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## PER CAPITA GREENHOUSE GAS (GHG) EMISSIONS ABOVE G20 AVERAGE

**GHG emissions (incl. land use) per capita (tCO<sub>2</sub>e/capita)<sup>1</sup>**

Canada's total GHG emissions (excl. land use) increased by 19% between 1990 and 2017.



Data for 2017  
Sources: Enerdata, 2020; UN  
Department of Economic and Social Affairs  
Population Division, 2020

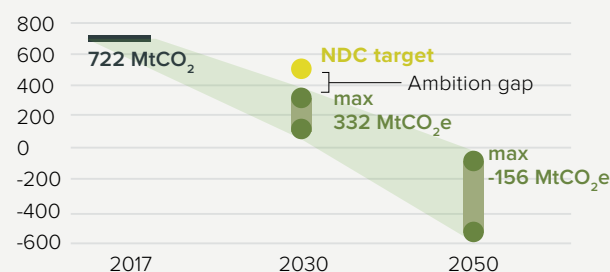
## NOT ON TRACK FOR A 1.5°C WORLD



Canada's fair-share range is below 332 MtCO<sub>2</sub>e by 2030 and below -156 MtCO<sub>2</sub>e by 2050. Under Canada's 2030 NDC target, emissions would only be limited to 526 MtCO<sub>2</sub>e. Canada can achieve

1.5°C-compatibility via strong domestic emissions reductions, supplemented with contributions to global emissions reduction efforts. All figures exclude land use and are based on pre-COVID-19 projections.

**Canada's 1.5°C 'fair-share' pathway (MtCO<sub>2</sub>e/year)<sup>1&2</sup>**



Source: Climate Action Tracker, 2020

## KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION



**CLIMATE ACCOUNTABILITY LEGISLATION**

**Table climate legislation that enshrines science-based targets in law**, including an enhanced 2030 target. Five-year budgets can help achieve the 2030 target along with

mechanisms for data collection, reporting, transparency and oversight.



**IMPROVED BUILDINGS EFFICIENCY**

**Post-COVID investments should adhere to "Green Strings"** by prioritising investment in improving energy efficiency, production and adoption of zero-emission vehicles, and growing Canada's clean energy sectors.



**COMMIT TO CLIMATE FINANCE TARGET**

Fossil fuels still make up about 76% of Canada's energy mix, with the share of renewable energy – mostly hydropower – stagnating at around 15% over the past three decades.

**Adopt a nationwide long-term renewable energy target and promote development of renewables instead of natural gas to replace retiring coal plants.**

## RECENT DEVELOPMENTS



In July 2020, the federal government reversed an earlier decision and now requires a proposed coal mine expansion to undergo a federal impact assessment. COVID-19 has delayed progress on many policies.



The Emergency Response Act has empowered Export Development Canada to channel public funds to prop-up domestic oil and gas operations – without a cap to the financing, public scrutiny or a sunset clause to end the changes.



Canada's September Throne Speech promises climate accountability legislation, a new NDC, enhanced climate targets and an industrial strategy around zero-emission vehicles in the coming months.

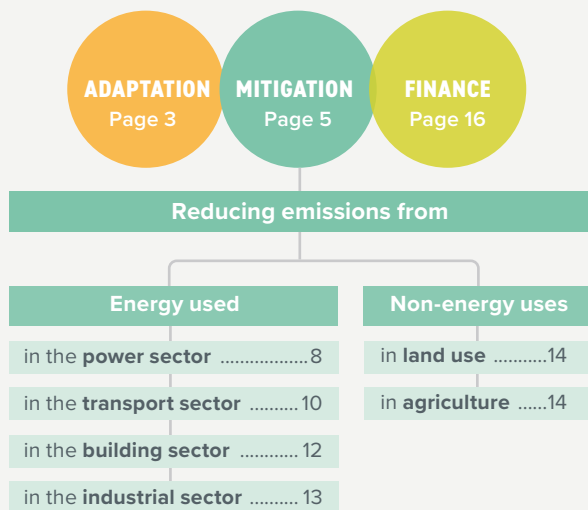
## CORONAVIRUS RECOVERY

Since March 2020, the federal government has been developing and implementing economic recovery measures to help individuals and businesses with the immediate financial and health impacts of the COVID-19 pandemic. Financial support for health and safety, direct support measures and tax liquidity support amounts to approximately 14% of GDP or CAD 324,922m. Any large employers that request support must publish annual climate-related financial disclosure reports and outline how they will contribute to meeting the country's climate targets.

Sources: Corkal, Gass and Cosbey, 2020; Croome and Abreu, 2020

## CONTENTS

We unpack Canada's progress and highlight key opportunities to enhance climate action across:

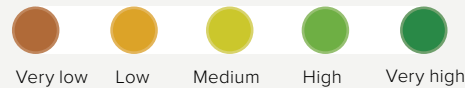


## LEGEND

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



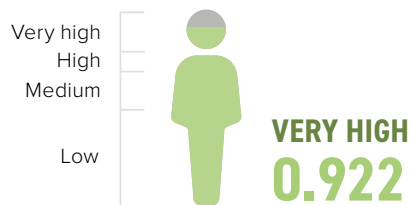
**Policy Ratings<sup>5</sup>** evaluate a selection of policies that are essential pre-conditions for the longer-term transformation required to meet the 1.5°C limit.



## SOCIO-ECONOMIC CONTEXT

### Human Development Index

The Human Development Index reflects life expectancy, level of education, and per capita income. Canada ranks very high on the Index.



Data for 2019. Source: UNDP, 2019

### Gross Domestic Product (GDP) per capita (PPP constant 2015 international \$)

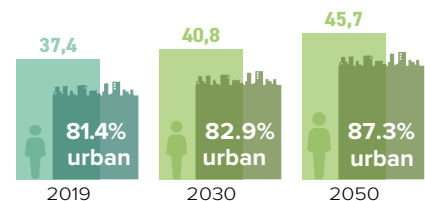


Data for 2019. Source: The World Bank, 2020

### Population and urbanisation projections

(in millions)

Canada's population is expected to increase by about 22% from 2019 levels by 2050; and become steadily more urbanised from an already high level.



Source: The World Bank, 2019; United Nations, 2018

### Death rate attributable to air pollution

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

**0.1 CANADA**  
**0.1-1.1 G20 RANGE**

More than 5,000 people die in Canada every year as a result of outdoor air pollution, due to stroke, heart disease, lung cancer and chronic respiratory diseases. Compared to total population, this is still one of the lower levels in the G20.

**5,335 deaths per year**

Data for 2016. Source: WHO, 2018

## JUST TRANSITION



Canada has taken some steps towards ensuring a just transition for coal power workers; however, much work remains for other fossil fuel and high carbon sector workers and communities. Canada is a founding member of the Powering Past Coal Alliance and is committed to phasing out coal-fired electricity generation by 2030. In 2018, the government established a Task Force to engage with

Source: Liberal Party of Canada, 2019

stakeholders on a just transition for workers as result of this phase-out. **The government responded in its 2019 Budget by establishing a CAD 150m infrastructure fund to support affected communities, in addition to funding for coal worker transition centres.** During the last federal election (October 2019), the government promised to pass a "Just Transition Act", but has yet to introduce the necessary legislation.

# 1. ADAPTATION

## ADDRESSING AND REDUCING VULNERABILITY TO CLIMATE CHANGE



**Increase the ability to adapt to the adverse effects of climate change and foster climate resilience and low-GHG development.**



Canada is vulnerable to climate change and adaptation actions are needed.



**HIGH COST OF EXTREME WEATHER**

On average, 15 fatalities and almost USD 1.7bn losses 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.

