

**BROWN TO GREEN:** 

### THE G20 TRANSITION TOWARDS A NET-ZERO EMISSIONS ECONOMY

# CANADA

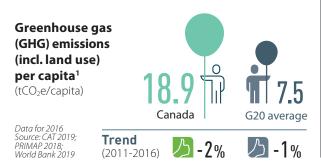


2019



### Canada's greenhouse gas (GHG) emissions are – per capita – much higher than the G20 average.

Canada's total GHG emissions (excl. land use) increased by 17% between 1990 and 2016.



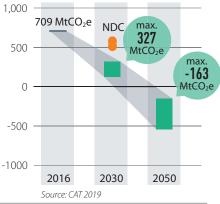
Canada's fair-share range is below 327 MtCO<sub>2</sub>e by 2030 and below -163 MtCO<sub>2</sub>e by 2050. Under Canada's 2030 NDC target, emissions would only be limited to 518-557 MtCO<sub>2</sub>e. 1.5°C-compatibility can be achieved via strong domestic emissions reductions, supplemented with contributions to global emissions-reduction efforts. All figures are drawn from the Climate Action Tracker and exclude land use.

Canada is not on track

for a 1.5°C world.

### 1.5°C compatible pathway<sup>2</sup>





### Recent developments<sup>3</sup>

In April 2019, the federal government implemented a nationwide carbon price, starting at US\$15.35 per tCO<sub>2</sub>e and rising annually as a backstop national minimum standard.

In August 2019, the Canadian Energy Regulator Act (CERA) was enacted as a new federal governance structure to oversee the energy sector. In June 2019, the government approved the expansion of the Trans Mountain crude oil pipeline shortly after issuing a declaration of a national climate emergency.

Key opportunities for enhancing climate ambition<sup>3</sup>

The transport sector is the largest source of  $CO_2$  emissions (30% of total)

#### Canada needs to adopt a Clean Fuel Standard and enhance measures for zero-emission vehicles, including light and heavyduty trucks.

Canada's long-term target is inconsistent with a 1.5°C pathway

The government needs to legislate a fair and equitable target to achieve carbon neutrality by 2050 at the latest. Building emissions are far above G20 average

The federal government needs to lead by example to encourage provinces to undertake deep energy retrofits of existing buildings.

This country profile is part of the **Brown to Green 2019** report. The full report and other G20 country profiles can be downloaded at: *http://www.climate-transparency.org/g20-climate-performance/g20report2019* 

### CANADA – SOCIO-ECONOMIC CONTEXT



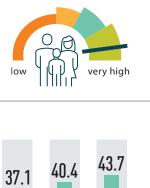
#### **Human Development Index**

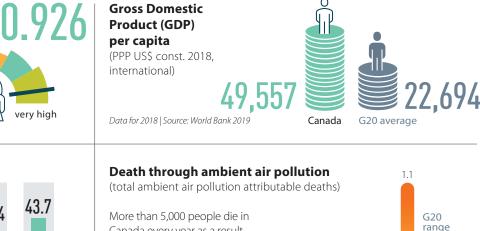
The Human Development Index reflects life expectancy, level of education, and per capita income. Canada ranks among the highest countries.

Data for 2017 | Source: UNDP 2018

#### **Population projections** (millions)

Canada's population is expected to grow by about 18% by 2050.





Canada every year as a result of outdoor air pollution, due to stroke, heart disease, lung cancer and chronic respiratory diseases. Compared to the total population, this is at the lowest end of the G20 range.

#### Data for 2016 Source: World Health Oraanization 2018

5.335 attributable deaths

Canada 01

Ambient air pollution attributable death rate per 1,000 population per year, age standardised

### **JUST TRANSITION**<sup>3</sup>

The Pan-Canadian Framework calls for "a commitment to skills and training to provide Canadian workers with a just and fair transition to opportunities in Canada's clean growth economy", and a coal phase-out by 2030.

2018

2030

Source: World Bank 2019

2050

In 2018, the government of Canada set up the Task Force on Just Transition for Canadian Coal Power Workers and Communities, mandated to engage with relevant stakeholders, provinces and municipal governments. In 2019, the Task Force recommended inter alia funding the establishment of local transition centres in affected coal communities, a pension bridging programme for workers who will retire early due to the coal phase-out, and programmes for income support, education and skills development for transitioning workers. In response, Canada's 2019 federal budget

proposes a dedicated \$150 million infrastructure fund to support affected communities, in addition to funding for coal worker transition centres.

Canada's fossil fuel industry accounts for 1% of the national workforce, concentrated in Alberta, Saskatchewan and Newfoundland and Labrador provinces. Canadian trade unions have continued to campaign for just transition implementation,



providing proposals for programmes on skills development, worker retraining and employment insurance, while calling for clean energy investment to be targeted at indigenous, remote and rural communities.

#### Legend for all country profiles

#### Trends



The trends show developments over the past five years for which data are available

The thumbs indicate assessment from a climate protection perspective.

### Decarbonisation Ratings<sup>4</sup>

These ratings assess a country's performance compared to other G20 countries. A high scoring reflects a relatively good effort from a climate protection perspective but is not necessarily 1.5°C compatible.



### **Policy Ratings<sup>5</sup>**

The policy ratings evaluate a selection of policies that are essential pre-conditions for the longer-term transformation required to meet the 1.5°C limit.

