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Race to the front

Tracking pan-Canadian climate progress and where we go from here

Erin Flanagan
Dianne Zimmerman, Matt Horne,
Tom-Pierre Frappé-Sénéclauze

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photo: iStock.com, Knud Nielsen

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Race to the front

Tracking pan-Canadian climate progress and where we go from here

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Photo: Office of the Prime Minister of Canada

Despite historical challenges, Canada's federal, provincial, and territorial governments have a new and exciting consensus on the need to decarbonize our economy — expressed through the Vancouver Declaration on Clean Growth and Climate Change.

Executive summary

2016 is set to be a decisive year for climate policies in Canada. Building on a rush of climate policy commitments leading up to the Paris climate conference and strong growth in clean energy investments, Canada is now navigating uncharted territory. For the first time ever, Canadian political leaders are negotiating a pan-Canadian climate plan to meet or exceed the country's 2030 emissions reduction target.

Canada's approach to climate change is often described as piecemeal: federal, provincial and territorial governments have pursued a mix of carbon pricing and sector-specific regulations to reduce emissions over time, but these efforts have not always been effective at reducing carbon pollution and have been disconnected from a larger vision to grow and support low-carbon economic development pathways in Canada. And, despite past commitments to achieve climate targets, Canada has never produced a national climate change plan — let alone one sufficiently ambitious to achieve our international obligations.

Despite historical challenges, Canada's federal, provincial, and territorial governments now have a new consensus on the need to decarbonize our economy. This consensus was expressed in the Vancouver Declaration on Clean Growth and Climate Change released at the March 2016 first ministers meeting.

In our view, collaboration and consensus across national and sub-national governments is important, since some provinces have already made important contributions to emissions reductions worth scaling nationally, and since many of the challenges facing individual sectors are shared across the country. But,

even in the absence of a strong national consensus on the best path forward to reduce emissions, the point remains: the federal government must demonstrate a coherent plan to meet or exceed its 2030 target, be it through additional federal actions or a combination of federal, provincial, territorial and Indigenous and local government commitments.

What Canada needs now is a race to the front of the pack on climate action. All provinces and territories can and should do more to reduce their emissions and align their economic and environmental policies with the ambition outlined in the Paris Agreement. At the next first ministers meeting, we expect Prime Minister Trudeau and the premiers to announce new or strengthened policies in key sectors — including buildings, transportation, electricity and oil and gas — to lay the foundation for long-term climate success. Done right, strong climate action at the federal, provincial and territorial levels can secure Canada's required emissions reductions and support its transition to a low-carbon economy.

Looking outward, Canada must work to reverse current trends in clean technology. Recent data illustrates what's on the line: Canada is losing market share in the global clean technology sector, and saw a 41% decline from 2005 and 2014. Meanwhile, Bloomberg New Energy Finance has shown that fossil fuel development will attract $2.1 trillion worth of investments by 2040 — but renewable energy will outpace that at $7.8 trillion over the same period. Global data is clear: we are in a clean growth century, and the economic wins associated with clean energy and technology development will only grow with time. Ensuring Canada and its provinces and territories are well positioned to compete in this growing global marketplace should remain a core priority for our governments.

To achieve these economic goals, Canada's governments must accelerate climate policy progress and invest in infrastructure that supports long-term decarbonization. We look forward to ambitious commitments at the first ministers meeting aligned with a prosperous, low-carbon economy for Canada.

Introduction

A banner year for climate commitments

2016 is set to be the most important year ever for climate policy development in Canada. On the heels of the UN climate summit in Paris, Prime Minister Trudeau and Canada's provincial and territorial premiers met in Vancouver to discuss climate change mitigation and clean economic development — a meeting that culminated in the Vancouver Declaration on Clean Growth and Climate Change.[1] The Vancouver Declaration contained, for the first time, political consensus across all members of the Canadian federation on the need for Canada to live up to its international climate obligations.

Through the Vancouver Declaration, the prime minister and premiers committed to "implement GHG mitigation policies in support of meeting or exceeding Canada's 2030 target [...] including specific provincial and territorial targets and objectives" and to "increase the level of ambition of environmental policies over time [...], consistent with the Paris Agreement". Importantly, Canada's first ministers noted that such policies represent an opportunity for Canada to build a strong and diverse economy, and to promote long-term economic growth. These commitments demonstrate that climate action is now a central policy priority for Canada's national and sub-national governments.

More recently, Prime Minister Trudeau has signed the Paris Agreement and announced a second first ministers meeting on climate change to be held in the fall of 2016. At this time, we expect Canada's first ministers will announce a credible domestic plan to meet or exceed the country's existing 2030 emissions reduction goal. This plan will contain additional commitments from the federal, provincial and territorial governments — with the precise balance of national versus sub-national action likely depending on the extent to which national consensus is maintained. Regardless, the federal government will be responsible for articulating Canada's pathway to meet or exceed its 2030 target.


photo: Pembina Institute

But how are Canada's first ministers doing at improving Canada's climate performance? This report summarizes Canada's progress at reducing carbon pollution over the last decade, evaluate trends in Canada's greenhouse gas emissions inventory as they stand today, and outlines the state of climate policy nationally and in each of Canada's provinces and territories. Further, the report employs recent modelling to review the extent to which governments have made policy commitments consistent with ameliorating Canada's climate performance out to 2030. Our analysis closes with key policy recommendations for the prime minister and premiers as they prepare to meet again to release a pan-Canadian climate plan.

State of the inventory

Canada's 2016 National Inventory Report shows that Canada's emissions totaled 732 Mt in 2014 — only 2% below 2005[2] levels of 747 Mt, and an increase of 20% above 1990 levels.[3] At present, Canada is not on track to achieve its 2020 emissions reduction goal under the Copenhagen Accord, nor its 2030 climate target.

Carbon pollution trends from 2005 to 2014 underscore that progress at reducing emissions has been significant in some parts of Canada — namely Ontario, Quebec and Atlantic Canada — but this progress was not matched in Western Canada. Emissions rose by 18% in Alberta, 8% in Saskatchewan, and 4% in Manitoba. Emissions declined by 4% in B.C., 19% in Ontario, 8% in Quebec, and 22% in Atlantic Canada. In sum, Canada's national emissions declined by 2% over this period (see Figure 2) Notably, Canada's economy experienced a sustained decrease in economic activity from 2007 to 2009, which was partly responsible for the national emissions decline from 758 Mt to 696 Mt over this period. Since then, national emissions have steadily increased: carbon pollution grew by 5% in the five years from 2009 to 2014 (see Figure 1).

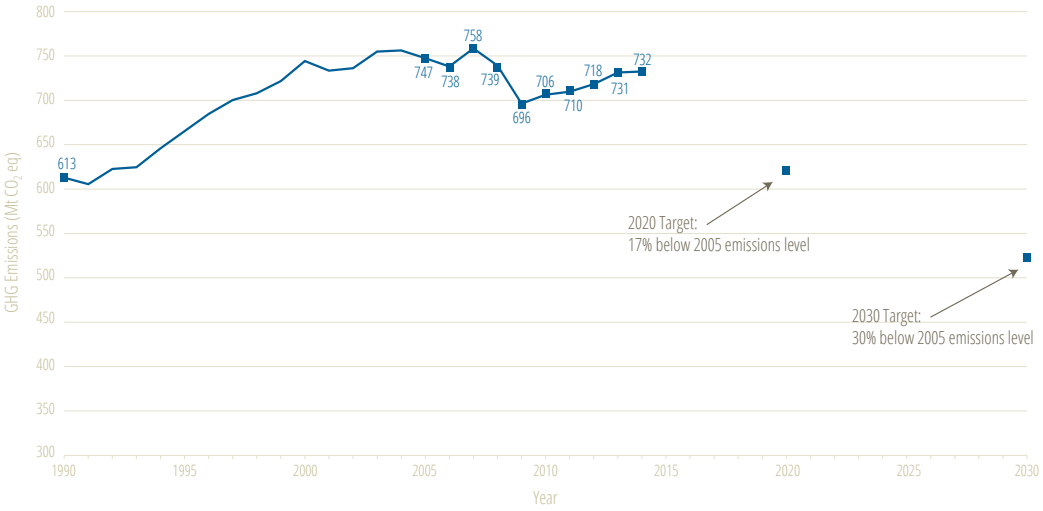


Figure 1: National emissions trends, 1990 to 2014

Adapted from: Environment and Climate Change Canada [4]

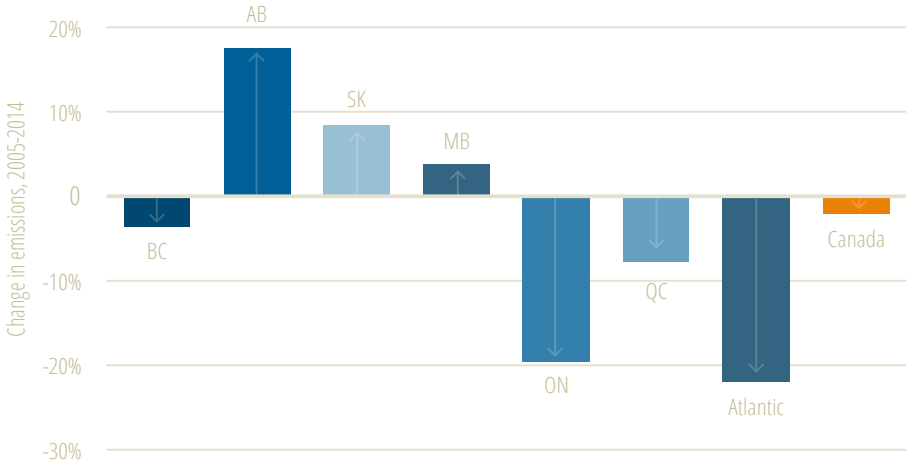


Figure 2: Change in emissions by province, 2005-2014

Data source: Environment and Climate Change Canada[5]

Provincial and territorial trends

Canada's provinces and territories contribute to the emissions inventory in different ways, with emissions footprint depending on population size, natural resource profile (including electricity grid), and structure of the economy. In absolute terms, Alberta is Canada's largest emitter (274 Mt) and second-largest emitter per capita after Saskatchewan (see Table 1 and Figure 3). Coming in at second largest is Ontario, Canada's most populous province yet third-lowest emitting province per capita (170 Mt).

	GHG emissions (2014, Megatonnes)	Population (2014)	GHG emissions per capita (tonnes)	Nominal GDP (million of $)	GHG emissions per unit of GDP (tonnes)
BC	62.9	4,638,400	13.6	237,188	265.2
AB	273.8	4,120,900	66.4	375,756	728.7
SK	75.5	1,122,300	67.3	82,780	912.1
MB	21.5	1,280,200	16.8	64,077	335.5
ON	170.2	13,677,700	12.4	721,970	235.7
QC	82.7	8,214,900	10.1	370,064	223.5
NB	14.9	754,600	19.7	32,056	464.8
NS	16.6	942,400	17.6	39,077	424.8
PE	1.8	146,200	12.3	6,003	299.9
NL	10.6	529,100	20.0	33,514	316.3
YT	0.3	37,000	8.1	2,603	115.3
NT	1.5	44,000	34.1	4,731	317.1
NU	0.3	36,100	8.3	2,487	120.6

Table 1: Provincial and territorial emissions comparisons

Data source: Environment and Climate Change Canada, Statistics Canada [6]

Quebec (82.7 Mt), Saskatchewan (75.5 Mt) and British Columbia (62.9 Mt) form the middle of the pack in Canada's inventory in absolute terms, and 11, 10 and 9% of national emissions respectively. Despite forming the middle of the pack in absolute terms, these provinces have significantly different per capita emissions, with Saskatchewan as Canada's largest per capita emitter at 67.3 tonnes per capita, and Quebec as Canada's lowest per capita provincial emitter at 10.1 tonnes per capita.

