PEMBINA institute

Building a Pan-Canadian Climate Plan

Policy options to meet or exceed Canada's 2030 emissions target

Pembina Institute submission to the federal-provincial-territorial climate change working groups

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The Pembina Institute welcomes the opportunity to share with the Government of Canada its views on a credible approach to tackling climate change for the country. Below, we provide details on an overall carbon pricing approach and specific recommendations for key sectors in the Canadian emissions inventory, including transportation, buildings, electricity, oil and gas, and government decision-making.

Background

Policy development context

In December 2015, more than 190 nations adopted the Paris Agreement — a legally binding international agreement that aims to limit long-term global temperature rise to well below 2 degrees Celsius above pre-industrial levels.[1] The Paris Agreement expressly demonstrates a near-global consensus on the urgent need to transition to a low-carbon economy. Building on the success of COP21, 175 nations signed the Paris Agreement on its opening day at the UN headquarters in New York City on April 22.[2] That these nations came together to re-affirm the Agreement at the UN demonstrates global political will never before seen on this issue. Canada, for its part, signed the Paris Agreement on opening day and has committed to ratifying the Agreement in the fall of 2016.[3]

In March 2015, prior to the Paris conference, the Government of Canada submitted its Intended Nationally Determined Contribution (INDC) to the United Nations Framework Convention on Climate Change (UNFCCC).[4] Canada's INDC commits the country to an economy-wide greenhouse gas reduction goal of 30 per cent below 2005 levels by 2030. Nearly one year later, in March 2016, Prime Minister Trudeau and Canada's provincial and territorial premiers met in Vancouver to discuss climate change mitigation and economic development strategies to promote clean growth of the economy — a meeting that culminated in the Vancouver Declaration on Clean Growth and Climate Change.[5]

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

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[1] UNFCCC, *Adoption Of The Paris Agreement*, FCCC/CP/2015/L.9/Rev.1, December 12, 2015. https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf

[2] UN Sustainable Development, "List of Parties that signed the Paris Agreement on 22 April." http://www.un.org/sustainabledevelopment/blog/2016/04/parisagreementsingatures/

[3] Margo McDiarmid, "Catherine McKenna praises Alberta, says Leap Manifesto 'not helpful'," CBC News, April 21, 2016. http://www.cbc.ca/news/politics/mckenna-ndp-leap-manifesto-1.3545955

[4] Government of Canada, *Canada'S INDC Submission to the UNFCCC* (2015). http://www4.unfccc.int/submissions/INDC/Published%20Documents/Canada/1/INDC%20-%20Canada%20-%20English.pdf

[5] Canadian Intergovernmental Conference Secretariat, "Vancouver Declaration on clean growth and climate change," March 3, 2016. http://www.scics.gc.ca/english/conferences.asp?a=viewdocument&id=2401

international climate obligations. Specifically, 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".[6] 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.

State of Canada's greenhouse gas emissions reductions policies

Undoubtedly, Canada has made significant climate policy progress over the last year. Unfortunately, this progress comes after many years of policy inaction, both at the provincial and federal levels. At present, Canada is not on track to achieve its 2020 emissions reduction goal under the Copenhagen Accord, nor its 2030 INDC. Canada's 2016 National Inventory report shows that Canada's emissions totalled 732 Mt in 2014 — only 2 per cent below 2005 levels of 747 Mt, and an increase of 20 per cent above 1990 levels.[7] Using the 2030 INDC as a floor, not a ceiling on ambition, Canada's emissions will be at most 524 Mt by 2030.

Canada's second biennial report on climate change, submitted to the UNFCCC in April, takes stock of federal, provincial and territorial climate commitments up to September 2015, and details Canada's progress towards its 2020 and 2030 goals. According to their estimates, Canada's emissions are likely to be 768 Mt in 2020 and 815 Mt in 2030.[8] Taken relative to Canada's maximum inventory size of 524 Mt in 2030, the biennial report indicates that the emissions gap in 2030 could be as much as 291 Mt in 2030 — more than four times the size of emissions currently produced in the oilsands (68 Mt in 2014). It's clear from this data that, even with all federal, provincial and territorial policies in place as of September 2015, significantly greater effort is required to achieve Canada's climate goals.

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[6] Canadian Intergovernmental Conference Secretariat, "Vancouver Declaration on clean growth and climate change," March 3, 2016. http://www.scics.gc.ca/english/conferences.asp?a=viewdocument&id=2401

[7] Environment and Climate Change Canada, *National Inventory Report 1990-2014: Greenhouse Gas Sources and Sinks in Canada* (2016) Part 1. http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php

[8] Environment and Climate Change Canada, *Canada's Second Biennial Report on Climate Change,* Section 5: Projections. https://www.ec.gc.ca/GES-GHG/default.asp?lang=En&n=02D095CB-1#BR-Sec5

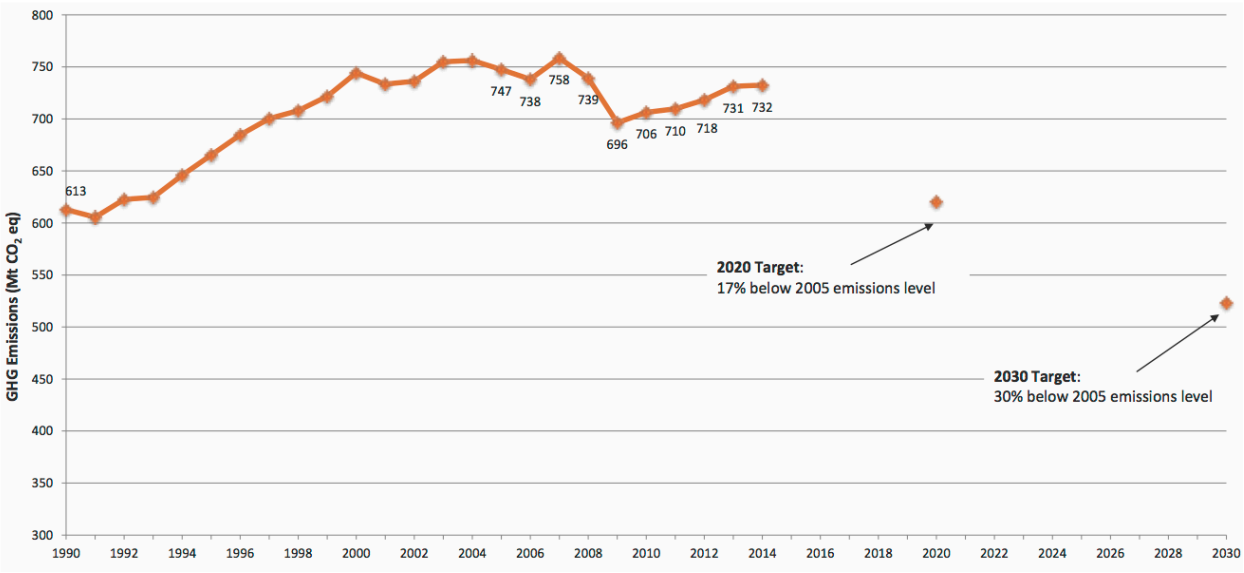

Figure 1: National emissions trends, 1990 to 2014

Source: Environment and Climate Change Canada [9]