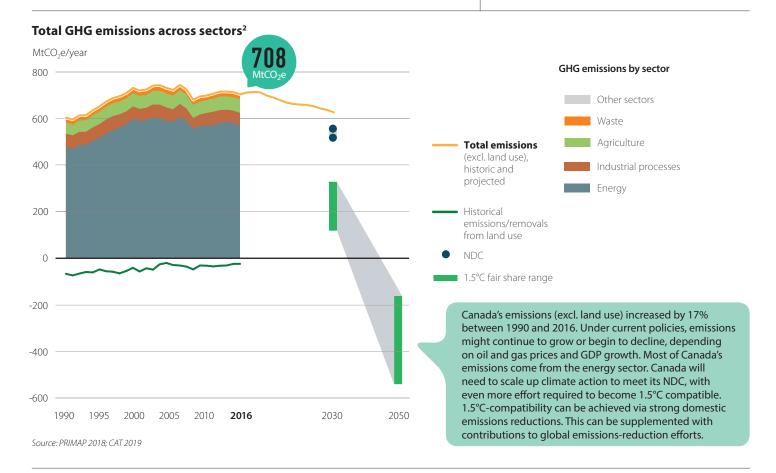


For more information see the Annex and Technical Note

# MITIGATION BIG PICTURE

### CANADA

Canada's GHG emissions have increased by 17% (1990-2016) and the government's climate targets for 2030 (-30% from 2005 levels) and 2050 (-80%) are not in line with a 1.5°C pathway.



#### Nationally-determined contribution (NDC): Mitigation

Targets	To reduce greenhouse gas emissions by 30% below 2005 levels by 2030
Actions	Actions specified (sectors: energy, transport, buildings, industry, agriculture, land use, forestry and waste)

Source: UNFCCC, NDC of respective country

#### Long-term strategy (LTS) to be submitted to the UNFCCC by 2020

Status	Submitted to UNFCCC in November 2016
2050 target	Canada's LTS does not set an official 2050 target. The document explores options for and implications of 80% net emission reductions below 2005 levels
Interim steps	Yes
Sectoral targets	No

### Climate action tracker (CAT) evaluation of $\ensuremath{\mathsf{NDC}}^2$



Source: UNFCCC, LTS of respective country

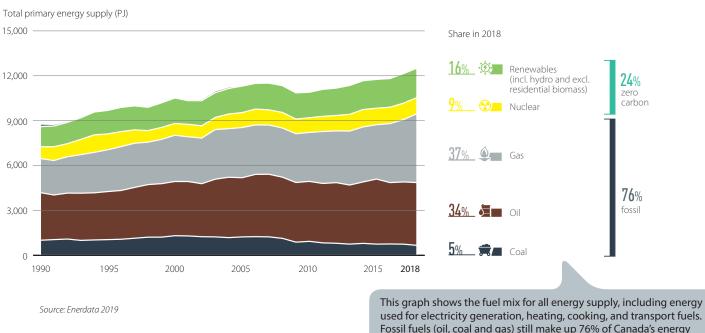


Fossil fuels still make up around 76% of Canada's energy mix (including power, heat, transport fuels, etc). Energy supply from renewables is only developing slowly. The carbon intensity of the energy mix has not declined in the past decade, which is not compatible with a 1.5°C pathway.

The share of fossil fuels globally needs to fall to 67% of global total primary energy by 2030 and to 33% by 2050 and to substantially lower levels without Carbon Capture and Storage.

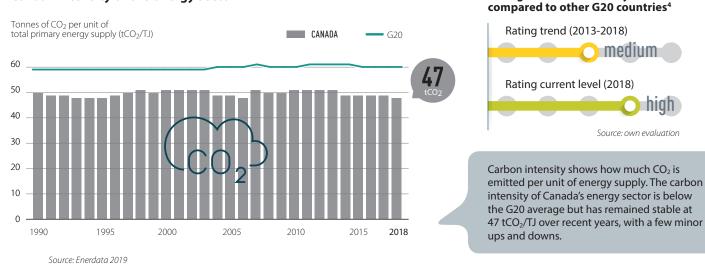
Source: IPCC SR1.5 2018

### Energy mix<sup>7</sup>



used for electricity generation, heating, cooking, and transport fuels. Fossil fuels (oil, coal and gas) still make up 76% of Canada's energy mix, which is slightly below the G20 average. The growing energy demand has been covered mainly with gas.

**Rating of carbon intensity** 



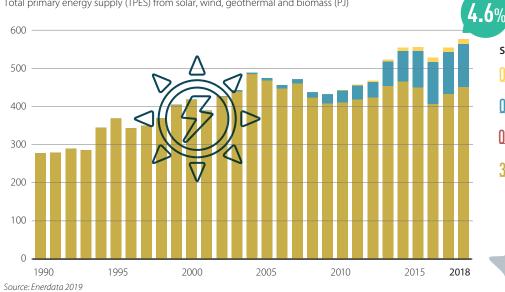
### Carbon intensity of the energy sector

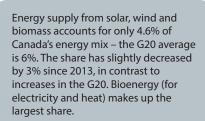
### **CANADA** Country Profile 2019



#### Solar, wind, geothermal and biomass development<sup>8</sup>

Total primary energy supply (TPES) from solar, wind, geothermal and biomass (PJ)





traditional biomass

Share of TPES in 2018

0.09% 🖄 Solar

0.90% - Wind

0.00% Geothermal

3.61 % Piomass, excl.

Rating of share in TPES compared to other G20 countries<sup>4</sup>



Source: own evaluation

#### Energy supply per capita

Total primary energy supply per capita (GJ/capita)



Trend +4% (2013-2018)

Rating of energy supply per capita compared to other G20 countries<sup>4</sup>

Rating trend (2013-2018) low Rating current level (2018) 🔘 very low

Source: own evaluation

The level of energy supply per capita is closely related to economic development, climatic conditions and the price of energy.

Canada has the highest energy supply per capita (340 GJ/capita) in the G20 and the level continues to rise (+4%, 2013-2018).

