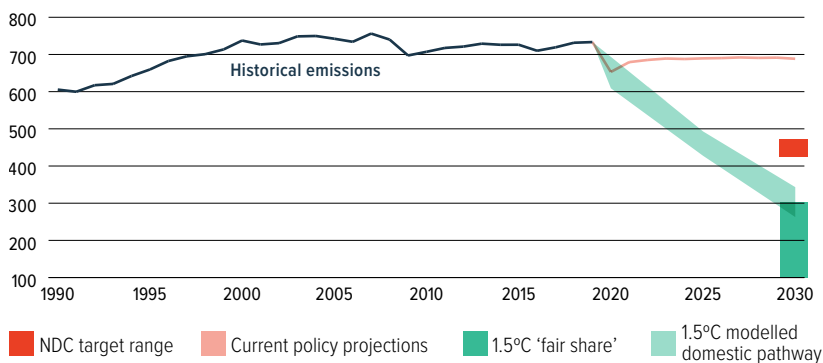




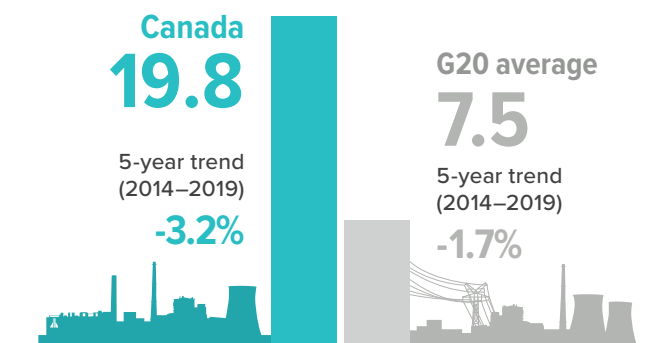
## NOT ON TRACK FOR A 1.5°C WORLD

1.5°C compatible emissions pathway (MtCO<sub>2</sub>e/year)<sup>1</sup>

Canada's updated NDC target would decrease emissions 40–45% below 2005 levels, or to approximately 427–467 MtCO<sub>2</sub>e (excl. LULUCF) in 2030. To keep below the 1.5°C temperature limit, analysis by the 1.5°C Pathways Explorer shows that Canada's emissions would need to be around 299 MtCO<sub>2</sub>e by 2030, leaving a minimum ambition gap of about 128 MtCO<sub>2</sub>e. When compared with its 1.5°C 'fair share' contribution, Canada would need to strengthen its NDC target and provide additional support for emission reductions in developing countries.

*Climate Action Tracker, 2022a; 2022b; Climate Analytics, 2022; Gütschow et al., 2021*

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

tCO<sub>2</sub>e/capita<sup>2</sup> in 2019

Canada's per capita emissions are 2.7 times the G20 average. Total per capita emissions have decreased by 3.2% from 2014 to 2019.

*Gütschow et al., 2021; World Bank, 2022*

## RECENT DEVELOPMENTS



**The federal government released its 2030 Emissions Reduction Plan** outlining a sector-by-sector approach to achieve the emissions target set in Canada's updated NDC, but this target is not 1.5°C compatible.



**In 2021, Canada signed the Global Methane Pledge and adopted a methane reduction target of at least 75% below 2012 levels by 2030 for its oil and gas sector emissions.** It is working on an economy-wide strategy to further reduce methane emissions.



**Oil and gas production has continued to increase**, and the government has approved new oil and gas projects, such as the Bay du Nord offshore project.

## KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION



**Stop approving new oil and gas fields and develop a phase-out plan.** In 2022, the Canadian government approved a controversial offshore oil field project, which, if built, could extract oil until 2058.



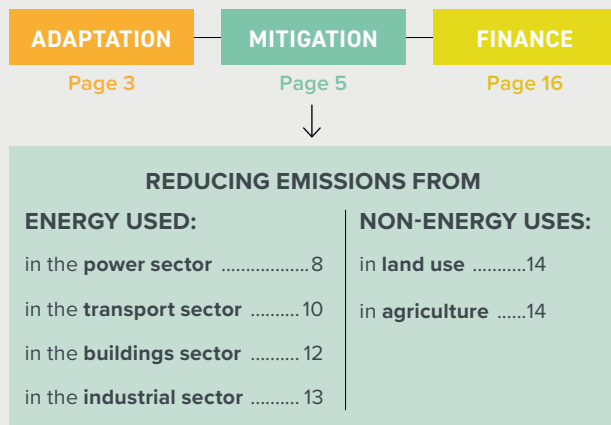
**Improve governance and oversight** of emissions from the harvested wood products industry, expand carbon pricing systems to include it, and do more to protect and restore forests.