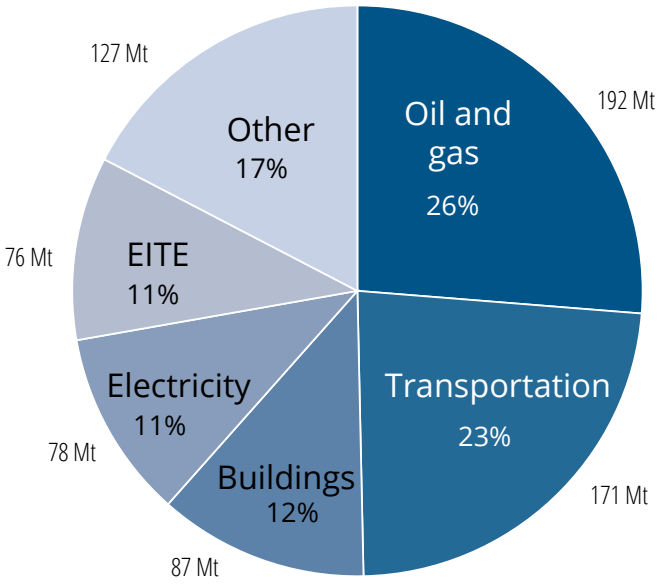

Figure 2 - Canadian emissions by economic sector, 2014

EITE: Emissions Intensive Trade Exposed sectors— excludes oil, gas and coal activities. Other: Agriculture, waste, construction, forestry, coal production and light manufacturing.

Data source: [10]

[9] *2016 NIR*, Part 1, Figure 2-1, 39.

[10] *2016 NIR*, Part 1, Table S-3, 23.

More recently, research demonstrates that Canada's emissions gap in 2030 is slightly smaller than official government estimates.[11] After September 2015, a significant number of new climate policies were announced that were not taken into account in the biennial report. These policies include Alberta's Climate Leadership Plan, Ontario's cap-and-trade regulation, Saskatchewan's 50 per cent 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.[12] Accordingly, based on the modeler's expert judgment, these policies could reduce emissions to 709 Mt in 2030, leaving a gap of 185 Mt in 2030.[13] While these estimates provide a more up-to-date assessment on the efficacy of existing and developing climate policies across Canada, the point remains: even with all national and sub-national climate efforts to date, Canada must bring in new ambitious new policies and/or significantly increase the stringency of existing programs, to close the gap to 2030.

[11] 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-28b0.kxcdn.com/wp-content/uploads/2016/04/Still-Minding-the-Gap-V10.1-1.pdf

[12] Ibid., 4.

[13] Ibid., Figure 3.

An ambitious policy package to achieve Canada's 2030 goal

With this context established, the Pembina Institute recommends the federal government, in cooperation with the provinces and territories, promptly introduce new legislation, regulations and policies to reduce greenhouse gas emissions across all sectors of the economy.

Summary of policy recommendations

1. Develop and implement a national price on carbon
2. Accelerate the phase-out of coal-fired electricity
3. Support deployment of renewables in Northern and remote communities
4. Accelerate the expansion of low-carbon transportation options
5. Transform Canada's existing buildings and require new buildings to be ultra-low carbon
6. Implement national methane reduction regulations for the oil and gas sector
7. Align government decision making with climate science

These recommendations are further described in the sections below.

1. Develop and implement a national price on carbon

The Pembina Institute is supportive of the federal government's commitment to ensure there is a carbon price floor across Canada. We recognize that it is a challenging policy to move forward at a national level, in particular because of the mix of carbon pricing systems already in place provincially that in the case of Quebec (and soon to be Ontario) are linked with California as part of a larger international carbon market.

Finding a way to overcome these challenges and follow through on the federal government's commitment to price carbon will stimulate innovation and reduce emissions economy-wide, and is likely to increase carbon pricing alignment and coordination across the country. However, in recognition of those challenges we are presenting two options that we think have the potential to succeed. We have developed these options with the following five principles in mind:

1. **Carbon pricing stringency should increase across Canada.** While the provincial carbon pricing systems in place have been important examples of climate leadership, they all need to become stronger in order to provide an incentive that is sufficient to support Canada meeting or exceeding its 2030 climate target. Specifically, we think that the outcome of the federal carbon pricing process should be carbon prices in all provinces that, by 2018, are increasing above current schedules or projections.
2. **Revenue generated from any federal carbon pricing mechanism should be recycled to the province from which the revenue originated.** For example, if the federal government collected $1 billion from sources in Quebec, then $1 billion would be recycled to Quebec. This could be accomplished through direct investment in the relevant province (e.g. clean infrastructure), financial transfers to the province, or federally administered programs to support low-income households or emissions-intensive, trade exposed sectors.
3. **The gaps in stringency between provincial carbon pricing systems should be reduced.** While the existing gaps in carbon pricing systems (currently up to $30 per tonne) don't impose significant economic costs, they represent a barrier to

continued policy progress. Aligning carbon pricing stringency across the country also offers some economic benefit to the country.[14]

4. **Carbon pricing should not adversely impact low-income households**. At a minimum, Canada's climate policy should avoid exacerbating issues of equity and poverty in Canada, and ideally it could help ameliorate them. All three of Canada's current carbon pricing systems are using different approaches to show how this is possible.
5. **The economic competiveness of Canada's emissions-intensive, trade-exposed sectors should be maintained as carbon pricing stringency increases.** Whatever approaches are used to maintain competiveness, they should: preserve (and ideally strengthen) the incentive to reduce carbon pollution, only be used if a sector can demonstrate material competiveness challenges because of the carbon price, and be developed in a transparent and consistent manner.[15]

Option 1: A federal carbon tax with support for provincial carbon pricing leadership

In this option, the federal government would implement a carbon tax that is applied equally across the country. The rate of that federal tax would effectively become the national floor that would be added to the prices that already exist through provincial systems.[16] The revenue from the carbon tax would be recycled to the provinces from which it originated, and be used for the range of options articulated in principle 2.

To acknowledge the leadership of provinces that have carbon pricing systems in place, the federal government would provide additional financial support for climate change solutions. This financial support would encourage provinces to maintain systems already in place, and it would encourage the provinces without carbon pricing systems to adopt them, and as a result narrow the gap between carbon pricing systems. More work would be needed to determine the appropriate scale of federal government

[14] Canada's Ecofiscal Commission (2015). The Way Forward. Accessed at http://ecofiscal.ca/wayforward/.

[15] For further discussion on emissions-intensive, trade-exposed sectors, see the B.C. Climate Leadership Team recommendations (https://engage.gov.bc.ca/climateleadership/files/2015/11/CLT-recommendations-to-government_Final.pdf) and Provincial Carbon Pricing and Competiveness Pressures by Canada's Ecofiscal Commission (http://ecofiscal.ca/reports/provincial-carbon-pricing-competitiveness-pressures/).

[16] A potential exception would be in cap-and-trade jurisdictions if the market price begins to exceed the price floor. In this scenario, the additional carbon tax could cause the market price to drop as low as back to the floor. If the carbon price in cap-and-trade jurisdictions continues to sit at the price floor as projected in the near term, then the federal carbon tax would be additive as it would in B.C. and Alberta where the provinces have adopted carbon taxes.

support and whether or not it would need to be indexed to the stringency of provincial carbon pricing systems in some way.