Data for 2018 | Source: Enerdata 2019; World Bank 2019

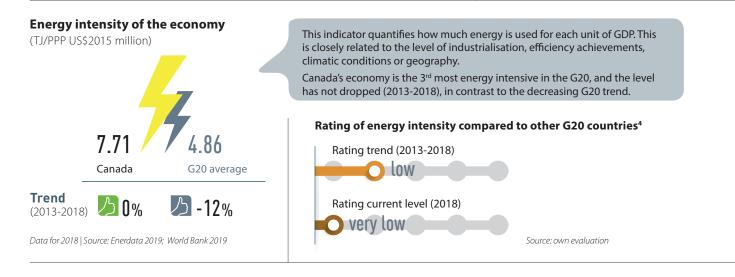


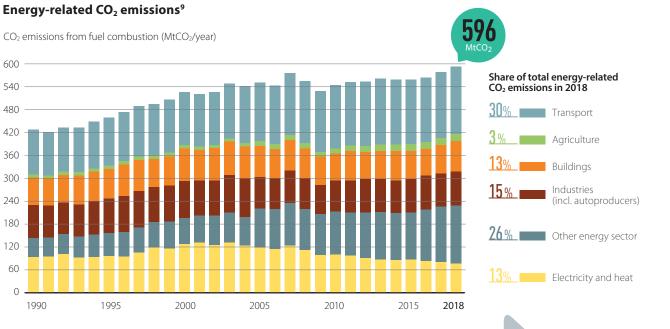


Canada has the highest energy supply per capita and the 3rd most energy-intensive economy in the G20. Energy-related  $CO_2$  emissions are rising further, which is not in line with the 1.5°C limit.

Global energy and process-related CO<sub>2</sub> emissions must be cut by 40% below 2010 levels by 2030 and reach net zero by 2060.





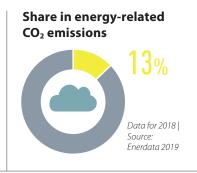


Source: Enerdata 2019

The largest driver of overall GHG emissions are  $CO_2$  emissions from fuel combustion. In Canada, they have increased in the past decade and are now, with 596 MtCO<sub>2</sub>, at their highest level so far. At 30%, the transport sector is the largest contributor to energy-related  $CO_2$  emissions.

# MITIGATION POWER SECTOR

Canada produces only 5% of its electricity from coal. The decision to phase out coal power by 2030 is in line with a 1.5°C limit, given that Canada as an industrialised country needs to move faster.



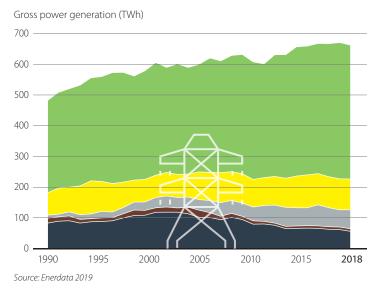
Coal must be phased out in the EU/OECD no later than 2030, in the rest of the world no later than 2040. Electricity generation needs to be decarbonised before 2050, with renewable energy the most promising option.⁵

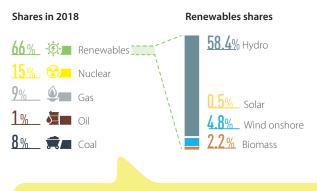
Source: IPCC SR1.5 2018; Climate Analytics 2016; Climate Analytics 2019

**CANADA** 

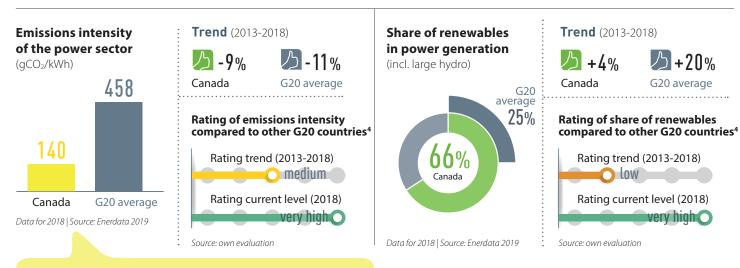
### **STATUS OF DECARBONISATION**

#### **Power mix**





Renewables make up two-thirds of Canada's power mix, which is the second highest level in the G20. The largest proportion of renewable power comes from large hydropower (58% of power generation) while other renewables play only a minor role. The share of coal power has decreased from 19% in 2000 to 8% of the power mix in 2018.



For each kilowatt hour of electricity, 140 gCO<sub>2</sub> are emitted in Canada. This is one of the lowest levels in the G20, reflecting the high share of renewables. Emission intensity has, however, only dropped by 9% from 2013 to 2018, less than the G20 average of -11%.



+20%

# MITIGATION POWER SECTOR



### CANADA

### **POLICIES**<sup>5</sup>

#### Renewable energy in the power sector



Canada has not set itself a long-term renewable target. Responsibility for renewable support schemes lies at provincial level, leading to large differences in policy development and implementation across provinces.

### Coal phase-out in the power sector



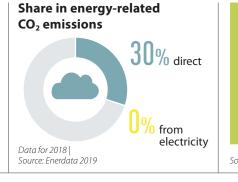
In 2016, Canada announced the phase-out of coal by 2030 and adopted respective federal regulations in 2018. These included performance standards on coal and natural gas-fired power stations that are expected to affect all coal units. As of January 2019, 9GW of coal capacity are still in operation.

Source: own evaluation

Source: own evaluation

# MITIGATION TRANSPORT SECTOR =

**97%** of passenger transport is by private car in Canada, and per capita emissions from transport are the 2<sup>nd</sup> highest in the G20. In order to stay within a 1.5°C limit, passenger and freight transport need to be decarbonised.