Adhere to the Glasgow Climate Pact decision to "revisit and strengthen" 2030 targets this year and **submit a stronger NDC target by COP27.**

## Contents

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



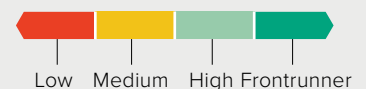
## Legend

**Trends** show developments over the past five years for which data are available. A red exclamation mark indicates negative trends from a climate protection perspective. !

**Decarbonisation Ratings<sup>3</sup>** assess a country's performance compared to other G20 Members. A high score reflects a relatively good effort from a climate protection perspective but is not necessarily 1.5°C compatible.



**Policy Ratings<sup>4</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



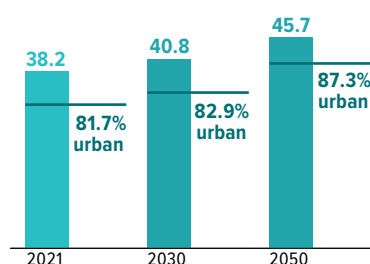
**0.93** very high

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

Data for 2019.  
UNDP, 2020

### Population and urbanisation projections

(in millions)

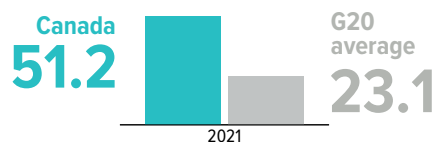


Canada's population is projected to increase by 19% by 2050, and become more urbanised. Sea level rise and storm surges pose risks to coastal cities and can cause damage to infrastructure, property, and people.

United Nations, 2018; World Bank, 2022

### Gross Domestic Product (GDP) per capita

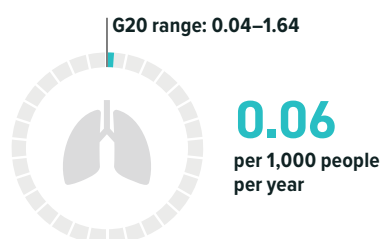
(thousand PPP constant 2015 international \$ per person) in 2021



World Bank, 2021

### Death rate attributable to ambient air pollution

(death rate per 1,000 population per year, age standardised) in 2019



Over 4,380 people died in Canada in 2019 due to stroke, heart disease, lung cancer and chronic respiratory diseases as a result of outdoor air pollution. This is one of the lower levels in the G20.

Institute for Health Metrics and Evaluation, 2020

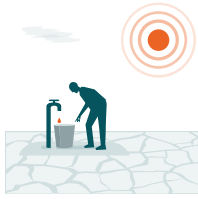
## A JUST TRANSITION

Canada has taken some steps towards ensuring a just transition for coal power plant workers. A founding member of the Powering Past Coal Alliance, Canada is committed to phasing out unabated coal-fired electricity generation by 2030. In 2018, the government established a task force to engage with stakeholders, and has since funded several programmes to support communities at risk from the transition. In 2019, the federal government committed to passing a Just Transition Act. However, in 2022, the Office of the Auditor General of Canada found that responsible agencies were not prepared to support a just transition and had failed to adopt an implementation plan or necessary governance structures. The legislation development process was delayed due to the pandemic and federal elections, but written submissions on future legislation closed in April 2022, while consultations with stakeholders continues, and it is possible that legislation will be tabled before the end of 2022.

Beer, 2022a; Minister of Environment and Climate Change, 2022; Natural Resources Canada, 2022; Office of the Auditor General of Canada, 2022

# ADAPTATION

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



In 2021, severe droughts impacted numerous areas of southwestern Canada, resulting in poor pasture production and unreliable water supplies.



Even in the world's largest freshwater lake system, the Great Lakes basin, some off-lake areas in southern Ontario experience periodic and even chronic water shortage.