## ADAPTATION NEEDS

### Climate Risk Index

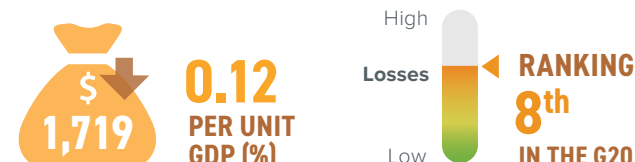
Impacts of extreme weather events in terms of fatalities and economic losses that occurred. All numbers are averages (1999-2018).

#### Annual weather-related fatalities



Source: Based on Germanwatch, 2019

#### Annual average losses (USD mn PPP)



Source: Based on Germanwatch, 2019

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

Impact ranking scale:

! Very low ! Low ! Medium ! High ! Very high

			1.5°C	2°C	3°C
<b>WATER</b>		% of area with increase in water scarcity	!	!	!
		% of time in drought conditions	!	!	!
<b>HEAT AND HEALTH</b>		Heatwave frequency	!	!	!
		Days above 35°C	!	!	!
<b>AGRICULTURE</b>	<b>Maize</b>	Reduction in crop duration	!	!	!
		Hot spell frequency	!	!	!
		Reduction in rainfall	!	!	!
	<b>Soybean</b>	Reduction in crop duration	!	!	!
		Reduction in rainfall	!	!	!
		Reduction in crop duration	!	!	!
	<b>Wheat</b>	Hot spell frequency	!	!	!
		Reduction in rainfall	!	!	!
		Reduction in crop duration	!	!	!

Source: Water, Heat and Health: own research. Agriculture: Arnell et al., 2019.

Note: These indicators are national scale results, weighted by area and based on global data sets. They are designed to allow comparison between regions and countries and, therefore, entail simplifications. They do not reflect local impacts within the country. Please see technical note for further information.

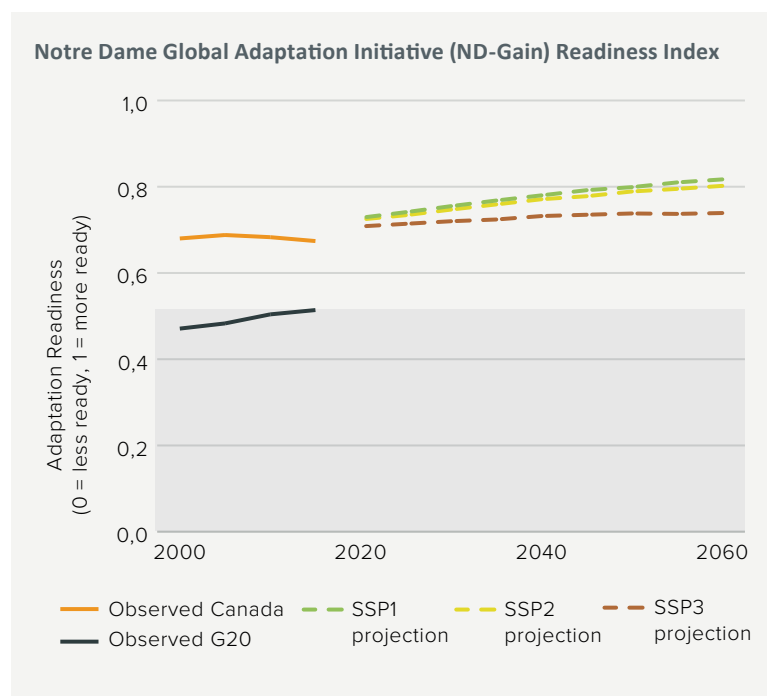
### CORONAVIRUS RECOVERY

The 2020 Speech from the Throne focused on COVID-19 recovery. It commits Canada to taking action on extreme climate risks by retrofitting homes and buildings, investing in reducing floods and wildfires, adapting industries and the economy for a zero-emissions future by stimulating research and development and providing incentives to enhance competitiveness of Canada's clean tech sectors, enhancing clean electricity, and building resilience while lowering emissions in agriculture.

Source: Governor General of Canada, 2020

## Adaptation readiness

The figure shows 2000-2015 observed data from the ND-GAIN Index overlaid with projected Shared Socioeconomic Pathways (SSPs) from 2015-2060.



Canada scored well above the G20 average between 2000 and 2015 and is projected to continue doing so given its combination of social, economic and governance structures. While adaptation challenges exist, Canada is well positioned to adapt to the impacts of climate change. Socio-economic developments compatible with SSP1 and SSP2 diverge little and would increase Canada's adaptation readiness slightly more and somewhat sooner than those compatible with SSP3 due to the generally high rate of readiness.

The readiness component of the Index created by the Notre Dame Global Adaptation Initiative (ND-GAIN) encompasses social economic and governance indicators to assess a country's readiness to deploy private and public investments in aid of adaptation. The index ranges from 0 (low readiness) to 1 (high readiness).

The overlaid SSPs are qualitative and quantitative representations of a range of possible futures. The three scenarios shown here in dotted lines are qualitatively described as a *sustainable development-compatible scenario (SSP1)*, a *middle-of-the-road (SSP2)* and a *'Regional Rivalry' (SSP3)* scenario. The shaded area delineates the G20 average in 2015 for easy reference.

Source: Andrijevic et al., 2020

## ADAPTATION POLICIES

### National Adaptation Strategies

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

### Nationally Determined Contribution (NDC): Adaptation

Targets	Actions
Not mentioned	Actions specified in infrastructure, health sectors

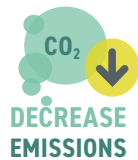
## 2. MITIGATION

### REDUCING EMISSIONS TO LIMIT GLOBAL TEMPERATURE INCREASE

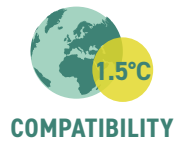


Hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit to 1.5°C, recognising that this would significantly reduce the risks and impacts of climate change.

#### EMISSIONS OVERVIEW



Canada's GHG emissions increased by 19% (1990-2017) and the government's climate targets for 2030 (-30% from 2005 levels) and 2050 net-zero are **not in line with a 1.5°C pathway**.

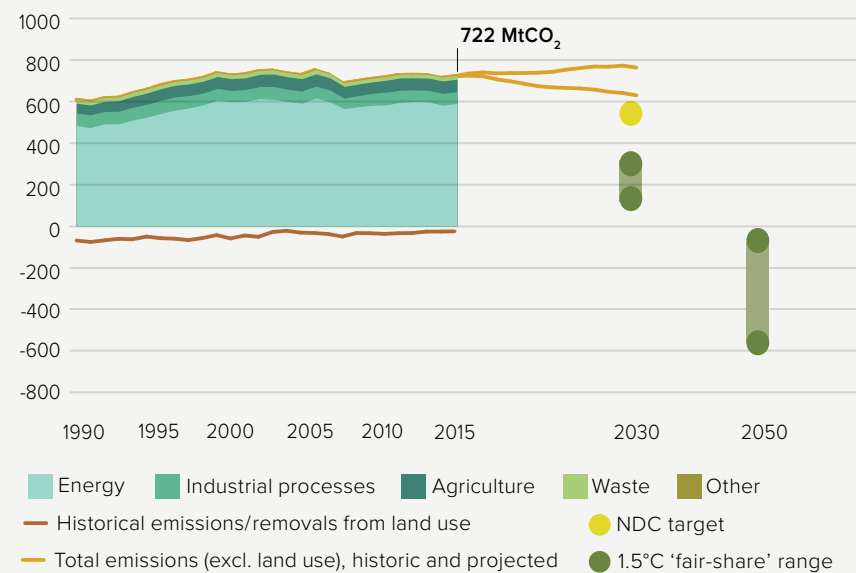


In 2030, global CO<sub>2</sub> emissions need to be 45% below 2010 levels and reach net-zero by 2050. Global energy-related CO<sub>2</sub> emissions must be cut by 40% below 2010 levels by 2030 and reach net-zero by 2060.

