HEATING UP, BACKING DOWN

Evaluating recent climate policy progress in Canada

Hadrian Mertins-Kirkwood

ACW | Adapting Canadian Work and Workplaces to Respond to Climate Change

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Heating Up, Backing Down: Evaluating recent climate policy progress in Canada

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About the author

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The project investigates how Canada's diverse workplaces can best adapt work to mitigate greenhouse gases, and the changes needed in law and policy, work design, and business models for industry and services, to assist the "greening" of workplaces and work. ACW membership includes 56 individual researchers and 25 partner organizations in 7 countries.

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Introduction

As extreme weather events wreak unprecedented havoc on people and economies around the world, climate change is becoming increasingly difficult to ignore.

The summer of 2018 brought a heatwave that was responsible for nearly 100 deaths in Québec alone.[1] Meanwhile, a record-breaking wildfire season led to a state of emergency in British Columbia.[2] In spring 2019, Eastern Ontario and Quebec were hit by the second "hundred-year flood" of the last three years.[3] Although no single event is attributable to climate change, the rise of global temperatures over the past century has increased the likelihood and severity of floods, droughts, wildfires and storms.[4] Across Canada, the risk of extreme weather events causing severe human and economic damage is at an all-time high.[5] When the costs to human health and ecosystems are included, the toll of climate change will be tens of billions of dollars per year within half a century.[6]

Avoiding the worst effects of climate change will require a coordinated global effort in which Canada can and should play a leading role. We are one of the top ten highest emitting countries in the world. On a per capita basis, Canadians are among the most polluting people on the planet.[7] For the most part, our political leaders acknowledge Canada's responsibility to act on climate change and have committed to reducing emissions through climate policies. Success in this endeavour is essential to the global transition to a cleaner economy. As a wealthy country with a large energy sector, we have the rare capacity to meaningfully decarbonize the economy, which can then serve as a model to the rest of world. To wait for others to lead is both irresponsible and misguided, as the greatest long-term benefits of the clean economy will flow to the earliest adopters.

With Canada's global responsibility as the backdrop, this report begins by identifying two important emerging issues in the Canadian climate policy conversation: an overemphasis on carbon pricing and an absence of supply-side energy policies. Then, building on our 2017 report *Tracking Progress: Evaluating government plans and actions to reduce greenhouse gas emissions in Canada*, we analyze new emissions data and new policy announcements to assess federal, provincial and territorial governments' progress toward Canada's domestic and international greenhouse gas (GHG) emission reduction targets.[8]

Overall, we find that climate policy in Canada is less ambitious and less comprehensive than even two years ago. A recent backlash against otherwise promising policies risks setting Canada back on a path to rising GHG emissions and increases the future costs of transition. Restoring earlier momentum is essential, but even the full implementation of the Pan-Canadian Framework on Clean Growth and Climate Change is insufficient. More ambitious policies backed by bold climate leadership will be necessary for Canada to achieve its goals and make a positive contribution in humanity's existential fight against climate change. We cannot afford to back down as the world heats up.

Key issues

In our previous report, we identified three key obstacles to effective climate policy in Canada: (1) an ambition gap between government policies and official targets; (2) a deep economic dependence on fossil fuels, and; (3) an underappreciation of the need to support workers in the transition to a cleaner economy. Those issues remain as relevant today as they did two years ago.

In this report we introduce for discussion two additional, related issues that will become increasingly important in the coming years: (1) the problematic conflation of carbon pricing with climate policy more broadly, and (2) the absence of supply-side energy policies to tackle the root cause of climate change.

Decentering carbon pricing

For many Canadians and even for some policy analysts, carbon pricing has become synonymous with climate action.[9] Indeed, the forthcoming federal election is already being framed as a referendum on the carbon pricing backstop.[10] However, placing carbon pricing—specifically, the federal carbon pricing backstop regulation—at the centre of Canada's climate policy dialogue introduces several risks to a productive and inclusive transition to a zero-carbon economy.

First, carbon pricing is increasingly polarized along partisan lines with conservative parties typically rejecting any form of taxation. Many, if not most, conservative politicians in Canada have promised to repeal or oppose carbon pricing schemes if they are elected.[11] On the other hand, most conservative voters agree that climate action is necessary and are willing to entertain other approaches to reducing emissions.[12] Putting too much emphasis on pricing alone risks alienating large segments of the Canadian electorate from the decarbonization conversation. Although the introduction of direct household rebates under the federal plan may have increased overall acceptance of the carbon pricing policy, the vast majority of federal Conservative voters still oppose it.[13]

Second, carbon pricing has become a battleground for provincial autonomy. Few provinces have endorsed the federal backstop policy outright and several governments of different political stripes have vowed to fight it. Only British Columbia and Québec implemented and maintained carbon pricing systems of their own volition. Nova Scotia and Newfoundland and Labrador eventually introduced their own systems, but only in response to federal pressure. The rest have or will have the federal backstop imposed either voluntarily, as in Prince Edward Island, or involuntarily, as in Alberta, Saskatchewan, Manitoba, Ontario and New Brunswick. Butting heads with provincial governments over carbon pricing may make it harder for the federal government to implement other climate policies that require cooperation across jurisdictions.

Third, although carbon pricing is the most economically *efficient* climate policy on the table, it is not necessarily the most *effective* policy option available to Canadian governments for reducing greenhouse gas emissions. In other words, there are many other policies that may be more expensive, especially in the short term, but achieve greater emissions reductions than pricing alone.

If the goal of a climate policy is to rapidly transform the energy system by redirecting investment from fossil fuels to renewable energy sources, then direct regulation can be far more effective than an equivalent carbon price. For example, Ontario's regulated phase-out of coal-fired electricity generation, which was one of the single greatest emission reduction policies in North American history, achieved in the electricity sector what a carbon tax in the range of $80 to $100 per tonne would have.[14] The carbon pricing proposals on the table today–generally in the range of $10 to $50 per tonne–would not have closed any coal plants. Yet even a tax of $100 per tonne, if it were politically viable, would not necessarily have closed the plants as quickly as the regulatory approach did. Indeed, a carbon price provides an incentive to invest in efficiency improvements, which may have extended the lifespan of some coal plants. Moreover, communities and governments may have propped up unprofitable coal plants for non-economic reasons.

The limitations of carbon pricing are especially apparent if factors other than economic efficiency are considered. For example, if the goals of decarbonization include energy democracy—i.e., an economy characterized by public investment and community ownership of energy projects—then an exclusively market-oriented approach is insufficient. By relinquishing the domain of climate action to private actors, carbon pricing alone will reproduce existing social and economic inequities.

In sum, turning the complex climate policy conversation in Canada into a yes-or-no referendum on carbon pricing creates a focus for political opposition to climate action and precludes alternative climate policies that may be more effective in reducing emissions and transitioning to an inclusive, sustainable economy.

To be clear, carbon pricing is an important climate policy tool that should remain a part of the Canadian climate policy conversation. Among their many benefits, carbon pricing systems have the potential to generate significant government revenues to be reinvested into climate initiatives and/or a progressive tax and transfer system (even if that is not how the current federal policy is structured). The main risk today is that a narrow debate over a modest national carbon price sucks the oxygen out the broader climate policy conversation, and sidetracks potentially more meaningful climate action at all levels of government.

Supply-side energy policy

Reducing greenhouse gas emissions enough to avoid the worst effects of climate change will require a rapid and dramatic reduction of coal, oil and natural gas consumption.[15] Consequently, the majority of mainstream climate policies, such as carbon pricing, renewable energy investment and energy efficiency measures, focus on reducing *demand* for fossil fuels. Demand-side measures alone are theoretically sufficient for reducing emissions and meeting climate targets. However, for a number of reasons, directly reducing the *supply* of fossil fuels is also essential if Canada and the world are going to reduce greenhouse gas emissions on the timeline and scale required by the climate crisis.

First, price elasticity in the fossil fuel market ensures that coal, oil and natural gas will continue to be produced and burned long after they've been superseded by alternative energy sources. Reducing overall demand for fossil fuels drives down prices, which has the unintended effect of sustaining

residual demand for those fuels. Achieving a zero-carbon economy means constricting fossil fuels even if they remain economically productive at lower prices.

Second, the accepted methodology for tracking and assigning greenhouse gas emissions places the responsibility for reductions on the consumer alone (whether that's an individual, a firm or a country). In Canada's case, we extract 1.2 billion tonnes of carbon per year but are only considered responsible for the approximately 700 million tonnes of carbon emitted domestically.[16] Demand-side policies alone are insufficient for discouraging the export of fossil fuels, which is a crucial issue for a large fossil fuel exporter such as Canada.[17]

Third, even where supply-side climate policies are no more effective or efficient than demand-side policies at reducing emissions, they have a number of practical advantages. For example, policies directly targeting the fossil fuel industry often receive greater public support than policies like carbon pricing where the costs are diffused and the benefits are hard to see.[18] Supply-side policies also create an impetus for public investment and innovation in alternative energy industries because governments are required to meet the energy needs of their economies without the crutch of fossil fuels.

In sum, demand-side policies to reduce fossil fuel consumption should be complemented by supply-side policies designed to phase out fossil fuel production. A comprehensive approach to transitioning the energy system will be more effective than either set of policies on their own.

As an obvious first step, Canadian governments must put an end to all fossil fuel subsidies, which are supply-side energy policies that directly contravene those governments' own climate policies and commitments. Canada has promised to phase out "inefficient" fossil fuel subsidies by 2025, but according to the Office of the Auditor General the federal government does not have a plan to meet that goal.[19] Until it does, Canada cannot make real progress in tackling climate change. According to the International Monetary Fund, direct fossil fuel subsidies are valued at $1.4 billion per year in Canada, but once all externalities are included (e.g., health impacts, cleanup costs, uncollected taxes), the indirect public subsidy to coal, oil and gas producers in this country is a staggering US$43 billion per year (approximately $58 billion).[20]

Other supply-side measures available to Canadian governments include: raising taxes and royalties on resource extraction to discourage production; introducing regulatory restrictions to directly reduce production (akin to the phase-out of coal-fired electricity generation); offering financial incentives to leave resource assets in the ground; raising the environmental standards for existing projects, and placing a moratorium on new fossil fuel projects entirely.

A similar range of policy options is available for expanding the supply of alternative energy sources. Governments can make direct investments in the energy system, provide subsidies and other financial incentives for renewable energy projects, require public utilities to provide a certain portion of electricity generation from clean sources (i.e., renewable portfolio standards), or facilitate greater trade in environmental goods, among other options.

Climate policy profiles

The two main goals of government climate policy are to reduce greenhouse gas emissions (i.e., mitigation) and to prepare the country for more extreme climate events (i.e., adaptation). In Canada, mitigation has been the higher policy priority to date and is the focus of this report, although a renewed emphasis on adaptation will be necessary in the coming years as the physical impacts of climate change become increasingly apparent.

For each of the federal, provincial and territorial governments in Canada, we provide a brief overview of climate policy progress followed by a series of summary charts highlighting the latest available emissions data. We also include two sets of government projections for future emissions. The first is based on the policies in force in each jurisdiction in September 2018, and the second is based on policies that are planned but have not yet been implemented (most notably, the federal clean fuel standard). Note that the second scenario assumes each province adopts or maintains a carbon pricing system at least as stringent as the federal carbon pricing floor.

Evaluating each province individually—not just Canada as a whole—is important because our subnational governments exercise significant autonomy over critical policy areas such as natural resources and transportation. Indeed, for the most part, climate change mitigation policy in Canada is provincial energy policy. The production and combustion of fossil fuels—primarily oil, natural gas and coal—produce greenhouse gas emissions that are the predominant drivers of global warming. Any meaningful effort to reduce emissions in Canada must aim to reduce and, ultimately, to eliminate these fuels on both the supply (production) and demand (consumption) sides, which is largely the purview of the provinces.

Unless otherwise noted, the latest year for which data are available is 2017. Sources are listed in the appendix.

CANADA (FEDERAL)

Canada is both one of the biggest energy producers in the world (in absolute terms) and one of the biggest energy consumers in the world (proportionate to our population). A long-standing economic and political dependence on fossil fuel production and consumption is the key barrier to implementing effective climate policies.

Progress toward targets

After three years of declines, Canadian GHG emissions ticked up by 1% in 2017 to 716 Mt total. Overall, emissions have declined just 2% since 2005. Per capita emissions and emissions intensity have continued their gradual decline, reflecting general efficiency improvements in the economy.

This middling progress is a product of the limited ambition of Canada's efforts to mitigate climate change. Based on current policies across the country, emissions are projected to plateau over the next decade. New federal policies on the horizon, such as the clean fuel standard and the ramp up of the federal carbon pricing floor, will lead to more sizeable reductions if and when they come into effect, but even if all proposed actions are accounted for Canada is still projected to fall short of its 2020 and 2030 targets.