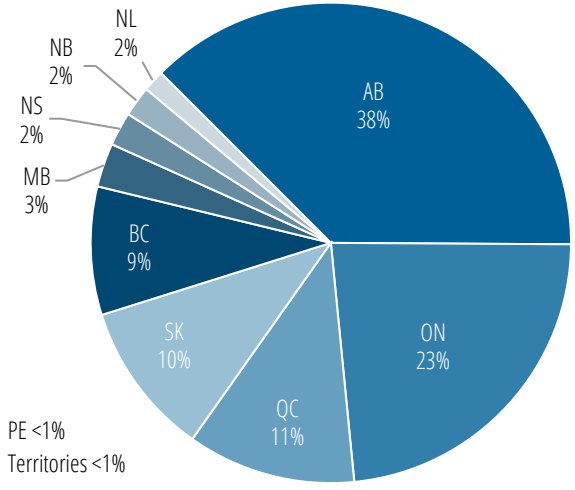


Figure 3: Provincial and territorial contribution to national inventory, 2014

Source: Environment and Climate Change Canada [7]

Sector trends

Breaking down data along sector lines, nearly 50% of Canada's emissions come from two sectors: oil and gas and transportation. At 26% of the national inventory, Canada's oil and gas sector is a significant challenge to emissions reductions (see Figure 4). Since 2005, oil and gas sector emissions have risen by 20%, while economy-wide emissions decreased by 2% over the same period.

The transportation sector is Canada's second-largest source of carbon pollution in the country by economic sector.[8] Since 2005, the transportation sector has hovered between 22 to 24% of Canada's total emissions inventory. Comparing 2005 emissions to 2014, the sector remained unchanged at 171 Mt. It is the largest source of carbon pollution in many of Canada's provinces, including British Columbia, Quebec, Manitoba, Ontario and Newfoundland and Labrador.[9]

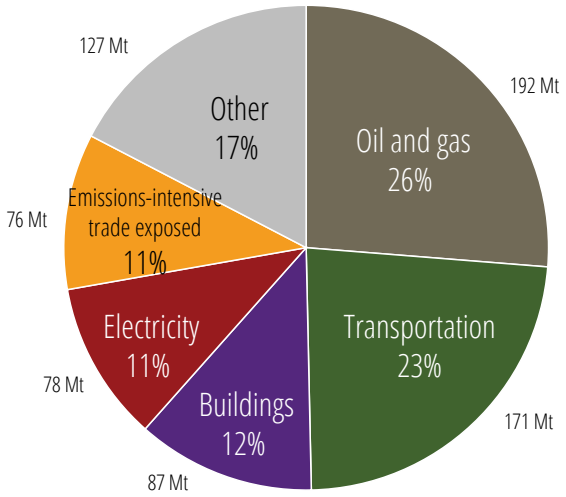


Figure 4: Canadian emissions by economic sector, 2014

Data source: Environment and Climate Change Canada[10]

Looking to the third- and fourth-largest emitting sector, total energy consumption of homes and buildings accounts for 12% of Canada's greenhouse gas emissions.[11] The buildings sector has remained stagnant since 2005, with emissions in 2014 2% above emissions in 2005. Lastly, Canada's electricity sector represents just over 78 Mt, approximately 11% of Canada's overall emissions in 2014.[12] Despite Canada's low emitting grid on aggregate, and important emissions reductions in the sector since 2005, Canada's electricity sector remains its fourth-largest emitter. Coal represents over 75% of these electricity emissions, at around 61 Mt, while only providing around 10% of our electricity.[13]

Reviewing sector trends from 2005 to 2014 (Figure 5) demonstrates two things. One, progress has been limited in the transportation and buildings sector: emissions in both sectors remained relatively unchanged over the time period (buildings increased by 2 Mt while transportation remained static). Second, growth in emissions in the oil and gas sector has been offset by reductions in other sectors, especially the electricity sector (oil and gas sector emissions rose 33 Mt over the time period, while electricity emissions decreased by 40 Mt).

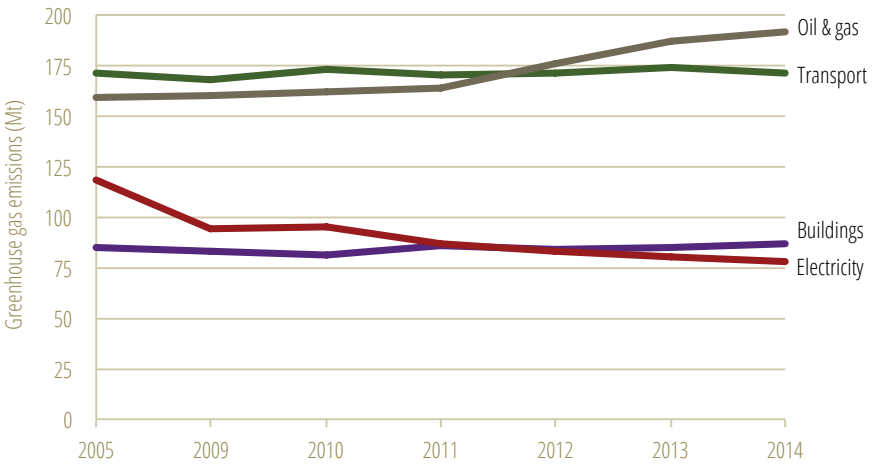


Figure 5: Emissions trends in key sectors, 2005-2014

Data source: Environment and Climate Change Canada[14]

Taking stock of existing climate policies

In order to evaluate progress towards the 2030 target, we examine data presented in *Still Minding the Gap: An Assessment of Canada's Greenhouse Gas Reduction Obligations*, part of the Deep Decarbonization Pathways Project.[15] This report demonstrates potential emissions scenarios in 2030 assuming full implementation of provincial climate commitments as of April 2016, including Alberta's Climate Leadership Plan, Ontario's cap-and-trade regulation, Saskatchewan's 50% commitment for installed renewable energy capacity, and the Canada-U.S. joint commitment to regulate new and existing sources of methane emissions in their oil and gas sectors.[16] Modelling also includes B.C.'s 2008 climate plan, light duty vehicle emissions standards, federal regulations requiring 5% renewable content in gasoline and 2% in diesel fuel and heating oil, and the federal emissions performance standard for coal-fired power introduced in 2012. It does not include B.C.'s 2016 climate plan update nor Ontario's 2016 Climate Action Plan.

The results of *Still Minding the Gap* were used to estimate percent change in emissions for Canadian provinces assuming complete implementation of announced climate policies. In this scenario, emissions will decline relative to 2005 levels for Alberta, Ontario, and Quebec by 13, 37 and 29% respectively. Emissions will rise for B.C., Saskatchewan, Manitoba and for Atlantic Canada by 34, 20, 63 and 20% respectively. Over the same period, Canada's emissions are likely to decline by 10%. Canada's commitment to the United Nations Framework Convention on Climate Change is to reduce total emissions by 30% below 2005 levels by 2030; thus, all climate policies included in this model are not sufficient to close the gap to the national 2030 target.

These findings underscore that, even with all national and sub-national climate efforts to date, Canada must bring in ambitious new policies and/or significantly increase the stringency of existing programs, to close the gap to 2030. In order for Canada to align its emissions profile with a credible long-term low greenhouse gas strategy, it must implement effective policies to reduce emissions across the economy. This can occur in different ways: through regulations in specific sectors, through sufficiently stringent carbon pricing mechanisms, or through a combination of both approaches.

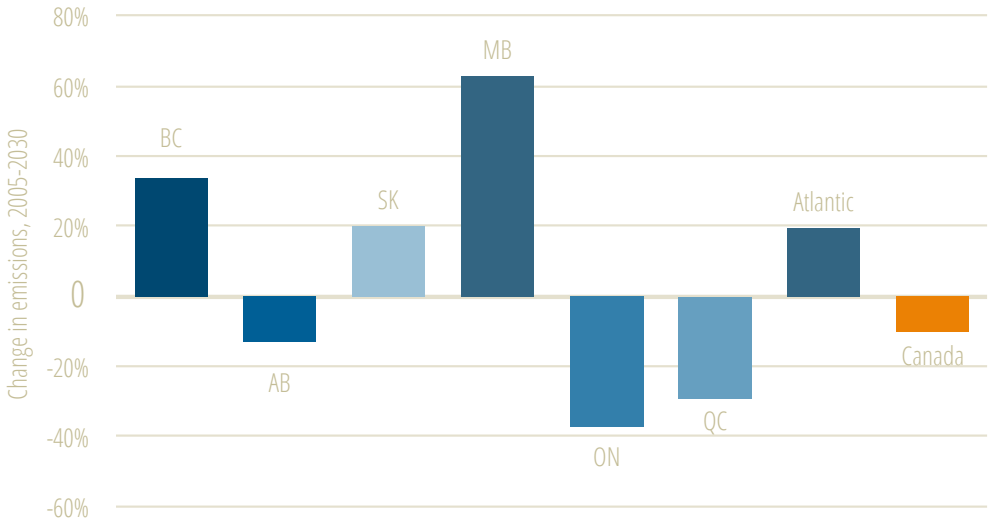


Figure 6: Change in emissions by province, 2005-2030, low oil scenario

Data source: Decarbonization Pathways Project and Environment and Climate Change Canada[17]

Progress reports

Over the last two decades, Canada's federal, provincial, and territorial governments have gradually introduced climate policies and other fiscal tools to reduce emissions within their jurisdictions. In the following section, we'll review the state of climate action in each province and territory. In doing so, we look at the jurisdiction's greenhouse gas emissions performance since 2005, outline key policy developments over the last decade, and suggest an area for continued improvement. These areas for improvement were determined by cross-referencing the jurisdiction's top three emitting sectors against its existing climate policies. If provinces were missing carbon pricing systems or sector-specific policies, those are highlighted as key requirements to producing a credible climate plan and supporting the pan-Canadian climate process. For select jurisdictions, areas of excellence are noted. These areas of excellence were selected based on our assessment of the policy's potential to scale nationally and, in doing so, make a material impact towards the 2030 target. To take stock of current and developing policy progress, we've evaluated each jurisdiction's climate policies in key sectors — including buildings, transportation, electricity and the oil and gas sector — against our established criteria for "best-in-class" performance within that sector. Those evaluations are shown in a 'progress report' column for each jurisdiction. For details on each sector's policy criteria and method of evaluation, see Appendix A. A summary of provincial 'progress report' columns is provided in Appendix B.

photo: Roberta Franchuk, Pembina Institute

British Columbia

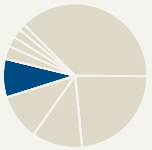
B.C. is Canada's fifth-largest emitting province in absolute terms. In 2014, B.C.'s emissions totaled 62.9 Mt, with per capita emissions of 13.6 tonnes.

B.C.'s top three emitting sectors are transportation (20.8 Mt), oil and gas (14.4 Mt) and "waste and other" (10.7 Mt) — a category that includes waste, coal production, light manufacturing, construction and forestry. These three sectors represent 33%, 22% and 17% of the province's total emissions, respectively. Overall, B.C.'s emissions decreased by 4% from 2005 to 2014.

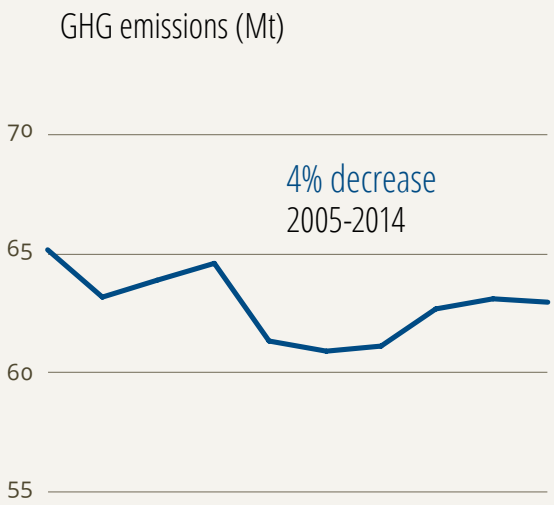
In 2007, B.C. began implementing a suite of policies to reduce carbon pollution. The province cancelled two proposed coal-fired power plants and followed that with commitments to improve energy conservation and renewable energy development.[18,19]

In 2008, B.C. introduced an economy-wide carbon tax at $10 per tonne of emissions. B.C.'s carbon tax increased gradually over time, to $30 per tonne in 2012 — the price at which the tax is currently "frozen".[20] The tax applies to almost all the fossil fuels burned in the province (e.g., coal, gasoline, natural gas). In addition to its carbon tax, B.C. introduced a host of complementary measures including a Renewable and Low Carbon Fuel Requirement Regulation,[21] incentives for energy efficiency and low-carbon vehicles, renewable electricity requirements and a commitment to a carbon neutral public sector.[22]

In May 2015, B.C. Premier Christy Clark convened a panel of experts to make recommendations that would put British Columbia on track to meet its legislated emissions-reduction targets while maintaining a strong economy. The Climate Leadership Team (CLT) delivered its recommendations in October 2015.[23]



Provincial share of GHG emissions 2014
9%



In August 2016, B.C. released a new climate plan. The plan does not include most of the CLT's recommendations and is not projected to see carbon emissions in the province significantly decline before 2030. Under this plan, B.C.'s emissions could flat-line over the next 15 years, leaving the provincial inventory roughly unchanged between today and 2030 and well off track of its 2020 and 2050 targets.