Source: Rogelj et al., 2018

#### GHG emissions across sectors and CAT 1.5°C 'fair-share' range (MtCO<sub>2</sub>e/year)

Total GHG emissions across sectors (MtCO<sub>2</sub>e/year)



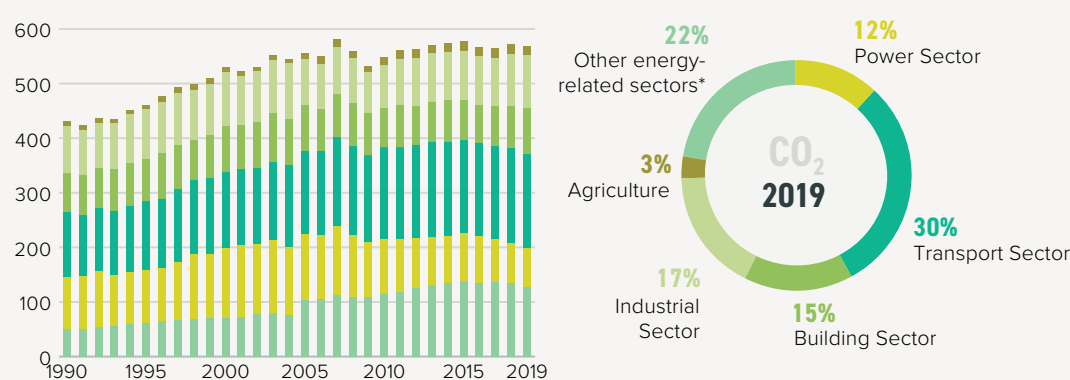
Canada's emissions (excl. land use) have increased by 19% between 1990 and 2017.

Canada was not on track to meet its NDC prior to the pandemic under either its current or planned policies. While emissions will drop in 2020 due to the lockdown and a slowdown in emissions is likely due to the economic impact of the pandemic, **Canada is still likely to miss its 2030 target**. Canada will need to scale up climate action to meet its NDC, with even more effort required to become 1.5°C 'fair-share' compatible, and can do so by adopting a green recovery package.

Sources: Gütschow et al., 2019; Climate Action Tracker, 2020

#### Energy-related CO<sub>2</sub> emissions by sector

Annual CO<sub>2</sub> emissions from fuel combustion (MtCO<sub>2</sub>/year)



\* 'Other energy-related sectors' covers energy-related CO<sub>2</sub> emissions from extracting and processing fossil fuels. Due to rounding, some graphs may sum to slightly above or below 100%.

The largest driver of overall GHG emissions are CO<sub>2</sub> emissions from fuel combustion.

In Canada, the transport, energy and industry sectors are the three largest contributors to emissions.

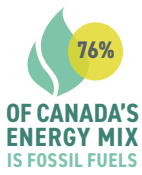
Source: Enerdata, 2020

#### CORONAVIRUS RECOVERY

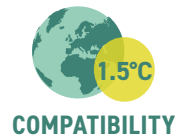
The federal government's COVID-19 Economic Recovery Plan has provided CAD 2.5bn in support to the oil and gas sector to clean up orphan and inactive wells and to reduce fugitive methane emissions. Depending on how this support is structured, it could undermine the "polluter pays" principle. CAD 330m has also been provided to the country's airports.

Source: Department of Finance Canada, 2020

## ENERGY OVERVIEW



**Fossil fuels still make up around 76% of Canada's energy mix (including power, heat, transport fuels, etc.).** Over the past three decades, the share of renewable energy has stayed at 15-16%. The carbon intensity has declined slowly in recent years.

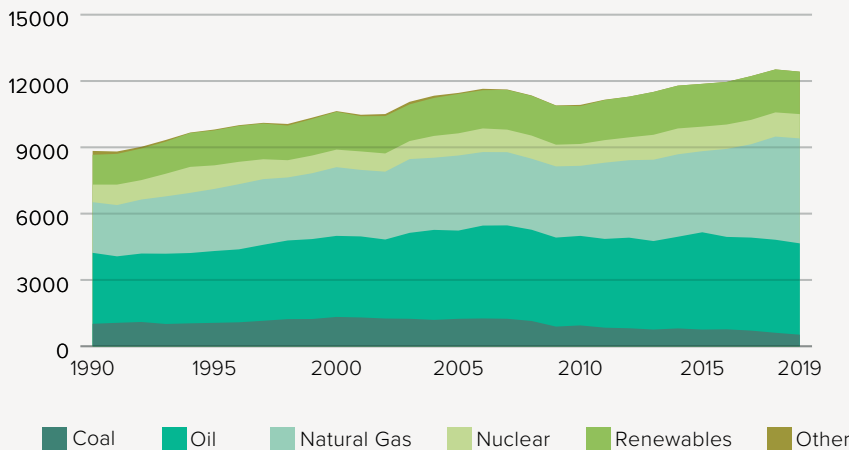


The share of **fossil fuels in the global primary energy mix needs to fall to 67% by 2030 and to 33% by 2050** (and to substantially lower levels without Carbon Capture and Storage).

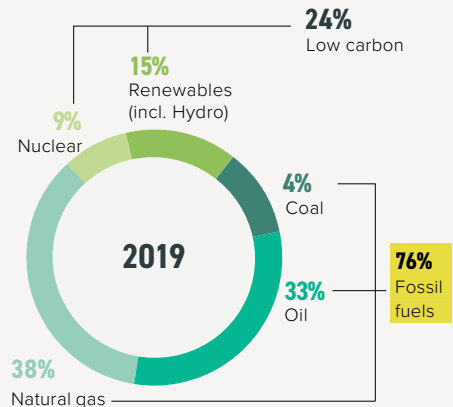
Source: Rogelj et al., 2018

## Energy Mix

Total primary energy supply (PJ)



Source: Enerdata, 2020

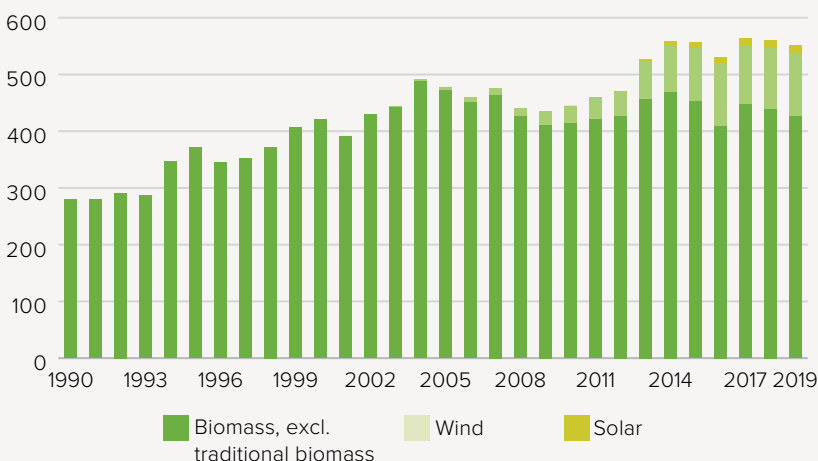


Due to rounding, some graphs may sum to slightly above or below 100%.

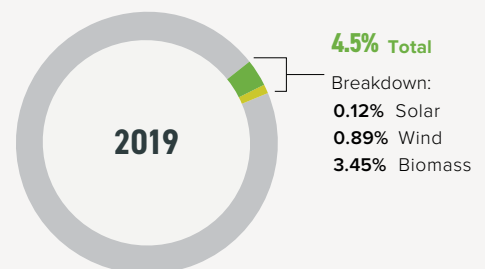
This graph shows Canada's energy supply fuel mix and includes energy used for electricity generation, heating, cooking, as well as transport fuels. Fossil fuels (oil, coal and gas) make up 76% of Canada's energy mix, which is slightly lower than the G20 average. The share of natural gas has increased in recent years due, in part, to the country phasing out coal in its electricity generation.