Climate policy developments

Since its successful negotiation of the Pan-Canadian Framework on Clean Growth and Climate Change (PCF) in 2016, the federal government under the leadership of Environment and Climate Change Minister Catherine McKenna has focused on implementing the framework's four pillars: carbon pricing, complementary climate policies, adaptation measures, and investments in the clean economy.

Details for the federal carbon pricing backstop were introduced in 2017, but backlash from key provinces resulted in a delayed timeline for implementation and, more recently, amendments to the policy to ease the demands on heavy industry.[21] In October 2018, the government confirmed the policy would be imposed in Saskatchewan, Manitoba, Ontario and New Brunswick, and, on April 1, 2019, the policy came into force in those provinces.[22] Notably, 90% of revenues generated by the pricing system in backstopped provinces are being recycled to households through annual rebate cheques rather than invested in other emission reduction initiatives.

Of the PCF's complementary climate policies, the most important is a clean fuel standard—on track for implementation in 2020-21—that will achieve 30 Mt of emissions reductions per year by 2030.[23] The accelerated coal phase-out is also on track, although it mostly reinforces pre-existing provincial policies.

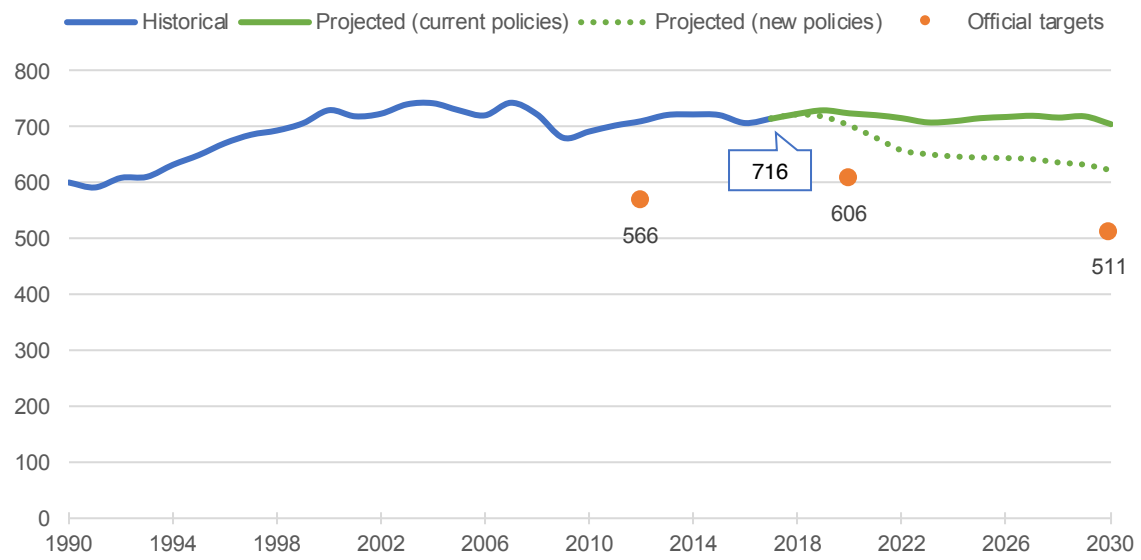
Investment in the clean economy is crucial for Canada to transition off fossil fuels, and through financing, direct funding, and incentives to the private sector the federal government has promised more than $50 billion specifically for green infrastructure, public transit, and other low-carbon initiatives.[24] Unfortunately, much of the announced federal spending is backloaded over the next decade.

In contrast, the federal government purchased the Trans Mountain oil pipeline for $4.5 billion in May 2018 and committed to expanding the project at a cost of at least $9.3 billion.[25] Although a court challenge delayed the project, the federal government recommitted to getting it built. This massive public investment in new fossil fuel infrastructure comes at precisely the moment when trillions of dollars in green infrastructure is necessary to decarbonize the Canadian economy and build adaptive capacity.[26]

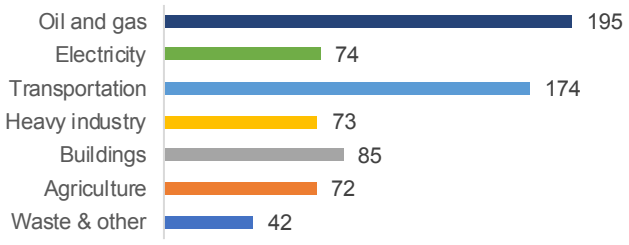
In response to pressure from labour groups and other activists, the federal government has started to acknowledge the potential impact of climate policies on workers and communities. The creation of a just transition task force was a significant step forward for climate justice, although many of the task force's recommendations have not yet been implemented.[27] Moreover, while 200,000 people work in Canada's fossil fuel industry and hundreds of thousands more are indirect beneficiaries, the task force was only narrowly focused on coal communities in a handful of provinces.

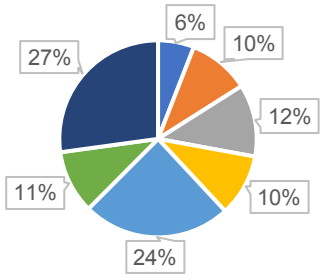
Figure 1: Summary charts for Canada

Greenhouse gas emissions (Mt CO_2e) by year



Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)

Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)

BRITISH COLUMBIA

A new provincial government has adopted a climate plan that seeks to restore British Columbia to its historical place of climate leadership. Yet a stubborn commitment to fossil fuel infrastructure continues to frustrate the long-term viability of the province's emission reduction targets.

Progress toward targets

British Columbia is often lauded for its revenue-neutral carbon tax, but that policy alone is too weak to drive the structural changes decarbonization requires. Emissions in BC have plateaued over the past five years causing the province to miss its 2016 emissions target by 20%. Faced with the likelihood of missing its 2020 target as well, the province's new government abandoned that legislated goal and replaced it with a new 2030 target of a 40% reduction in emissions from 2007 levels.[28]

Even with an extended timeline, the province is projected to miss its future targets by a sizeable margin. In addition to the 2030 target, BC's goal for 2040 is a 60% reduction below 2007 levels and the province's 2050 goal is an 80% reduction. None of these targets are likely to be met given current policies. Even the province's own climate plan projects a 6.1 Mt (17%) shortfall in 2030.[29] The province already has an extremely clean electricity sector, so future reductions must come from other sectors, especially transportation and oil and gas, but the province has so far avoided meaningfully addressing the latter.[30]

Climate policy developments

The government raised the carbon tax from $35/tonne in April 2018 and again to $40/tonne in April 2019. The price will continue to rise by $5 per year until it reaches $50/tonne in 2021. Unlike the initial carbon tax, which recycled 100% of revenues into tax cuts and rebates, a portion of the new revenues will be used to support climate policies.[31]

The province's latest climate plan, *CleanBC*, includes several important initiatives in the transportation, buildings and industrial sectors. Subsidies for zero-emission vehicles (ZEVs), investments in charging infrastructure, and a ZEV standard for automakers will ensure fewer gasoline-powered vehicles on the road in the coming decades. A new Efficiency BC program will support retrofitting of the building stock. Industrial methane leaks will be more tightly regulated.

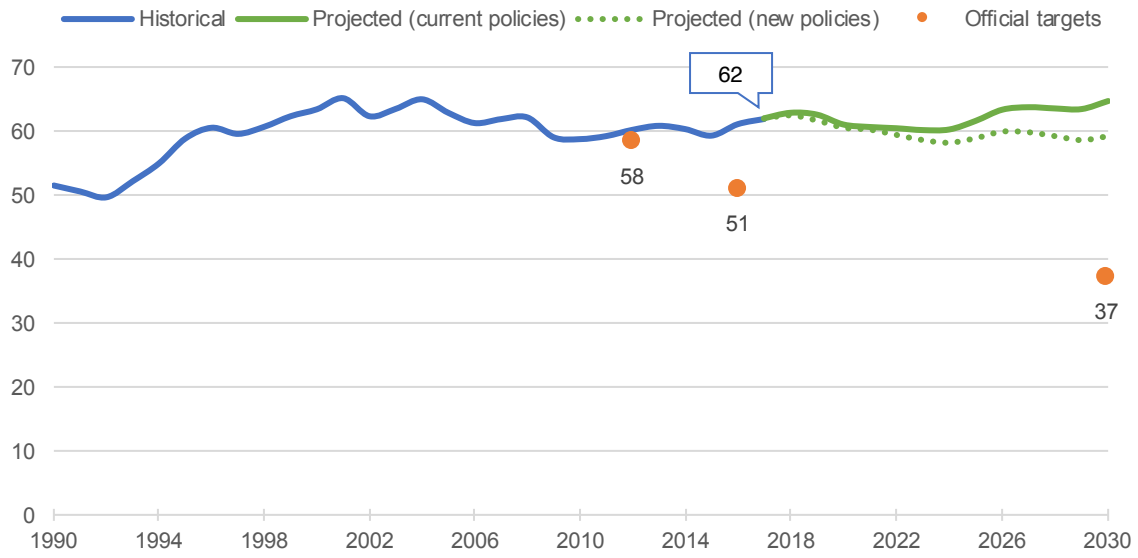
Roughly 12,000 people work in BC's fossil fuel sector—mainly in coal mining and natural gas distribution. The new climate plan includes some just transition language with a handful of skills training initiatives. Further details will be provided in a forthcoming "labour readiness plan."

BC has opposed the construction of new pipelines that would facilitate the continued expansion of the Alberta oil sands. However, a concern for exported carbon emissions is not reflected in the province's enthusiasm for new liquified natural gas (LNG) production facilities. The government announced a handful of tax breaks for LNG producers in March 2018 at a total cost of $6 billion over the next few decades.[32] Moreover, LNG producers are exempt from paying the full carbon tax. Instead, they

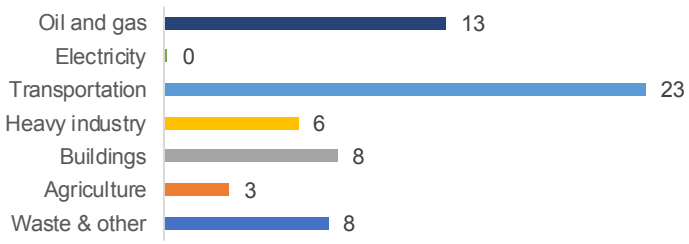
are subject to a performance standard that only prices the highest emitters in the sector. If all of the planned LNG facilities in the province are completed they will increase BC's domestic emissions by more than 10 Mt per year and increase global emissions even further when the exported natural gas is consumed.[33]

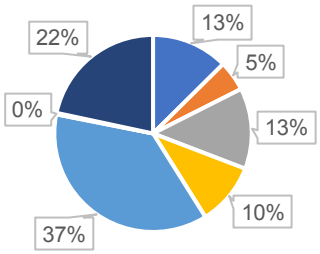
Figure 2: Summary charts for British Columbia

Greenhouse gas emissions (Mt CO_2e) by year

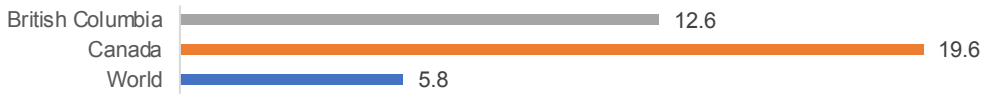


Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)



Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)

ALBERTA

As the source of 38% of Canada's GHG emissions, Alberta is key to the national emission reduction effort. The previous provincial government began implementing a comprehensive climate plan in 2015, but Alberta's deep dependence on the fossil fuel sector created significant political opposition to the plan. A new government, elected in spring 2019, has threatened to undo nearly all of the province's climate policies.

Progress toward targets

Total emissions increased to 273 Mt in 2017 as increases in the oil and gas sector more than offset reductions in electricity and transportation. Overall, emissions in 2017 were 18% higher than 2005 levels and 58% higher than 1990 levels.

Although emissions growth is projected to slow in the coming decades, it appears unlikely Alberta will reduce total emissions in absolute terms based on current policies. The province does not have official emission targets, but Alberta is on track to dramatically overshoot its fair share of the national targets in 2020 and 2030.

In a progress report released in December 2017, the provincial government acknowledged that even in a best-case scenario where private sector innovation produces significant gains, emissions will fall only 19% below current levels by 2030. A more likely scenario where new policies are implemented shows emissions falling just 7% in that time.[34] However, the likelihood that the new provincial government reverses climate policies may drive emissions in the opposite direction.[35]

Climate policy developments

At the core of Alberta's previous climate plan were four key policies. First, an accelerated phase-out of coal-fired electricity generation designed to eliminate 40 Mt of emissions per year by 2030. Second, an economy-wide carbon pricing system. Third, an oil sands emissions cap of 100 Mt. Fourth, a strategy to modestly reduce methane emissions.[36] The new government has promised to scrap the entire plan, although the coal phase-out is backed by federal regulations so it will likely proceed.