The town of Lytton, BC, was almost completely destroyed by a devastating wildfire after days of record-breaking heat in 2021, and was evacuated again a year later, due to recurring wildfires.

## ADAPTATION NEEDS

### Impacts of a changing climate

#### Exposure to warming



**0.7°C**  
Higher

Between 2017 to 2021, the average summer temperatures experienced by people in Canada were 0.7°C higher than the 1986–2005 average global mean temperature increase of 0.3°C.

#### Changes in the ability to work due to exposure to excessive heat



**24.2m** Labour hours lost  
**130%** increase

In 2021, heat exposure in Canada led to the loss of 24.2 million potential labour hours, a 130% increase from 1990–1999.

#### Loss of earnings from heat-related labour capacity reduction



**982m** Loss in labour capacity (USD)  
**0.05%** of GDP

Extreme heat can make it unbearable or even dangerous to work in a range of economically important sectors. The potential income loss in 2021 – in the service industry, manufacturing, agriculture, and construction sectors – from labour capacity reduction due to extreme heat was USD 982m in Canada, or 0.05% of GDP.

*Romanello et al., 2022; World Meteorological Organization, 2022*

### Exposure to future impacts at 1.5°C warming and higher

Different levels of global warming are projected to have a wide range of impacts of varying severity across the world. The percentages at 1.5°C are calculated as an increase/decrease from the reference period of 1986–2006. Using the projected impacts at 1.5°C of warming as a reference, we compare impacts that may occur at higher levels of warming.

Climatic	At 2°C	At 2.5°C	At 3°C
Local <b>precipitation</b> : +4.5% at 1.5°C warming	1.6 times	2 times	2.8 times
Local <b>snowfall</b> : -3.3% at 1.5°C warming	1.6 times	2 times	3 times

Local precipitation is projected to increase by 4.5% above the average over the reference period, if global temperature rises by 1.5°C. More warming is projected to further increase precipitation: under a 2.5°C warming scenario, it is projected to double. Local snowfall is expected to decrease under a 1.5°C scenario by 3.3% from the reference period level. At 3°C of warming, the decrease would be three times that amount.

Fresh water	At 2°C	At 2.5°C	At 3°C
<b>Surface run-off</b> : +1.5% at 1.5°C warming	2.3 times	2.2 times	2.1 times
<b>River discharge</b> : +0.5 at 1.5°C warming	4.8 times	3.7 times	5.8 times
Total <b>soil moisture content</b> : +0.4% at 1.5°C warming	0.9 times	0.9 times	1.8 times

In Canada, the percentage of surface run-off and total soil moisture is projected to increase by 1.5% and 0.4%, respectively, if global temperature rises by up to 1.5°C. This gain of surface run-off/moisture content would be 2.1 times and 1.8 greater (or an increase of approximately 3.2% and 0.72%), respectively, at 3°C of warming. Under 1.5°C of warming, river discharge would increase by 0.5%, and this would be 5.8 times greater under 3°C of warming.

Hazards	At 2°C	At 2.5°C	At 3°C
Number of people annually exposed to <b>wildfires</b> : 14,164 at 1.5°C warming	1.2 times	1.6 times	1.8 times

The number of people exposed annually to hazards is expected to rise as the temperature increases. For example, the number of people exposed annually to wildfires is projected to be approximately 14,000 above the number of people exposed during the reference period, at 1.5°C of warming, and 1.8 times greater if warming increases to 3°C.

Economic	At 2°C	At 2.5°C	At 3°C
Annual expected damage from <b>hurricanes</b> : +10.5% at 1.5°C warming	2.4 times	3.9 times	5.2 times
Annual expected damage from <b>river flood</b> : +38.2% at 1.5°C warming	1.7 times	1.9 times	2.1 times
<b>Labour productivity</b> due to heat stress: -0.7% at 1.5°C warming	1.7 times	2.6 times	3.6 times

The annual expected damage from hurricanes and river flooding at 3°C is 5.2 times greater and 2.1 times greater, respectively, than the damage under a 1.5°C scenario. Labour productivity is projected to fall by 0.7% under 1.5°C of warming, and this decrease would be 3.6 times larger at 3°C of warming.