## Solar, Wind, Geothermal, and Biomass Development

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



Solar, wind, geothermal and biomass account for 4.5% of Canada's energy supply



Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts. Due to rounding, some graphs may sum to slightly above or below 100%.

## Decarbonisation rating: RE share of TPES compared to other G20 countries

5-year trend (2014-2019):



Current year (2019):

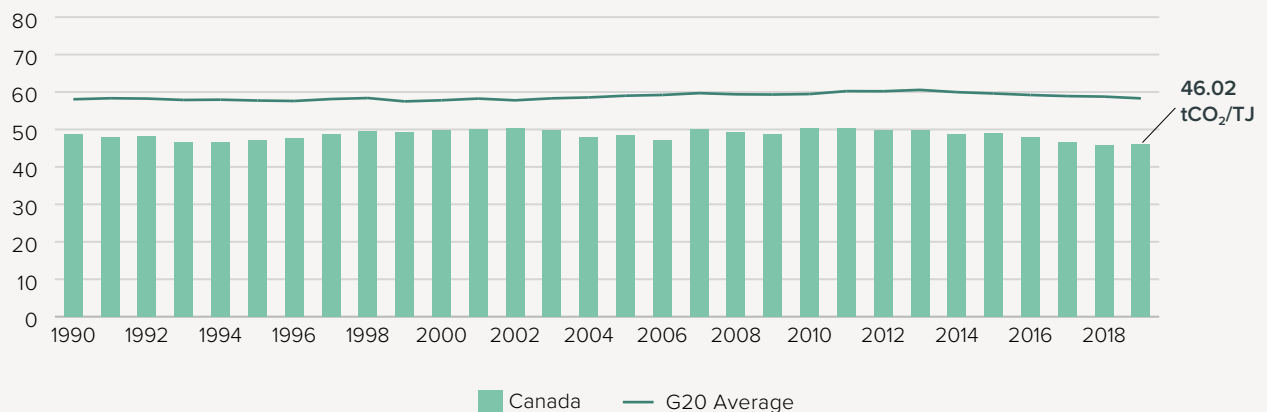


Solar, wind, geothermal and biomass account for 4.5% of Canada's energy supply – the G20 average is 6%. The share in total energy supply has decreased by around 5.9% in the last five years in Canada (2014-2019). Bioenergy (for electricity and heat) makes up the largest share.

Source: Enerdata, 2020

## Carbon Intensity of the Energy Sector

Tonnes of CO<sub>2</sub> per unit of total primary energy supply (tCO<sub>2</sub>/TJ)



### Decarbonisation rating: carbon intensity of the energy sector compared to other G20 countries



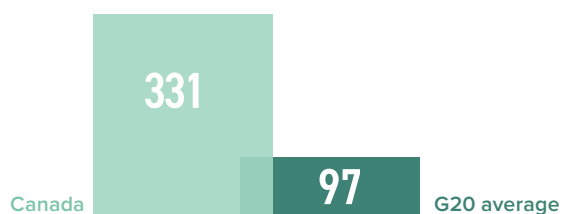
Carbon intensity shows how much CO<sub>2</sub> is emitted per unit of energy supply.

In Canada, carbon intensity has declined slowly in recent years, reaching 46 tCO<sub>2</sub>/TJ in 2019, and is better than the G20 average.

Source: own evaluation

## Energy supply per capita

(GJ/capita)



### TPES per capita (GJ/capita): 5-year trend (2014-2019)



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

Energy use per capita in Canada is 331 GJ/capita, well above the G20 average, and has increased by 1.6% over the past five years (2014-2019).

### Decarbonisation rating: energy supply per capita compared to other G20 countries



Source: own evaluation

## Energy intensity of the economy

(TJ/PPP USD2015 millions)



Data for 2018. Sources: The World Bank, 2020; Enerdata, 2020

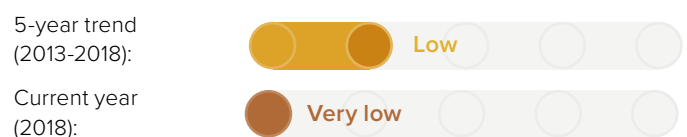
### Energy intensity of the economy: 5-year trend (2013-2018)



This indicator quantifies how much energy is used for each unit of GDP, which is closely related to the level of industrialisation, efficiency, climatic conditions and geography.

Canada's energy intensity is one of the highest in the G20 and is decreasing at a slower rate compared to the G20.

### Decarbonisation rating: energy intensity compared to other G20 countries



Source: own evaluation

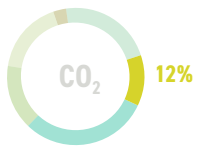




## POWER SECTOR

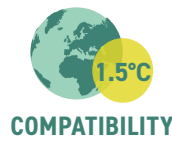
Emissions from energy used to make electricity and heat

Canada currently produces 7% of electricity from coal. Its decision to phase out coal power by 2030 is in line with a 1.5°C limit. However, much of that coal-fired power generation will be replaced with natural gas instead of renewable energy, which is not in line with the 1.5°C limit.



Share in energy-related CO<sub>2</sub> emissions from electricity and heat production

Source: Enerdata, 2020



### Coal and decarbonisation

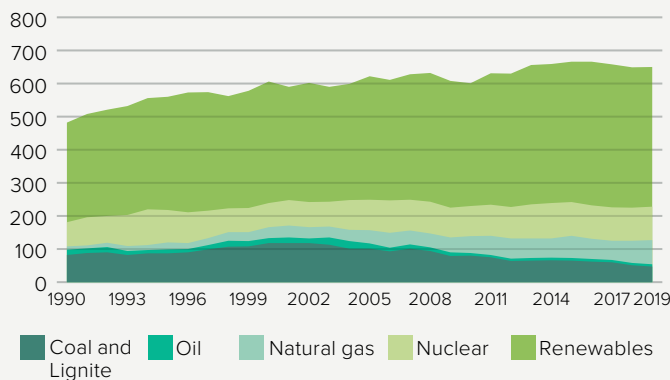
Worldwide, coal use for power generation needs to peak by 2020, and between 2030 and 2040, **all the regions of the world need to phase out coal-fired power generation**. Electricity generation has to be decarbonised before 2050, with renewable energy the most promising alternative.

Sources: Rogelj et al., 2018; Climate Analytics, 2016; Climate Analytics, 2019

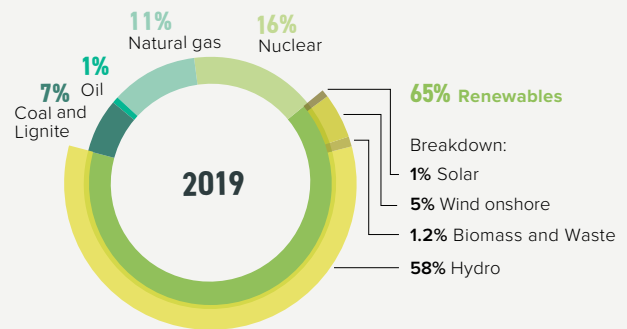
## STATUS OF DECARBONISATION

### Electricity mix

#### Gross power generation (TWh)



Source: Enerdata, 2020

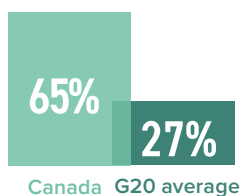


Due to rounding, some graphs may sum to slightly above or below 100%.