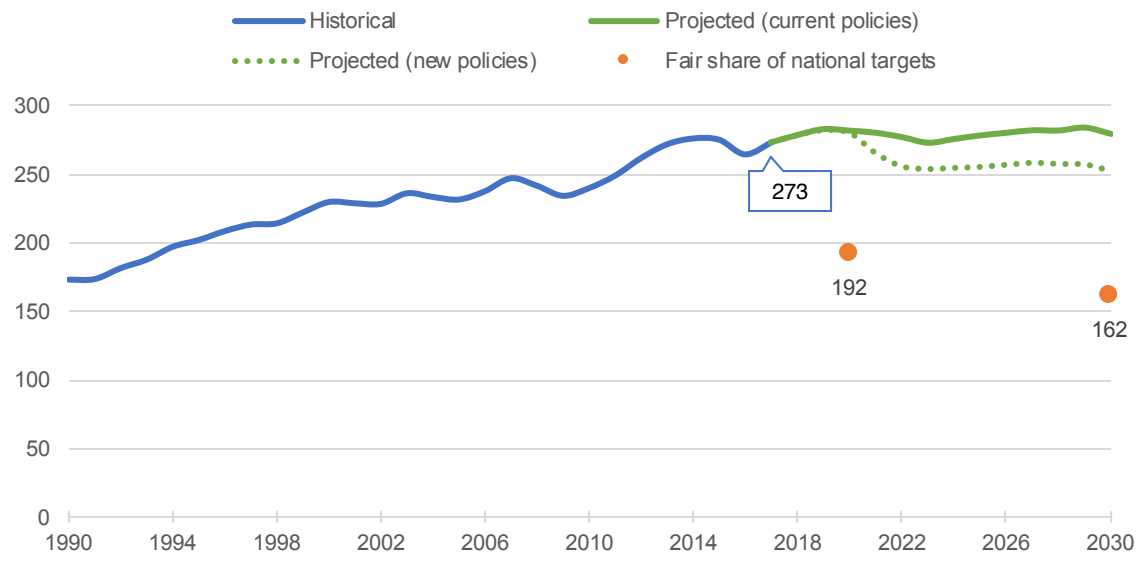
The new government has also promised to accelerate approvals of new oil and gas projects. Already, total emissions from approved oil sands projects will reach 131 Mt per year once they are operational.[37] Achieving Canada's long-term emissions reduction targets (e.g., 146 Mt nationally by 2050) is virtually impossible if these projects proceed.

One recent bright spot in the Albertan climate policy conversation is the province's focus on transitioning fossil fuel workers and communities to a cleaner economy. Two just transition funds were introduced in fall 2017 to help coal workers and communities adjust to the phase-out of coal-fired electricity generation. Although these policies are narrowly targeted at a subset of the fossil fuel industry, Alberta's transition strategy for the thermal coal sector may be setting the stage for similar moves in the oil and gas sectors down the road. Whether these programs will continue under the new government is unclear.

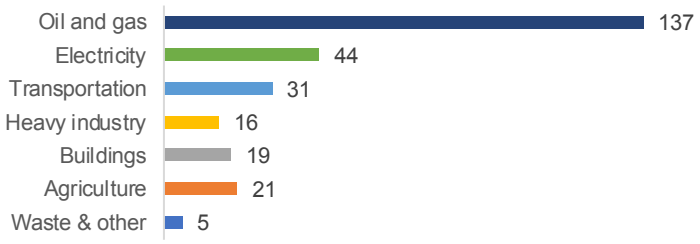
Overall, the province of Alberta is failing to reckon with the inevitable decline of the fossil fuel sector and is instead doubling down on an industry that is destined to shrink and collapse in the coming decades.[38] Short-term political opportunism is putting the province's long-term economic and environmental sustainability at serious risk.

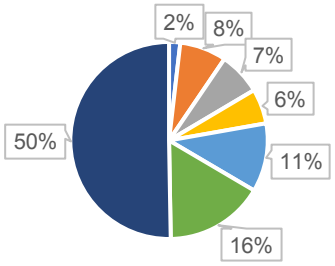
Figure 3: Summary charts for Alberta

Greenhouse gas emissions (Mt CO_2e) by year



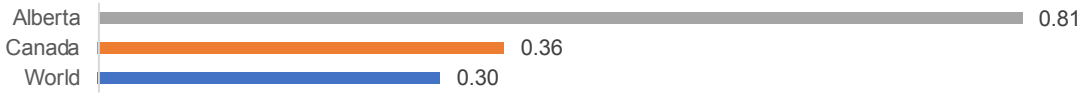
Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)

Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)



SASKATCHEWAN

With the highest per capita emissions in the country, Saskatchewan is arguably the Canadian province most dependent on fossil fuels. Despite a desperate need to transition to a lower-carbon economy, the provincial government has obstructed federal climate action and not yet advanced a realistic alternative.

Progress toward targets

Saskatchewan's GHG emissions rebounded to 78 Mt in 2017 after a slight decline the previous year. Unfortunately, the 2016 reductions were due to a contraction in oil and gas production associated with wildfires rather than efficiency improvements or climate policies. Oil and gas production has since recovered, driving emissions higher.[39]

The province has no official emission reduction targets but Saskatchewan is projected to exceed its fair share of the national goals by a wide margin.

Climate policy developments

The government of Saskatchewan released *Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy* in December 2017.[40] The brief document puts a welcome focus on climate change adaptation, but it fails to take seriously the issue of climate change mitigation. Implementation of the plan began in 2019. In its first status report, the province found it was making progress on most of its environmental goals despite failing to reduce emissions.[41] The strategy contains few firm regulatory or financial commitments to reduce the province's emissions in absolute terms. For example, a promise to expand renewable energy sources to "up to 50 per cent of generating capacity" doesn't necessarily mean fossil fuel use will decline.

Indeed, the province remains committed to carbon-capture-and-storage (CCS) technology, which is an attempt to reduce emissions from fossil fuel-based electricity generation while continuing to burn the same amounts of fuel. However, to the extent CCS is reliable and effective, it is significantly less cost-effective than other climate policies. To date, SaskPower's Boundary Dam project has sequestered 2.2 Mt of emissions that would otherwise have ended up in the atmosphere at a cost of $1.5 billion, which is equivalent to a carbon tax in the range of hundreds of dollars per tonne.[42] In part due to the high cost, previous plans to expand CCS to other Boundary Dam sites were abandoned, but the province is still considering CCS for other coal-fired power plants.

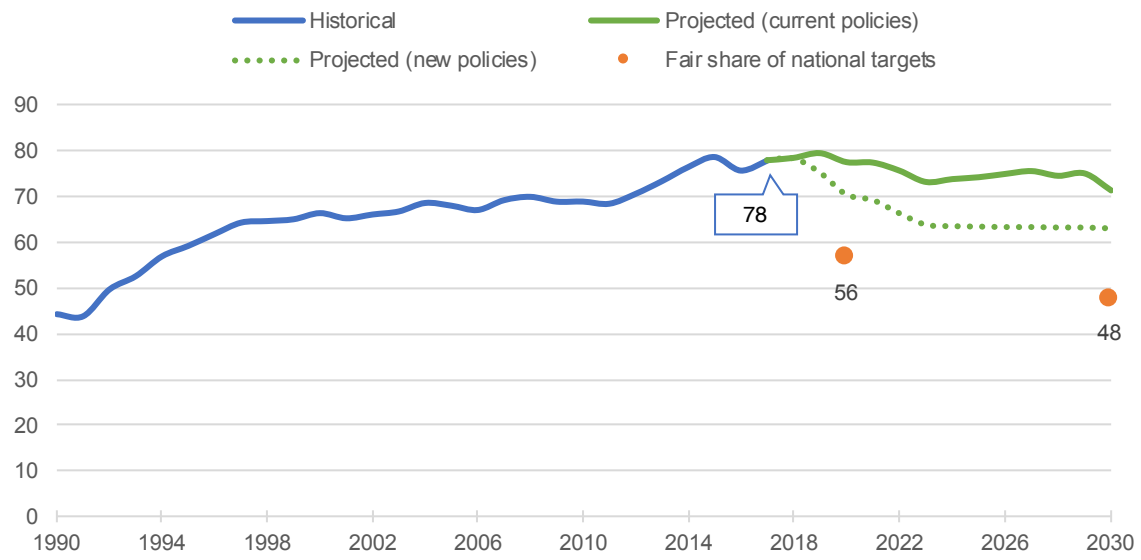
The province confirmed an output-based performance standard for industrial emitters in August 2018. Like the comparable system in Alberta, the standard will penalize the highest-emitting industrial facilities with a modest carbon price. However, the Saskatchewan policy is so weak that it will only reduce the province's overall emissions by an average of 0.5 Mt per year over the next decade.[43]

Saskatchewan has rejected an economy-wide carbon pricing system while challenging the federal government's authority to impose its backstop. Nevertheless, the federal system came into effect in Saskatchewan in April 2019.

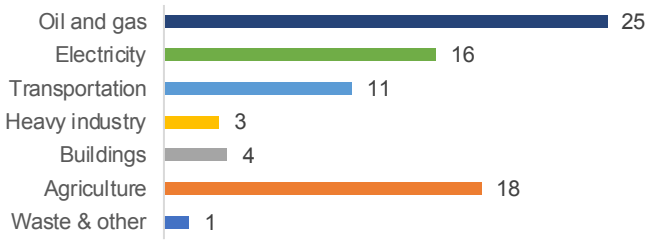
Given the large number of fossil fuel workers in Saskatchewan—17,000 people or about 3% of the workforce—the province needs a plan for a just transition to employment in a cleaner economy. To date, no such plan has been announced.

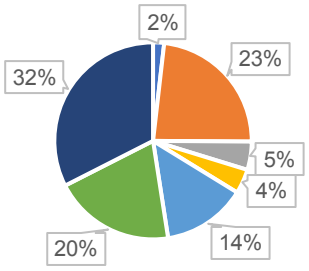
Figure 4: Summary charts for Saskatchewan

Greenhouse gas emissions (Mt CO_2e) by year



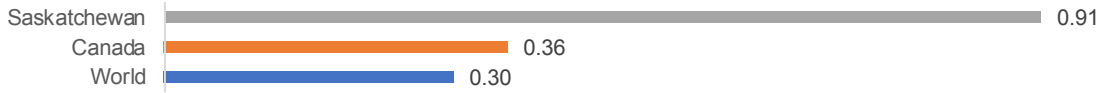
Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)

Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)



MANITOBA

Manitoba has a strong record on climate plans with a weaker record on emissions reductions. The province has published several strategies over the past decade, but it has not yet implemented structural reforms aimed at reducing fossil fuel use.

Progress toward targets

Manitoba's total GHG emissions climbed to an all-time high of 22 Mt in 2017 and are projected to remain at that level for the foreseeable future. The province benefits from a publicly-owned, low-emission electricity grid and a relatively small extractive sector, but rising emissions in the transportation and agricultural sectors pose a challenge moving forward.

The province had previously set 2030 and 2050 emissions targets, but in 2017 the government replaced them with a more convoluted "carbon savings account" approach, which measures cumulative rather than annual emissions. Regardless of how emissions are measured, the province will not reduce emissions enough to meet its fair share of the national targets without more ambitious policies.

Climate policy developments

In February 2018 the province belatedly signed on to the Pan-Canadian Framework in order to qualify for federal funding through the Low Carbon Economy Fund. The move came shortly after the December 2017 release of *A Made-in-Manitoba Climate and Green Plan*, which outlines actions to mitigate and adapt to climate change.[44]

As part of its new plan, Manitoba planned to introduce a flat carbon tax of $25/tonne in 2018, which would have exceeded the federal benchmark for the first two years. However, in October 2018 the premier abruptly canceled the plan and announced the province would join Saskatchewan and Ontario in challenging the federal backstop. The move has been called a "catastrophic failure" by environmentalists.[45]

Even if the carbon pricing plan had gone ahead, the province did not commit to raising the price over time, so by 2020 the policy would no longer have been in compliance with federal regulations. This approach may have led to greater emissions reductions than the federal system in the first five years, but it would have been far less effective in the long-term.[46] Manitoba also promised to implement an output-based pricing system for industrial emitters, but the proposal exempted significant portions of the economy such as agriculture.

In response to the province's intransigence, the federal backstop carbon price came into effect in Manitoba in April 2019.