For further assessments of impacts under different warming scenarios, and a detailed explanation of the methodology, go to <https://climate-impact-explorer.climateanalytics.org>

Climate Analytics, 2021

# ADAPTATION POLICIES

## National Adaptation Strategies

Document name	Publication year	Fields of action (sectors)												Monitoring & evaluation process	
		Agriculture	Biodiversity	Coastal areas and fishing	Education and research	Energy and industry	Finance and insurance	Forestry	Health	Infrastructure	Tourism	Transport	Urbanism		Water
Pan-Canadian Framework on Clean Growth and Climate Change (PCF)	2020			✓	✓				✓	✓					Federal, provincial and territorial governments work with the sectoral ministries to take regular stock of the progress achieved.

A National Adaptation Strategy is in progress and should be published by the end of 2022.

## Nationally Determined Contribution (NDC): Adaptation

### TARGETS

None

### ACTIONS

Limited information provided on adaptation activities, with a focus on some provincial and Indigenous peoples' priorities.

# MITIGATION

**Paris Agreement:** 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.

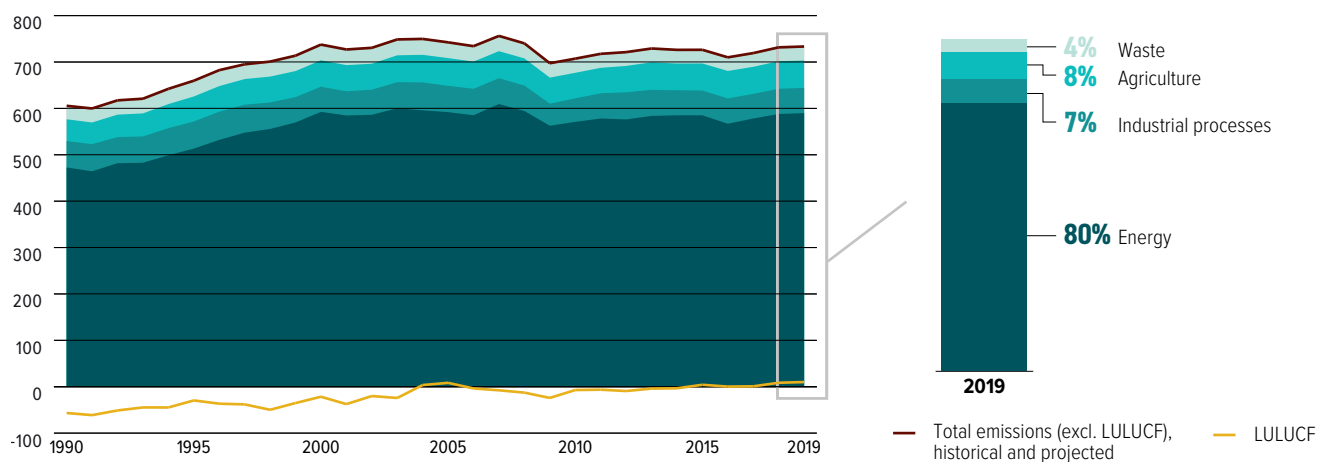
## EMISSIONS OVERVIEW



Canada's total **greenhouse gas emissions (excl. LULUCF)** have increased by **21%** (1990–2019). In the same period, its total methane emissions (excl. LULUCF) have increased by 4.8%.