Renewables make up for close to two thirds of Canada's power mix, although wind and solar energy are only a small fraction of this electricity generation. The lion's share is from hydropower. The share of coal has been declining slowly since the early 2000s and unabated coal-fired power generation will be phased out completely by 2030. In Alberta, coal generation has declined substantially, in part due to the province's carbon pricing scheme. Much of Canada's coal capacity is expected to be replaced with natural gas.

### Share of renewables in power generation

(incl. large hydro)



Source: Enerdata, 2020

#### Decarbonisation rating: share of renewables compared to other G20 countries

5-year trend (2014-2019):



Current year (2019):



Source: own evaluation

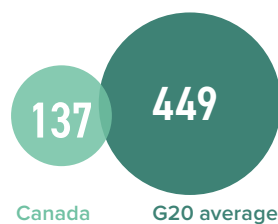
#### Share of renewables in power generation: 5-year trend (2014-2019)





## Emissions intensity of the power sector

Country vs G20 average (gCO<sub>2</sub>/kWh)



Source: Enerdata 2020

### Emissions intensity: 5-year trend (2014-2019)



**-12.3%**  
Canada



**-10.3%**  
G20 average

For each kilowatt hour of electricity, 137gCO<sub>2</sub> is emitted in Canada, one of the lowest levels in the G20, reflecting the high share of renewables in the energy mix. Emissions-intensity has also dropped by 12.3% from 2014 to 2019, which is a faster decline than the G20 average decline of 10.3%.

### Decarbonisation rating: emissions intensity compared to other G20 countries

5-year trend  
(2014-2019):



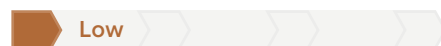
Current year  
(2019):



Source: own evaluation

## POLICY ASSESSMENT

### 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.

In June 2019, the Albertan government cancelled its Renewable Electricity Programme, which would have provided support for an additional 3.6 GW of power. The province is now not on track to meet its 30% renewable electricity by 2030 goal; however, the continuing failing cost of renewables may change that.

Source: own evaluation

### Coal phase-out in the power sector



#### In 2016, Canada announced the phase-out of coal-fired electricity by 2030 and adopted federal regulations in 2018.

However, much of the replacement capacity will come from natural gas. The federal government came under fire for deciding not to subject a coal mine expansion project to a federal impact assessment; however, it reversed its decision in July 2020. If approved, the expansion would increase annual coal production by 5 Mt per year beginning in 2022 for export to Asia.

Source: own evaluation



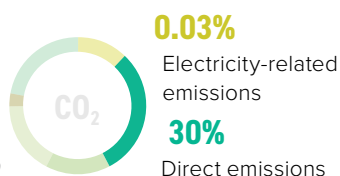
## TRANSPORT SECTOR

Emissions from energy used to transport people and goods

Direct emissions from the transport sector in Canada totalled 30% in 2019. **Canada's transport emissions are driven by its almost total reliance on oil (96,1%).**

Share in energy-related CO<sub>2</sub> emissions from transport sector

Source: Enerdata, 2020



COMPATIBILITY

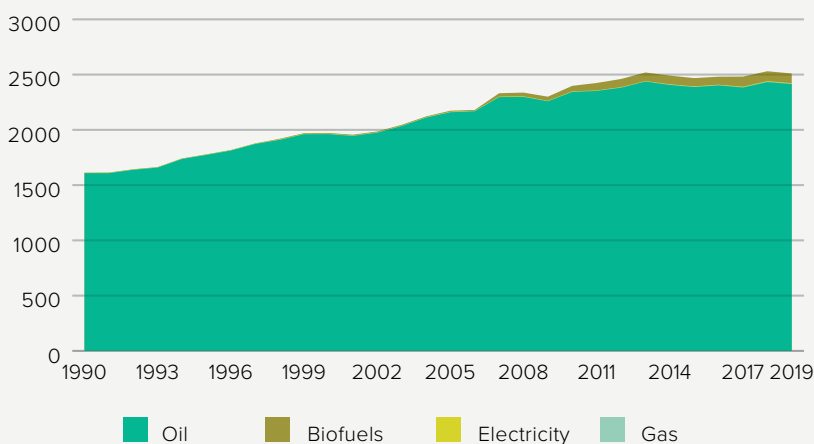
The share of low-carbon fuels in the transport fuel mix must increase to about 60% by 2050.

Source: Rogelj et al., 2018

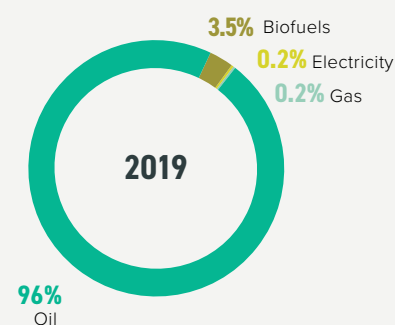
## STATUS OF DECARBONISATION

### Transport energy mix

Final energy consumption of transport by source (PJ/year)



Source: Enerdata, 2020



Due to rounding, some graphs may sum to slightly above or below 100%.

Biofuels make up only 3.5% of the energy mix in transport; oil continues to dominate at just over 96% of the fuel mix for the transport sector.

### Transport emissions per capita

excl. aviation (tCO<sub>2</sub>/capita)



Data for 2018. Source: Enerdata, 2020

Decarbonisation rating: transport emissions compared to other G20 countries

5-year trend (2013-2018):



Current year (2018):



Source: own evaluation

Transport emissions: 5-year trend (2013-2018)



-5.5%  
Canada



+5.5%  
G20 average

**Aviation emissions per capita<sup>6</sup>**(tCO<sub>2</sub>/capita)

Data for 2017. Source: Enerdata, 2020

**Decarbonisation rating: aviation emissions compared to other G20 countries**

5-year trend (2012-2017):



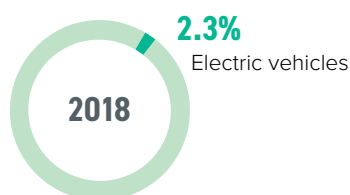
Current year (2017):



Source: own evaluation

**Aviation emissions: 5-year trend (2012-2017)****+3.4%**  
Canada**+18.7%**  
G20 average**Motorisation rate****669 VEHICLES PER 1,000 INHABITANTS (2016)**

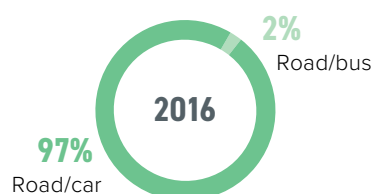
Data for 2016. Source: Vieweg et al., 2018

**Market share of electric vehicles in new car sales (%)**

Source: International Energy Agency, 2019

**Passenger transport**

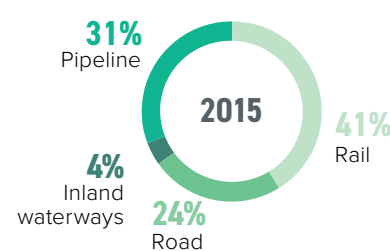
(modal split in % of passenger-km)



Data for 2016. Source: Vieweg et al., 2018

**Freight transport**

(modal split in % of tonne-km)



Data for 2015. Source: Vieweg et al., 2018

**POLICY ASSESSMENT****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) and a few provinces have ZEVs already (QC, BC). A Clean Fuel Standard, including annual carbon intensity reduction requirements for liquid fuels, is set to be finalised in the fall of 2020.