Option 2: A federal carbon tax with an option for provinces to adopt equivalent systems

In this option, the federal government would establish a schedule of carbon prices and implement a carbon tax in line with that schedule. They would also provide an option for provinces and territories to opt-out of the federal tax if they could demonstrate a provincial system with a price and coverage that are equal to or higher than the federal system. Assessing equivalency for provinces using carbon taxes would be straightforward given the simplicity of those policies. The task would be more challenging for cap-and-trade provinces, and we would recommend basing the equivalency test for price on the auction price for allowances for a given period.

Provinces and territories would presumably take the equivalency option because it would give them complete control of revenue decisions. As a result, marginal carbon prices would be in alignment across the country, and mechanisms would likely continue to differ for at least the medium term.

If the systems are administered by the provinces and territories through equivalency agreements, the revenue would stay in the provinces from which it originated and the federal government would not have direct control over how that revenue was used. Alternatively, if a province or territory chose not to adopt an equivalent carbon pricing system, the federal government would collect the revenue and recycle it to the relevant jurisdiction as per option 1.

Rate schedule and coverage

For either option, the carbon price should apply to all sources of carbon pollution that can be accurately measured with a schedule of rate increases that extends for 10 years. In our view, the price schedule should begin – at the latest – in 2018. In the case of option 1, the price schedule could start as early as 2017 because provinces wouldn't need time to establish equivalent carbon prices.

We recommend a price schedule that ramps up quickly, as such a system would increase the likelihood of Canada achieving its climate targets, and would allow other complementary policies to achieve more emissions reductions. For both option 1 and 2 described above, the price schedule should increase by $10 per tonne per year. An annual increase of this magnitude would align with the schedule recommended by B.C.'s Climate Leadership Team, the first increase in Alberta's new carbon tax, and

several modelling exercises that have evaluated policy options to achieving various climate targets in Canada.[17,18,19,20]

For option 1, we recommend a federal carbon tax that begins at $10 per tonne as early as 2017, and increases by $10 per tonne per year. For option 2, we recommend a federal price schedule that begins at $40 per tonne in 2018, and that increases by $10 per tonne per year thereafter.

If first ministers' instead choose a price schedule that slowly ramps up (e.g. $5 per tonne per year, as employed in the first phase of B.C.'s carbon tax), then the overall climate plan will need to rely more heavily on federal and provincial regulations, and provincial carbon prices that exceed the federal schedule.

Combining options

While we have presented the two options in this paper separately, they are not mutually exclusive. A national system for carbon pricing could include a federal carbon tax that goes up to a specified level, with a schedule above that where the provinces could choose to implement equivalent systems instead.

[17] BC Climate Leadership Team, *Recommendations to Government,* (2015). https://engage.gov.bc.ca/climateleadership/files/2015/11/CLT-recommendations-to-government_Final.pdf

[18] Pembina Institute and David Suzuki Foundation. *Climate leadership, economic prosperity,* (2009). https://www.pembina.org/pub/1909

[19] NRTEE, *Achieving 2050: A carbon pricing policy for Canada,* (2009). http://nrt-trn.ca/wp-content/uploads/2011/08/carbon-pricing-tech-backgrounder-eng.pdf

[20] OECD, *Environmental Outlook to 2050,* Climate Change chapter (2015). http://www.oecd.org/env/cc/49082173.pdf

2. Accelerate the phase-out of coal-fired electricity

Canada's electricity sector represents just over 85 Mt, approximately 12 per cent of Canada's overall emissions in 2014 (732 Mt).[21] Coal represents over 70 per cent of these electricity emissions, at around 61 Mt, while only providing around 10 per cent of our electricity.[22] Coal plants are highly concentrated in a small number of locations across the country: half of Canada's top-10 GHG emitters are coal plants and Canada's 14 coal plants emit around one-quarter of GHG emissions from Canada's approximately 560 reporting facilities.[23]

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 first eliminate unabated coal-fired electricity on the grid. The Deep Decarbonization Pathway Project (DDPP), an initiative of the United Nations Sustainable Development Solutions Network, identifies the decarbonization of electricity as one of six key components of an overall emissions reduction package consistent with limiting atmospheric warming to 2 degrees C. They note that, in 2050, "low-emitting electricity captures a much larger share of total energy use across the entire economy and provides a low-cost fuel-switching path for currently fossil fuel-based end uses."[24]

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 and commit to an accelerated phase-out schedule for Canada's coal-fired electricity. 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. The schedule must account for regional

[21] NIR 2016, Part 3, Table A13-1

[22] Ibid.

[23] Environment Canada, Reported Facility Greenhouse Gas Data: Downloadable Emissions Data, http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=8044859A-1

[24] http://deepdecarbonization.org/wp-content/uploads/2015/09/DDPP_CAN.pdf, 4.

electricity supply.

Table 1 shows a possible schedule in line with fair treatment for different ages of plants given the economic and policy realities in mind at the time of their investment, modeled closely on the schedule that can be instituted in Alberta without compensation for these privately owned facilities.

Table 1. Proposed timeline for phasing out Canada's unabated coal-fired electricity units

Unit Name	Prov.	Year commissioned	Capacity (MW)	End of economic life	Allowed life (CEPA regs.)	Proposed end-of-life	Proposed life
Battle River 3	AB	1969	150	2019	50	2016	47
Trenton 5	NS	1969	154	2019	50	<2019	50
Boundary Dam 4	SK	1970	139	2019	49	<2019	49
Sundance 1	AB	1970	280	2019	49	2017	47
HR Milner 1	AB	1972	150	2019	47	2016	44
Point Tupper 1	NS	1973	154	2019	46	2019	46
Boundary Dam 5	SK	1973	139	2019	46	2019	46
Sundance 2	AB	1973	280	2019	46	2017	44
Battle River 4	AB	1975	150	2025	50	2016	41
Sundance 3	AB	1976	407	2026	50	2020	44
Sundance 4	AB	1977	392	2027	50	2020	43
Sundance 5	AB	1978	392	2028	50	2020	42
Boundary Dam 6	SK	1978	284	2028	50	2020	42
Lingan 1	NS	1979	155	2029	50	2020	41
Sundance 6	AB	1980	392	2029	49	2020	40
Lingan 2	NS	1980	155	2029	49	2020	40
Poplar River 2	SK	1980	291	2029	49	2020	40
Battle River 5	AB	1981	370	2029	48	2021	40
Keephills 1	AB	1983	406	2029	46	2023	40
Keephills 2	AB	1983	406	2029	46	2023	40
Lingan 3	NS	1983	155	2029	46	2023	40
Poplar River 1	SK	1983	291	2029	46	2023	40

Lingan 4	NS	1984	155	2029	45	2024	40
Sheerness 1	AB	1986	380	2036	50	2026	40
Genesee 1	AB	1989	410	2039	50	2029	40
Sheerness 2	AB	1990	380	2040	50	2026	36
Trenton 6	NS	1991	154	2041	50	2030	39
Shand 1	SK	1992	276	2042	50	2030	38
Belledune 1	NB	1993	458	2043	50	2030	37
Genesee 2	AB	1994	410	2044	50	2029	35
Point Aconi 1	NS	1994	171	2044	50	2030	36
Genesee 3	AB	2005	495	2055	50	2030	25
Keephills 3	AB	2011	495	2061	50	2030	19

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 can secure non-emitting generation as the predominant replacement for coal production. At Alberta's rate of replacement (two-thirds replacement with renewables[25]), a national phase-out would reduce emissions by approximately 40 Mt relative to current emissions.

