Washington, DC: World Bank. Available online at: <http://documents.worldbank.org/curated/en/636161467995665933/State-and-trends-of-carbon-pricing-2015> (accessed September 1, 2022).

World Bank (2022). *Carbon Pricing Dashboard*. Washington, DC: World Bank. Available online at: https://carbonpricingdashboard.worldbank.org/map_data (accessed November 7, 2022).

Xiang, D., and Lawley, C. (2019). The impact of British Columbia's carbon tax on residential natural gas consumption. *Energy Econ.* 80, 206–218. doi: 10.1016/j.eneco.2018.12.004