In order for B.C. to change its emissions course and achieve its legislated emissions reduction target, it must increase its carbon tax, extend its coverage, and introduce stronger complementary regulations in its buildings, transportation and oil and gas sectors.[24]

Policy category	BC British Columbia
Climate action plan	
Publication date	2016
Emissions reduction target(s)?	✓
Emission trends	
Emissions since 2005	↓
Emissions projections to 2030 *+	↑
Carbon price**	
Marginal price of carbon in 2020	●
Coverage of carbon price in 2020	●
Buildings	
New	●
Existing	●
Transportation	
Passenger / light-duty vehicles	●
Goods movement / heavy-duty vehicles	●
Public transit / active transportation	●
Electricity	
Decarbonizing electricity generation	●
Oil and gas	
Venting, flaring and fugitive methane emissions	●

Legend

- ● Significant policy in place
- ● Some policy in place
- ● Little or no policy in place

*,+,** See Appendix B

Area of excellence

B.C.'s renewable and low-carbon fuel standard was introduced in 2010. Targeting a 10% reduction in carbon pollution per litre of motor fuel by 2020, the low-carbon fuel standard resulted in the avoidance of 0.9 Mt of emissions in 2012. B.C.'s 2016 climate announcement included a commitment to increase its standard to 15% by 2030, which could secure 1.4 Mt of incremental emissions reductions.[25] Given the importance of decarbonized transportation in the long run across Canada, B.C.'s LCFS merits broader consideration.

Area for improvement

B.C. has received significant accolades for its carbon tax. But, recently, the tax's ability to support B.C. in achieving its climate targets has been questioned. B.C has frozen the program at $30 per tonne, so in real terms, the price is effectively falling. Carbon prices need to increase in order to be effective, and we encourage the province to move forward on this.

Alberta

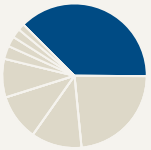
Alberta is Canada's largest emitting province, at 273.8 Mt — more than 37% of Canada's total emissions. Further, at 66.4 tonnes per person, Alberta is Canada's second-largest emitter on a per capita basis.

Alberta's top three emitting sectors are oil and gas (132 Mt), electricity (44.3 Mt) and transportation (32.7 Mt), representing 48%, 16%, and 11% of its total emissions respectively.

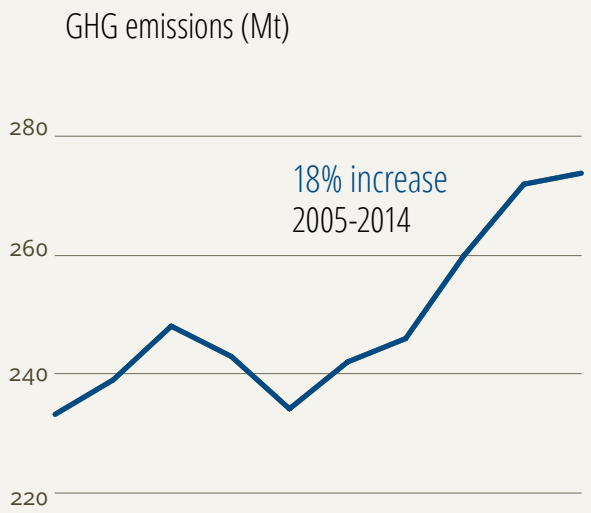
Since 2005, the province's total emissions have risen 18% — the largest percentage change in Canada over that period. Specifically, emissions from Alberta's oil and gas sector grew by 34% between 2005 and 2014. Alberta has the highest emitting electricity grid of any province in Canada, at 790 grams CO_2e per kWh.

Over the past decade, Alberta has made limited progress at introducing policies to effectively reduce emissions. However, in November 2015 the provincial government announced a plan to reduce emissions in the province. Core elements of Alberta's Climate Leadership Plan include:

- An accelerated phase-out of coal-fired electricity to 2030
- A renewable energy generation target for replacement generation of 30% by 2030
- A carbon levy on all emitting fuels used for transportation and heating — starting at $20 per tonne in 2017, moving to $30 per tonne in 2018. Further, an output-based allocation system for large industrial emitters will be designed to reward top quartile performance in the sectors to which it applies.
- The levy is expected to raise $9.6 billion over the first five years, with $6.2 billion to be invested in renewable energy, energy efficiency, and green infrastructure, and $3.4 billion set aside as rebates for households, businesses and communities
- Regulations to reduce oil and gas methane emissions by 45% by 2025
- A cap on oilsands emissions at 100 Mt annually



Provincial share of GHG emissions 2014
38%



With carbon pricing and an oil and gas methane regulation under development, Alberta's announced policies cover the major emitting sectors in the province.

Despite significant new announcements, Alberta's climate plan could do more to support electrification of buildings and transportation. Alberta lags behind other provinces in the adoption of the building code and a retrofit strategy, electrification of personal transportation, and promotion of public transit. As it seeks to implement and build upon its recent climate commitments, Alberta should articulate an economy-wide climate strategy with specific GHG reduction goals for 2030 and beyond.

Policy category	AB Alberta
Climate action plan	
Publication date	2016
Emissions reduction target(s)?	✕
Emission trends	
Emissions since 2005	↑
Emissions projections to 2030 *+	↓
Carbon price**	
Marginal price of carbon in 2020	●
Coverage of carbon price in 2020	●
Buildings	
New	●
Existing	●
Transportation	
Passenger / light-duty vehicles	●
Goods movement / heavy-duty vehicles	●
Public transit / active transportation	●
Electricity	
Decarbonizing electricity generation	●
Oil and gas	
Venting, flaring and fugitive methane emissions	●

Legend

- ● Significant policy in place
- ● Some policy in place
- ● Little or no policy in place

*,+,** See Appendix B

Area of excellence

With its accelerated coal-fired power phase-out, Alberta is reducing emissions by approximately 30 Mt. Burning coal for electricity produces GHGs and air pollution, meaning that Alberta's policies will both reduce carbon pollution and improve air quality and health outcomes for Albertans. With Alberta's commitment in hand, other provinces (SK, NB, NS) should follow suit and decarbonize their electricity systems.

Area for improvement

Transportation is a notable and growing source of emissions in Alberta, having increased more than 30% since 2005. Alberta should join leading jurisdictions in developing a low-carbon transportation strategy for personal vehicles and goods movement. In particular, this could include the adoption of a low-carbon fuel standard and the adoption of a goods movement strategy to reduce GHG emissions from the freight sector.

Saskatchewan

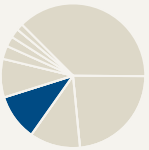
Saskatchewan is the country's fourth-largest emitter in absolute terms (75.5 Mt in 2014), and its largest emitter on a per-capita basis at 67.2 tonnes per person. Nearly three quarters of Saskatchewan's emissions come from three sectors: oil and gas (25.3 Mt), agriculture (16.7 Mt), and electricity (14.3 Mt).

These sectors represent 34%, 22% and 19% of the province's emissions, respectively. Since 2005, the province's emissions have risen by 8%. Saskatchewan's grid remains the second most carbon intensive in Canada, at 780 grams CO_2 per kWh.

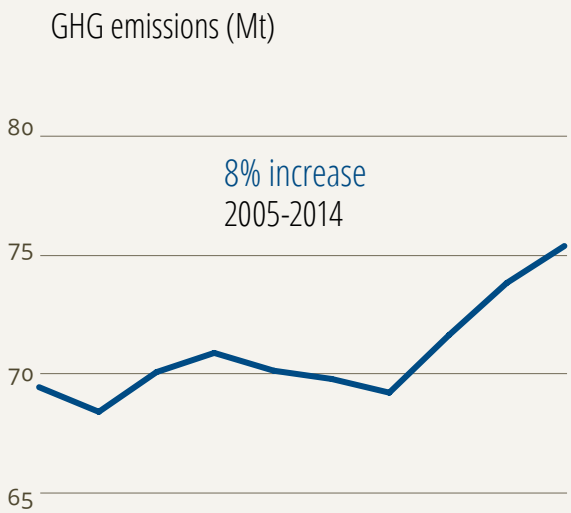
Over the past decade, Saskatchewan has made limited progress reducing emissions: emissions have risen by 8% since 2005. In 2009, Saskatchewan released Bill 95: *The Management and Reduction of Greenhouse Gases and Adaptation to Climate Change Act*.[26] This act outlined greenhouse gas reporting rules, a technology fund, and the architecture of an emissions reduction target. However, the act itself did not stipulate an emissions baseline year nor an emissions reductions obligation. Further, the act was never proclaimed by the government.

Saskatchewan is a proponent of carbon capture and storage (CCS) technology: in October 2014, SaskPower began operating a CCS unit on the Boundary Dam (Unit 3) generating station. The project retrofitted an existing coal-fired generation unit, and captures approximately 1 Mt annually.[27] The project's final cost was $1.5 billion, with the Government of Canada contributing $240 million.

In November 2015, SaskPower announced it would generate 50% of the province's electricity from renewable sources by 2030.[28] This target would effectively double the renewable energy capacity above current levels. In addition to its clean electricity target, Saskatchewan has a renewable fuels regulation with a mandate of 7.5% ethanol blend in gasoline. Further, SaskPower has established a goal of 100 MW of energy conservation by 2017 — of which it says its already achieved 90 MW through demand-side management activities.[29] While an important achievement, this conservation goal was established after the province softened its 2007 goal of 300 MW conservation by 2017.



Provincial share of GHG emissions 2014
10%



In order to reduce emissions in the near term, Saskatchewan must make additional efforts. The province should consider implementing economy-wide carbon pricing and an accelerated phase-out of coal-fired power, in addition to its renewables target, and working with the federal government to implement its recent commitment to reduce oil and gas methane emissions by 40–45% below 2012 levels by 2025. Further, Saskatchewan should develop an economy-wide climate strategy with specific GHG reduction goals and sector strategies for 2030 and beyond.

Policy category	SK Saskatchewan
Climate action plan	
Publication date	N/A
Emissions reduction target(s)?	✗
Emission trends	
Emissions since 2005	↑
Emissions projections to 2030 *+	↑
Carbon price**	
Marginal price of carbon in 2020	●
Coverage of carbon price in 2020	●
Buildings	
New	●
Existing	●
Transportation	
Passenger / light-duty vehicles	●
Goods movement / heavy-duty vehicles	●
Public transit / active transportation	●
Electricity	
Decarbonizing electricity generation	●
Oil and gas	
Venting, flaring and fugitive methane emissions	●

Legend

- Significant policy in place
- Some policy in place
- Little or no policy in place

*,+,** See Appendix B

Area for improvement

Saskatchewan's grid is one of Canada's worst performing, from a climate perspective, at 780 grams CO_2e per kWh. Given the importance of electrification to Canada's climate goals, Saskatchewan should complement its 50% renewable capacity target by setting dates for the phase-out of coal-fired power in line with those under development in Alberta.

Manitoba

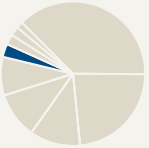
Manitoba is one of Canada's lowest emitting provinces in absolute terms (21.5 Mt) and is in the middle of the pack on a per capita basis (16.8 tonnes per person).