In November 2015 we were pleased to learn that Minister McKenna was evaluating options for an accelerated national coal phase-out.[26] To implement this accelerated phase-out, the environment minister needs only to strengthen the existing Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations issued under the *Canadian Environmental Protection Act* (CEPA) — a federal authority that is already being exercised for this purpose. The accelerated phase-out is simply a strengthening of these regulations, which were originally drafted with a 45-year phase-out before being weakened to allow up to 50 years of unabated coal emissions. Improving the existing regulatory regime has two advantages:

1. It already allows for coal to continue if coal plants physically meet an emissions performance standard based on "good-as-gas". This standard needs to improve, because the emissions intensity of gas (375 tonnes per GWh or less) is now lower

[25] Alberta Government, Climate Leadership: Ending coal pollution, http://www.alberta.ca/climate-coal-electricity.cfm

[26] Government of Canada, "Minister McKenna pleased to see Alberta taking leadership on climate," news release, November 22, 2015. http://news.gc.ca/web/article-en.do?nid=1021789

than the 420 tonnes per GWh permitted in the existing regulations, but this does permit coal to continue with CCS deployment, should CCS become economic within the timeframe. However, the hope that CCS for coal power will become economic — a hope that has been clearly dashed over the last decade — cannot allow unabated coal to continue beyond the above schedule.

2. The CEPA regime allows for equivalency agreements with provinces that can meet the same GHG reductions through other policy approaches. This can allow for greater flexibility in jurisdictions that have unique circumstances; such as Nova Scotia with its relatively small system, heavy extant reliance on coal power and absence of existing natural gas infrastructure.

Co-benefits to an accelerated coal-fired electricity phase-out schedule

In addition to climate change, air pollution is another federal government priority that can be addressed with a coal phase-out. Environment and Climate Change Minister Catherine McKenna's mandate letter includes the directive to "work with provinces and territories to set stronger air quality standards, monitor emissions, and provide incentives for investments that lead to cleaner air and healthier communities." Regionally, coal plants are dominant polluters: they are the three largest GHG emitters and mercury emitters in Saskatchewan and top the lists of worst emitters in Nova Scotia, New Brunswick, and Alberta for a number of pollutants and GHGs. In fact, over the first 20 years of even the relatively weak existing federal regulations on coal-fired GHGs, Canada will avoid 900 premature deaths, 800 emergency room visits, 120,000 asthma episodes and 2,700,000 smog days.[27] Accelerating the end-of-life dates for coal units will commensurately improve these outcomes much further. Our extrapolation using the schedule in 1 indicates that Alberta, for example, could more than double the benefits in avoided health impacts. Nationally, this is likely around another 1,000 deaths avoided.[28]

[27] Environment Canada, *Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations: Regulatory Impact Analysis Statement* (2012).

[28] The RIAS, referenced in footnote 23, provides an assessment of the health impacts avoided by the advanced closure of coal units under the federal regulations. The extrapolation calculated a "health impact factor" based on the number of avoided health impacts per reduction of coal-fired electricity (in GWh), then applied this factor to the larger amount of reductions in coal-fired GWh that is generated by the above schedule.

With GHGs and air pollution combined, the externalities of coal combustion are absolutely unmatched — they can be an order of magnitude higher than other common energy sources. Fortunately, because we have readily available, competitively priced, alternative technologies for producing electricity, the best means for reducing both types of emissions are perfectly aligned: shut down coal combustion or require stringent GHG and air pollution performance standards (if the necessary controls can prove economic).[29] The economics of coal are also clear: when accounting for full costs, including those borne by society, coal is not competitive. Thus, the pace of coal plant closures increasingly defines leadership on this critical climate issue. Scheduled closures also supply clearer investment signals for replacement generation.

Clear deadlines for phasing out conventional coal will prove very persuasive for international recognition of Canada's climate action. The international community increasingly recognizes the imperative to stop burning our highest-emitting fossil fuel to avoid wasting unnecessary emissions under a constrained global carbon budget — particularly in developed countries.[30] Countries are lining up to join a global move away from coal. The U.K. announced a phase-out of unabated coal-fired electricity by 2025, leaders in Germany and Italy have expressed similar interest, and coal is falling state-by-state south of our border. We have already seen that this action is spurred by international common cause and a mutual race-to-the-top, inspired by leading jurisdictions, including Ontario and now Alberta. These two provinces are already demonstrating leadership and paving the way for national action.

[29] In fact, under federal BLIERs, the federal government already has the authority and impetus to impose pollution control reductions on Canada's coal plants. Consideration has already been given to applying BLIERs reduction controls at plant mid-life. Under an accelerated phase-out schedule, it would be possible to exempt units from the mid-life BLIERs, where they are scheduled to close within 10 years after their mid-life trigger date, thus saving the units from the cost of these necessary controls.

[30] Kiri Hanks and Julie-Anne Richards, *Let Them Eat Coal* (Oxfam, 2015); E3G, "G7 climate agreement means coal phase out actions required" (2015). http://www.e3g.org/news/media-room/g7-climate-agreement-means-coal-phase-out-actions-required

3. Support deployment of renewables in remote communities

It is critical that opportunities for remote, Indigenous and northern communities to be full participants – and reap long-term benefits – of Canada's climate action are at the heart of the first ministers' climate strategy. Through the pan-Canadian climate plan, the federal government has an opportunity to work in partnership with Indigenous peoples as they shift away from reliance on fossil fuels and towards energy systems that harness the power of the sun, wind, water and earth. Accelerating climate solutions in Indigenous communities offers the opportunity to not only improve energy resilience — such as avoiding new load restrictions and electricity brownouts — but also can help improve the health and wellness of Indigenous peoples in the long-run.

Many remote Indigenous communities are in need of support to help phase out diesel-powered energy systems. 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).[31] These communities collectively consume more than 90 million litres of diesel fuel every year, producing greenhouse gases that directly contribute to climate change. This approach to generating heat and power creates local air pollution, including particulate matter, and can contaminate soil and water during transportation and storage if spills occur.

Phasing out legacy diesel systems and supporting renewable energy systems could present important benefits to Indigenous communities, through the creation of new employment, skills development, business and entrepreneurship opportunities. Further, well-designed replacement systems are likely to be more affordable – which can translate into opportunities for government to inject capital into other sectors of the economy, including housing, health, and education. Concrete federal activities to support the transition away from diesel-powered energy systems include:

[31] Government of Canada. *Status of Remote / Off-grid Communities in Canada*, (2011) https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/canmetenergy/files/pubs/2013-118_en.pdf