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

Source: own evaluation

**Phase out fossil fuel heavy-duty vehicles**

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

Source: own evaluation

**Modal shift in (ground) transport**

Canada's Long-term Infrastructure Plan (2016) promises CAD 28.7bn (USD 22bn) 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



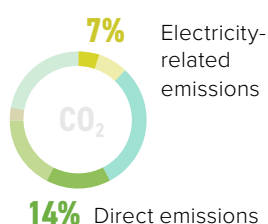
## BUILDING SECTOR

Emissions from energy used to build, heat and cool buildings

Canada's building emissions – counting heating, cooking but also electricity use – make up 15% of total CO<sub>2</sub> emissions. **Per capita, building-related emissions are more than double the G20 average.**

Direct buildings emissions (from burning fuels for heating, etc) account for 14% of buildings sector emissions, while indirect emissions (from grid-electricity for air conditioning, appliances, etc) contribute 7% of Canada's electricity-related CO<sub>2</sub> emissions.

Source: Enerdata, 2020



**Global emissions from buildings need to be halved by 2030**, and be 80-85% below 2010 levels by 2050, mostly through increased efficiency, reduced energy demand, and electrification in conjunction with complete decarbonisation of the power sector.

Source: Rogelj et al., 2018

## STATUS OF DECARBONISATION

### Building emissions per capita

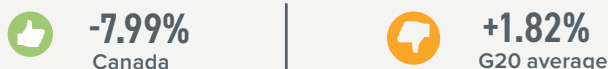
(incl. indirect emissions) (tCO<sub>2</sub>/capita)



Source: Enerdata, 2020

Building-related emissions per capita are almost double the G20 average. This reflects partly climatic conditions but also the high level of floor area per person. In contrast to the G20 average, Canada has managed to decrease the level by 8% (2014-2019).

#### Building emissions: 5-year trend (2014-2019)



#### Decarbonisation rating: building emissions compared to other G20 countries

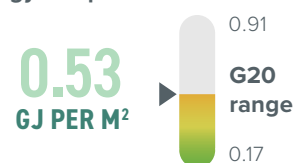
5-year trend (2014-2019):  High

Current year (2019):  Low

Source: own evaluation

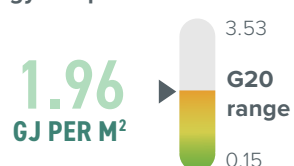
### Residential buildings

Energy use per m<sup>2</sup>



### Commercial and public buildings

Energy use per m<sup>2</sup>

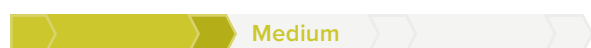


Building emissions are largely driven by how much energy is used in heating, cooling, lighting, household appliances, etc. **In Canada, energy use per m<sup>2</sup> in residential, commercial and public buildings is just higher than the middle of the range of the G20 countries.**

Different data year for each country  
Source: Castro-Alvarez et al., 2018

## POLICY ASSESSMENT

### Near zero energy new buildings



Different government levels are working together on a nationwide "net-zero energy building code" by 2030 (by 2020 would be 1.5°C compatible) as well as a mandatory energy use labelling scheme. 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; however, different levels of government 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



## INDUSTRY SECTOR

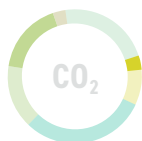
Emissions from energy in the industrial sector

Industry-related emissions make up 17% of direct CO<sub>2</sub> emissions in Canada, a slight increase compared to 2018.

Share in energy-related CO<sub>2</sub> emissions from industrial sector

Source: Enerdata, 2020

17%  
Direct emissions



4%  
Electricity-related emissions



COMPATIBILITY

Industrial emissions need to be reduced by 65-90% from 2010 levels by 2050.

Source: Rogelj et al., 2018

## STATUS OF DECARBONISATION

### Industry emissions intensity<sup>7</sup>

(tCO<sub>2</sub>e/USD2015 GVA)



Data for 2016. Sources: Gütschow et al., 2019; Enerdata, 2020

### Industry emissions: 5-year trend (2012-2017)



-10%  
Canada



-12%  
G20 average

### Decarbonisation rating: emissions intensity of industry compared to other G20 countries

5-year trend (2012-2017):



Current year (2017):



Source: own evaluation

### Carbon intensity of cement production<sup>8</sup>

(kgCO<sub>2</sub>/tonne product)

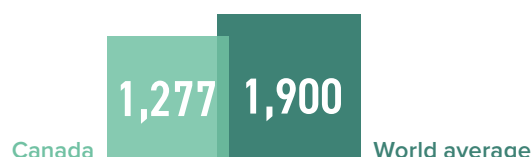


Canada's cement industry is slightly more emissions-intensive than the global average.

Data for 2016. Sources: CAT Decarbonisation Data Portal, 2020; Climate Action Tracker, 2019

### Carbon intensity of steel production<sup>8</sup>

(kgCO<sub>2</sub>/tonne product)



Steel production and steelmaking are significant GHG emission sources, and challenging to decarbonise.

Data for 2016. Sources: World Steel Association, 2018; CAT Decarbonisation Data Portal, 2020

## POLICY ASSESSMENT

### Energy Efficiency



GHG emissions from the industry sector are mainly driven by the oil and gas industry. Passed in July 2019, the federal-level Greenhouse Gas Pollution Pricing Act has a federal carbon price and a federal emissions trading system - the Output-Based Pricing System (OBPS).

The OBPS should provide a price incentive for industrial emitters to reduce greenhouse gas emissions while maintaining competitiveness and protecting against "carbon leakage".

On 31 May 2020, an amendment to the OBPS Regulations postponed the reporting and verification processes for the 2019 compliance period from 1 June 2020 to 1 October 2020.

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



## LAND USE SECTOR

### Emissions from changes in the use of the land



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, e.g. by halting the expansion of residential areas and by creating new forests.

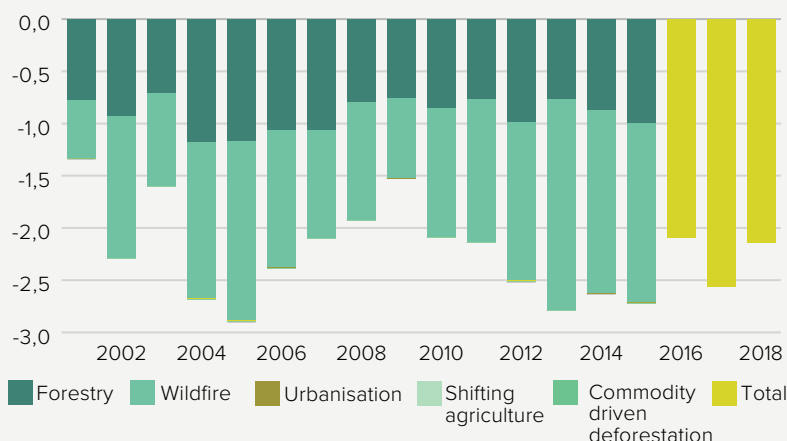


**Global deforestation needs to be halted and changed to net CO<sub>2</sub> removals by around 2030.**

Source: Rogelj et al., 2018

## Global tree-cover loss

Gross tree-cover loss by dominant driver (million hectares)



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. 2000 tree cover extent – >30% tree canopy.

Source: Global Forest Watch, 2019

From 2001 to 2018, Canada lost 646 Mha of tree cover, equivalent to a 5.2% decrease since 2000. This does not take tree-cover gain into account.

## POLICY ASSESSMENT

### Target for 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



## AGRICULTURE SECTOR

### Emissions from agriculture



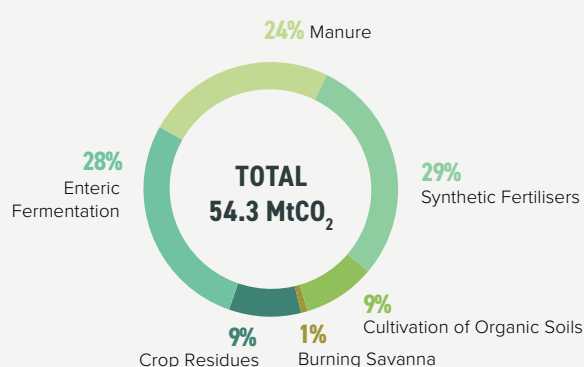
Canada's agricultural emissions come mainly from the use of synthetic fertilisers, digestive processes in animals, and livestock manure. **A 1.5°C pathway requires dietary shifts, increased organic farming, and less fertiliser use.**



**Methane emissions (mainly enteric fermentation) need to decline to 10% by 2030** and to 35% by 2050 (from 2010 levels). Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).