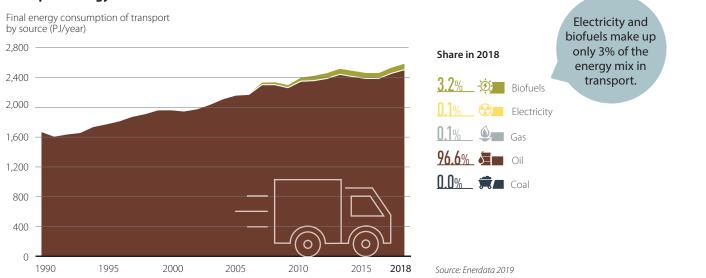


The proportion of low-carbon fuels in the transport fuel mix must increase to about 60% by 2050.



### **STATUS OF DECARBONISATION**

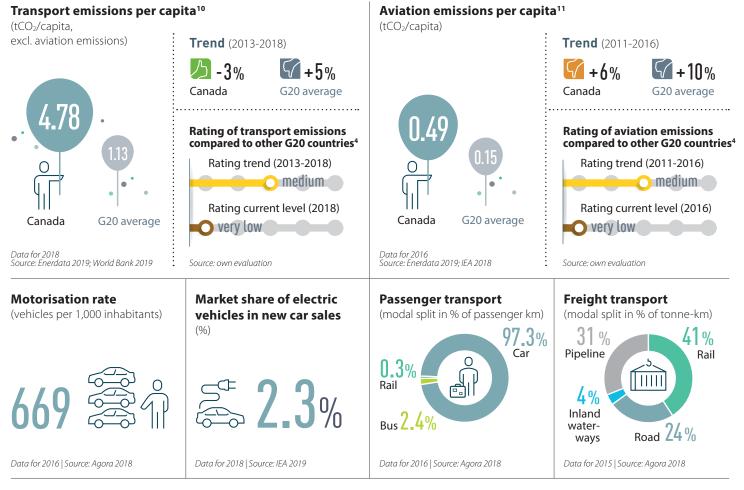
### Transport energy mix



# MITIGATION TRANSPORT SECTOR =

# CANADA

### STATUS OF DECARBONISATION (continued)



### **POLICIES**<sup>5</sup>

### Phase out fossil fuel cars



The Zero-Emission Vehicle (ZEV) Infrastructure Programme aims at 100% of sales by 2040 (100% by 2035 would be 1.5°C compatible), supported since 2019 by a purchase incentive. A Clean Fuel Standard, including annual carbon intensity reduction requirements for liquid fuels, is set to be finalised in 2020.



The Advisory Council on Climate Action warned in May 2019 that measures are insufficient to achieve ZEV targets.

# Phase out fossil fuel heavy-duty vehicles



Canada has no plans yet for phasing out emissions from freight transport. In 2018, however, Canada launched the Green Freight Assessment Programme to support carriers in implementing emission reduction strategies. Canada revised its emission regulations for HDVs in 2018, tightening standards for model year 2021 and then again for 2027.

The government delayed the rollout of GHG emission standards for trailers by one year (until May 2020) responding to delays in the US.

Source: own evaluation

### Modal shift in (ground) transport



Canada's Long-term Infrastructure Plan (2016) promises CA\$28.7 billion (US\$22.03) until 2030 to spur investments in public transport infrastructure and services. One pillar of Canada's Transportation 2030 strategy (2017) aims to shift from higher to lower emitting modes of transport. However, there are no concrete federal policies to promote a modal shift.

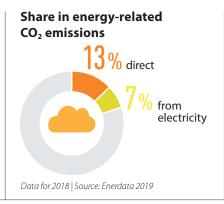
Source: own evaluation

Source: own evaluation

# MITIGATION BUILDINGS SECTOR

# CANADA

Canada's building emissions – including heating, cooking and electricity use – make up a fifth of total CO<sub>2</sub> emissions. Per capita, building-related emissions are more than double the G20 average.

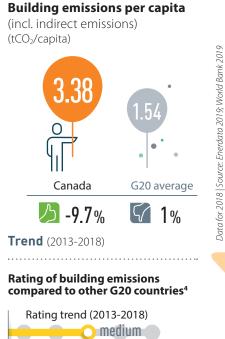


Global emissions from buildings need to be halved by 2030, and be about 80% below 2010 levels by 2050, achieved mostly through increased efficiency, reduced energy demand and electrification in conjunction with complete decarbonisation of the power sector.



Source: IEA ETP B2DS scenario assessed in IPCC SR1.5 2018

### **STATUS OF DECARBONISATION**



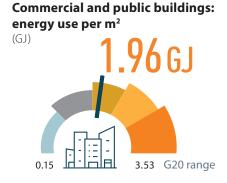
Rating current level (2018)

energy use per m<sup>2</sup> (GJ) 0.53 GJ 0.17 0.91 G20 range

Data: year different per country | Source: ACEEE 2018

**Residential buildings:** 

Building-related emissions per capita are more than double the G20 average. In contrast to the G20 average, Canada has managed to decrease the level by 10% (2013-2018).



Data: year different per country | Source: ACEEE 2018

Building emissions are largely driven by how much energy is used in heating, cooling, lighting, household appliances, etc. In Canada, energy use per m<sup>2</sup> is in the middle range of G20 countries.

Source: own evaluation

### **POLICIES**<sup>5</sup>

### Near-zero energy new buildings



Different government levels are working together on a nationwide 'netzero energy building code' by 2030 (by 2020 would be 1.5°C compatible) as well as a mandatory energy use labelling scheme. The province British Columbia aims for all new buildings to be net-zero energy ready by 2032.

Federal building codes are model codes that have no legal status until adopted by provincial jurisdictions.