1. **Removing downstream federal diesel fuel subsidies** that obscure the true cost of diesel systems, and re-allocating funds to support renewable energy projects. Continuing to subsidize downstream fossil fuels and electricity disadvantages renewable energy options, and costs the federal government millions of dollars every year.
2. **Introducing power procurement programs and incentives** that can be used by Indigenous businesses to attract capital and secure investment in clean energy projects. Incentives could be added to electricity produced from renewable energy systems ($ per kWh). A federal procurement program could work with provincial and territorial governments and utilities to develop power purchase contracts at fair prices that go *beyond* current standard avoided diesel costs. At present, many remote power purchase contracts are based upon an "avoided diesel" calculation, and do not reflect the true cost financial, social and environmental costs of diesel systems.
3. **Increasing capital investment and infrastructure investment** for clean energy technologies through green bonds that carve out explicit support for remote renewable energy systems.
4. **Deepen the financial capacity** of INAC to support community energy planning, local capacity building and detailed feasibility studies and business plans for Indigenous-owned renewable energy systems.
5. **Evaluate the direct and indirect socio-economic benefits** to Indigenous communities from the transition away from legacy diesel systems. Renewable energy systems, a type of community infrastructure that could be owned and controlled by communities, can offer positive returns on investment by local indigenous businesses and communities as a whole. The direct and indirect social and community benefits that this self-ownership of local renewable energy systems brings are considerable.
6. **Support existing provincial efforts** under the Pan-Canadian Task Force focused on offering alternatives to existing diesel infrastructure.[32]

[32] Government of Ontario, "Provincial & Territorial Ministers Working Together to Reduce Use of Diesel for Electricity in Remote Communities" news release, July 21, 2015. https://news.ontario.ca/mei/en/2015/07/provincial-territorial-ministers-working-together-to-reduce-use-of-diesel-for-electricity-in-remote.html

4. Support the expansion of low-carbon transportation options

At 171 Mt in 2014, transportation remains the second largest source of carbon pollution in Canada.[33] Since 2005, the transportation sector has hovered between 22 to 24 per cent of Canada's total emissions inventory. The majority of transport emissions are related to road transportation: despite improved vehicle efficiency, carbon pollution from the sector has remained stagnant since 2005.[34] As depicted in Table 2 below, 86 per cent of carbon pollution from the transportation sector comes from road transportation and off-road vehicles (gasoline and diesel).[35]

Table 2. GHG Emissions from transportation by Canadian Economic Sector

Transportation Mode	Emissions in 2014 (Mt)	Per cent by mode (%)[36]
Passenger transport	**95**	**56**
• Cars, trucks and motorcycles	86	50
• Bus, rail and domestic aviation	9	5
Freight transport	**68**	**40**
• Heavy duty trucks, rail	62	36
• Domestic Aviation and Marine	6	4
Other: recreational, commercial and residential	**9**	**5**
Total transportation	**171**	**23**

In order to address the largest sources of emissions from the transportation sector, the Pembina Institute recommends the first ministers take a combined approach that addresses direct emissions from vehicles, and lays the groundwork to reduce overall demand for fossil-fuel transportation options. This approach should include commitments to the following:

1. Develop a national land freight strategy,
2. Increase the share of zero-emission vehicles (ZEVs) sold in Canada,

[33] 2016 NIR, Part 3, Table A10-1

[34] 2016 NIR, Part 1, page 21.

[35] 2016 NIR, Part 1, Table 2-3.

[36] Percentages may not add up due to rounding.

3. Increase investment in active transportation and establish a national benchmarking report in major cities across Canada, and
4. Introduce a national Low Carbon Fuel Standard.

1. Develop and implement a national land freight strategy

Heavy-duty trucking is the fastest growing sub-sector of transportation emissions, and is projected to become the largest emitting segment of transportation globally by 2040.[37] In Canada, between 1990 and 2014, freight accounted for 32 MT of the total 55 MT increase in emissions from the transport sector.[38] In order to address emissions from light and heavy freight, the Institute recommends that a national land freight strategy be developed that:

1. **Requires greenhouse gas emissions standards and fuel efficiency standards** for medium- and heavy-duty engines and vehicles for post-2018 models. These standards should align with the U.S. EPA proposed Phase 2 standards.[39]
2. **Improves the efficiency of existing transportation systems**. This could include promoting the consolidation of regional business deliveries, better management of trucks and truck loads, and reducing vehicle kilometers travelled (VKT). Further, there is a clear role for the federal government in supporting technologies that improve fuel-efficiency and lower carbon emissions of medium- and heavy-haul vehicles. The federal government should consider introducing similar programs to the U.S. EPA's SmartWay program (designed to reduce GHG emissions and air pollution created by freight transportation in corporate supply chains)[40] and the Department of Energy's SuperTruck program – a public private partnership which promotes research and development to advance fuel efficiency through a competition to design and develop tractor-trailers that are 50 per cent more efficient than 2010 baseline models by 2015. [41]
3. **Promotes fuel switching from fossil fuels** (primarily diesel for medium and heavy-duty vehicles) to lower carbon alternatives such as liquid natural gas,

[37] Pollution Probe, Pathways Initiative Workshop report, http://www.pollutionprobe.org/pathways-workshop/

[38] NIR, Part 1, page 43.

[39] US EPA, https://www3.epa.gov/otaq/climate/regs-heavy-duty.htm

[40] U.S. EPA, https://www3.epa.gov/smartway/about/index.htm

[41] U.S. Office of Energy Efficiency and Renewable Energy, http://energy.gov/eere/vehicles/articles/supertruck-team-achieves-115-freight-efficiency-improvement-class-8-long-haul

compressed natural gas, biofuels and/or hydrogen. The federal government can introduce Low Carbon Fuel Standard regulations, can work with provinces and territories to support the build out of low-emission fuelling stations, and can dedicate R&D funding to help overcome barriers to these lower carbon alternatives.

4. **Promotes mode shifting from truck to rail.** According to the American Railway Association, trains on average are four times more fuel efficiently than trucks and reduce traffic congestion and lower greenhouse gas emissions by as much as 75 per cent.[42] As part of the shift from truck to rail, the federal government should also explore the opportunity to expand intermodal terminals and hubs across Canada. Given Canada's large land mass, intermodal options to move freight via ocean freight containers can lead to reduction in emissions since much of the freight can be moved by rail or lake/ocean carriers.[43]
5. **Provides incentives for, or education on cost savings of, efficiency technologies for trucking** such as side and tail skirting, anti-idling, and low rolling resistance tires and require driver training.

Introducing a freight strategy that aligns with the U.S. and that focuses on improved fuel efficiency, reducing VKT, and employing low-carbon fuels could lead to significant emission reductions from the transportation sector. For example, since 2004, the U.S. EPA SmartWay Transport Partnership has had a cumulative reduction of 72.8 Mt CO_2 reductions.[44] As such, a national freight strategy could represent a tangible step forward as Canada works to decarbonize its transportation system.

2. Increase the share of zero-emission vehicles sold in Canada

In 2015, there were approximately 1.9 million new vehicles sold in Canada.[45] Moving away from fossil fuel combustion and towards zero emission options in the personal transportation sector can dramatically reduce Canada's greenhouse gas emissions.