Source: Rogelj et al., 2018

## Emissions from agriculture (excluding energy)



Data for 2017.  
Source: FAO, 2019

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

Due to rounding, some graphs may sum to slightly above or below 100%.

## MITIGATION: TARGETS AND AMBITION

The combined mitigation effect of nationally determined contributions (NDC) submitted by September 2020 is not sufficient and will lead to a warming of 2.7°C by the end of the century. This highlights the urgent need for all countries to submit more ambitious targets by 2020, as they agreed in 2015, and to urgently strengthen their climate action to align to the Paris Agreement's temperature goal.

## AMBITION: 2030 TARGETS

### Nationally Determined Contribution (NDC): Mitigation

#### Targets

37% GHG emissions reduction compared to 2005 by 2025, 43% by 2030 (decarbonisation of the economy by the end of the century)

#### Actions

Actions specified in the following sectors: energy, land use and forestry, agriculture, industry, transport.

### Climate Action Tracker (CAT) evaluation of NDC and actions

	Critically Insufficient
	Highly Insufficient
●	Insufficient
	2°C Compatible
	1.5°C Compatible
	Role Model

NDCs rated "insufficient" are in the least stringent part of a country's 'fair-share' range and not consistent with holding warming below 2°C, let alone with the Paris Agreement's stronger 1.5°C limit. If all government NDCs were in this range, warming would reach over 2°C and up to 3°C.

Canada continues to implement its climate strategy, the "Pan-Canadian Framework on Clean Growth and Climate Change"; however, it remains far from meeting its NDC. Prior to the pandemic, the government was set to miss its NDC by a wide margin. Although emissions in 2020 are projected to fall due to the economic impact of the pandemic response measures, Canada is still likely to miss its 2030 NDC target, even if its additional planned policies are implemented.

*Evaluation as at October 2020, based on country's NDC. Source: Climate Action Tracker*

## TRANSPARENCY: FACILITATING AMBITION

Countries are expected to communicate their NDCs in a clear and transparent manner in order to ensure accountability and comparability.

The NDC Transparency Check has been developed in response to Paris Agreement decision (1/CP.21) and the Annex to decision 4/CMA.1. While the Annex is only binding from the second NDC onwards, countries are "strongly encouraged" to apply it to updated NDCs, due in 2020.



### NDC Transparency Check recommendations

For more visit [www.climate-transparency.org/ndc-transparency-check](http://www.climate-transparency.org/ndc-transparency-check)

To comply with the Paris Agreement by ensuring clarity, transparency and understanding, it is recommended that Canada provides the following additional information in the upcoming NDC Update (compared to the existing NDC), including:

- Provide information on circumstances under which values of the reference indicators may be updated
- Provide explicit information on whether target is single- or multi-year target.
- Provide relevant details on domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner.

## AMBITION: LONG-TERM STRATEGIES

Status	Submitted to UNFCCC in November 2016
2050 target	80% emission reduction goals below 2005 levels by 2050 (65% below 2005 levels excl. LULUCF)
Interim steps	30% below 2005 by 2030
Sectoral targets	No
Net-Zero target	Yes, although not yet legislated

The Paris Agreement invites countries to communicate mid-century, long-term, and low-GHG emissions development strategies by 2020. Long-term strategies are an essential component of the transition toward net-zero emissions and climate-resilient economies.



### 3. FINANCE

#### MAKING FINANCE FLOWS CONSISTENT WITH CLIMATE GOALS



**Make finance flows consistent with a pathway towards low-GHG emissions and climate-resilient development.**



Canada spent USD 2.2bn on fossil fuel subsidies in 2019, 69% of which goes to support petroleum. More than USD 3bn was raised through carbon revenues.



**COMPATIBILITY**

Investment in green energy and infrastructure needs to outweigh fossil fuels investments by 2050

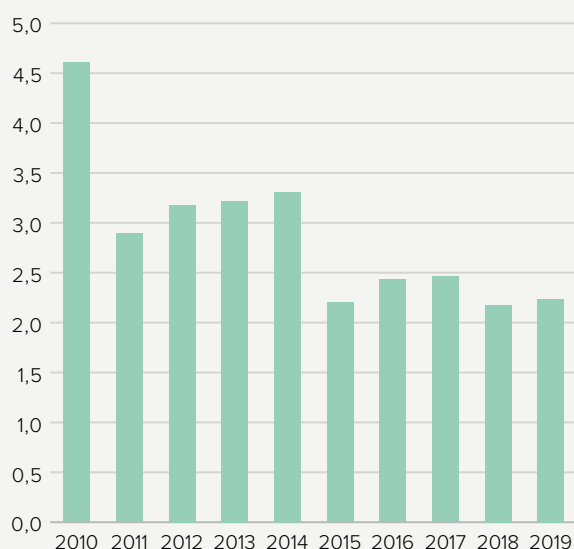
Source: Rogelj et al., 2018

### 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 the price.

#### Fossil Fuel Subsidies

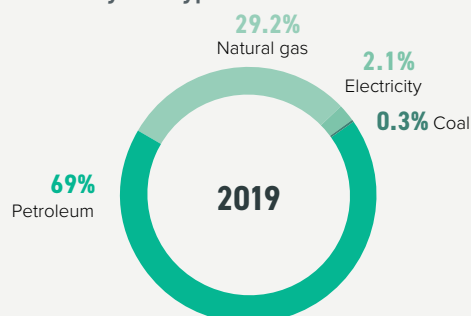
Canada Fossil fuel subsidies (USD billions)



Source: OECD-IEA Fossil Fuel Support database, 2020

#### Fossil Fuel Subsidies by fuel type

Subsidies by fuel type



Source: OECD-IEA Fossil Fuel Support database, 2020

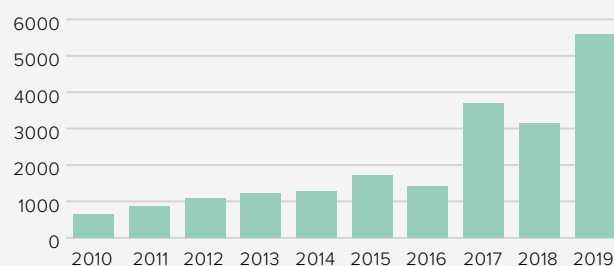
Due to rounding, some graphs may sum to slightly above or below 100%.

In 2019, Canada's fossil fuel subsidies totalled USD 2.2bn (compared to USD 4.6bn in 2010, with a gradual decline amid slight fluctuations since then). 52% of the subsidies quantified were for the consumption of fossil fuels, and the remainder for their production. The highest amount of quantified subsidies was for petroleum, at USD 1.5bn, followed by natural gas, at USD 0.7bn. The royalty-reduction programmes that target specific types of oil and natural gas projects in Alberta resulted in the highest subsidies, totalling USD 0.7bn for petroleum and natural gas.

#### Carbon Pricing and Revenues

Since 2007, several subnational carbon taxes and emissions trading schemes have emerged in Canada. Emissions are priced between USD 15/tCO<sub>2</sub> and USD 30/tCO<sub>2</sub>, with USD 5.6bn revenues generated in 2019 (estimates for some jurisdictions are missing). Subnational schemes cover between 43% and 91% of emissions. A federal carbon pricing initiative was introduced in 2019 in the form of a federal fuel charge, with pricing starting at USD 22/tCO<sub>2</sub> in 2019, increasing by USD 10 per year until it reaches USD 50/tCO<sub>2</sub> in 2022. In 2019, the federal fuel charge generated over USD 1.9bn revenues, representing the largest contribution to the yearly increase in global carbon revenues.