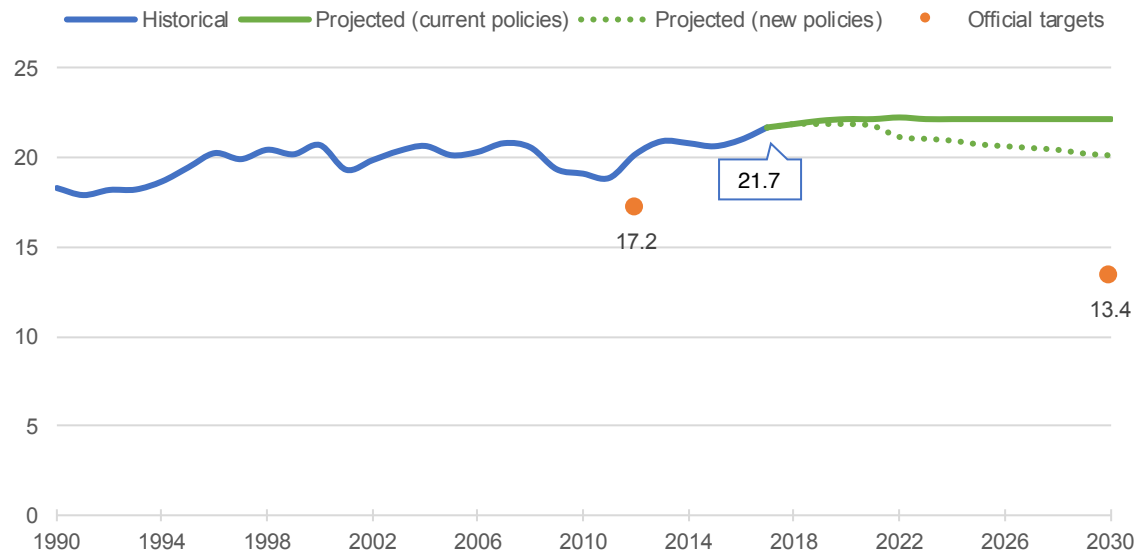
The province's new climate plan includes a 5% biodiesel mandate and a new government agency, Efficiency MB, designed to reduce energy use in homes and businesses. According to the province's calculations, regulatory measures such as these will reduce emissions by an average of 0.3 Mt per

year.[47] However, independent analysis has indicated that "the projected cumulative reductions over the first five years of the plan are likely on the high side."[48]

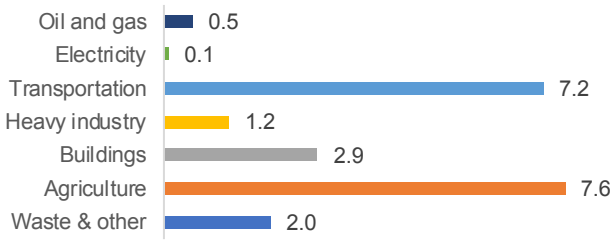
Manitoba has a history of training and educating workers in renewable energy, energy efficiency and other green industries, which remains a focus in the new plan. Unfortunately, the plan does not commit to any new funding for programs to better prepare the workforce for a lower-carbon economy. The plan does not address Manitoba's 3,000 fossil fuel workers whose livelihoods are at risk as the fossil fuel industries decline. In general, Manitoba's spending on climate initiatives, including public transit and adaptation measures, is far too low to be effective.

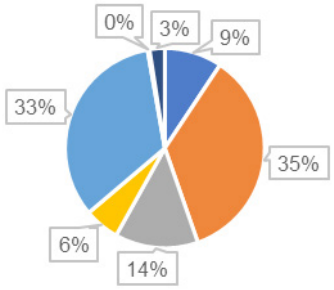
Figure 5: Summary charts for Manitoba

Greenhouse gas emissions (Mt CO_2e) by year



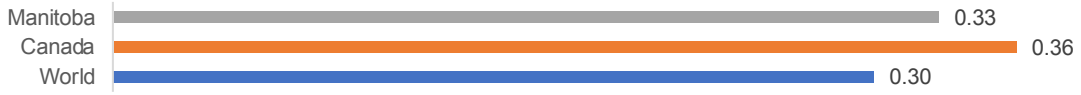
Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)

Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)



ONTARIO

Once a climate leader, Ontario's new government has nullified existing climate policies and vowed to obstruct federal climate action. Maintaining emissions reduction momentum in the province—Canada's second largest emitter—is essential for meeting national targets.

Progress toward targets

Ontario is one of the few provinces to meet past emissions reductions targets and, until recently, was on track to meet its targets for 2020 and 2030 as well. Success depended on the province's cap-and-trade system for pricing carbon emissions, which theoretically guaranteed Ontario would reduce emissions enough to reach its goals through the purchase of offsets and permits from other jurisdictions. In other words, under the previous provincial government's policy, Ontario had not planned to meet its targets through domestic reductions alone.

However, Ontario's new government, elected in June 2018, passed legislation to eliminate the carbon pricing system and cancel key portions of the province's Climate Change Action Plan, including the province's official emission reduction targets.[49] It also launched a court challenge against the federal government's backstop policy. According to the federal environment minister, these moves will result in Ontario's emissions being 49 Mt (47%) higher in 2030 than they would have been under the previous policies.[50]

Climate policy developments

The cap-and-trade system had been criticized for, among other issues, transferring capital out of the province to purchase permits and offsets in California rather than investing in emission reduction initiatives within the province.[51] Nevertheless, the system was achieving reductions in addition to generating government revenues for complementary climate policies. The Financial Accountability Office of Ontario estimates that the elimination of cap-and-trade will create a $3 billion shortfall in the provincial budget.[52]

The new government released its own climate plan, *Preserving and Protecting our Environment for Future Generations*, in November 2018.[53] While it includes modest funding for clean technology and energy efficiency measures, the plan has been widely panned by environmental groups for scaling back the province's ambitions and rolling back effective policies.[54] Before her office was eliminated by the new government, the Environmental Commissioner of Ontario concluded that the plan was "very inadequate."[55]

In lieu of the cap-and-trade system, the federal carbon pricing backstop came into effect in Ontario in April 2019.[56] Unlike the previous system, nearly all revenues are recycled directly to households instead of complementary climate policies.

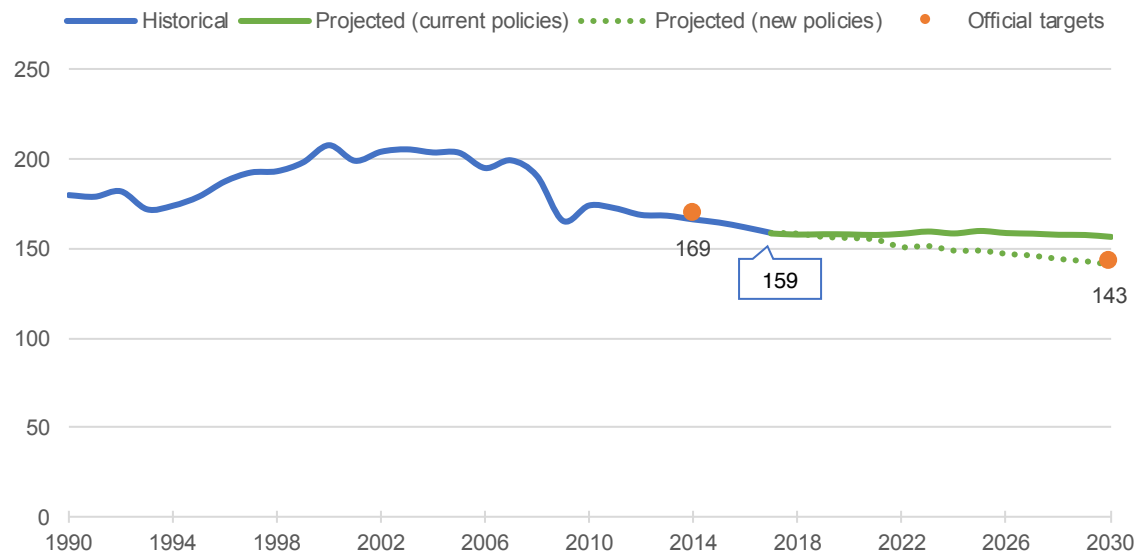
Due to its relatively small oil and gas sector—encompassing just 0.2% of the workforce—Ontario is well-positioned to shift to a lower-carbon economy with minimal economic hardship. Doing so will require ambitious policies across the board but especially in the transportation sector where emissions

are at all-time highs.

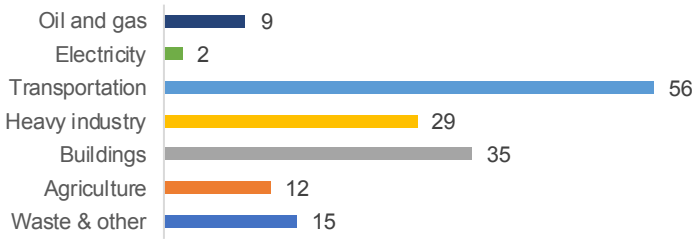
Cancelling investments in green energy, on the other hand, will cost jobs in precisely the sectors where they are needed most.

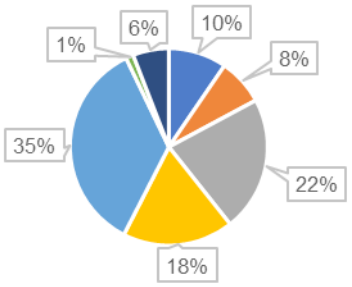
Figure 6: Summary charts for Ontario

Greenhouse gas emissions (Mt CO_2e) by year



Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)

Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)

QUÉBEC

As Canada's perennial climate policy leader, Québec continues to pursue ambitious measures to reduce greenhouse gas emissions and invest in the clean economy. The province's five-year-old cap-and-trade system for pricing carbon is the foundation for new efforts to transform the transportation sector.

Progress toward targets

Total emissions in the province have flattened in the past few years as rising transportation emissions offset efficiency improvements in the industrial sector.

Domestic emissions are projected to stay flat based on current policies, but the inclusion of offsets and permits purchased from California through their linked cap-and-trade systems ensures Québec will technically meet its targets in 2020 and 2030.

Québec continues to lead the provinces with the lowest per capita emissions. The average Québecer produces half the national average CO_2e emissions and only a seventh of what someone in Alberta or Saskatchewan produces.

Climate policy developments

Progress continues on the province's 2013-2020 Climate Change Action Plan.[57] A midterm review released in March 2018 concluded that the plan was succeeding in reducing emissions and driving productive investment in the low-carbon economy.[58] The province's Green Fund, which has mobilized more than $2 billion in revenues generated through the cap-and-trade system, has been instrumental in supporting and scaling up clean economy initiatives.

The cap-and-trade system remains subject to criticism for facilitating capital flight from Québec, where emissions reductions are expensive, to California, where permits can be purchased for less.[59] Although a linked cap-and-trade system achieves the lowest-cost emissions reductions overall, it does not necessarily reduce Québec's domestic emissions or ensure new investment in Québec's clean economy. Nevertheless, provided complementary regulations and investments are in place, the current carbon pricing system can effectively drive climate change mitigation in the province while funding other climate programs.

Moving forward, the province is focused on reducing emissions from the transportation sector by implementing the 2015-2020 Transportation Electrification Action Plan. A zero-emission vehicle standard came into effect in 2018 that requires automakers to supply a minimum share of electric vehicles to consumers. The province claims that by 2025 about 10% of vehicles sold or leased in Québec will be zero- or low-emission vehicles.[60]

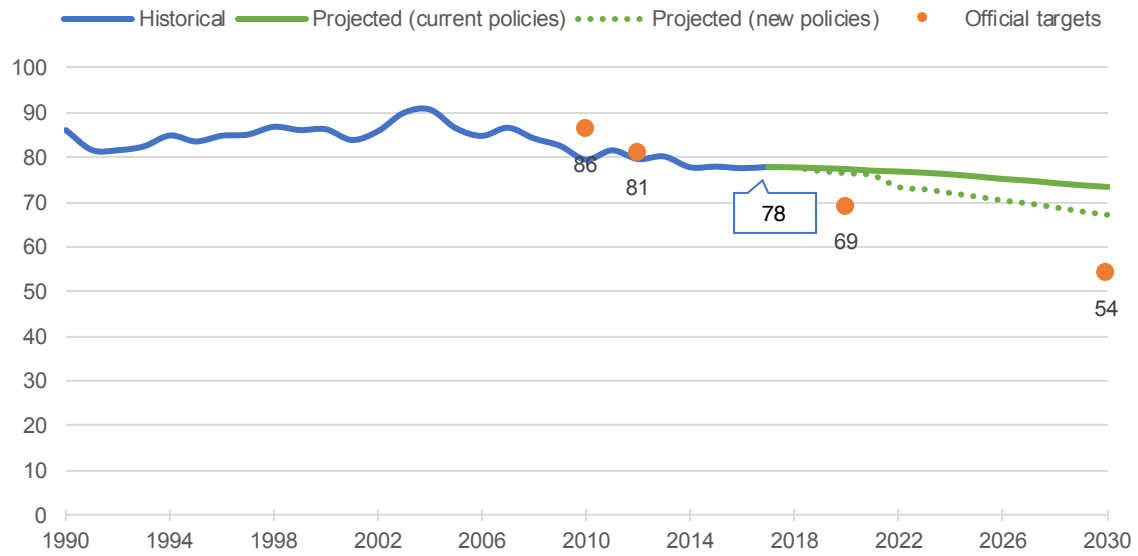
In April 2018, the province released a Sustainable Mobility Policy and accompanying 2018-2023 Action Plan that lists additional measures to transform the transportation sector.[61] On top of a long list of new targets—such as a 20% reduction in solo driving and a 20% reduction in average commute

times—the plan is backed by $3 billion in new spending on transportation initiatives. The bulk of new investments are in public transit infrastructure, but funds are also allocated to transit system research and development, improved industrial supply chains, and vehicle electrification.