To date, there has been important progress on this issue at the provincial level: British Columbia and Quebec are signatories to the International Zero-Emission Vehicle Alliance, Quebec has introduced legislation to set firm targets for ZEV sales. The

[42] Association of American Railroads, The Environmental Benefits of Moving Freight by Rail, https://www.aar.org/search/Pages/results.aspx?k=GHG%20benefits#k=GREENHOUSE%20GAS%20BENEFITS

[43] See http://www.intermodal.org/

[44] U.S. EPA Smartway partnership, https://www3.epa.gov/smartway/about/index.htm

[45] CBC News "Canada sets record for new vehicle sales in 2015," CBC News, January 5, 2016. http://www.cbc.ca/news/canada/windsor/canada-sets-record-for-new-vehicle-sales-in-2015-1.3390498

Government of Quebec's objective is to ensure 15.5 per cent of vehicles sold are non-polluting or electric by 2025.[46] In addition, Ontario's Climate Change Action Plan establishes an electric and hydrogen passenger vehicle sales target of 5 per cent by 2020, which will be reviewed and increased every five years. The federal government can build on existing actions, and accelerated the adoption of ZEVs through the following actions:

1. **Introduce federal ZEV legislation**. Starting with models manufactured in Canada in 2018, federal legislation would require that a certain percentage of major vehicle manufacturers' sales[47] have zero or near-zero tailpipe emissions. The target should have predictable and consistent increases to provide the auto industry long-term policy stability. We recommend a target of 10 per cent of sales by 2020, 22.5 per cent of sales by 2025, and 30 per cent of sales by 2030.[48]
2. **Increase the federal green levy and fee-bate program for ZEV purchases**. The federal green levy is a tax that manufacturers have to pay on vehicles that have poor fuel efficiency. In an effort to continue to support fuel-efficient vehicles, Canada should increase the Canadian Green Levy on internal combustion engine vehicles and use those revenues to fund rebate programs for the purchase of ZEVs. Consideration should also be made to eliminate the GST on ZEVs in order to further stimulate sales.
3. **Provide targeted support for ZEV adoption**. The federal government has a role to play in smoothing the transition to ZEVs in Canada. As such, smart policies that complement the deployment of additional ZEVs across Canada merit consideration. For example, the federal government could install fast charging stations on national highways, update the National Building Code to require that all new residential and commercial buildings in Canada include EV charging stations (as Ontario has done in its Climate Change Action Plan), and could lead by example through purchasing ZEVs for the federal government fleet.

[46] Government of Quebec, *An Act to increase the number of zero-emission motor vehicles in Québec in order to reduce greenhouse gas and other pollutant emissions*. http://www.assnat.qc.ca/en/travaux-parlementaires/projets-loi/projet-loi-104-41-1.html

[47] A federal ZEV mandate would apply to vehicles manufactured and imported into Canada.

[48] Climate Leadership Team: Recommendations to government October 31, 2015, http://engage.gov.bc.ca/climateleadership/files/2015/11/CLT-recommendations-to-government_Final.pdf

3. Establish national benchmarking for active transportation in major cities across Canada

Across Canada, cycling and walking are growing in popularity as a daily commuting option.[49] These transportation options offer a healthy, convenient and affordable alternative to driving and will play an increasingly important role in helping Canada meet its carbon commitments. In an effort to promote travel by active transportation, the federal government should:

1. **Establish a fourth infrastructure fund dedicated to active transportation projects**. This fund could provide initial funding of at least $1 billion over ten years to municipalities for eligible active transportation projects, including walking and designated cycling paths and necessary supporting facilities, including bike storage and benches.
2. **Develop a biennial national benchmarking report**. The report, mandated by Transport Canada, should track progress in cycling and walking infrastructure – including integration with transit hubs and corridors, cycling policies, and other public health and safety indicators. This report can be modeled off of the benchmarking report conducted in the U.S. by the Alliance for Biking and Walking, in conjunction with the Center for Disease Control and Prevention's *Healthy Community Design Initiative.*[50]

4. Introduce a national Low Carbon Fuel Standard (LCFS)

As described in the freight strategy above, reducing the carbon intensity of traditional transportation fuels is a great opportunity for the federal government to directly reduce the emissions in the transportation sector. British Columbia has introduced a renewable and low carbon fuel standard to help reduce their reliance on non-renewable fuels, help reduce the environmental impact of transportation fuels and contribute to a new low-carbon economy.[51] The Institute recommends that the federal government:

1. **Implement a national LCFS as a legislated intensity target (measured in grams of CO2e per MJ of energy) for all transportation fuels sold in Canada.** The LCFS should be increasingly stringent, in order to provide a clear signals to fuel producers

[49] Cycle Cities: Supporting Cycling in Canadian Cities, The Pembina Institute (http://www.pembina.org/pub/cycle-cities) (accessed June 7th)

[50] Alliance for Walking and Biking, http://www.bikewalkalliance.org/resources/benchmarking

[51] Government of British Columbia, *Greenhouse Gas Reduction (Renewable and Low Carbon Fuel Requirements) Act, [SBC 2008] Chapter 16*. http://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/renewable-low-carbon-fuels

and vehicle manufacturers for their investments and technology development pathways. To that end, the national LCFS should have a short and long-term framework that supports a 10 per cent decrease in CO2e intensity by 2020 and a 20 per cent decrease by 2030. Further, a national LCFS should be based on lifecycle environmental impact assessments that have a carefully defined boundary and encompass all steps from upstream production to final consumption.

5. Transform Canada's buildings sector

In Canada, total energy consumption of homes and buildings accounts for 12 per cent of Canada's secondary energy use and 11 per cent of our national greenhouse gas (GHG) emissions.[52] 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 per cent) of 30 per cent of the building stock by 2030, and for all new construction to be nearly net-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 do the following:

1. Create impetus to act with accessible benchmarking data and well-defined policy goals.
2. Characterize energy efficiency investments and provide clarity to markets and industry.
3. Harness private capital and enable structuring of larger investment opportunities.

1. Create impetus to act with accessible benchmarking data and well-defined policy goals

Having reliable, comparable data for energy and water use in buildings is crucial to targeting energy/water reduction opportunities and motivating owners and occupants to more efficient use. To that end, the federal government should pursue the following:

1. **Require energy-use benchmarking and reporting for all large buildings**, using the national Portfolio Manager platform. The government could further require national public disclosure of building performance data within two years of launch of reporting requirements. Expanding on the Government of Ontario's Energy

[52] Office of Energy Efficiency 2013 report on Energy Efficiency Trends in Canada 1990-2010. http://www.nrcan.gc.ca/energy/efficiency/buildings/4261

Reporting and Benchmarking (ERB) policy and building on lessons learned in New York, we recommend the program start with buildings over 50,000 square feet and reduce the size threshold over time.

2. **Enable access to building performance data from large commercial buildings**. Accessible data empowers industry to showcase successes to date and to identify areas that need more attention, and provides evidence to support policy development.
3. **Require home energy labelling at point of sale and major renovation**, using the national EnerGuide protocol.
4. **Provide support for education and training of professionals and trades** involved in retrofit and new construction projects. Further, the federal government could create a new red seal trade program for HVAC installers to ensure quality of installations, and consider the creation of energy renovation certification programs.

2. Characterize energy efficiency investments and provide clarity to markets and industry

Improved energy efficiency standards for new and existing buildings, and for the appliances and equipment used in buildings, are key to reducing the carbon emissions from Canada's homes and buildings. Setting mid- and short-term targets will guide private and public investments in training and R&D. To that end, the federal government should pursue the following:

1. **Update national building codes to meet nearly zero energy standards by 2025**, and work with the province to facilitate their adoption. This will require revisions to the National Energy Code for Buildings and Section 9.36 of the National Building Code (for homes) for new construction. Transitions along this revision schedule can be facilitated by creating a nearly zero energy stretch code, adapting Passive House standard to a Canadian context (revising R-2000 for homes) and creating a schedule of EUI targets for more complex building types along the way to nearly zero energy building. These stretch codes should be developed in the next year and made available to provinces and local government to adopt as voluntary or baseline standards.
2. **Incorporate life cycle carbon reduction and climate adaptation as explicit objectives of the national building code**. We recommend the government explore how carbon intensity targets could be used alongside EUI targets for stretch codes to prime innovation for low energy and low emissions buildings.
3. **Develop or adapt a performance-based retrofit code providing targets** suitable for a range of renovation sizes (small and major). ASHRAE-100 standard can be used

to set performance targets, while design guides such as NRCan's upcoming 'Major Renovation Guidelines' provide more detailed instruction on how to achieve such targets, without restricting contractors to a set of prescribed requirements which might not be appropriate to any given situation.