Carbon revenues (USD millions)



Source: IACE, 2019; OECD, 2018

#### CORONAVIRUS RECOVERY

Any large employers that request support from the federal government's COVID-19 Economic Recovery Plan must publish annual climate-related financial disclosure reports and outline how they will contribute to meeting the country's climate targets. Subject to these same terms, the Large Employer Emergency Financing Facility (LEEFF) was devised in July 2020 to provide short-term liquidity through interest-bearing term loans of CAD 60m or more.

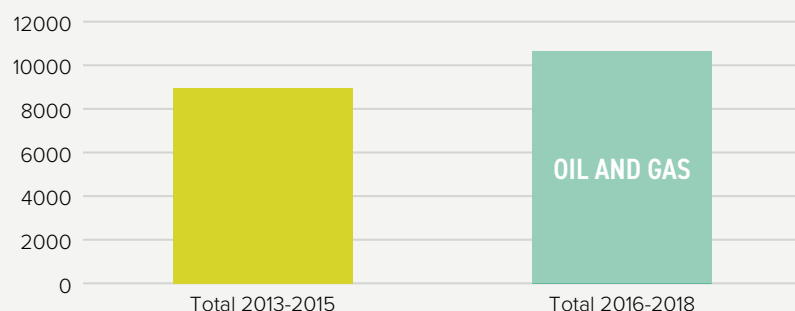
Source: Canada Development Investment Corporation, 2020

## 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 fossil fuels

Public finance provided to fossil fuels (in USD millions)



The database used to estimate public finance for fossil fuels is a bottom-up database, based on information that is accessible through various online sources and is, therefore, incomplete.

Source: Oil Change International, 2020

Between 2016 and 2018, Canada provided an average of USD 10.6bn per year in public finance for the oil and gas sector through its ECA, Export Development Canada (EDC). This represents an increase compared to the USD 8.9bn per year provided during the previous period 2013-2015. In 2016-2018, Canada was the G20 second largest supporter of fossil fuels, which is especially notable considering the relatively small size of Canada's economy and population. No finance was identified for coal or coal-fired power production between 2016 and 2018 by the public finance institutions of Canada.

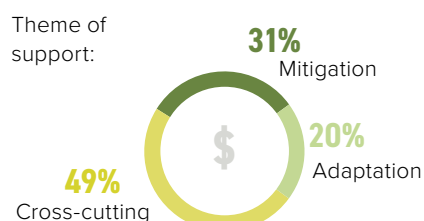
### Provision of international public support

(annual average 2017 and 2018)

Climate finance contributions are sourced from Party reporting to the UNFCCC.

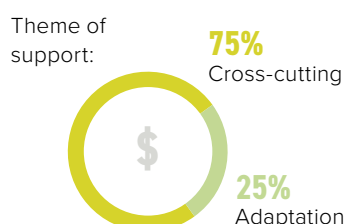
#### Bilateral, regional and other channels

Annual average contribution: **307.32** MN USD



#### Multilateral climate finance contributions

Annual average contribution: **53.97** MN USD



#### Core / General Contributions

Annual average contribution: **139.3** MN USD

Canada's bilateral finance increased seven-fold in the 2017/18 period compared to 2015/16. It has significant amounts of cross-cutting spending across bilateral and multilateral climate finance flows. Of the G20 countries obligated to provide climate finance, Canada's contributions remain relatively small compared to other G20 countries. Canada's Green Climate Fund replenishment pledge in 2019 was not more ambitious than its initial pledge in 2015.

## FINANCIAL POLICY AND REGULATION

### Financial policy and regulation

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		None 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 aligning prudential and climate change objectives in the national financial architecture.	●			
			Mandatory	Voluntary	Under Discussion/ implementation	None identified
Enhanced supervisory review, risk disclosure and market discipline	Climate risk disclosure requirements	Disclose the climate-related risks to which financial institutions are exposed		●		
	Climate-related risk assessment and climate stress-test	Evaluate the resilience of the financial sector to climate shocks			●	
Enhanced capital and liquidity requirements	Liquidity instruments	Mitigate and prevent market illiquidity and maturity mismatch				●
	Lending limits	Limit the concentration of carbon-intensive exposures				●
		Incentivise low carbon-intensive exposures				●
	Differentiated reserve requirements	Limit misaligned incentives and channel credit to green sectors				●

While regulation of securities and disclosure requirements are regulated at provincial level, the Bank of Canada (BoC) has expressed support for TCFD implementation and noted that the bank is an active member of the Green Finance Study Group. In 2018, Canada's Minister of Environment and Climate Change and Minister of Finance jointly appointed the Expert Panel on Sustainable Finance to explore and report on opportunities and challenges faced by the country to scale and align sustainable finance with the country's climate and economic goals. In 2019, the BoC announced a multi-year research initiative to understand better the risks that climate change poses to the economy and financial system. In March 2019, the BoC joined the Central Banks' and Supervisors' NGFS.

### Nationally Determined Contribution (NDC): 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

## ENDNOTES

For more detail on the sources and methodologies behind the calculation of the indicators displayed, please download the Technical Note at: [www.climate-transparency.org/g20-climate-performance/g20report2020](http://www.climate-transparency.org/g20-climate-performance/g20report2020)





- 1 '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 emissions 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.

- 3 In order to maintain comparability across all countries, this report utilises the PRIMAP year of 2017. However, note that Common Reporting Format (CRF) data is available for countries which have recently updated GHG inventories.
- 4 The Decarbonisation Ratings assess the current year and average of the most recent five years

(where available) to take account of the different starting points of different G20 countries.

- 5 The selection of policies rated and the assessment of 1.5°C compatibility are informed by the Paris Agreement, the IPCC's 2018 SR15 and the Climate Action Tracker (2016). The table below displays the criteria used to assess a country's policy performance.
- 6 This indicator adds up emissions from domestic aviation and international aviation bunkers in the respective country. In this Country Profile, however, only a radiative forcing factor of 1 is assumed.
- 7 This indicator includes only direct energy-related emissions and process emissions (Scope 1) but not indirect emissions from electricity.
- 8 This indicator includes emissions from electricity (Scope 2) as well as direct energy-related emissions and process emissions (Scope 1).

On endnote 5.	 Low	 Medium	 High	 Frontrunner
<b>Renewable energy in power sector</b>	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
<b>Coal phase-out in power sector</b>	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)
<b>Phase out fossil fuel cars</b>	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
<b>Phase out fossil fuel heavy-duty vehicles</b>	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
<b>Modal shift in (ground) transport</b>	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
<b>Near zero energy new buildings</b>	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)
<b>Energy efficiency in Industry</b>	0-49% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard	50-79% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard	80-89% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard	Over 90% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard
<b>Retrofitting existing buildings</b>	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
<b>Net-zero deforestation</b>	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

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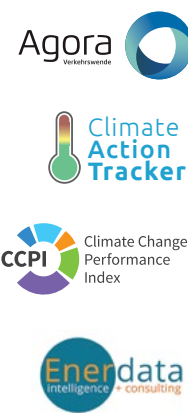


Climate Transparency is a global partnership with a shared mission to stimulate a "race to the top" in climate action in G20 countries through enhanced transparency. [www.climate-transparency.org](http://www.climate-transparency.org)

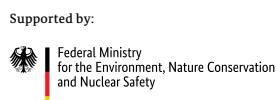
### PARTNERS



### DATA PARTNERS



### FUNDERS



based on a decision of the German Bundestag