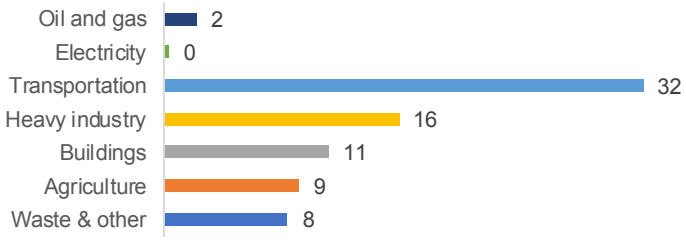
In October 2018, the province elected a new government that has promised to meet existing commitments, but has not indicated it will raise the province's climate policy ambitions. The new government will be responsible for developing a comprehensive climate plan once the current plan ends in 2020.

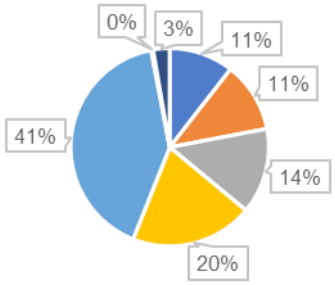
Figure 7: Summary charts for Québec

Greenhouse gas emissions (Mt CO_2e) by year

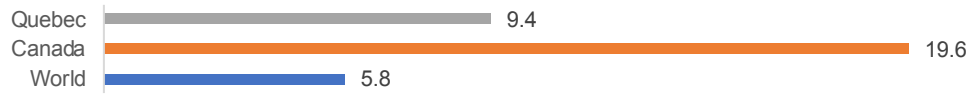


Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)



Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)

NEW BRUNSWICK

After a decade of successfully reducing electricity sector emissions, New Brunswick's climate policy progress has ground to a halt. The government remains rhetorically committed to climate action but has failed to introduce new policies that would drive deeper, economy-wide emissions reductions.

Progress toward targets

New Brunswick experienced a 37% decline in emissions between 2001 and 2015, but progress since then has stalled. Emissions from the electricity sector, which fell more than 50% in the 2000s, have plateaued in the 2010s. Meanwhile, emissions from passenger vehicles have reached all-time highs.

The province is party to a series of regional emission reduction targets agreed to by the New England Governors and Eastern Canadian Premiers (NEG-ECP) for 2010, 2020, 2030 and 2050.[62] The province exceeded its fair share of the regional emission reduction target in 2010.

New Brunswick has legislated its own domestic targets for 2020 and 2030. It will likely meet its 2020 target of 14.8 Mt, but the longer term 2030 target is uncertain. New policies targeting electricity generation, the transportation sector and the petroleum refining industry will be necessary in the coming decade.

Climate policy developments

The province's 2016 Climate Change Action Plan remains the blueprint for climate policy. The core of the plan is a Climate Change Act, introduced in December 2017.[63] The Act legislated New Brunswick's emission reduction targets and created a Climate Change Fund to support mitigation and adaptation initiatives.

Rather than introduce a new carbon pricing system as initially promised, the province decided to reallocate a portion of its existing gasoline and diesel tax revenues to the Climate Change Fund. The portion of revenues flowing to the fund increases each year in line with the federal backstop carbon price such that the total tax remains constant. In other words, the province is cutting its gas tax as the carbon tax increases.

Although the province asserts it is in compliance with federal carbon pricing regulations, the federal environment minister disagrees because New Brunswick's plan "does not create a new incentive to cut carbon pollution."[64] Moreover, this approach ignores the majority of the province's emissions in other sectors because the gas tax only applies to transportation fuels. Ultimately, the federal government imposed the backstop carbon price in New Brunswick.[65]

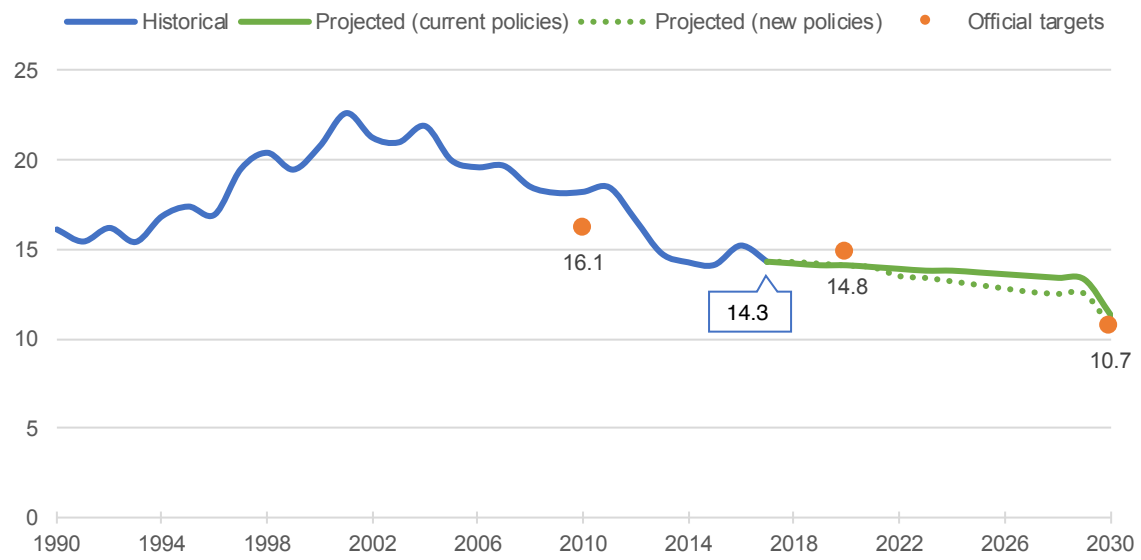
The federal output-based performance standard for large emitters will apply to the 10 highest-emitting facilities in New Brunswick.[66]

Other elements of the climate plan include supports for small-scale, locally-owned renewable energy projects and a $234 million investment in energy efficiency. The province has not committed to

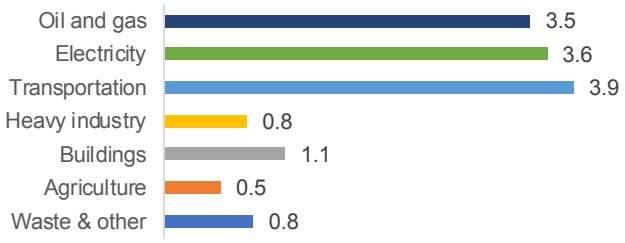
phasing out coal-fired electricity generation by 2030 as required by the federal government unless and until an alternative domestic power industry can scale up to replace it.

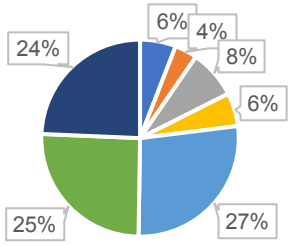
Figure 8: Summary charts for New Brunswick

Greenhouse gas emissions (Mt CO_2e) by year



Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)

Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)

NOVA SCOTIA

As the Canadian province with the best record on emissions reductions, Nova Scotia is a positive example for the rest of the country to follow. The challenge now is to maintain momentum and to scale up the clean economy so that Nova Scotians reap the economic benefits of further decarbonization.

Progress toward targets

Total emissions have fallen 35% from their peak in 2004. The electricity sector has experienced especially large emissions reductions as fossil fuel-based power stations have reduced generation and renewable alternatives have expanded (including the only tidal power station in North America). Improved energy efficiency has also been an important driver of emissions reductions. On a per capita basis, Nova Scotians use 30% less electricity than the national average.[67]

The province has met all of its GHG targets so far and is projected to meet the NEG-ECP regional targets for 2020 and 2030. Longer-term decarbonization will require the wind-down of all remaining coal plants, which still account for two thirds of provincial power generation, as well as measures targeting the transportation sector.

Climate policy developments

Efficiency Nova Scotia, an innovative independent organization created by the provincial government in 2008, continues to deliver efficiency improvements across the province. Nova Scotia's annual emissions are 0.84 Mt lower today due to measures introduced between 2008 and 2017.[68]

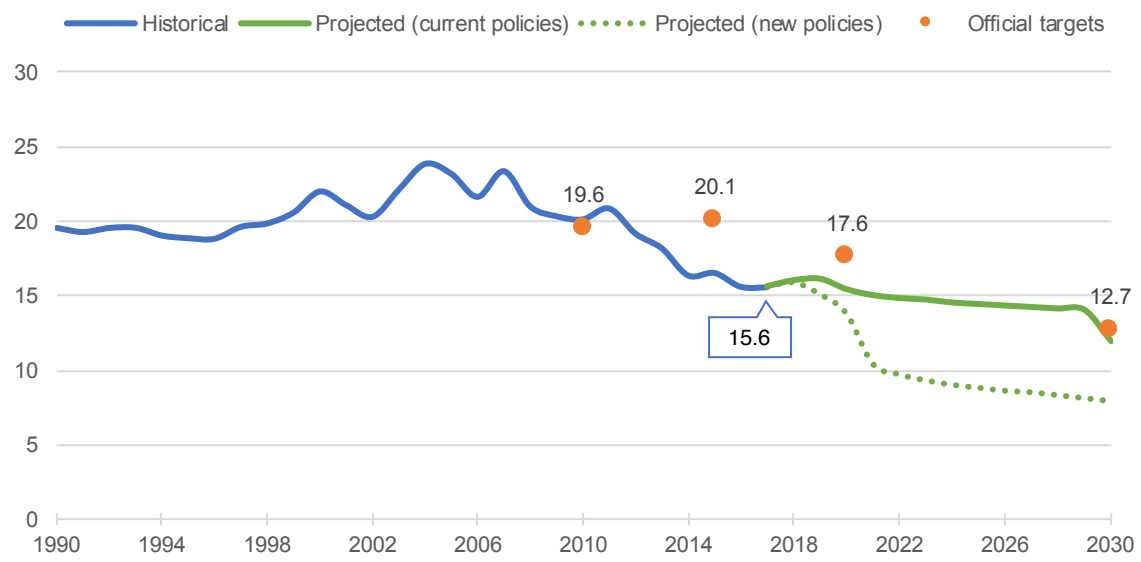
The province is aiming to generate 40% of its electricity from renewable sources by 2020, including hydro, wind, solar, tidal, biomass and geothermal power. Despite laudable progress to date—wind power has increased ten-fold in the past decade and now accounts for 11% of total electricity generation—the target may not be achievable through domestic generation alone, in which case the province will be required to import more clean electricity to make up the difference.

In order to comply with federal carbon pricing regulations, Nova Scotia implemented a cap-and-trade system in January 2019. Unlike the cap-and-trade system in Québec, Nova Scotia's proposed system is not linked to other jurisdictions. An unlinked system prevents capital from flowing out of the province in the form of permit trades and offsets, but the carbon price paid by Nova Scotian facilities should theoretically be higher.

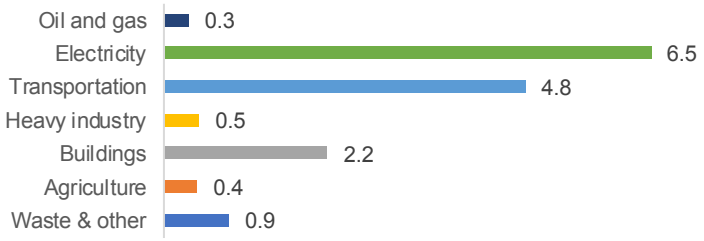
However, the province has committed to giving away the majority of emissions allowances for free to companies covered by the system (as much as 80% for fuel suppliers).[69] The more credits gifted to industrial emitters outside of an auction, the less effective the cap-and-trade system will be in terms of both emissions reductions and revenue generation. By the province's own estimates, the cap-and-trade system will only reduce emissions by a total of 0.65 Mt by 2022—or roughly 0.16 Mt per year.[70] As critics have noted, "carbon pricing systems that don't drive emission reductions are missing the point."[71]

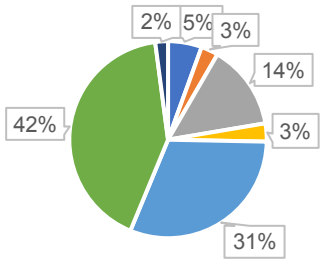
Figure 9: Summary charts for Nova Scotia

Greenhouse gas emissions (Mt CO_2e) by year



Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)

Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)

PRINCE EDWARD ISLAND

Canada's wind power leader is one of the cleanest jurisdictions in the country, but to truly decarbonize the provincial economy the government of PEI will need to push ahead with emissions reduction initiatives for the transportation sector.

Progress toward targets

Emissions in the province have not declined since 2013 due to increases from the transportation and agriculture sectors. The province is projected to remain on its flat emissions trajectory, so while the regional NEG-ECP target for 2020 is achievable, the province's domestic 2030 target appears out of reach based on current policies.