Manitoba's three largest emitting sectors are transportation, agriculture and buildings — 7.8 Mt, 6.6 Mt, and 3 Mt each, representing 36%, 31% and 14% of total emissions in the province. Overall, Manitoba's emissions rose by 4% between 2005 and 2014.

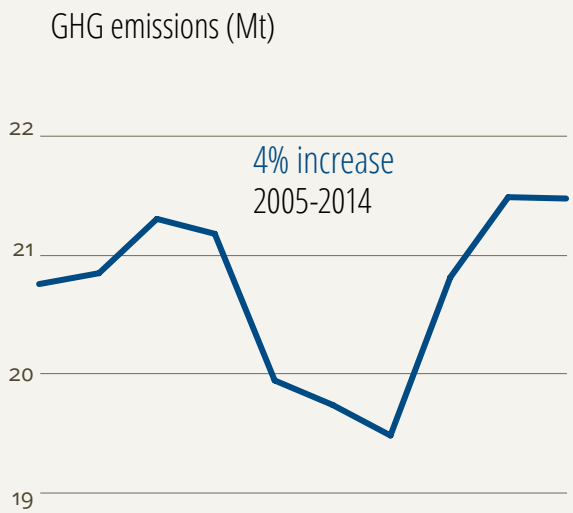
In December 2015, Manitoba released a Green Economy Action Plan with three emissions reductions targets: 33% below 2005 by 2030, 50% below 2005 by 2050, and carbon neutral by 2080.[30]

Since 2009, gasoline sold in Manitoba must contain at least 8.5% ethanol and diesel fuel sold must contain at least 2% biodiesel. On the electricity file, Manitoba has pursued a number of initiatives: in 2012, Manitoba implemented an emissions tax on coal-fired power at a $10 per tonne, which is recycled into the province's Biomass Energy Support Program. Further, a ban on coal and petroleum coke for home heating will be implemented in 2017. Further, Manitoba Hydro's Power Smart demand side management plan[31] has been effective at improving energy conservation outcomes in the province. According to the government's data, Power Smart has resulted in a cumulative 820 MW in electricity savings and 114 million cubic metres in avoided natural gas consumption.[32]

On the buildings file, Manitoba has committed to ensuring all government-funded buildings projects meet LEED Green Building Rating System silver standard or better.[33] However, for commercial and residential buildings, the province has been less forthcoming — Manitoba committed to introducing new energy performance requirements for commercial buildings, but has yet to do so.



Provincial share of GHG emissions 2014
3%



In order for Manitoba to reduce its emissions out to 2030, it must establish programs to reduce reliance on fossil fuels in its transportation sector. The province could advance its previous commitment to implement a cap-and-trade system, linked with Ontario, Quebec, California and soon Mexico — or it could establish an economy-wide carbon tax. Further, Manitoba should consider additional measures to electrify transportation and support mode switching from personal vehicles to transit and active transportation when possible.

Policy category	MB Manitoba
Climate action plan	
Publication date	2015
Emissions reduction target(s)?	✓
Emission trends	
Emissions since 2005	↑
Emissions projections to 2030 *+	↑
Carbon price**	
Marginal price of carbon in 2020	●
Coverage of carbon price in 2020	●
Buildings	
New	●
Existing	●
Transportation	
Passenger / light-duty vehicles	●
Goods movement / heavy-duty vehicles	●
Public transit / active transportation	●
Electricity	
Decarbonizing electricity generation	●
Oil and gas	
Venting, flaring and fugitive methane emissions	●

Legend

- ● Significant policy in place
- ● Some policy in place
- ● Little or no policy in place

*,+,** See Appendix B

Area for improvement

Manitoba is one of Canada's last remaining provinces to implement carbon pricing, despite announcements on numerous occasions that it would implement cap-and-trade. As such, it should join other provinces in establishing a carbon pricing regime designed to support the province in achieving its emissions reduction goals.

Ontario

At 170.2 Mt in 2014, Ontario is Canada's second-largest emitter in absolute terms, but is the third lowest emitting province per capita at just 12.4 tonnes.

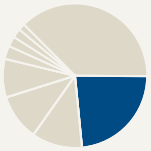
In 2014, Ontario's three largest emitting sectors were transportation, buildings and emissions intensive trade exposed sectors — predominantly iron, steel, chemicals and fertilizers. These three sectors represent 33%, 22% and 18% of the province's total emissions. Overall, Ontario's emissions decreased by 19% from 2005 to 2014.

Ontario introduced the *Green Energy* and *Green Economy Act* in 2009 – legislation applauded by a wide range of stakeholders for laying the groundwork for low carbon economic development in Ontario. Central to the Act is a feed–in tariff program (FIT) designed to provide price certainty to renewable energy developers and encourage more clean electricity supply in the province.

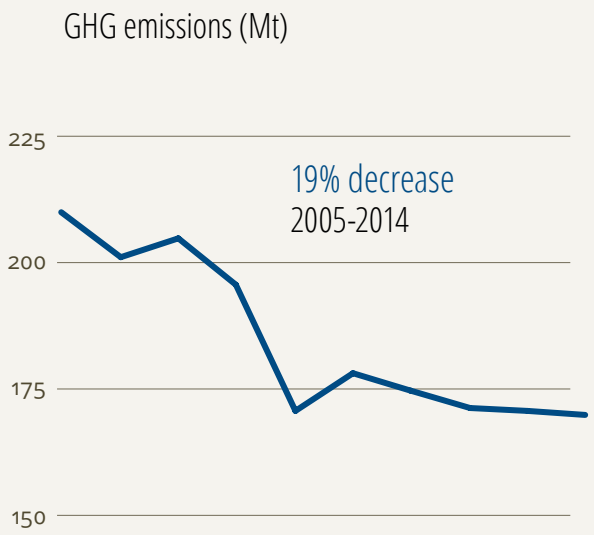
In 2014, Ontario was the first jurisdiction in Canada to phase out and ban coal-fired electricity generation. At peak coal consumption, one-quarter of Ontario's electricity generation came from coal-fired power. It transitioned away from coal in just over 10 years. As a result, Ontario's electricity sector emissions have fallen 86% since 2005, with the coal-fired power phase-out responsible for approximately 34 Mt of reductions.[34]

Building on these successful initiatives, Ontario announced its intention to price carbon through an international carbon market, called the Western Climate Initiative (WCI) in 2015. The WCI program applies a cap to province-wide emissions, which declines in line with the province's own climate change targets. Ontario has three emissions reduction targets, which were enshrined into law in 2016: 15% below 1990 levels by 2020, 37% below 1990 by 2030, and 80% below 1990 levels by 2050.

In addition to its carbon pricing plans, Ontario has committed to reinvest revenues from carbon pricing into further emission reductions and to pursue a host of complementary measures.



Provincial share of GHG emissions 2014
23%



Ontario's Climate Action Plan outlines $8.3 billion worth of spending on incentives and infrastructure between 2016 and 2020, including incentives for electric vehicles and energy efficiency retrofits, and significant expansion of public transportation infrastructure.[35] The plan also details 28 key actions to achieve its climate change goals, including changes to the building code, sales targets for electric and hydrogen vehicle sales, a renewable fuel regulation, and support for community energy planning.

Policy category	ON Ontario
Climate action plan	
Publication date	2016
Emissions reduction target(s)?	✓
Emission trends	
Emissions since 2005	↓
Emissions projections to 2030 *+	↓
Carbon price**	
Marginal price of carbon in 2020	●
Coverage of carbon price in 2020	●
Buildings	
New	●
Existing	●
Transportation	
Passenger / light-duty vehicles	●
Goods movement / heavy-duty vehicles	●
Public transit / active transportation	●
Electricity	
Decarbonizing electricity generation	●
Oil and gas	
Venting, flaring and fugitive methane emissions	●

Legend

- ● Significant policy in place
- ● Some policy in place
- ● Little or no policy in place

*,+,** See Appendix B

Area of excellence

In its climate action plan, Ontario has made major commitments to reduce emissions from commercial and residential buildings. The climate action plan commits to long-term energy efficiency targets for new buildings, low-interest financing for energy efficiency, incentives for retrofits to social housing and apartments, energy labelling and benchmarking and support for skills training and workforce expansion in the low-carbon buildings sector. Taken together, the province has articulated a compelling package of measures to reduce emissions from new and existing buildings — a sector representing 22% of the province's emissions today. Comprehensive buildings policy of this nature is required across Canada to decarbonize and transform the built environment, and to reap the important economic and employment benefits associated with climate action in this sector.

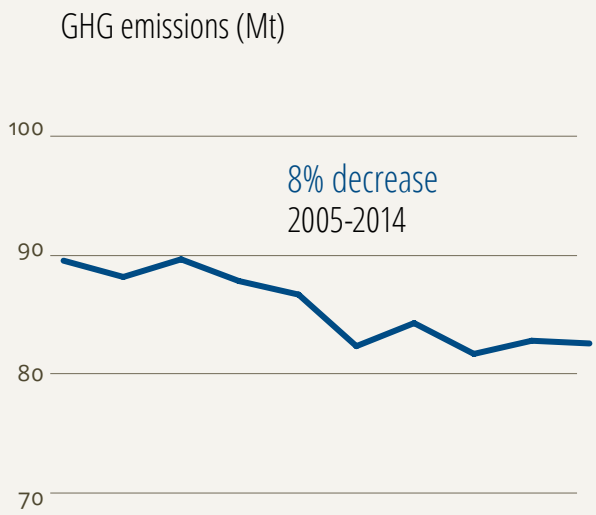
Area for improvement

In 2014, 10% of Ontario's emissions came from freight transport. Ontario's climate action plan outlines early steps to reduce emissions in this sector —including a renewable fuel standard to reduce the carbon intensity of fuels burned in the transportation sector. However, given that emissions from freight are significant, and the challenge this presents to Ontario's overall climate ambitions, the province should release a stand-alone goods movement strategy to map out a climate-friendly future for the sector.

Quebec

Despite being Canada's third-largest emitter in absolute terms (82.7 Mt), Quebec is the lowest emitting province per capita at 10.1 tonnes in 2014.

Provincial share of GHG emissions 2014
11%



Quebec's top three emitting sectors are transportation at 30.9 Mt, emissions intensive trade exposed industries — such as iron, steel and cement production — at 18 Mt, and "waste and other" — a category that includes waste, light manufacturing, construction and forestry — at 10.8 Mt. Taken together, these three sectors represent over 70% of all emissions in Quebec, with each sector representing 37%, 21% and 13% respectively. Overall, Quebec's emissions decreased by 8% from 2005 to 2014.

The Government of Quebec has three of Canada's most ambitious climate targets: 20% below 1990 levels by 2020, 37.5% below 1990 levels by 2030, and 80 to 95% below 1990 by 2050. All but the 2050 target are legislated. In 2012 Quebec achieved its Kyoto Protocol emissions target of 6% below 1990 levels.

Over the last decade, the Government of Quebec has introduced significant new climate change policies. In 2009, Quebec introduced vehicle fuel-efficiency regulations for model years 2010 to 2016, aligned with regulations developed in the state of California. In 2011, the province amended those regulations to harmonize with updated North American commitments. During this time period, Quebec also made significant investments in electric vehicle infrastructure: in 2012, Quebec launched Electric Circuit — a program aimed at increasing the number of 240-volt and 400-volt charging stations across Quebec, and now Ontario.

Expanding on this, Quebec's 2013-2020 Climate Change Action Plan came into force in January 2013, creating Canada's first carbon market, linked with California's cap-and-trade system through a bilateral agreement under the Western Climate Initiative. Expanding on this, Quebec's 2013-2020 Climate Change Action Plan came into force in January 2013, creating Canada's first carbon market, linked with California's cap-and-trade system through a bilateral agreement under the Western Climate Initiative. A key element of Quebec's approach to tackling climate change has been the creation of a Green Fund where money raised through WCI is channeled to be re-invested in various programs to further reduce emissions.[36] For example, two-thirds of revenue from its carbon market go to sustainable transportation measures, including electrification, mode switching and reducing emissions from freight.

Despite its numerous climate commitments, Quebec has made slow progress in key areas of transportation policy – especially public transit. As a result, public transit ridership levels began to decline in 2015. Action in key areas of the transportation sector will remain critical for Quebec to achieve its long-term climate goals. To that end, the province must invest in public transit and accelerate additional transportation measures. For example, the province could adopt a more ambitious ZEV sales target in its proposed legislation, to reach 50% of sales to be electric vehicles by 2030.