Source: own evaluation

### Renovation of existing buildings



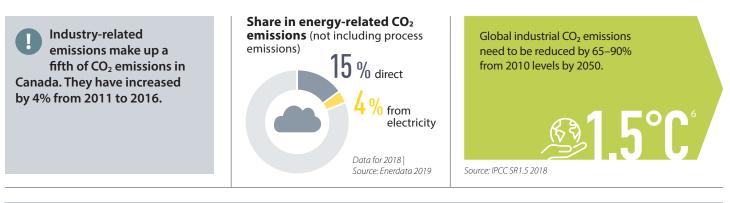
Canada has no strategy for energy retrofitting. Different government levels are working together on a model code for energy retrofitting existing buildings by 2022. In July 2019, the federal government announced financial support for deep energy retrofits in residential buildings in Toronto and Hamilton.

Federal building codes are model codes that have no legal status until adopted by provincial jurisdictions.

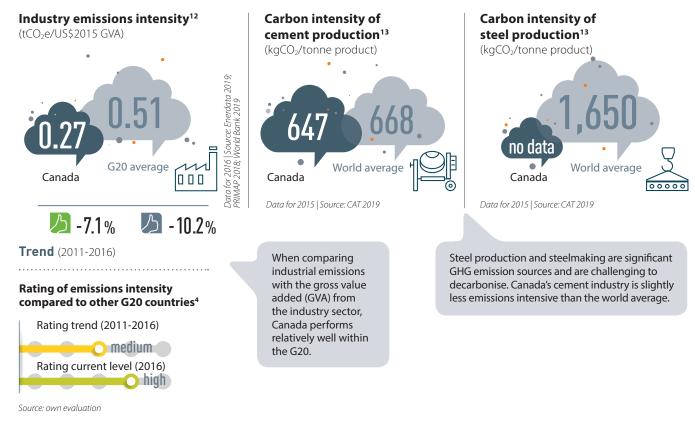
Source: own evaluation

# MITIGATION INDUSTRY SECTOR

### CANADA



### STATUS OF DECARBONISATION



POLICIES

### **Energy efficiency**



Mandatory energy efficiency policies in Canada cover only 11-25% of total energy use (as of 2017). GHG emissions from industry are mainly driven by the oil and gas industry. In June 2018, Canada adopted a carbon tax on fuel and an emission-trading system for large industrial emitters as a federal backstop for those provinces that have not adopted their own carbon pricing system as of April and January 2019 respectively.



Several provinces have challenged the constitutionality of a mandatory federal carbon pricing system. The first two cases were decided in favour of the federal government and will now be appealed to the Supreme Court.

Source: own evaluation



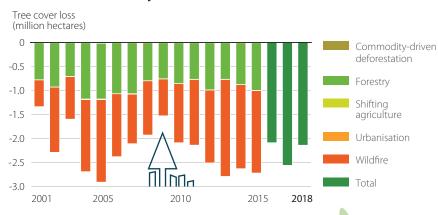


### In order to stay within the 1.5°C limit, Canada needs to make the land use and forest sector a net sink of emissions, eg by halting the expansion of residential areas and by creating new forests.

Global deforestation needs to be halted and changed to net CO<sub>2</sub> removals by around 2030. Source: IPCC SR1.5 2018

**CANADA** 

#### Gross tree cover loss by dominant driver<sup>14</sup>



### POLICIES

#### (Net) zero deforestation



Deforestation rates are close to zero but forest degradation and forest fires are major threats to the carbon sequestration capacity of Canadian forests. As Canada's approach to LULUCF under the UNFCCC excludes "natural disturbance", these substantial emissions are excluded from national accounts.

Source: own evaluation

Source: Global Forest Watch 2019

Note: 2000 tree cover extent | >30% tree canopy | these estimates do not take tree cover gain into account

From 2001 to 2018, Canada lost 40.7Mha of tree cover, equivalent to a 9.7% reduction since 2000. This does not take tree-cover gain into account. Wildfires and harvesting of wood products were the main reasons for forest loss.

# MITIGATION AGRICULTURE



Canada's agricultural emissions come mainly from the use of synthetic fertilizers, digestive processes in animals, and livestock manure. A 1.5°C pathway requires dietary shifts, increased organic farming, and less fertilizer use.

Global methane emissions (mainly enteric fermentation) need to decline by 10% by 2030 and by 35% by 2050 (from 2010 levels). Nitrous oxide emissions (mainly from fertilzers and manure) need to be reduced

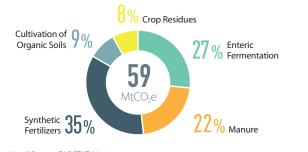
by 10% by 2030 and by 20% by 2050.



Source: IPCC SR1.5 2018

In Canada, the largest sources of GHG emissions in the agricultural sector are synthetic fertilizers, digestive processes in animals (enteric fermentation), and livestock manure. A shift to organic farming, more efficient use of fertilizers, and diet changes could help reduce emissions.

GHG emissions from agriculture (not including energy)



Data for 2016 | Source: FAOSTAT 2019

# ADAPTATION

### $\rightarrow$ Canada is vulnerable to climate change and adaptation actions are needed.

- → On average, 11 fatalities and losses amounting to US\$1.7 billion occur yearly due to extreme weather events.
- → With global warming, society and its supporting sectors are increasingly exposed to severe climate events, such as increasing heatwave frequency.



**CANADA** 

### **ADAPTATION POLICIES**

Nationally-determined contribution: Adaptation					
Targets	Not mentioned				
Actions Actions specified (sectors: infrastructure, health)					

Source: UNFCCC, NDC of respective country

### National adaptation strategies

			Fields of action (sectors)												
Document name	Publication year	Agriculture	Biodiversity	Coastal areas & fishing	Education & research	Energy & industry	Finance & insurance	Forestry	Health	Infrastructure	Tourism	Transport	Urbanism	Water	M&E process (reporting frequency)
PAN-Canadian framework on clean growth and climate change	2016			x	x				x	x					Federal, provincial and territorial governments work with the sectoral ministries to take regular stock of the progress achieved

Source: own research

Adaptation measures are being discussed principally at municipal and regional levels, mostly focusing on infrastructure and asset risk management. The federal government convened an expert panel in 2018, which mainly discussed flood risk management.