### GHG emissions across sectors<sup>5</sup>

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

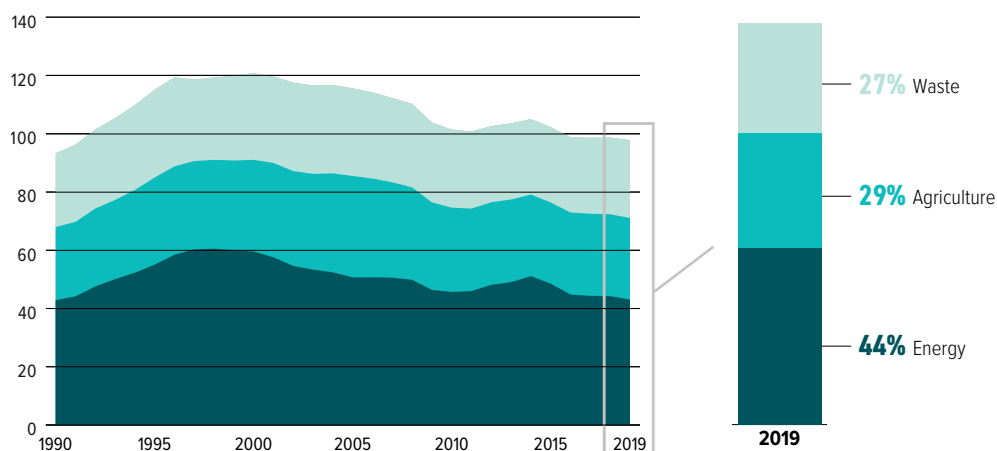


Canada's GHG emissions (excl. LULUCF) increased by 21% between 1990–2019 to 733 MtCO<sub>2</sub>e/yr. When considered by category, increases were largely due to a sustained increase in energy-related emissions from 1990–2005, but growth in emissions was seen in all sectors over the same timeframe. Despite long-standing targets to cut emissions, Canada has yet to establish a clear downward trend in emissions reductions.

Gütschow et al., 2021

### Methane emissions by sector

Total CH<sub>4</sub> emissions (MtCO<sub>2</sub>e/year)



**Canada signed the Global Methane Pledge at COP26 in November 2021.**

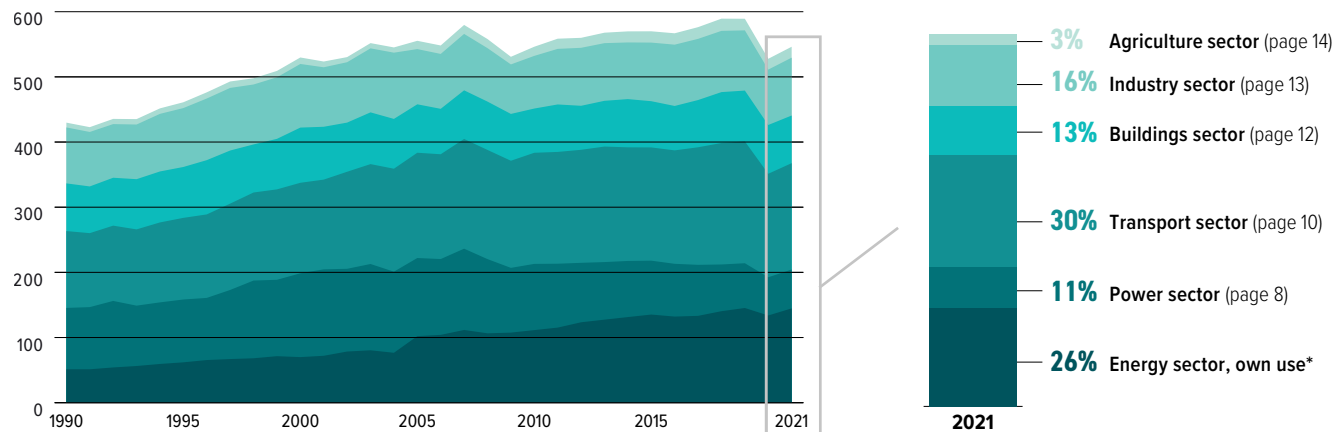
Participating countries pledged to undertake voluntary actions to contribute to a collective reduction of global methane emissions by at least 30% from 2020 levels by 2030. Further scrutiny of plans and implementation will be required.

Methane is a potent, though short-lived, greenhouse gas, accounting for an estimated third of global warming. Canada's total methane emissions (excl. LULUCF) increased by 4.8% between 1990–2019 to 98 MtCO<sub>2</sub>e/yr, although actual emissions are likely to be higher than reported. Energy sector emissions constituted 43% of all CH<sub>4</sub> emissions, with agriculture and waste sectors producing 28% and 27%, respectively. In 2021, Canada set a 2030 reduction target of at least 75% below 2012 levels for its oil and gas sector methane emissions; building on a 2025 target of 40–45% reductions.

Climate and Clean Air Coalition, 2021; Gütschow et al., 2021

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

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



**The largest driver of overall greenhouse gas emissions is CO<sub>2</sub> emissions from fuel combustion.** In Canada, emissions have been increasing since 1990. At 29.8%, the transport sector is the largest contributor, followed by the energy sector's own use – essentially oil and gas production – and industry, at 26.5% and 16.3%, respectively. CO<sub>2</sub> emissions from fuel combustion dropped notably in 2020, largely due to the impacts of COVID-19, but rebounded in 2021 as the economy recovered.