Because almost all of the energy generated within the province comes from wind power—imports of electricity and fuel make up the rest of the energy mix—few gains can be made in the traditional climate policy areas of fossil fuel production and electricity generation. Instead, PEI will need to tackle passenger and freight transportation to realize future emissions reductions.

Climate policy developments

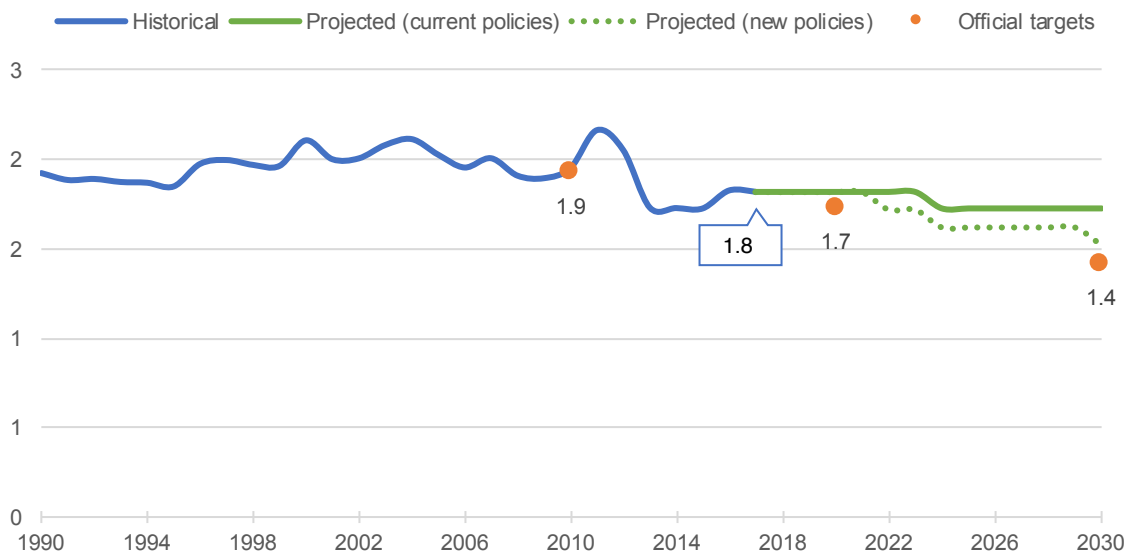
PEI released a new five-year Climate Change Action Plan in May 2018 with a focus on reducing transportation emissions.[72] The plan to install a province-wide electric vehicle charging network is promising, as is the commitment to increase the share of electric vehicles in the government's fleet.

The majority of the plan's measurable emissions reductions come through the government-run efficiencyPEI program. The province is hoping that uptake of home and business retrofitting programs will reduce total energy demand.

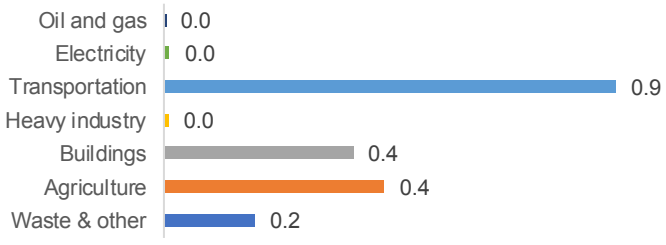
The province voluntarily adopted the federal carbon pricing policy. Unlike the provinces where the backstop was imposed involuntarily, all carbon pricing revenues generated within PEI will go to the provincial government to be spent at its discretion.

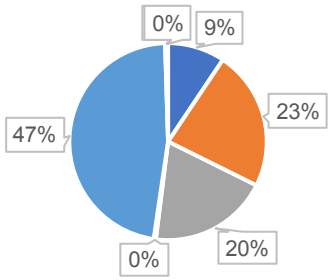
Figure 10: Summary charts for Prince Edward Island

Greenhouse gas emissions (Mt CO_2e) by year

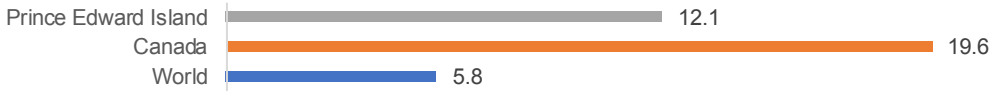


Greenhouse gas emissions (Mt CO_2e) by sector

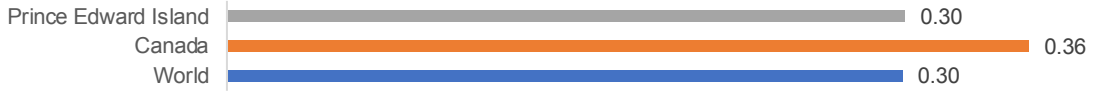




Greenhouse gas emissions per capita (tonnes CO_2e per person)



Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)



NEWFOUNDLAND AND LABRADOR

As one of the country's leading oil producers and one of the provinces most susceptible to the impacts of climate change, Newfoundland and Labrador has an important role to play in Canada's transition to a clean economy. However, despite a clear need for action, the provincial government has dismissed or delayed the implementation of effective climate policies.

Progress toward targets

Emissions in Newfoundland and Labrador dipped to 10.5 Mt in 2017 after climbing for the previous few years. Although hydro power accounts for the vast majority of electricity generation in the province, the growing use of petroleum and natural gas power is preventing larger reductions in overall emissions.

Emissions are projected to rise in the next five years before declining in the long term. Nevertheless, the province will miss the regional NEG-ECP targets and its own newly established 2030 target by a wide margin. The oil and gas sector remains a key sticking point for climate action. Emissions from the transportation sector are also a long-term concern.

Climate policy developments

After several years of delays, in early 2019 the provincial government released *A Way Forward*, its first climate plan since 2011.[73] The plan includes action items addressing every area of the economy, but few measurable commitments and very little new spending to support those initiatives.

The plan's carbon pricing component is similar in design to the federal backstop; however, numerous exemptions render it almost entirely ineffective. For example, home heating fuels and off-grid diesel have been entirely excluded. The government has also cut the provincial gas tax to offset the increased cost of automotive fuels under the carbon pricing system. In effect, most energy consumers will see no change in prices under this system, which means there is little incentive to reduce emissions. The province estimates that the system will lead to cumulative emissions reductions of only 0.65 Mt by 2030 or roughly 0.06 Mt per year.

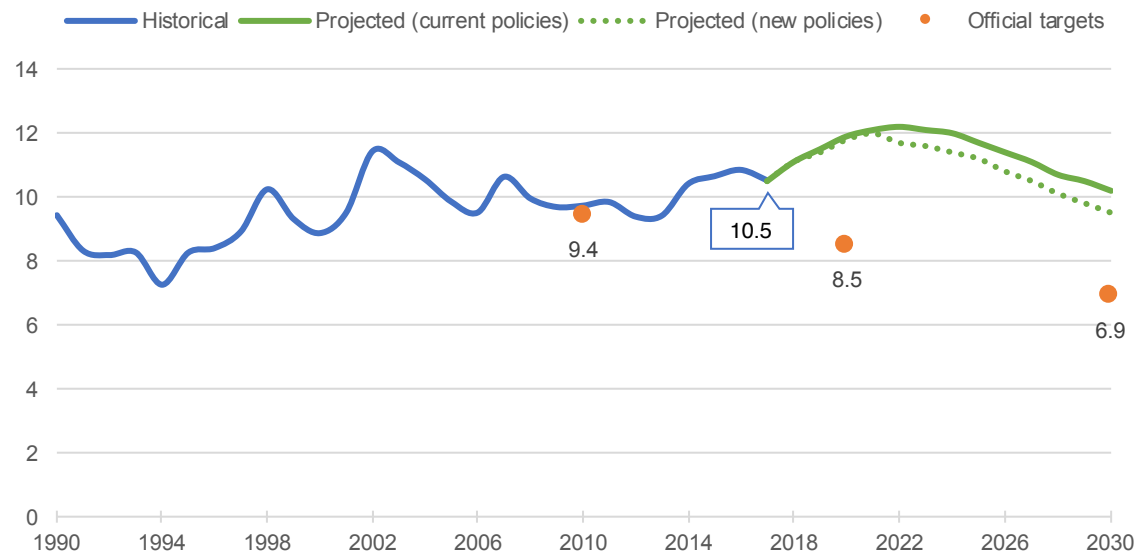
Meanwhile, the province continues to subsidize oil and gas production. In July 2018, the government announced a $90 million stake in a new offshore oil project led by Norwegian energy giant Equinor.[74] If it proceeds, the project will produce 300 million barrels of crude oil over the next few decades, which will ultimately release more than 129 megatonnes of carbon emissions into the atmosphere.[75] Newfoundland and Labrador also maintains subsidies for oil-based electricity generation.[76] Indeed, the government's plan for the oil and gas sector, released one year before the climate plan, aspires to double the volume of oil produced in the province by 2030.[77]

An ambitious, comprehensive climate plan is essential for Newfoundland and Labrador, precisely because the province is so dependent on fossil fuel production. The oil and gas sector accounts for a quarter of GDP and 2% of direct employment. Even with those jobs, the province's unemployment rate is almost double the national average. An unplanned, unmanaged reduction in fossil fuel production

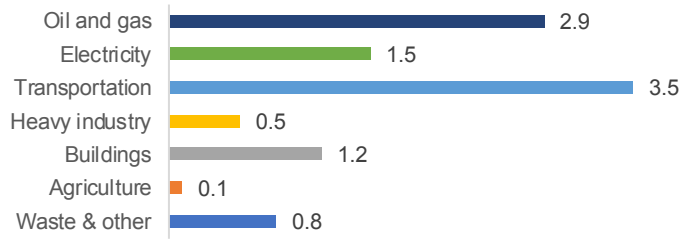
without a strategy to scale up cleaner industries will cause even more hardship down the line as fossil fuels are phased out across the country and around the world.

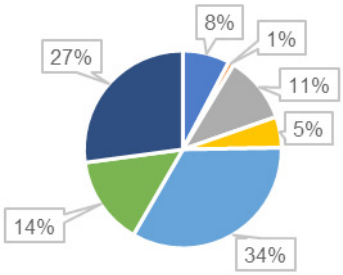
Figure 11: Summary charts for Newfoundland and Labrador

Greenhouse gas emissions (Mt CO_2e) by year

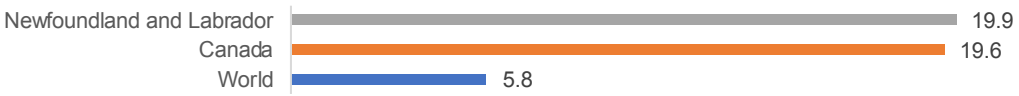


Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)



Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)

TERRITORIES

Climate change adaptation is a greater concern than mitigation for the vulnerable northern territories of Yukon, the Northwest Territories and Nunavut. Given their limited capacity, the territories are taking proactive steps to adjust to a changing climate.

Progress toward targets

Emissions data are difficult to analyze or project for the territories because the totals are low and often volatile. In general, emissions have gradually increased over the past few decades and are projected to climb further before plateauing in the decades to come.

The Northwest Territories has set an emission reduction target for 2030 of 30% below 2005 levels, which it is currently not on track to meet. Yukon aims to have a carbon neutral government by 2020 and has set some sector-specific targets, but it does not have an economy-wide target. Nunavut has not set any targets.

The biggest challenge for the territories is reducing emissions from transportation and off-grid power generation. Diesel makes up a much higher proportion of fuel use than in the provinces in part because low population densities prohibit extensive public transit and electricity infrastructure.

Climate policy developments

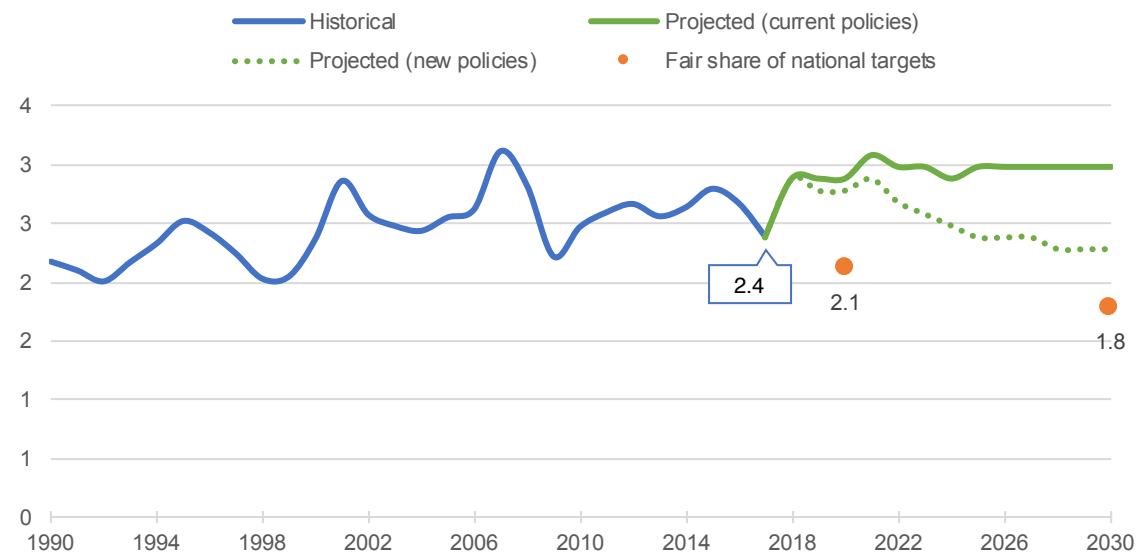
The Northwest Territories released a Climate Change Strategic Framework and an accompanying Energy Strategy in May 2018 that established new emissions targets and potential mitigation measures for the 2018-2030 period.[78] A forthcoming action plan will include more details on specific initiatives, but the province has already committed to introducing a $20/tonne carbon tax in July 2019.[79] The tax excludes or provides generous rebates for aviation fuels, heating fuels and electricity production, so it remains to seen whether the system is stringent enough to drive emissions reductions. If neither heating nor electricity costs go up, which the government claims will be the case, then the carbon tax will have little or no impact on emissions.