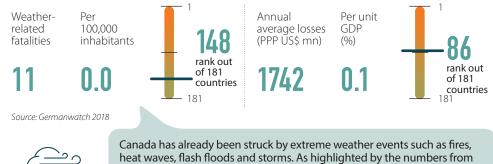
# CANADA

### **ADAPTATION NEEDS**

### Climate Risk Index for 1998-2017

Impacts of extreme weather events in terms of fatalities and economic losses that occured

### Global Climate Risk Index 2019 | All numbers are averages (1998-2017)



Canada has already been struck by extreme weather events such as fires, heat waves, flash floods and storms. As highlighted by the numbers from the Climate Risk Index, such extreme weather events result in fatalities and economic losses. Climate change is expected to worsen the intensity, frequency and impacts of such events.

### Exposure to future impacts at 1.5°C, 2°C and 3°C

		1.5°C	2°C	3°C
Water	% of area with increase in water scarcity			
	% of time in drought conditions			
Heat & Health	Heatwave frequency			
	Days above 35°C			

Source: own research

Agriculture	Maize	Reduction in crop duration		
		Hot spell frequency		
		Reduction in rainfall		
	Soybean	Reduction in crop duration		
		Reduction in rainfall		
	Wheat	Reduction in crop duration		
/\ à		Hot spell frequency		
		Reduction in rainfall		

Overall, with rising temperatures, all sectors are adversely affected. In the water sector, water scarcity and time spent in drought conditions slightly increase. The frequency of heat waves increases significantly, together with an increase in the number of days with temperatures above 35°C.

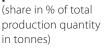
#### Impact ranking scale

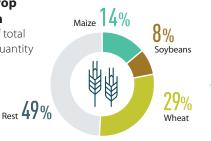


Blank cells signify that there is no data available

Source: Based on Arnell et al 2019

### National crop production





There are drastic reductions in crop duration for wheat, maize and soybeans. Wheat and maize are also negatively affected by an increase in hot spell frequency, whereas soybeans are affected by a slight reduction in rainfall.

Data for 2017 | Source: FAOSTAT 2019

### FINANCE

Canada's fossil fuel subsidies totalled US\$2.4bn in 2017, mostly for petroleum and natural gas. More than US\$3bn was raised through carbon taxes.

#### Nationally-determined contribution: Finance

Conditionality	Not applicable
Investment needs	Not specified
Actions	National actions to align financial flows specified (fiscal policy levers and public spending)
International market mechanisms	Not mentioned

Investment into green energy and infrastructure needs to outweigh fossil fuel investments by 2025.



**CANADA** 

Source: IPCC SR1.5 2018

Source: UNFCCC, NDC of respective country

### Financial policy and regulation supporting a brown to green transition

Through policy and regulation governments can overcome challenges to mobilising green finance, including: real and perceived risks, insufficient returns on investment, capacity and information gaps.

Category	Instruments	Objective	Under discussion/ implementation	Not identified
Green Financial Principles	N/A	This indicates political will and awareness of climate change impacts, showing where there is a general discussion about the need for alig- ning prudential and climate change objectives in the national financial architecture.	x	

			Mandatory	Voluntary	Under discussion	Not identified
Enhanced super- visory review,	Climate risk disclosure requirements	Disclose the climate-related risks to which financial institutions are exposed			x	
risk disclosure and market discipline	Climate-related risk assessment and climate stress-test	Evaluate the resilience of the financial sector to climate shocks		x		
Enhanced capital and liquidity	Liquidity instruments	Mitigate and prevent market illiquidity and maturity mismatch				x
requirements	Lending limits	Limit the concentration of carbon-intensive exposures				x
		Incentivise low carbon-intensive exposures				x
	Differentiated Reserve Requirements	Limit misaligned incentives and canalise credit to green sectors				x

Source: own research

While regulation of securities and disclosure requirements are regulated at provincial level, the Bank of Canada has expressed support for TCFD (Task Force on Climate-related Financial Disclosures) implementation and noted that the bank is an active member of the Green Finance Study



Group. Meanwhile, the Canadian Association of Pension Supervisory Authorities amended its guidance in February 2017 to list Environmental, Social and Governance (ESG) issues as typical risks to be evaluated by pension trustees; however, there is no mandatory requirement associated with this.

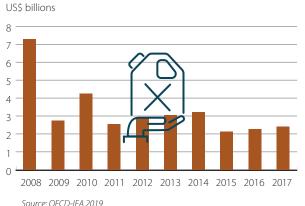
### FINANCE

# CANADA

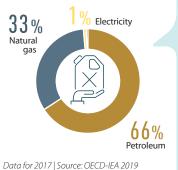
### **Fiscal policy levers**

Fiscal policy levers raise public revenues and direct public resources. Critically, they can shift investment decisions and consumer behaviour towards low-carbon, climate-resilient activities by reflecting externalities in prices.

### Fossil fuel subsidies



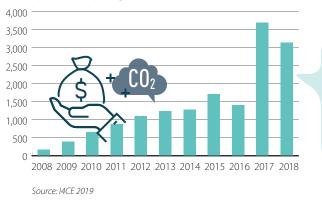
### Subsidies by fuel type



In 2017, Canada's fossil fuel subsidies totalled US\$2.4bn (compared to US\$7.3bn in 2008, with a gradual decline since then). Of the subsidies quantified, 58% were for the production of fossil fuels, with the remainder for consumption. The highest amount of subsidy was for petroleum, at US\$1.6bn, followed by natural gas at US\$0.8bn. The royaltyreduction programmes that target specific types of oil and natural-gas projects in Alberta have resulted in the highest subsidies - US\$4.9bn for petroleum and US\$4.4bn for natural gas.