Policy category	QC Quebec
Climate action plan	
Publication date	2016
Emissions reduction target(s)?	✓
Emission trends	
Emissions since 2005	↓
Emissions projections to 2030 *+	↓
Carbon price**	
Marginal price of carbon in 2020	●
Coverage of carbon price in 2020	●
Buildings	
New	●
Existing	●
Transportation	
Passenger / light-duty vehicles	●
Goods movement / heavy-duty vehicles	●
Public transit / active transportation	●
Electricity	
Decarbonizing electricity generation	●
Oil and gas	
Venting, flaring and fugitive methane emissions	●

Legend

- ● Significant policy in place
- ● Some policy in place
- ● Little or no policy in place

*,+,** See Appendix B

Area of excellence

In 2015 Quebec released a transportation electrification action plan, for 2015-2020, *Propelling Quebec forward with electricity*. This plan included a commitment to implement a legislative framework for the electrification of transportation, and to promote electric public transit and personal vehicles. More recently, Quebec introduced legislation to set targets for ZEV sales. The Government of Quebec's objective is to ensure 15.5% of vehicles sold are non-polluting or electric by 2025.[37] Given that the transportation sector is Canada's second largest wedge of emissions in absolute terms, policy and legislative strategies like those pursued in Quebec will be an important piece of the decarbonization puzzle.

Area for improvement

Despite its progress on electrification, Quebec has not advanced complementary policies for transportation fuels, such as a renewable fuel requirement or a carbon-intensity based LCFS. Passenger and freight transportation together represent one-third of all emissions in Quebec. As it works to expand electrification options, it should also work to decarbonize transportation fuels by adopting a low-carbon fuel standard and/or renewable fuel requirement like that pursued in B.C.

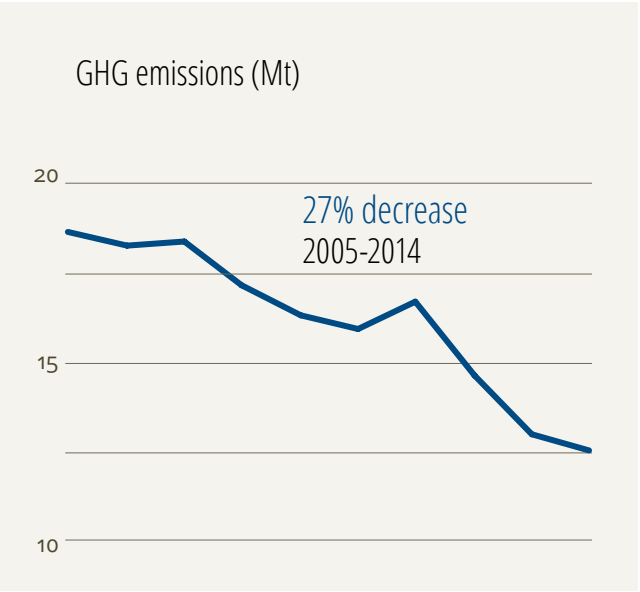
New Brunswick

New Brunswick, through its energy, agriculture, forestry and waste management practices, generated 14.9 Mt of emissions in 2014.

Despite its small size, the province was one of the top five per capita emitters in Canada in 2014 at 19.7 tonnes per person. The three highest emitting sectors are electricity (4.7 Mt), transportation (3.9 Mt), and oil and gas (2.8 Mt), representing 31%, 26%, and 19% of the province's total emissions. Within these categories, New Brunswick has a small number of point source emitters: 31% of electricity emissions come from burning coal, oil, and natural gas to generate electricity at Belledune and Coleson Cove and from plants supplying electricity through power purchase agreements.[38] Oil and gas emissions are primarily generated from Irving Oil's refinery in Saint John.

Overall, New Brunswick's emissions declined by 27% between 2005 and 2014. The province has committed to reduce its greenhouse gas emissions by 10% below 1990 levels by 2020 and 75 to 85% below 2001 levels by 2050. New Brunswick, along with other Atlantic provinces and New England states, agreed to a regional emissions reduction target of 35 to 45% below 1990 levels by 2030. This target implies New Brunswick should aim to lower its emissions to between 9 to 11 Mt by 2030. In 2011, with the release of the provincial *Energy Vision*, and the 2013 *Electricity Act*, New Brunswick committed to a renewable portfolio standard requiring 40% of electricity sales to be sourced from renewable energy by 2020. In 2014, the province also updated its climate change action plan.[39]

NB Power also is moving forward on its commitment to purchase 80 MW of First Nations and community-owned power generated from renewable energy sources as part of the effort to meet the renewable portfolio standard. The utility has a net metering program and is committed to shifting peak load to off-peak hours through technology and Smart Grid (internet) management.



The province needs to ramp up its energy efficiency programming from current modest levels (about half a percent of retail sales a year, compared to 1 to 3% of retail sales for programs in northeastern states of the U.S.) and plan for accelerated phase-out of coal for electricity generation. Further, New Brunswick has yet to make significant progress on its second-largest source of emissions: the transportation sector. New Brunswick should proactively plan for electrification of transportation by articulating a vision for EVs aligned with leading provinces, like Quebec.

Despite a historical lack of policy action coming from the province, New Brunswick has recently begun to chart a new direction. Earlier in 2016 New Brunswick created a legislative select committee on climate change to develop an improved response to climate change from the province. Recommendations from the select committee could inform provincial negotiations with the federal government and lay the foundation for long-term and sustainable job creation. But, in order to reduce emissions in the near term, New Brunswick must make additional efforts: the province should consider implementing economy-wide carbon pricing and an accelerated phase-out of coal-fired power.

Policy category	NB New Brunswick
Climate action plan	
Publication date	2014
Emissions reduction target(s)?	✓
Emission trends	
Emissions since 2005	↓
Emissions projections to 2030 *+	↑
Carbon price**	
Marginal price of carbon in 2020	●
Coverage of carbon price in 2020	●
Buildings	
New	●
Existing	●
Transportation	
Passenger / light-duty vehicles	●
Goods movement / heavy-duty vehicles	●
Public transit / active transportation	●
Electricity	
Decarbonizing electricity generation	●
Oil and gas	
Venting, flaring and fugitive methane emissions	●

Legend

- Significant policy in place
- Some policy in place
- Little or no policy in place

*,+,** See Appendix B

Area for improvement

New Brunswick is one of Canada's last remaining provinces to burn coal for electricity generation. Given the importance of electrification to Canada's climate goals, New Brunswick should complement its 40% renewable generation target by setting dates for the phase-out of coal fired power in line with those under development in Alberta. Further, to ensure a complementary package of climate policies are in place in the province, the province should ramp up its efficiency and renewable energy requirements.

Nova Scotia

Representing 2.3% of Canada's total emissions, Nova Scotia is the largest emitter in Atlantic Canada at 16.6 Mt in 2014.

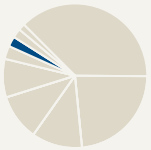
Nova Scotia's top three sources of emissions are the electricity sector (7.3 Mt), transportation (4.3 Mt) and buildings (2.2 Mt) — collectively representing more than 80% of total emissions in the province. Overall, Nova Scotia's emissions decreased by 29% between 2005 and 2014 — the largest decrease of any province over that period.

Nova Scotia has four coal-fired electricity plants, with eight generation units total, representing 60% of the province's total electricity generation and 37.4% of the province's total emissions in 2014. Nova Scotia has the third most carbon-intensive grid in Canada, at 700 grams CO_2e per kWh.

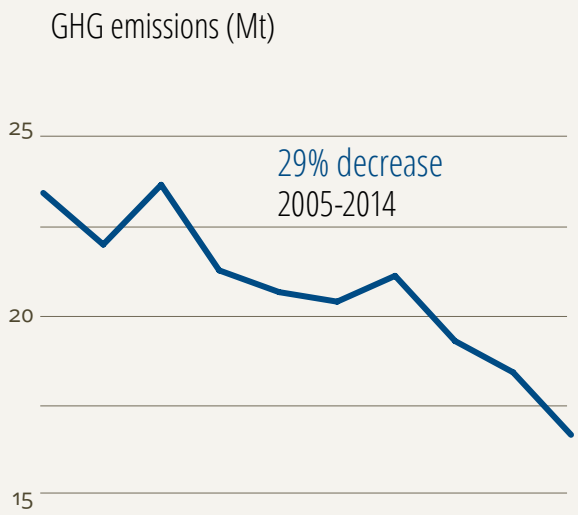
Over the last decade, Nova Scotia has not stood still on climate action: in 2007, it established a declining cap on emissions from its electricity sector — the first of its kind in North America. This cap is 7.5 Mt by 2020 and 4.5 Mt by 2030. Also in 2007, Nova Scotia established a renewable electricity strategy with a target of 25% renewable electricity by 2015 and 40% renewable electricity by 2020. In 2015, Nova Scotia joined New England governors and other Atlantic premiers in adopting regional climate targets of 10% below 1990 levels by 2020 and 35 to 45% below 1990 levels by 2030.

Nova Scotia is a world-renowned leader in energy efficiency programming, with the establishment of North America's first independent efficiency utility, Efficiency Nova Scotia. Its 2009 Climate Change Action Plan commits the province to increase overall energy efficiency by 20% over 2008 levels by 2020.[40]

However, troubling trends are emerging: Nova Scotia's leadership position is threatened due to clawbacks on existing climate programs.



Provincial share
of GHG emissions 2014
2%



For example, in 2011/2012, the province established a Community Feed-in Tariff (COMFIT) for renewable energy projects owned by First Nations, municipalities, universities, non-profits and co-operatives — the first of its kind in Canada. This program was a great success, with over 200 MW of COMFIT projects awarded. However, the program was abruptly discontinued in August 2015.

But, in order for the province to continue to reap the benefits of the transition to a low-carbon economy, we encourage it to design and implement climate policies that will reduce emissions in its transportation and electricity sectors. Specifically, Nova Scotia should consider implementing economy-wide carbon pricing and an accelerated phase-out of coal-fired power to 2030 or a 40 year end-of-life. Further, Nova Scotia can build on past success by updating its climate and renewable energy targets to ensure its policies continue to align with long-term decarbonization.

Policy category	NS Nova Scotia
Climate action plan	
Publication date	2009
Emissions reduction target(s)?	✓
Emission trends	
Emissions since 2005	↓
Emissions projections to 2030 *+	↑
Carbon price**	
Marginal price of carbon in 2020	●
Coverage of carbon price in 2020	●
Buildings	
New	●
Existing	●
Transportation	
Passenger / light-duty vehicles	●
Goods movement / heavy-duty vehicles	●
Public transit / active transportation	●
Electricity	
Decarbonizing electricity generation	●
Oil and gas	
Venting, flaring and fugitive methane emissions	●

Legend

- ● Significant policy in place
- ● Some policy in place
- ● Little or no policy in place

*,+,** See Appendix B

Area of excellence

Efficiency Nova Scotia was created in 2009 with a mandate to support better use of energy across Nova Scotia. The organization is independent from the provincial government and from the utility, Nova Scotia Power. To date, Efficiency NS has been successful in achieving its mandate: according to the government's own data, between 2008 and 2013 energy efficiency initiatives reduced annual electricity load in Nova Scotia by 604 GWh or just over 5%. Energy efficiency is essential to climate action across Canada — and the unique model of Efficiency NS merits broader consideration.

Area for improvement

Nova Scotia is one of Canada's last remaining provinces to implement carbon pricing. In order to continue its emissions reductions trends, particularly in growing segments like transportation, it should join other provinces in adopting an economy-wide carbon price with a predictable schedule for price increases.

Prince Edward Island

Prince Edward Island is Canada's smallest emitting province in absolute terms, at just 1.8 Mt of carbon pollution in 2014.