After studying the issue, Yukon and Nunavut elected to adopt the federal backstop policy voluntarily.

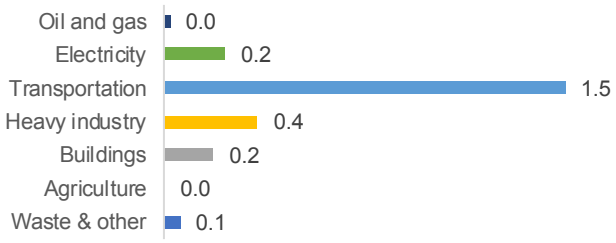
Otherwise, the territories continue to focus on adaptation research and planning.[80] The next steps, such as widespread construction of more climate resilient infrastructure, are dependent on federal and territorial funding.

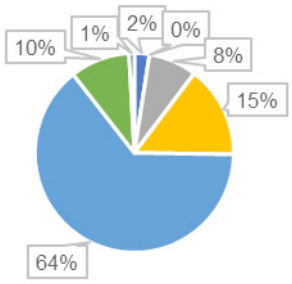
Figure 12: Summary charts for Yukon, Northwest Territories and Nunavut

Greenhouse gas emissions (Mt CO_2e) by year



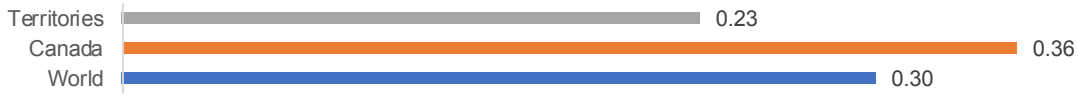
Greenhouse gas emissions (Mt CO_2e) by sector





Greenhouse gas emissions per capita (tonnes CO_2e per person)

Greenhouse gas emissions intensity (Mt CO_2e per $1 million GDP)



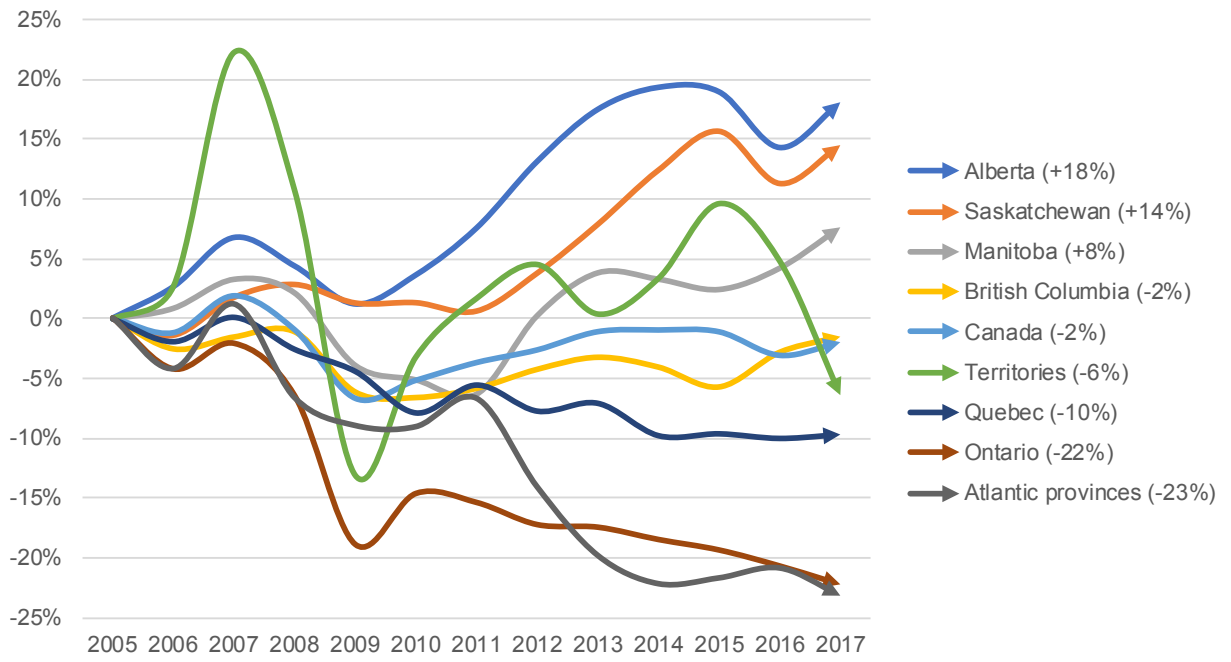
Conclusion

Canada's climate policy conversation at the federal, provincial and territorial level has made little progress since the last ACW/CCPA domestic policy summary report was published in May 2017. Some new plans and initiatives were introduced in the past two years, but the dominant trend was a reluctance to follow through on earlier commitments and, in many cases, to backtrack on earlier policy progress. Governments have either delayed policies or watered them down to such an extent that Canada's emissions trajectory is now in worse shape than it was two years ago.

In several domains, Canadian climate policy has regressed. For example, a number of provinces, led by Saskatchewan and Ontario, are challenging the federal government's legal authority to impose a carbon price. British Columbia, Manitoba and other jurisdictions abandoned emissions targets that they had little hope of achieving. Meanwhile, the federal government itself has made major investments into new fossil fuel infrastructure. Canadian governments are taking one step forward and two steps back on climate action, even as the physical impacts of climate change take a growing toll on communities and ecosystems across the country.[81]

As the world heats up, the federal, provincial and territorial governments cannot afford to back down on their climate policy ambitions. Even though the majority of provinces have seen total emissions decline in the past decade, the reductions have been too small in the aggregate to meaningfully reduce the country's climate impact (see Figure 13). Past progress should be acknowledged, but it cannot become an excuse for future inaction.

Figure 13: Change in greenhouse gas emissions since 2005



Going forward, the climate policy conversation needs to move beyond demand-side policies like carbon pricing—as important as they are—to embrace supply-side measures designed to reduce the production of fossil fuels and develop a clean energy economy. Climate change is a massive and complicated threat that demands a comprehensive response. Focusing on only one side of the fossil fuel equation is inadequate given the scale of the challenge, especially when political opposition has coalesced around a single policy approach.

As a rich country with a large fossil fuel industry, Canada has a unique opportunity to demonstrate to the world how decarbonization can work. It is the responsibility of every government in the country to push ahead with ambitious climate policies to get us there.

Appendix

Unless otherwise noted, all figures referenced in the climate policy profiles and summary charts are derived from the following sources:

Historical GHG emissions and GHG emissions by sector

Environment and Climate Change Canada, "Canada's Official Greenhouse Gas Inventory," Government of Canada, April 15, 2019, https://open.canada.ca/data/en/dataset/779c7bcf-4982-47eb-af1b-a33618a05e5b.

The latest year for which GHG emissions data are available is 2017, so that is the reference year for all data comparisons and analysis. Note the term "heavy industry" is used in place of "emissions-intensive and trade-exposed industries" throughout this report.

Projected GHG emissions through 2030

Environment and Climate Change Canada, "Canada's Greenhouse Gas Emissions Projections," Government of Canada, February 21, 2019, http://data.ec.gc.ca/data/substances/monitor/canada-s-greenhouse-gas-emissions-projections.

The emission projections released in February 2019 are adjusted by the author to reflect the official emissions data released in April 2019. Our "current policies" data corresponds to the government's "with measures" projections, and our "new policies" data corresponds to the government's "with additional measures" projections.

Population (to calculate emissions per capita)

Statistics Canada, "Table 17-10-0005-01: Population estimates on July 1st, by age and sex," Statistics Canada Data, last modified May 10, 2019, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501.

Gross domestic product (to calculate emissions intensity)

Statistics Canada, "Table 36-10-0222-01: Gross domestic product, expenditure-based, provincial and territorial, annual (x 1,000,000)," Statistics Canada Data, last modified May 10, 2019, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610022201.

Global average GHG emissions per capita and global average GHG emissions intensity

Jos G.J. Olivier and Jeroen A.H.W. Peters, in *Trends in global CO2 and total greenhouse gas emissions: 2018 Report*, PBL Netherlands Environmental Assessment Agency, December 2018, http://www.pbl.nl/en/trends-in-global-co2-emissions, pp. 40 & 46.

Electricity generation

Statistics Canada, "Table 25-10-0020-01: Electric power, annual generation by class of producer," Statistics Canada Data, last modified September 21, 2018, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2510002001.

Number and share of fossil fuel workers

Hadrian Mertins-Kirkwood, *Making decarbonization work for workers: Policies for a just transition to a zero-carbon economy in Canada*, Canadian Centre for Policy Alternatives and Adapting Canadian Work and Workplaces to Respond to Climate Change, January 2018, https://www.policyalternatives.ca/publications/reports/making-decarbonization-work-workers.

Notes

[1] Allan Woods, "More than 90 deaths now linked to heat wave in Québec," *Toronto Star*, July 18, 2018, https://www.thestar.com/news/canada/2018/07/18/89-deaths-now-linked-to-heat-wave-in-Québec.html.

[2] Jon Azpiri, "2018 wildfire season now the worst on record for hectares burned," *Global News*, August 29, 2018, https://globalnews.ca/news/4417276/2018-wildfire-season-worst-record-hectares-burned.

[3] René Bruemmer, "Tracking the severity of Quebec floods is a complicated science," *Montreal Gazette*, April 26, 2019, https://montrealgazette.com/news/local-news/tracking-the-severity-of-quebec-floods-is-a-complicated-science.

[4] Intergovernmental Panel on Climate Change, *Global Warming of 1.5 °C: An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*, World Meteorological Organization and United Nations Environment Programme, October 2018.

[5] Actuaries Climate Index, "Actuaries Climate Index Fall 2017 Data Released," Society of Actuaries, August 2018, https://www.soa.org/resources/announcements/press-releases/2018/2018-actuaries-climate-fall.

[6] National Round Table on the Environment and the Economy, *Paying the Price: The Economic Impacts of Climate Change for Canada*, Library and Archives Canada, 2011.

[7] J.G.J. Olivier, K.M. Schure and J.A.H.W. Peters, *Trends in global CO2 and total greenhouse gas emissions: 2017 Report*, PBL Netherlands Environmental Assessment Agency, December 2017, p. 43.

[8] Hadrian Mertins-Kirkwood, *Tracking Progress: Evaluating government plans and actions to reduce greenhouse gas emissions in Canada*, Canadian Centre for Policy Alternatives and Adapting Canadian Work and Workplaces to Respond to Climate Change, May 2017.

[9] The Ecofiscal Commission, for example, is an independent policy organization that views carbon pricing alone as sufficient for meeting Canada's climate targets and therefore preferable to any other climate policies. See: Dale Beugin, Brendan Frank, Glen Hodgson, Richard Lipsey, Nancy Olewiler, and Chris Ragan, *Clearing the air: How carbon pricing helps Canada fight climate change*, Canada's Ecofiscal Commission, April 2018.

[10] John Ivison, "The carbon tax could be the ballot question in the 2019 federal election," *National Post*, June 18, 2018, https://nationalpost.com/news/politics/john-ivison-the-carbon-tax-could-be-the-ballot-question-in-the-2019-federal-election.

[11] See, for example: Kevin Bissett, "New Brunswick Tories say election will be a 'referendum on carbon

tax'," *Globe and Mail*, August 28, 2018, https://www.theglobeandmail.com/canada/article-new-brunswick-tories-say-they-will-refund-federal-carbon-tax-through.

[12] Bruce Anderson, "Political Risk & Climate Action," Abacus Data, November 9, 2017, http://abacusdata.ca/political-risk-climate-action.

[13] Angus Reid Institute, "Carbon Pricing: Rebate announcement tips opinion in favour of federal plan, slim majority now support it," November 1, 2018, http://angusreid.org/carbon-pricing-rebate.