### **Carbon revenues**

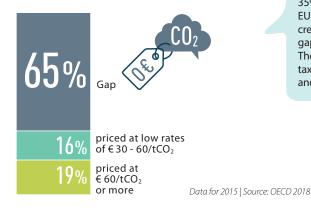
Carbon revenues (US\$ millions) from explicit carbon pricing schemes



Since 2007, several subnational carbon taxes and emissions-trading schemes have emerged in Canada. Emissions are priced from US\$14/tCO<sub>2</sub> to US\$30/tCO<sub>2</sub>, with US\$3.1bn revenues generated in 2018 (estimates for some jurisdictions are missing). The percentage of emissions covered by the subnational schemes vary between 10% and 91%. A federal carbon pricing initiative was agreed in 2018, with pricing starting at US\$20/tCO<sub>2</sub> in 2019, increasing by US\$10 per year until it reaches US\$50/tCO<sub>2</sub> in 2022.

### Carbon pricing gap<sup>15</sup>

% of energy-related CO2 emissions



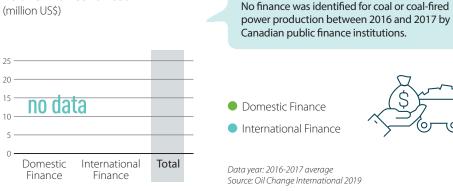
35% of Canada's  $CO_2$  emissions are priced at EUR30 or higher (the low-end benchmark), creating a carbon pricing gap of 65%. This gap is lower than the G20 average of 71%. The price covers not only explicit carbon taxes but also specific taxes on energy use and the price of tradable emission permits.

### FINANCE

### **Public finance**

Governments steer investments through their public finance institutions including via development banks, both at home and overseas, and green investment banks. Developed G20 countries also have an obligation to provide finance to developing countries and public sources are a key aspect of these obligations under the UNFCCC.

#### Public finance for coal<sup>16</sup>



### Commitments to restrict public finance to coal and coal-fired power<sup>17</sup>

MDB level	National development agencies and banks	Domestic export credit agencies	Export credit restriction in OECD	Comment
_	_	X	X	In addition to the OECD agreement to restrict coal finance, Canada's export credit agency, EDC, will not finance coal plants unless equipped with carbon capture storage (CCS), thermal coal mines or related infrastructure.
X yes 🗕	no	not applica	ble	Source: own research

### Provision of international public support<sup>18</sup>

Canada has some of the smallest flows of bilateral finance and finance through multilateral climate funds of the G20 countries that are obligated to provide climate finance. It does have the highest level of adaptation spending in its bilateral flows, with spending via multilateral climate funds that are largely cross-cutting. Bilateral flows are less than in the 2013–2014 period, balanced by an increase in flows through multilateral climate change funds. Canada has announced it will contribute CAD 300 million to the replenishment of the Green Climate Fund in 2019, matching its previous contribution.

Obligation to provide
climate finance
under UNFCCC

#### Bilateral climate finance contributions



NO



Theme of support

Adaptation

**9%** 

Cross-

cutting

**91%** 

Other

0%

United Nations Framework Convention on Climate Change

Annual average contribution	Theme of support				
(mn US\$, 2015-2016)	Mitigation	Adaptation	Cross- cutting	Other	
42.65	13%	81%	6%	0%	

Mitigation

0%

### Source: Country reporting to UNFCCC

#### Multilateral climate finance contributions See Technical Note for multilateral climate funds included and method to

included and method to attribute amounts to countries

Source: Country reporting to UNFCCC

#### Core/General Contributions

Annual average contribution (mn US\$, 2015-2016)

104.41

Annual average

contribution

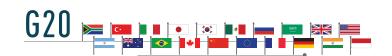
(mn US\$, 2015-2016)

72.82

Source: Country reporting to UNFCCC

### CANADA

### ENDNOTES



- 'Land use' emissions is used here to refer to land-use, land use change and forestry (LULUCF). The Climate Action Tracker (CAT) derives historical LULUCF emissions from the UNFCCC Common Reporting Format (CRF) reporting tables data converted to the categories from the IPCC 1996 guidelines, in particular separating Agriculture from Land use, land-use change and forestry (LULUCF), which under the new IPCC 2006 Guidelines is integrated into Agriculture, Forestry, and Other Land Use (AFOLU).
- 2) The 1.5°C fair share ranges for 2030 and 2050 are drawn from the CAT, which compiles a wide range of perspectives on what is considered fair, including considerations such as responsibility, capability, and equality. Countries with 1.5°C fair-share ranges reaching below zero, particularly between 2030 and 2050, are expected to achieve such strong reductions by domestic emissions reductions, supplemented by contributions to global emissions-reduction efforts via, for example, international finance. On a global scale, negative emission technologies are expected to play a role from the 2030s onwards, compensating for remaining positive emissions.

The CAT's evaluation of NDCs shows the resulting temperature outcomes if all other governments were to put forward emissions reduction commitments with the same relative ambition level.

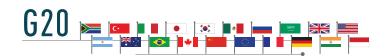
The 2030 projections of GHG emissions are from the CAT's June 2019 update and are based on implemented policies, expected economic growth or trends in activity and energy consumption.

The CAT methodology does not consider GHG emissions from LULUCF due to the large degree of uncertainty inherent in this type of data, and alsoto ensure consistency and comparability across countries.