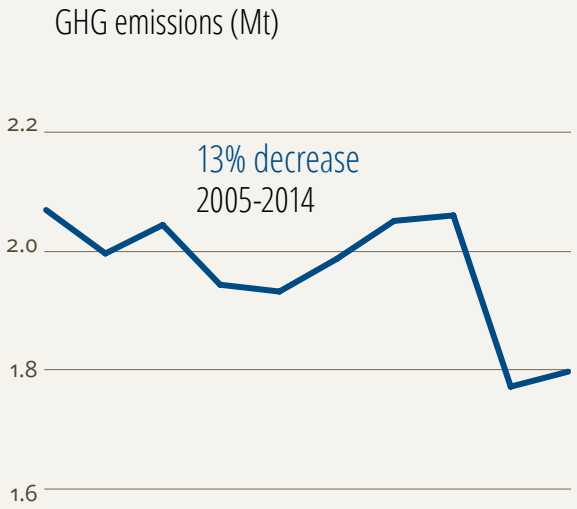
Despite this, its per capita emissions are comparable to Ontario's at 12.3 tonnes per person. P.E.I.'s largest source of emissions is its transportation sector, at 0.8 Mt, more than 40% of total emissions. Of these transportation emissions, more than 60% are generated by personal vehicles and 25% are generated by heavy-duty freight transportation. P.E.I.'s second and third largest emitting sectors are buildings and agriculture, each representing 0.4 Mt or 22% of total emissions.

Like other Atlantic provinces, P.E.I. has committed to the climate targets outlined in the resolution of New England governors and Atlantic Canadian premiers. Those targets are 10% below 1990 levels by 2020, 35–45% below 1990 levels by 2030, and 75–85% below 2001 levels by 2050.

In 2008, P.E.I. released a provincial climate change strategy that identified a need to improve its buildings, energy efficiency, renewables and transportation policy.[41] Despite this recognition, the province has been slow to implement policy in many of its key emitting sectors.

In terms of renewable energy deployment, P.E.I. has made important progress. The province is a national leader in wind energy development — in light of its strategic wind energy potential, it introduced the Island Wind Energy Strategy in 2008. As of 2015, P.E.I. has a total peak electrical load of over 240 MW and the Island's seven wind facilities have a combined generating capacity of 203 MW.[42] Despite this renewable energy capacity, P.E.I. relies heavily on imported nuclear and oil-fired electricity and capacity coming from New Brunswick.

Provincial share of GHG emissions 2014
<1%



Policy category	PE Prince Edward Island
Climate action plan	
Publication date	2008
Emissions reduction target(s)?	✓
Emission trends	
Emissions since 2005	↓
Emissions projections to 2030 *+	↑
Carbon price**	
Marginal price of carbon in 2020	●
Coverage of carbon price in 2020	●
Buildings	
New	●
Existing	●
Transportation	
Passenger / light-duty vehicles	●
Goods movement / heavy-duty vehicles	●
Public transit / active transportation	●
Electricity	
Decarbonizing electricity generation	●
Oil and gas	
Venting, flaring and fugitive methane emissions	

Legend

- ● Significant policy in place
- ● Some policy in place
- ● Little or no policy in place

*,+,** See Appendix B

Area for improvement

Prince Edward Island is one of Canada's last remaining provinces to implement carbon pricing. In order to reduce emissions in key sectors, including transportation and buildings, it should join other provinces in adopting an economy-wide carbon price with a predictable schedule for price increases.

Newfoundland and Labrador

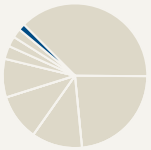
Newfoundland and Labrador represents 2% of Canada's total emissions, at 10.6 Mt in 2014.

It's Canada's second-smallest emitting province in absolute terms, but the country's third highest emitter per capita. Newfoundland and Labrador's three largest emitting sectors are transportation (3.5 Mt), oil and gas (2.7 Mt) and electricity (1.2 Mt) representing 33%, 25% and 11% of total emissions respectively. Overall, Newfoundland and Labrador's emissions rose by 4% between 2005 and 2014.

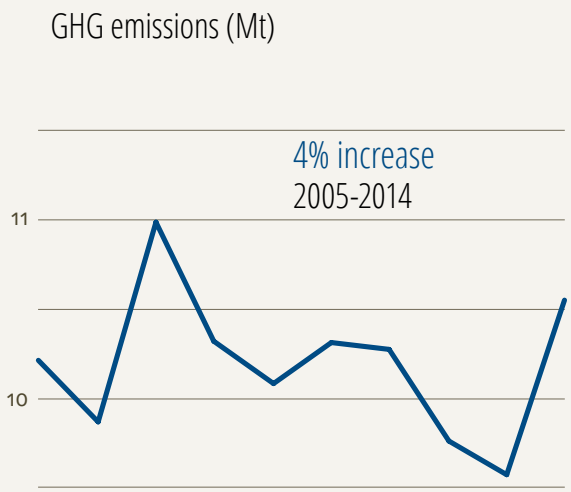
Like other Atlantic provinces, Newfoundland and Labrador has committed to the climate targets outlined in the resolution of New England governors and Atlantic Canadian premiers. Those targets are 10% below 1990 levels by 2020, 35–45% below 1990 levels by 2030, and 75–85% below 2001 levels by 2050.

In 2005, Newfoundland and Labrador released its first climate change action plan. This plan focused on research, education and outreach on climate change mitigation and adaptation — but resulted in limited policy progress in these areas. The government updated this plan in 2011, and at that time outlined specific actions to be pursued in the areas of residential energy efficiency, government procurement, and large industrial emitters. For example, the 2011 plan committed to developing a climate target for Newfoundland's EITE sector.

In June 2016, the province introduced Bill 34: *Management of Greenhouse Gas Act* — a legislative framework that requires emissions monitoring across the sector and creates a greenhouse gas reduction fund to be re-invested into clean technology opportunities in the province. Despite its commitment to do so in 2012, this legislation did not establish emissions reductions targets for large industry.



Provincial share of GHG emissions 2014
2%



In other sectors, such as electricity and buildings, Newfoundland has made some progress. The 2011 Energy Efficiency Action Plan established an energy conservation target of 20% below business-as-usual by 2020. To support this goal, the province's 2011 budget allocated $12 million over three years to support its existing residential energy efficiency program. Building on this, in 2015 the provincial utilities, Newfoundland and Labrador Hydro and Newfoundland Power, launched a net-metering program that allows for individuals to generate electricity from renewable sources for their own consumption.

Building on its 2011 climate change action plan, Newfoundland has recently announced plans to introduce an updated strategy. Consultation on this strategy concluded in September 2016, and further details have yet to be announced.

Policy category	NL Newfoundland & Labrador
Climate action plan	
Publication date	2011
Emissions reduction target(s)?	✓
Emission trends	
Emissions since 2005	↑
Emissions projections to 2030 *+	↑
Carbon price**	
Marginal price of carbon in 2020	●
Coverage of carbon price in 2020	●
Buildings	
New	●
Existing	●
Transportation	
Passenger / light-duty vehicles	●
Goods movement / heavy-duty vehicles	●
Public transit / active transportation	●
Electricity	
Decarbonizing electricity generation	●
Oil and gas	
Venting, flaring and fugitive methane emissions	●

Legend

- Significant policy in place
- Some policy in place
- Little or no policy in place

*,+,** See Appendix B

Area for improvement

Newfoundland and Labrador is one of Canada's last remaining provinces to implement carbon pricing. In order to reduce emissions in key sectors, including large industry and trasnportation, it should join other provinces in adopting an economy-wide carbon price with a predictable schedule for price increases.

Territories

Yukon, Nunavut, the Northwest Territories

Canada's three territories are in a unique position compared to much of the rest of Canada: the effects of climate change are already being felt in the North, and therefore climate adaptation and resiliency factor significantly into their climate planning.

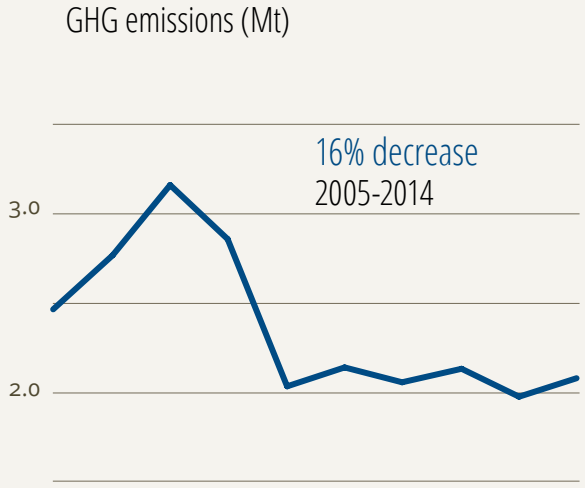
Further, compared to the provinces, the territories have a relatively low emissions profile. Due to this, territorial governments have a focus on adaptation measures, alongside mitigation efforts.[43]

In 2011, the governments of Nunavut, Yukon, and the Northwest Territories released a pan-territorial adaptation strategy that outlines strategies to address climate change effects, including thawing permafrost and threats to food security.[44] In the same year, the territorial governments released a renewable energy inventory, recognizing the need to decrease reliance on fossil fuels and to increase focus on energy efficiency and investment in renewables.[45] Continuing these efforts, the Northwest Territories and Yukon governments are part of a pan-Canadian taskforce, announced July 2015, to reduce the use of diesel in remote communities.[46]

The territories have also released individual climate strategies or emissions targets. For example, the Yukon government is tracking progress on emission reductions targets for black carbon and methane, transportation and decarbonizing government operations.[47] The Northwest Territories government has introduced rebates for energy efficiency upgrades,[48] as well as running energy efficiency programs with the Arctic Energy Alliance for businesses and homes.[49]

As noted in the Pembina Institute's submission to the Vancouver declaration working groups, phasing out diesel in remote communities should be a key priority of the first ministers. Of the 292 remote communities in Canada, 257 are not connected to any provincial or territorial electrical grids and have their own microgrid networks (predominately run by large diesel-powered generators).[50] These communities collectively consume more than 90 million litres of diesel fuel every year. Phasing out reliance on diesel for electricity generation offers the opportunity to improve energy resilience, such as avoiding new load restrictions and electricity brownouts.

Territorial share of GHG emissions 2014
<1%



Area for improvement

Continued work is needed to increase renewables in remote communities. A recent study from the University of Waterloo demonstrates that the feasibility and economic benefits of wind and solar projects for communities in the north, with support from municipal government officials in Nunavut, are better than fossil alternatives.[51] In the near future, there should be increased federal investments in renewable projects in the north. Through the pan-Canadian climate plan, the federal government should increase investments in renewable projects in the North, to support the transition away from fossil fuel forms of electricity generation.

Recommendations

What Canada needs now is a race to the front of the pack on climate action. All provinces and territories can and should do more to reduce their emissions and align their economic and environmental policies with the ambition outlined in the Paris Agreement. To meet or exceed Canada's 2030 emissions reduction goal, the first ministers must address existing gaps in the country's climate policy landscape, and should seek to build on the success of programs and policies already established by federal, provincial, territorial, Indigenous and local governments. To that end, specific policies and strategies, as outlined below and in the Institute's submission to the federal government's online climate change portal, build on existing success and merit consideration for broader implementation.

1. Accelerate Canada's coal-fired power phase-out to 2030

In order for Canada to secure significant emissions reduction benefits from the eventual electrification of the economy — including in buildings, transportation, and industry — it must also eliminate unabated coal-fired electricity on the grid. To that end, we recommend that the federal government require zero-emitting electricity supply by 2050, with a schedule for decreasing proportion of emitting sources of electricity between now and 2050. Further, the federal government should join provincial trends (Ontario, Alberta) and commit to an accelerated phase-out schedule for Canada's remaining coal-fired electricity, in Saskatchewan, New Brunswick and Nova Scotia. More specifically, the government should incrementally claw back the end-of-life of coal plants in a measured fashion down to 40 years, with no later than a 2030 end-date for unabated coal power. This schedule should account for regional electricity supply. With the significant advancement of renewable energy and energy storage technologies, the adoption of an increasing carbon price over time, and the deployment of grid integration investments, Canada should secure non-emitting generation as the predominant replacement for coal production. In our view, this should be a cornerstone element of a federal climate plan.