4. **Accelerate development and adoption of energy and water use standards** for equipment and appliances.
5. **Support the creation of an asset class for energy efficiency investment in buildings** to facilitate flow of private capital and the creation of a retrofit market. This can be done by developing or adopting protocols to verify potential energy savings, such as the Investor Confidence Project (ICP). In the United States and Europe, the ICP is being used to designate projects as "Investor Ready Energy Efficiency"[53] – increasing certainty around energy savings and financial return.[54] Such framework can reduce soft costs of retrofit projects (by removing the necessity for both investors and building owners to do the analysis), reduce risk, and enable access to debt at a lower rate.

3. Harness private capital and enable structuring of larger investment opportunities

Public funds (from governments and utilities) and policies should leverage private investment in efficiency projects. In our view, projects with the highest carbon abatement potential should be prioritized. To that end, the federal government should pursue the following:

1. **Provide seed funding to revolving loan funds** to mobilize private capital by attracting low-cost capital, requiring co-financing, and offering loan guarantees. Consider creating a national green bank to administer such financing, or supporting other jurisdictions to do so. Tools to attract private investment also include more specialized institutions, such as the U.K. Green Investment Bank, which has invested £260 million (C$482 million) in energy efficiency projects and has been quite successful in sparking follow-up private sector investment.
2. **Provide strategic financial support to incentivize and remove barriers to deep retrofits**. For example consumer rebates, supply chain incentives, financing

[53] Investor Confidence Project, "Project Certification: Investor Ready Energy Efficiency." www.eeperformance.org/project-certification.html

[54] Finance for Resilience, "Investor Confidence Project." www.financeforresilience.com/priority/investor-confidence-project

options. Property Assessed Clean Energy (PACE) loans can allow government to fund the up-front cost of energy efficiency retrofits, which are paid back over time by the property owner. PACE loans are available in many regions across the United States, and have been quite popular in Colorado and California. Similarly, some municipalities can offer Local Improvement Charges (LICs) to effectively finance capital investments, to the benefit of certain residents, and collect repayment through a long-term surcharge on a property tax bill. To be effective, these financing tools must be made available to homeowners and building owners through public or private 'one-stop-shop' outfits which offer energy assessments, access to financing, and either provide the energy services directly or assist in the selection of pre-qualified contractors.

3. **Reform tax policy to stimulate investment in efficiency**. For example, tax credits and changes to deductibility rules can be used to stimulate retrofitting. Provinces and municipalities can be encouraged to offer property-assessed financing.

Through better depiction (and standardization) of investment opportunities, building owners and operators can greatly benefit from financial aggregation of energy efficiency projects, as this will attract patient and low-cost capital from pension funds, sovereign wealth funds, or other institutional investors. Individual project deals are not large enough to attract these investors, but aggregating projects has potential to create new deals in the range of $50 to 100 million.

4. Use public sector investments in public buildings to accelerate demand and innovation

The federal government owns or occupies over 27 million square meters of floor space, providing opportunities to model the pathway to deep emissions reductions across a range of building types and regions. Including provincial and municipal buildings, the public sector offer opportunities to demonstrate leadership and long-term commitment to a low carbon vision and to stimulate the marketplace. To that end, the federal government should pursue the following:

1. **Require benchmarking and disclosure of public building performance.** Sharing performance data from the 38,048 federal buildings will build the database, provide private owners and operators a reference point and facilitate disclosure in private markets. The government should also encourage provinces and municipalities to also benchmark and disclose performance of their public buildings; this will increase the range of building types to include more civic facilities (recreation centres, libraries, etc).

2. **Begin constructing nearly zero energy publicly owned buildings starting in 2017.** Support a review of procurement policies to change public procurement from a culture of 'lowest-cost' to one of 'highest life cycle value'. Provide procurement guidelines to public agencies so they know how to ask for, assess, and select bids for high performance buildings.[55]
3. **Upgrade public buildings through deep energy retrofits (25 to 50 per cent energy reduction) at a rate of two per cent per year**. This can be supported by the national green bank (see above) or by a distinct public building revolving fund to support investments by sub-national governments and agencies.

[55] B.C. Construction Association, *Construction Innovation Project: Building B.C.'s vision* (2015). https://www.bccassn.com/media/bcca-report-construction-innovation-2016.pdf

6. Implement national methane reduction standards for the oil and gas sector

Methane, a climate pollutant with significantly worse short-term climate effects than carbon dioxide, currently represents 15 per cent of Canada's emissions inventory (110 Mt).[56] Of those emissions, approximately 48 per cent (53 Mt) are generated in the energy sector. In fact, 40 per cent of these emissions are fugitive emissions from the oil and natural gas sector alone.[57]

Recent analysis from ICF International demonstrates that the Canadian oil and gas industry can achieve a 45 per cent reduction in emissions of methane using low-cost, readily available control measures.[58] Achieving a nationwide 45 per cent methane reduction goal would reduce emissions by 27 Mt, at an average annual cost of less than one cent per thousand cubic feet of produced natural gas. Adopting the necessary emissions-control technologies and operating practices to make these reductions possible would require a capital investment of $726 million, or about one per cent of annual industry capital expenditure.[59] In addition to the climate benefit of such regulations, reducing methane also reduces conventional pollutants – including volatile organic compounds and hazardous air pollutants – that can harm human health and the environment.

Federal and provincial governments have recently shown significant interest in taking action to reduce methane emissions. In March 2016, Canada and the U.S. released a joint statement on climate and energy in which both countries announced plans to regulate existing and new sources of methane in their oil and gas sectors by 40 to 45 per

[56] 2016 NIR Part 3, Table A9-3.

[57] Ibid

[58] Environmental Defence Fund and Pembina Institute, *Economic Analysis of Methane Emission Reduction Opportunities in the Canadian Oil and Natural Gas Industries* (2015), prepared by ICF International. https://www.pembina.org/reports/edf-icf-methane-opportunities.pdf

[59] Ibid

cent below 2012 levels by 2025.[60] To achieve this common target, both countries have committed to promulgate new oil and gas sector regulations. To that end, Environment and Climate Change Canada is currently developing federal rules, with the final regulations scheduled to be published by the end of 2017. These regulations will cover emissions from the same sources subject to current and proposed U.S. regulations, and will also require reductions from unique Canadian sources, including heavy oil.

Prior to the federal commitment, the Government of Alberta announced its intention to reduce methane emission for upstream oil and gas operations by 45 per cent, relative to 2014 levels, by 2025.[61] When implemented, this target is likely to reduce Alberta's emissions by 14 Mt by 2025. To implement this target, the Alberta Energy Regulator has been tasked with convening a multi-stakeholder advisory group to develop a package of regulations, offset protocols, best practices, and a mechanism for tracking progress.