[14] Mark Jaccard, Mikela Hein and Tiffany Vass, *Is Win-Win Possible? Can Canada's Government Achieve Its Paris Commitment… and Get Re-Elected?*, School of Resource and Environmental Management, Simon Fraser University, September 20, 2016, p. 2.

[15] Brian Walsh, et al., "Pathways for balancing CO_2 emissions and sinks," *Nature Communications*, April 13, 2017, https://www.nature.com/articles/ncomms14856.

[16] Marc Lee, *Extracted Carbon: Re-examining Canada's contribution to climate change through fossil fuel exports*, Canadian Centre for Policy Alternatives, Parkland Institute and Corporate Mapping Project, January 2017.

[17] Michael Lazarus, Peter Erickson and Kevin Tempest, *Supply-side climate policy: the road less taken*, Stockholm Environment Institute, Working Paper 2015-13, October 2015, p. 5.

[18] Fergus Green and Richard Denniss, "Cutting with both arms of the scissors: the economic and political case for restrictive supply-side climate policies," *Climatic Change*, vol. 150, no. 1–2, September 2018, section 4.1.1.

[19] Office of the Auditor General of Canada, "Report 7—Fossil Fuel Subsidies," *2017 Spring Reports of the Auditor General of Canada to the Parliament of Canada*, May 2017, http://www.oag-bvg.gc.ca/internet/English/parl_oag_201705_07_e_42229.html, section 7.44.

[20] David Coady, Ian Parry, Nghia-Piotr Le and Baoping Shang, *Global Fossil Fuel Subsidies Remain Large: An Update Based on Country-Level Estimates*, International Monetary Fund, Working Paper 19/89, May 2019, p. 35.

[21] Chris Ragan and Jason Dion, "Understanding the recent changes to the federal carbon price," Canada's Ecofiscal Commission, August 3, 2018, https://ecofiscal.ca/2018/08/03/understanding-the-recent-changes-to-the-federal-carbon-price.

[22] Environment and Climate Change Canada, "How we're putting a price on carbon pollution," Government of Canada, October 26, 2018, https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/putting-price-on-carbon-pollution.html.

[23] Environment and Climate Change Canada, "Clean Fuel Standard," Government of Canada, last modified July 19, 2018, https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-standard.html.

[24] Includes infrastructure and other spending commitments made in the 2016, 2017, 2018 and 2019 federal budgets.

[25] The Canadian Press, "Cost to twin Trans Mountain pipeline could go $1.9B higher, Kinder Morgan says," *CBC News*, August 7, 2018, https://www.cbc.ca/news/canada/calgary/kinder-morgan-trans-mountain-pipeline-costs-could-rise-completion-delayed-1.4776643.

[26] Len Coad, Robyn Gibbard, Alicia Macdonald, and Matthew Stewart, *The Cost of a Cleaner Future: Examining the Economic Impacts of Reducing GHG Emissions*, Conference Board of Canada, September 2017, p. viii.

[27] Task Force on Just Transition for Canadian Coal Power Workers and Communities, *A Just and Fair Transition: For Canadian coal power workers and communities*, Government of Canada, December 2018.

[28] Government of British Columbia, "New bill updates targets for reducing carbon pollution," *BC Gov News*, May 7 ,2018, https://news.gov.bc.ca/releases/2018ENV0021-000860.

[29] Government of British Columbia, *CleanBC: Our Nature, Our Power, Our Future*, December 2018 (updated March 2019), p. 59.

[30] Marc Lee, "BC's shiny new climate plan: A look under the hood," *Policy Note*, December 17, 2018, https://www.policynote.ca/clean-bc.

[31] Government of British Columbia, "British Columbia's Carbon Tax," no date, https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/carbon-tax.

[32] Rob Shaw, "B.C. Premier John Horgan offers tax breaks to boost LNG industry," *Vancouver Sun*, March 22, 2018, https://vancouversun.com/news/politics/premier-horgan-offers-up-tax-breaks-for-lng-industry.

[33] Marc Lee, "LNG is incompatible with BC's climate obligations," *Policy Note*, July 11, 2018, https://www.policynote.ca/lng-is-incompatible-with-bcs-climate-obligations.

[34] Government of Alberta, *Climate Leadership Plan Progress Repor*t, December 2017, p. 8.

[35] Sharon J. Riley, "What Alberta's new UCP majority government means for the environment," *The Narwhal*, April 16, 2019, http://thenarwhal.ca/what-albertas-new-ucp-majority-government-means-for-the-environment.

[36] Environmental Defence Fund et al., *Joint Comments on Alberta Energy Regulator's Draft Requirements for Reducing Methane Emissions*, Environmental Defence Fund, May 28, 2018.

[37] Benjamin Israel, Jan Gorski and Morrigan Simpson-Marran, "The oilsands in a decarbonizing Canada," Pembina Institute, November 13, 2018, https://www.pembina.org/pub/oilsands-decarbonizing-canada.

[38] Kingsmill Bond, *2020 Vision: why you should see the fossil fuel peak coming*, Carbon Tracker

Initiative, September 2018, https://www.carbontracker.org/reports/2020-vision-why-you-should-see-the-fossil-fuel-peak-coming.

[39] Statistics Canada, "Table 25-10-0063-01: Supply and disposition of crude oil and equivalent," Statistics Canada Data, last modified October 12, 2018, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2510006301.

[40] Government of Saskatchewan, *Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy*, December 2017.

[41] Government of Saskatchewan, *Climate Resilience in Saskatchewan: 2019 Report*, April 2019.

[42] David Baxter, "SaskPower not moving ahead with further carbon capture projects at Boundary Dam 4 and 5," *Global News*, July 9, 2018, https://globalnews.ca/news/4320715/saskpower-not-moving-ahead-with-further-carbon-capture-projects-at-boundary-dam.

[43] Government of Saskatchewan, "New Industry Standards Next Step in Prairie Resilience Climate Change Strategy," August 29, 2018, https://www.saskatchewan.ca/government/news-and-media/2018/august/29/prairie-resilience-climate-strategy.

[44] Manitoba Sustainable Development, *A Made-in-Manitoba Climate and Green Plan: Hearing from Manitobans, Government of Manitoba*, December 2017.

[45] Joyanne Pursaga, "Province's green plan a 'catastrophic failure': researcher," *West Elgin Chronicle*, October 10, 2018, https://www.thechronicle-online.com/news/news-news/provinces-green-plan-a-catastrophic-failure-researcher/wcm/413e10b1-9585-4872-a894-c5133d2f73a1.

[46] Harvey Stevens, *An Analysis of Manitoba's Proposed Plan to Reduce Greenhouse Gas Emissions as Contained in the Manitoba Climate and Green Plan*, Canadian Centre for Policy Alternatives (Manitoba Office), August 2018.

[47] Author's calculations based on five-year cumulative emissions reductions.

[48] Stevens, *An Analysis of Manitoba's Proposed Plan*, p. 9.

[49] Rod Phillips, *Bill 4: An Act respecting the preparation of a climate change plan, providing for the wind down of the cap and trade program and repealing the Climate Change Mitigation and Low-carbon Economy Act*, 2016, Legislative Assembly of Ontario, 1st Session, 42nd Legislature, July 25, 2018.

[50] Robert Benzie, "Ontario's climate moves could equal the pollution from 30 coal-fired power plants, Ottawa warns," *Toronto Star*, August 30, 2018, https://www.thestar.com/news/queenspark/2018/08/30/ontarios-climate-moves-could-equal-the-pollution-from-30-coal-fired-power-plants-ottawa-warns.html.

[51] Hadrian Mertins-Kirkwood, *No Bad Option: Comparing the economic impacts of Ontario carbon pricing scenarios*, Canadian Centre for Policy Alternatives, April 2018.

[52] Financial Accountability Office of Ontario, *Cap and Trade: A Financial Review of the Decision to Cancel the Cap and Trade Program*, 2018.

[53] Government of Ontario, *Preserving and Protecting our Environment for Future Generations: A Made-in-Ontario Environment Plan*, November 2018.

[54] See, for example: Pembina Institute, "Ontario stalls on climate action: Pembina Institute reacts to the Government of Ontario's climate plan," November 29, 2018, https://www.pembina.org/media-release/ontario-stalls-climate-action; and Environmental Defence, "Environmental Defence gives Ontario a failing grade on its new climate change plan," December 4, 2018, https://environmentaldefence.ca/2018/12/04/environmental-defence-gives-ontario-failing-grade-new-climate-change-plan.

[55] Robert Benzie, "Ontario not doing enough for environment, watchdog warns in final report," *Toronto Star*, March 27, 2019, https://www.thestar.com/politics/provincial/2019/03/27/ontario-not-doing-enough-to-conserve-energy-and-curb-greenhouse-gas-emissions-environmental-watchdog-warns-in-her-final-report.html.

[56] Environment and Climate Change Canada, "Ontario and pollution pricing," Government of Canada, October 23, 2018, https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/ontario.html.

[57] Government of Québec, *Québec in Action: Greener by 2020 — 2013–2020 Climate Change Action Plan*, Bibliothèque et Archives nationales du Québec, 2012.

[58] Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques. *Bilan mi-parcours du Plan d'action 2013-2020 sur les changements climatiques*, 2017.

[59] Germain Belzile and Mark Milke, "The Carbon Market: Chasing Away Jobs and Capital Without Reducing GHGs," *MEI Energy Series*, Montreal Economy Institute, June 2018.

[60] Minister of Sustainable Development, Environment and the Fight against Climate Change, "The Zero-Emission Vehicles (ZEV) Standard Comes into Effect - Automakers will have to offer more rechargeable electric and hybrid vehicle models in Québec," Government of Québec, http://www.fil-information.gouv.qc.ca/Pages/Article.aspx?idArticle=2512184482&amp%3Blang=en.

[61] Government of Québec, *Transporter le Québec vers la modernité politique de Mobilité durable – 2030 Plan d'action 2018-2023*, 2018.

[62] Conference of New England Governors and Eastern Canadian Premiers, *Resolution 39-1: Resolution concerning climate change*, August 31, 2015.

[63] Serge Rousselle, *Bill 39: Climate Change Act*, Legislative Assembly of New Brunswick, 4th Session, 58th Legislature, December 14, 2018.

[64] Gail Harding, "Federal environment minister questions province's carbon price plan," *CBC News*, December 14, 2017, https://www.cbc.ca/news/canada/new-brunswick/federal-environment-minster-question-province-1.4449576.

[65] Environment and Climate Change Canada, "New Brunswick and pollution pricing," Government of Canada, October 23, 2018, https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/new-brunswick.html.

[66] Government of New Brunswick, *Update on New Brunswick Climate Change Actions*, December 2017.

[67] National Energy Board, "Provincial and Territorial Energy Profiles – Nova Scotia," Government of Canada, last modified August 15, 2018, https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/ns-eng.html.

[68] EfficiencyOne, *All the good things: Efficiency NS Annual Report 2017*, 2017, p. 11.

[69] Nova Scotia Environment, *Nova Scotia's Cap and Trade Program: Regulatory Framework*, Government of Nova Scotia, May 2019.

[70] Ibid., p. 24.

[71] Erin Flanagan and Stephen Thomas, "Time for Ottawa to cry foul over Nova Scotia cap-and-trade proposal," *Pembina Institute*, November 2, 2017, http://www.pembina.org/op-ed/time-for-ottawa-to-cry-foul-over-nova-scotia-cap-and-trade-proposal.

[72] Government of Prince Edward Island, *A Climate Change Action Plan for Prince Edward Island 2018-2023*, 2018.

[73] Government of Newfoundland and Labrador, *The Way Forward: On Climate Change in Newfoundland and Labrador*, March 2019.

[74] Kenn Oliver, "N.L., Equinor release framework agreement for $6.8-B Bay du Nord project," *The Telegram*, July 27, 2018, https://www.thetelegram.com/news/local/province-equinor-release-framework-agreement-for-68-b-bay-du-nord-project-229273.

[75] Author's calculations based on EPA data. See: United States Environmental Protection Agency, "Greenhouse Gases Equivalencies Calculator - Calculations and References," Government of the United States, last updated March 13, 2018, https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references.

[76] Yanick Touchette, "Canada: G7 Fossil Fuel Subsidy Scorecard," Overseas Development Institute, 2018, https://www.odi.org/sites/odi.org.uk/files/resource-documents/12211.pdf.

[77] Government of Newfoundland and Labrador, *Advance 2030: A Plan for Growth in the Newfoundland and Labrador Oil and Gas Industry*, February 2019, p. 9.

[78] Government of Northwest Territories, *2030 NWT Climate Change Strategic Framework*, 2018.

[79] Department of Finance, "Implementing Carbon Pricing in the NWT," Government of Northwest Territories, no date, https://www.fin.gov.nt.ca/en/carbon-pricing.

[80] See, for example: Research Northwest and Morrison Hershfield, *Yukon 'State of Play': Analysis of*

Climate Change Impacts and Adaptation, Environment Yukon's Climate Change Secretariat, November 14, 2017.

[81] Environment and Climate Change Canada, *Canada's Changing Climate Report*, Government of Canada, April 2019.