2. Enhance policy support for clean energy development

As of 2014, five provinces had renewable energy targets, clean energy standards, or renewable portfolio standards in place.[52] In 2015, Alberta and Saskatchewan joined these efforts, with aims to increase renewable energy in electricity generation to 30% and 50% by 2030, respectively. Progress is being made on renewable energy deployment across Canada, but more must be done in order for Canada to secure significant emissions reduction benefits from the eventual electrification of the economy — including in buildings, transportation, and industry. To that end, we believe the federal government has a role to play in facilitating the creation and implementation of a pan-Canadian electrification strategy. A pan-Canadian electrification strategy should build on successful provincial efforts to transform their electricity systems. This strategy should promote resilient electricity systems, fuelled by renewable energy, capable of reducing carbon pollution from transportation, buildings, and industrial processes, while also reducing risk to Canadians from polluting facilities. Done right, this electrification pathway offers important job creation potential and will help build healthy and resilient communities across the country.

3. Decarbonize fuels and expand low-carbon transportation options

Reducing carbon pollution from the transportation sector must be a central component of a credible pan-Canadian climate plan. We recommend the first ministers take a combined approach that addresses direct emissions from personal vehicles and lays the groundwork to reduce overall demand for fossil fuel transportation options.

First, the federal government should implement a national renewable and low-carbon fuel standard for all transportation fuels sold in Canada. Recent data from Clean Energy Canada found that existing renewable fuel requirements and low carbon fuel standards reduced annual carbon pollution by 4.3 Mt — equivalent to taking one million cars off of Canada's roads.[53] In order to build on mitigation opportunities in this sector, a federal LCFS should be increasingly stringent to ensure it provides a clear signal to fuel producers and vehicle manufacturers for their investments and technology development pathways. To that end, the national LCFS should have a framework that supports a 10% decrease in carbon intensity over 2010 levels by 2020 and a 20% decrease by 2030. Further, a national LCFS should be based on life cycle environmental impact assessments that have a carefully defined boundary and encompass all steps from upstream production to final consumption.

Second, the federal government should introduce zero-emissions vehicle legislation to increase ZEV penetration in the personal transportation market. Starting with models manufactured in Canada in 2018, federal legislation could require that a certain percentage of major vehicle manufacturers' sales have zero or near-zero tailpipe emissions, for example 10% of sales by 2020, 22.5% of sales by 2025, and 30% of sales by 2030.[54] The target should have predictable and consistent increases to provide the auto industry with long-term policy stability.

4. Transform Canada's buildings sector

In order for Canada to achieve its 2030 climate target and its longer-term decarbonization goals, it must significantly reduce emissions of existing buildings and ensure that new buildings are ultra low carbon. A national plan should set the stage for deep energy retrofits (energy reductions of 25 to 50%) of 30% of the building stock by 2030, and for all new construction to be nearly zero energy within the next 10 to 15 years. In our view, a national building sector efficiency strategy is Canada's opportunity to drive down emissions from buildings while also growing the economy. A thoughtful national strategy will spur collaboration between industry and government, reward early adopters, and attract the private capital necessary to transform the sector. To achieve these climate and job creation benefits, we recommend the federal government move forward on three key actions: improve energy efficiency standards for new and existing buildings; improve energy efficiency standards for the appliances and equipment used in buildings; and set mid- and short-term targets to guide private and public investments in training and R&D. To ensure the market is ready to deliver these high performance components and services, the federal government should remove barriers to private investment by ensuring energy efficiency information is available through home energy labelling and building benchmarking requirements, and by designing new financing mechanisms to unlock long-term investments in building energy efficiency. Further, because provinces have jurisdiction to adopt building codes, the first ministers should commit to releasing a national building code roadmap and retrofit strategy. Access to federal incentives and financing programs could be made conditional to subnational commitments to these roadmaps.

5. Ensure effective national carbon pricing strategies

Carbon pricing can stimulate innovation and reduce emissions economy-wide. Specifically, we think that all jurisdictions in Canada should adopt a carbon pricing system that applies to all sources of carbon pollution that can be accurately measured, with a schedule of rate increases and/or emissions decline that extends for 10 years. In our view, the schedule should begin — at the latest — in 2018. Further, we recommend a schedule that ramps up quickly, or an emissions cap that ramps down quickly, since such a system would increase the likelihood of Canada achieving its climate targets, and would allow other complementary policies to achieve further emissions reductions.

Planning for climate success

Examining the role of infrastructure in the pan-Canadian climate plan

Through its Low Carbon Economy Fund and ongoing green infrastructure spending, the federal government can unlock additional mitigation opportunities in the provinces and territories by investing in infrastructure that supports decarbonization. Importantly, Budget 2016 outlined the following mandate for the $2 billion Low Carbon Economy Fund:

> The Fund will support provincial and territorial actions that materially reduce greenhouse gas emissions and are incremental to current plans, and achieve significant reductions within the period of Canada's nationally determined target. Resources will be allocated towards those projects that yield the greatest absolute greenhouse gas reductions for the lowest cost per tonne.[55]

In our view, these federal investments should align and support provincial and municipal visions for the electrification of transportation, buildings and industrial processes, and reducing overall demand for fossil fuel products. In a recent report on Canada's electricity system,[56] we suggest the federal government establish funding criteria that would include the following principles:

- Integrate funding decisions with federal-provincial agreements aimed to secure long-term low-carbon electrification
- Support projects that maximize renewable energy supply
- Incorporate a life cycle environment and economic assessment into infrastrucuture investment decisions
- Consider a project's societal carbon cost through a formalized "climate test" for infrastructure investments
- Ensure governments are approving the best available technology solutions, with plans to improve performance over time, to support Canada's decarbonization process
- Invest in projects that advance a jurisdiction's climate resilience and adaptation goals.

In Budget 2016, the federal government outlined two phases of infrastructure investments: Phase I, aimed at supporting near-term investments ($3.4 billion to the Public Transit Infrastructure Fund, and $518 million to climate change mitigation and adaptation infrastructure). Building on this, Phase II investments will "go hand in hand with the transition to a low-carbon economy" and will be strategic and visionary in nature.[57] While we support this in principle, we recommend the federal government couch these investments in a larger decarbonization strategy in order to ensure investments are optimized across sectors and jurisdictions. We look forward to the federal government offering additional details and criteria for these investments before Budget 2017.

Creating strong, long-term accountability structures to assess climate progress

Through the Paris Agreement, the international community has recognized that existing climate plans are insufficient to achieve the temperature limits outlined in the agreement.[58] At home and abroad, successful climate action requires continuous review, evaluation and improvement. We urge the first ministers to design and implement a method of stocktaking for the pan-Canadian climate framework, to ensure commitments made this year are strengthened and improved upon with time. Further, we urge the first ministers to link the pan-Canadian climate process directly to the long-term low greenhouse gas strategy: since the Paris Agreement calls for carbon neutrality by mid-century, the prime minister and premiers should ensure the federal–provincial–territorial discussions align with and support the development of a collective strategy to achieve that end. Within this process, Canada should commit to increasing its climate ambition beyond its existing 2030 target, in line with the Paris Agreement requirements for developed nations.

Conclusion

The Paris Agreement, which Canada proudly supports, calls for immediate and ambitious emissions reductions policies from developed countries like ours. In order for Canada to be credible on climate change, both at home and abroad, it must build a coherent policy framework that ensures the country will, at a minimum, meet its 2030 climate change goal. Doing so will likely require all jurisdictions to put a price on carbon, and for the federal government to establish regulations for key sectors to improve their climate performance.

The federal government must demonstrate a coherent plan to meet or exceed its 2030 target, be it through additional federal actions or a combination of federal, provincial and territorial commitments.

In our view, the federal government, provinces and territories have an incredible opportunity to work together to establish policies and programs that allow the country to meet or exceed its existing climate target, and that lay the foundation for more ambitious emissions reductions by 2050. However, even in the absence of a strong national consensus on the best path forward to reduce emissions across the economy, the point remains: the federal government must demonstrate a coherent plan to meet or exceed its 2030 target, be it through additional federal actions or a combination of federal, provincial and territorial commitments.

At the next first ministers meeting, we expect Prime Minister Trudeau and the premiers to announce new or strengthened policies in key sectors — including buildings, transportation, electricity and oil and gas — to lay the foundation for long-term climate success. Done right, strong climate action at the federal, provincial and territorial levels can secure Canada's required emissions reductions and support its transition to a low-carbon economy. Global data is clear: we are in a clean growth century, and the economic wins associated with clean energy and technology development will only grow with time. Climate change mitigation presents an opportunity for Canada to reorient its economy to be competitive in the long-run. To achieve these economic goals, Canada's governments must accelerate climate policy progress and invest in infrastructure that supports long-term decarbonization. We look forward to ambitious commitments at the first ministers meeting aligned with a prosperous, low-carbon future for Canada.

Appendix A: Methodology

Notes on methodology and assumptions

Summary

Areas of excellence: Areas of excellence were determined based on the policy's potential to scale nationally and, in doing so, make a material impact towards the country's 2030 target.

Areas for improvement: Areas for improvement were determined by cross-referencing a jurisdiction's top three emitting sectors against its existing climate policies. If provinces do not have carbon pricing systems or climate policies to reduce the impact of its top three emitting sectors, those were recommended.

Methodology for evaluation: For each sector we establish criteria, including policies, investments, and strategies that, when taken together, would constitute best-in-class action for that sector. We then evaluate a jurisdiction's progress in that sector by measuring their degree of compliance with this set of criteria.

The evaluations presented herein represents our assessment of provincial policies in place or in development as of September 2016. Any errors or omissions are the responsibility of the authors. We will return to this work next year to measure national and sub-national policy progress coming out of the pan-Canadian climate framework, and we hope to develop a more detailed methodology at that time.

Data presented in this annex is drawn from the 2016 National Inventory Report, Annex 12: Provincial/Territorial Greenhouse Gas Emission Tables by Canadian Economic Sector, 1990–2014.

Carbon pricing

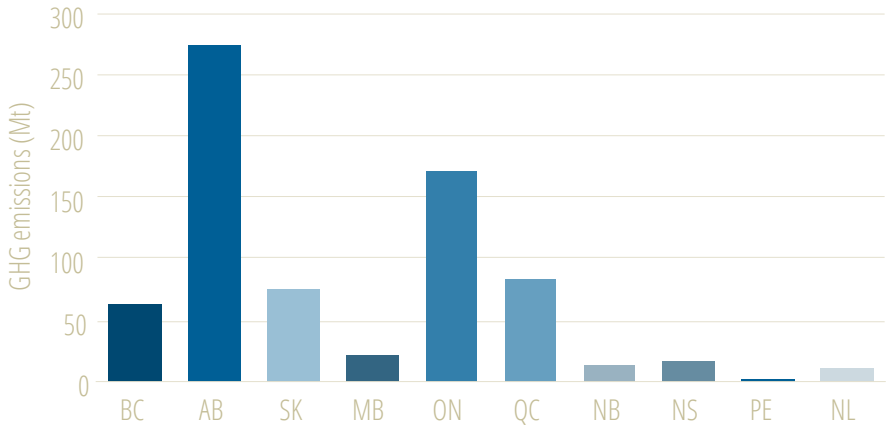


Figure 7: Total emissions by province in 2014

Scope of evaluation:

Marginal price of carbon

- Projected marginal carbon price in 2020

Price above $50 CAD

Price $15 to $49 CAD

Price below $15 or no system in place

Coverage of carbon pricing system

- Projected coverage of carbon pricing system in 2020

Greater than 75% coverage

Between 50 to 75% coverage

Less than 50% coverage or no system in place

Transportation

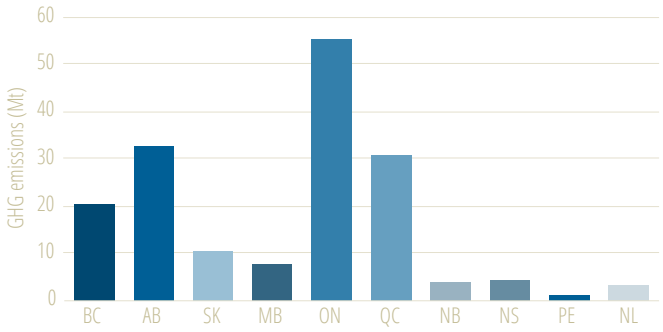


Figure 8: Transportation sector emissions by province in 2014, (Mt)