- 3) See the Brown to Green 2019 Technical Note for the sources used for this assessment.
- 4) The Decarbonisation Ratings assess the relative performance across the G20. A high scoring reflects a relatively good efforts from a climate protection perspective but is not necessarily 1.5°C compatible. The ratings assess both the 'current level' and 'recent developments' to take account of the different starting points of different G20 countries. The 'recent developments' ratings compare developments over the last five available years (often 2013 to 2018).
- 5) The selection of policies rated and the assessment of 1.5°C compatibility are informed by the Paris Agreement, the Special Report on 1.5°C of the International Panel on Climate Change (2018), and the Climate Action Tracker (2016): 'The ten most important short-term steps to limit warming to 1.5°C'. The table below displays the criteria used to assess a country's policy performance. See the Brown to Green Report 2019 Technical Note for the sources used for this assessment.

On endnote 5)	low	——————————————————————————————————————	-O high	frontrunner
Renewable energy in power sector	No policy to increase the share of renewables	Some policies	Policies and longer-term strategy/ target to significantly increase the share of renewables	Short-term policies + long-term strategy for 100% renewables in the power sector by 2050 in place
Coal phase-out in power sector	No target or policy in place for reducing coal	Some policies	Policies + coal phase-out decided	Policies + coal phase-out date before 2030 (OECD and EU28) or 2040 (rest of the world)
Phase out fossil fuel cars	No policy for reducing emissions from light-duty vehicles	Some policies (e.g. energy/ emissions performance standards or bonus/malus support)	Policies + national target to phase out fossil fuel light-duty vehicles	Policies + ban on new fossil- based light-duty vehicles by 2035 worldwide
Phase out fossil fuel heavy-duty vehicles	No policy	Some policies (e.g. energy/ emissions performance standards or support)	Policies + strategy to reduce absolute emissions from freight transport	Policies + innovation strategy to phase out emissions from freight transport by 2050
Modal shift in (ground) transport	No policies	Some policies (e.g. support programmes to shift to rail or non-motorised transport)	Policies+ longer-term strategy	Policies + longer-term strategy consistent with 1.5°C pathway
Near zero-energy new buildings	No policies	Some policies (e.g. building codes, standards or fiscal/ financial incentives for low- emissions options)	Policies + national strategy for near zero-energy new buildings	Policies + national strategy for all new buildings to be near zero- energy by 2020 (OECD countries) or 2025 (non-OECD countries)
Retrofitting exis- ting buildings	No policies	Some policies (e.g. building codes, standards or fiscal/ financial incentives for low- emissions options)	Policies + retrofitting strategy	Policies + strategy to achieve deep renovation rates of 5% annually (OECD) or 3% (non- OECD) by 2020
Energy efficiency in industry	No policies	Mandatory energy efficiency policies cover more than 26-50% of industrial energy use	Mandatory energy efficiency policies cover 51–100% of industrial energy use	Policies + strategy to reduce industrial emissions by 75%–90% from 2010 levels by 2050
(Net) zero deforestation	No policy or incentive to reduce deforestation in place	Some policies (e.g. incentives to reduce deforestation or support schemes for afforestation /reforestation in place)	Policies + national target for reaching net zero deforestation	Policies + national target for reaching zero deforestation by 2020s or for increasing forest coverage

### **ENDNOTES** (continued)



- 6) The 1.5°C benchmarks are based on the Special Report on 1.5°C of the International Panel on Climate Change (2018). See the Brown to Green 2019 Technical Note for the specific sources used for this assessment.
- 7) Total primary energy supply data displayed in this Country Profile does not include non-energy use values. Solid fuel biomass in residential use has negative environmental and social impacts and is shown in the category 'other'.
- Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.
- 9) The category 'electricity and heat' covers CO<sub>2</sub> emissions from power generation and from waste heat generated in the power sector. The category 'other energy use' covers energy-related CO<sub>2</sub> emissions from extracting and processing fossil fuels (e.g. drying lignite).
- 10) This indicator shows transport emissions per capita, not including aviation emissions.
- 11) This indicator adds up emissions from domestic aviation and emissions from international aviation bunkers in the respective country. Emissions by aircrafts in the higher atmosphere lead to a contribution to climate change greater than emissions from burning fossil fuels. In this Country Profile, however, only a radiative forcing factor of 1 is assumed.
- 12) This indicator includes only direct energy-related emissions and process emissions (Scope 1) but not indirect emissions from electricity.

- 13) This indicator includes emissions from electricity (Scope 2) as well as direct energy-related emissions and process emissions (Scope 1).
- 14) This indicator covers only gross tree-cover loss and does not take tree-cover gain into account. It is thus not possible to deduce from this indicator the climate impact of the forest sector. The definition of 'forest' used for this indicator is also not identical with the definition used for the indicator on page 3.
- 15) 'Effective carbon rates' are the total price that applies to CO<sub>2</sub> emissions, and are made up of carbon taxes, specific taxes on energy use and the price of tradable emission permits. The carbon pricing gap is based on 2015 energy taxes and is therefore likely to be an underestimate, as taxation has tended to increase in countries over time.
- 16) The database used to estimate public finance for coal is a bottom-up database, based on information that is accessible through various online sources, and is therefore incomplete. For more information, see to the Brown to Green 2019 Technical Note.
- 17) See the Brown to Green 2019 Technical Note for the sources used for this assessment.
- 18) Climate finance contributions are sourced from Biennial Party reporting to the UNFCCC. Refer to the Brown to Green Report 2019 Technical Note for more detail.

For more detail on the sources and methodologies behind the calculation of the indicators displayed, please download the Technical Note at: http://www.climate-transparency.org/g20-climate-performance/g20report2019

### CLIMATE TRANSPARENCY



http://www.climate-transparency.org/g20-climate-performance/g20report2019