In British Columbia, Premier Christy Clark's Climate Leadership Team (CLT) has recommended the Government of British Columbia adopt a 40 per cent reduction for fugitive and vented methane within five years (i.e by 2021). Further, the CLT has recommended B.C. implement regulations for leak detection and repair programs, develop a transparent reporting system, and extend the coverage of the province's carbon tax include methane emissions.[62] Since the release of the CLT recommendations, Premier Clark has stated that B.C. will adopt an approach to reducing methane that is consistent with Alberta.[63]

We acknowledge that important progress has been made on this file over the last year, and support ongoing efforts to implement existing commitments through federal and provincial processes. To that end, we recommend the federal government do the following:

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[60] The White House, "U.S.-Canada Joint Statement on Climate, Energy, and Arctic Leadership," Press release, March 10, 2016, available at https://www.whitehouse.gov/the-press-office/2016/03/10/us-canada-joint-statement-climate-energy-and-arctic-leadership.

[61] Alberta Government, Climate Leadership: Reducing methane emissions, http://www.alberta.ca/climate-methane-emissions.cfm

[62] Climate Leadership Team: Recommendations to government October 31, 2015, http://engage.gov.bc.ca/climateleadership/files/2015/11/CLT-recommendations-to-government_Final.pdf

[63] Shawn McCarthy," Canada, U.S. target methane in bid to curb climate change," Globe and Mail, March 8, 2016. http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/canada-us-aim-to-reduce-methane-emissions-by-40/article29080108/

1. **Introduce federal regulations that require methane reductions of 45 per cent below 2012 levels by 2025 for upstream oil and gas operations in Canada.** We recommend the federal government work with provincial and territorial governments to develop and implement a methane reporting system that tracks emissions from facilities by 2018. This system should include an open data portal that is accessible to the public and includes detailed facility-level information on emissions reductions achieved as compared to baseline.
2. **Work with provincial and territorial governments to ensure robust regulations are implemented.** The federal government should work with the provinces to ensure provincial regulations are robust, tailored to the strengths of each province, and aligned across regulating jurisdictions. A federal-provincial regulatory approach will be most effective if the strengths of each jurisdiction are brought to bear in the respective regulations. Further, the federal government should work with the provinces to ensure that these regulations are implemented in a timely manner.
3. **Re-assert Canada's global leadership.** Building on domestic policy commitments, discussions between Canada, the U.S. and Mexico are ongoing regarding a North American methane reduction goal.[64] The U.S., Canada, and Mexico are three of the world's largest oil and gas producing nations, and are responsible for nearly 20 percent of global oil and gas methane pollution.[65] Since reducing methane emissions is among the world's best opportunities to confront climate change, taking strong action to reduce methane pollution is an essential element of a credible North American climate plan. Were North America able to secure country-specific methane goals, backed by regulations, it would set an important example for global action to reduce oil and gas methane pollution. As such, we recommend Canada continue to demonstrate leadership in international fora by highlighting oil and gas methane reductions as an important global climate opportunity, and continue to advocate for comparable regulatory action in other oil and gas producing countries.

[64] Government of Canada, "North American Cooperation on Energy," news release, February 12, 2016. http://news.gc.ca/web/article-en.do?nid=1033769

[65] Pembina Institute, Environmental Defense Fund and Mario Molina Center. *North American Climate Leadership,* (2016). http://www.pembina.org/pub/north-american-climate-leadership

7. Align government decision-making with climate science

In addition to the above policy reforms, the federal government should take action to ensure its policy-making and decision-making processes align with its stated climate policy objectives. The federal government has shown some progress on this issue: on January 27, 2015, Ministers McKenna and Carr announced interim measures to assess the upstream greenhouse gas impact of major oil and gas projects.[66] In its forthcoming review of the *Canadian Environmental Assessment Act* and the *National Energy Board Act,* the federal government should build on this commitment. To that end, we recommend the following:

1. **Implement a permanent upstream greenhouse gas assessment in all future federal environmental assessments.** Making permanent an upstream greenhouse gas emissions assessment for major projects is a reasonable and necessary step for Canada: it's essential that new infrastructure be reviewed with an eye to its impact on Canada's ability to secure absolute emissions reductions in the near term, and do well on its international climate obligations. In addition to producing an analytical assessment of the likely carbon pollution generated by a project, the federal government should also comment on the impact of those increment emissions on the country's ability to achieve its climate goals. In our view, projects that are likely to build a strong and prosperous Canada in 2030, 2050 and beyond are also projects that are economically, socially, and environmentally viable in a 1.5 degree Celsius world.
2. **Assess the financial viability of proposed projects in the context of a future with increasingly strict carbon limits**. When evaluating the financial viability of infrastructure proposals, the federal government should employ economic analysis that considers progressively more stringent domestic and international climate action (consistent with 1.5 and 2 degree Celsius global temperature limits) and the related economic implications for new fossil fuel projects. This analysis will steer investments away from projects that would lock in unnecessary carbon pollution and burden the economy with stranded assets in the global pivot to clean energy.

[66] Government of Canada, "Government of Canada Moves to Restore Trust in Environmental Assessment," news release, January 27, 2016. http://news.gc.ca/web/article-en.do?nid=1029999

Additional considerations

We believe that the above policy recommendations would allow Canada to substantially reduce its greenhouse gas emissions, in line with the first ministers' commitment to meet or exceed the country's 2030 INDC. In addition to these policy recommendations, the Pembina Institute would like to offer support to the following portal policy submissions:

1. We support the joint Canadian Wind Energy Association and Canadian Solar Industries Association submission, specifically the following recommendations:

    3.1: Enhance the tax treatment of renewable energy projects

    3.2: Introduce Green Bonds for project debt financing

    3.3: Use infrastructure investment to enable more renewable energy in Canada

2. We support submissions on electrification from Clean Energy Canada and recommendations from the Canadian Parks and Wilderness Society on nature conservation for adaptation and mitigation.

Further, we encourage the government to remain ambitious in its development of a mid-century low-greenhouse gas strategy by the end of 2016. Importantly, the Paris Agreement text states that in order to achieve the temperature goals, the world must see a "peaking of greenhouse gas emissions as soon as possible" and that all countries must undertake "rapid reductions [...] so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gas emissions in the second half of the century". For Canada, this means transitioning away from polluting sources of energy like oil, coal and gas, and towards low-carbon solutions for electricity, transportation, buildings and other important sectors of the economy.

In advance of COP22, we encourage the government to articulate the outcome of the pan-Canadian climate process and to articulate its mid-century emissions reductions strategy. Specifically, we encourage the government to outline plausible emissions trajectories to meet exceed its 2030 target and aim for near zero emissions by 2050.

Conclusion

The Pembina Institute welcomes the opportunity to share with the Government of Canada its views on a credible approach to tackling climate change for the country. We continue to support the Government of Canada's intent to design and implement credible climate change polices that accelerate the country's transition to a low-carbon future. In that pursuit, we believe our recommendations on carbon pricing, transportation, buildings, electricity, oil and gas, and government decision-making would play an important role in supporting the first ministers' plan to meet or exceed our climate change commitments.

To ensure efforts to tackle climate change are inclusive and equitable, we encourage the federal, provincial and territorial governments make funds available to First Nations, Inuit and Métis communities to engage in education and outreach efforts on climate change mitigation and adaptation. Further, we look forward to working with the government as it implements other important social and environmental policies, including the United Nation's Declaration on the Rights of Indigenous Peoples.