Scope of evaluation

Public transit and active transportation

- Province has a regional transit strategy ★
- Province has a regional active transportation strategy[59]
- Province has dedicated funds (including alternative revenue-generating tools or taxes) for identified transit expansion projects
- There is adequate funding for operations and maintenance to make transit reliable and efficient
- Province has established, or is proposing, land-use planning tools that enable municipalities to encourage transit-supportive density and intensification
- Province has committed funding for infrastructure to support active transportation

Passenger and light-duty vehicles

- Province has a low-carbon fuel standard (LCFS) to reduce pollution from fuel for passenger/light-duty vehicles ★
- **or** has a zero emissions vehicle (ZEV) mandate (or equivalent other policies to encourage ZEV purchases) or signed on to the ZEV Alliance ★
- Province has committed funding for infrastructure of charging stations
- Province has, or is proposing to introduce, changes to building codes for houses and commercial space requiring charging station hook-up
- Province provides incentives to purchase electric vehicles (e.g. rebates, recycling or scrappage programs, etc.)
- Government fleets are electric or utilize lower carbon fuels

Goods movement and heavy-duty vehicles (HDV)

- Province has introduced, or is planning, a LCFS (note: this applies to fuels for passenger, light-, medium- and heavy-duty vehicles) ★
- Province has established a non-greenhouse gas based goods movement strategy
- Province has stablished a goods movement or low-carbon transportation strategy to reduce GHG emissions from the freight sector
- Province has committed funding for infrastructure or research to support low-carbon fueling stations
- Province has incentives for commercial fleet upgrades to low-carbon vehicles (e.g. a recycling or scrappage program for old HDVs, rebates for new HDVs)
- Province has incentives for, or education on cost savings of, efficiency technologies for trucking such as side and tail skirting, anti-idling, low rolling resistance tires or driver training.

Policies to support active transportation for city-level assessment of five cities across Canada can be found in *Cycle Cities* (Pembina Institute, 2015).

- All of the above in place or in development
- At least 50% of criteria achieved
- No starred items and less than 50% of criteria achieved

Buildings

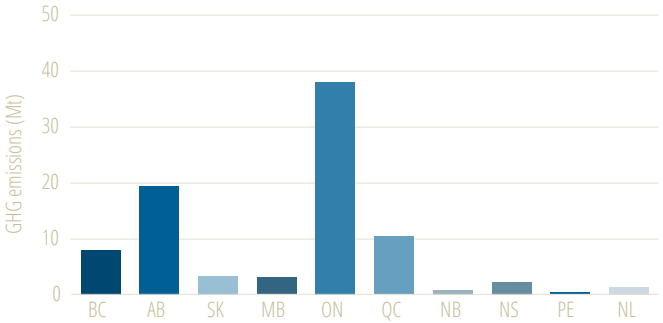


Figure 9: Buildings sector emissions by province in 2014, (Mt)

Scope of evaluation

New buildings

- Province has adopted latest National Energy Code for Buildings / National Building Code, or better[60] ★
- Province has a 'lead by example' policy for new public buildings ★
- Province has a clear target for performance for new buildings
- Province provides incentives and/or training support to accelerate market transformation for high performance new construction

● All of the above in place or in development

● At least the starred items

● Missing one or more starred items

Existing buildings

- Province has a taxpayer- or ratepayer-funded incentive program for energy upgrades in residential and commercial buildings
- Province has, or is developing, financing mechanisms to support energy efficiency upgrades
- Province leads by example with a comprehensive renovation program for existing public buildings
- Province has a retrofit strategy with measurable targets
- Province has, or is developing, an annual benchmarking and reporting requirement, with a plan towards public disclosure of energy performance
- Province has, or is developing, an home energy labeling policy at time of sale and/or renovation

● All of the above in place or in development

● At least half of the above in place or in development

● Less than half of the above

Electricity

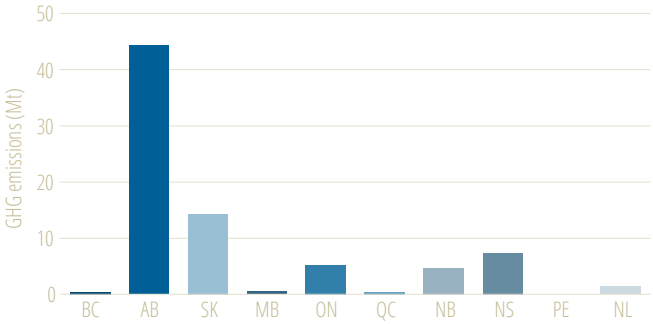


Figure 10: Electricity sector emissions by province in 2014, (Mt)

Scope of evaluation

Decarbonizing electricity generation

- Province has established a ban on coal-fired generation, and accelerated phase-out beyond existing federal performance standards, or has no current or planned coal-fired units ★
- Province has a renewable energy target, renewable portfolio standard regulations, pricing incentives for renewable generation and/or pre-existing decarbonized electricity supply

- All of the above in place or in development
- At least starred item
- No starred items

Oil and Gas

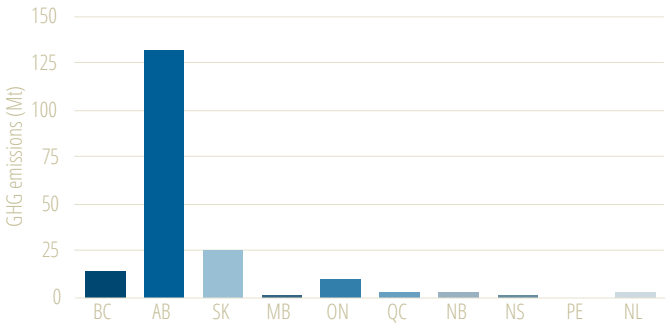


Figure 11: Oil and gas sector emissions by province in 2014, (Mt)

Scope of evaluation

Venting, flaring and fugitive methane emissions

- Province has committed to a target of 45% reduction by 2025 for new and existing sources of emissions ★
- Province has regulations to that effect in place or in development ★
- Province has incentives and/or programs for accelerated replacement of existing equipment
- Province has allocated resources to better measurement of oil and gas methane emissions

All of the above in place or in development

At least the starred items achieved ★

One or more starred items missing

Appendix B: Progress report summary

Policy category	BC British Columbia	AB Alberta	SK Saskatchewan	MB Manitoba	ON Ontario	QC Quebec	NB New Brunswick	PE Prince Edward Island	NS Nova Scotia	NL Newfoundland & Labrador
Climate action plan										
Publication date	2016	2016	N/A	2015	2016	2016	2014	2008	2009	2011
Emissions reduction target(s)?	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓
Emission trends										
Emissions since 2005	↓	↑	↑	↑	↓	↓	↓	↓	↓	↑
Emissions projections to 2030 *+	↑	↓	↑	↑	↓	↓	↑	↑	↑	↑
Carbon price**										
Marginal price of carbon in 2020	●	●	●	●	●	●	●	●	●	●
Coverage of carbon price in 2020	●	●	●	●	●	●	●	●	●	●
Buildings										
New	●	●	●	●	●	●	●	●	●	●
Existing	●	●	●	●	●	●	●	●	●	●
Transportation										
Passenger / light-duty vehicles	●	●	●	●	●	●	●	●	●	●
Goods movement / heavy-duty vehicles	●	●	●	●	●	●	●	●	●	●
Public transit / active transportation	●	●	●	●	●	●	●	●	●	●
Electricity										
Decarbonizing electricity generation	●	●	●	●	●	●	●	●	●	●
Oil and gas										
Venting, flaring and fugitive methane emissions	●	●	●	●	●	●	●		●	●

* Dave Sawyer and Chris Bataille, Still Minding the Gap An Assessment of Canada's Greenhouse Gas Reduction Obligations (Deep Decarbonization Pathways Project, 2016). http://climateactionnetwork-28bo.kxcdn.com/wp-content/uploads/2016/04/Still-Minding-the-Gap-V10.1-1.pdf

+ Sawyer and Bataille (2016) aggregates emissions data for Atlantic Canada. According to this source, emissions will increase for Atlantic Canada over this period. However, this aggregate trend may not reflect individual provincial trends.

**Ecofiscal comparing carbon pricing programs: http://ecofiscal.ca/wp-content/uploads/2016/07/Ecofiscal-Commission-Comparing-Stringency-Carbon-Pricing-Report-July-2016.pdf

Legend ● Significant policy in place ● Some policy in place ● Little or no policy in place

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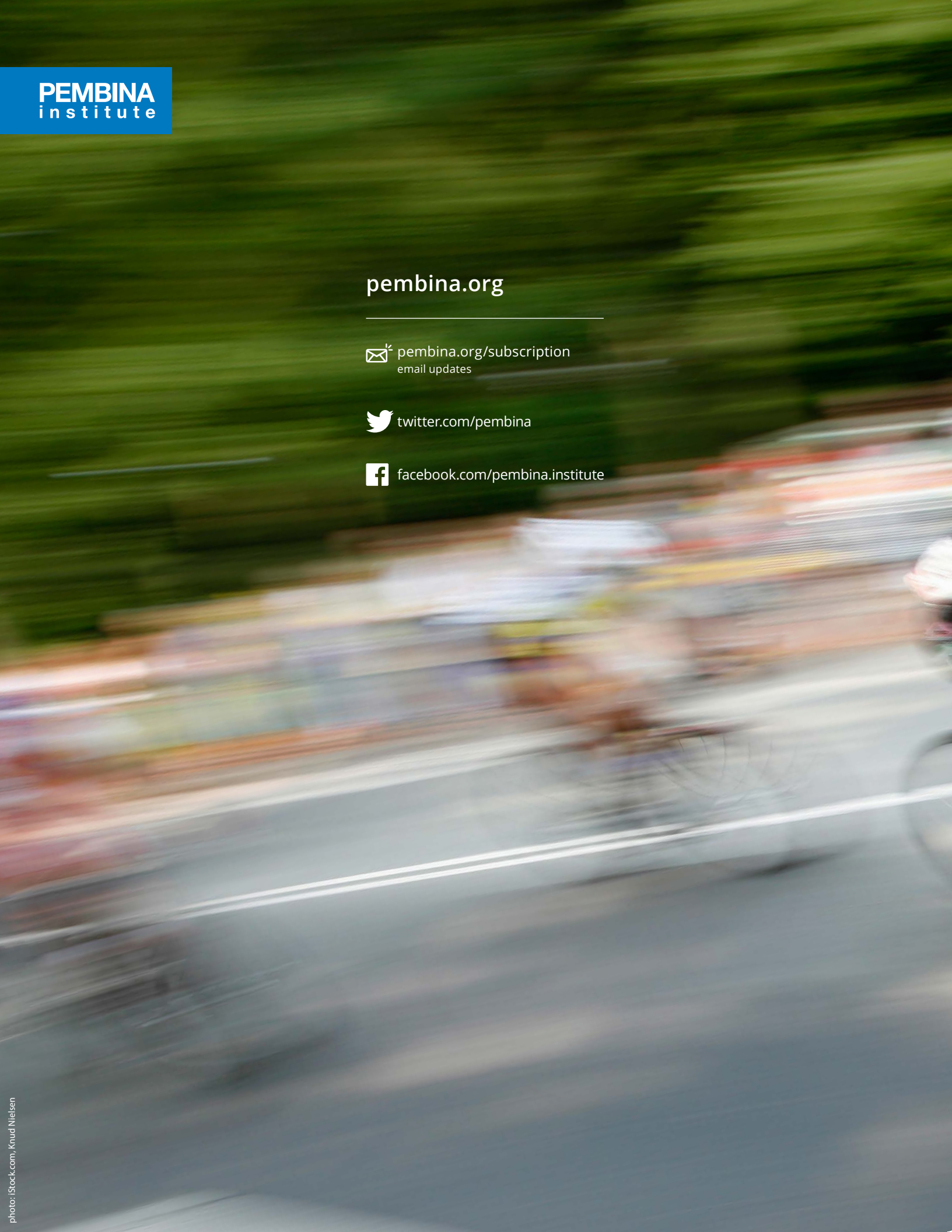

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