Enerdata, 2022

\*Includes energy-related CO<sub>2</sub> emissions from extracting and processing fossil fuels.

## ENERGY OVERVIEW



Fossil gas recently overtook oil in the energy mix, reaching a share of 41% in 2021, while the share of coal (4%) has continued to decline. The share of solar, wind, geothermal and biomass remained fairly steady during the 2016–2021 period.

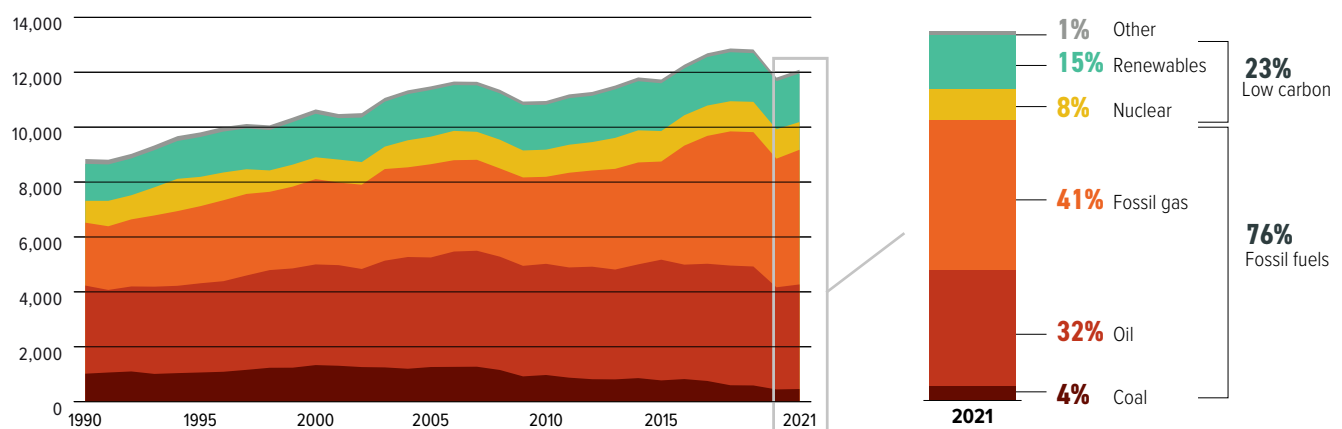


**The share of fossil fuels globally needs to fall to 67% of global total primary energy by 2030 and to 33% by 2050, and to substantially lower levels without carbon capture and storage.**

Rogelj et al., 2018

## Energy mix

Total primary energy supply (PJ)

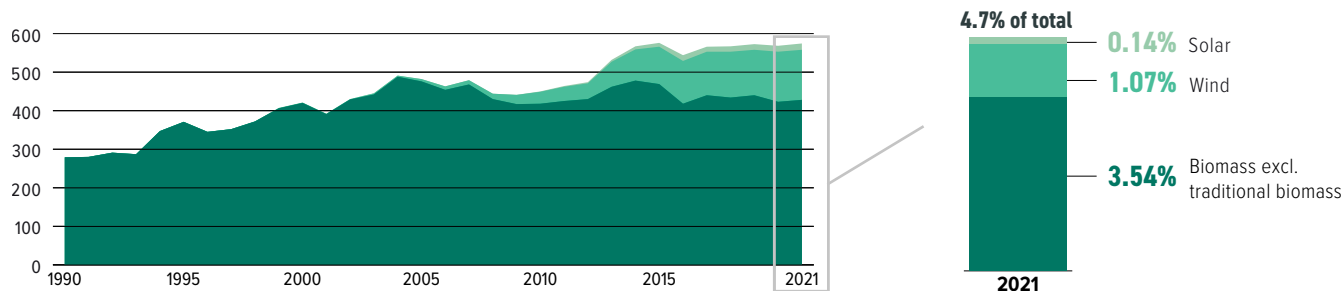


This graph shows the fuel mix for all energy supply, including energy used not only for electricity generation, heating, and cooking, but also for transport fuels. Fossil fuels (oil, coal, and gas) make up 76% of the Canada energy mix, lower than the G20 average of 81%. Increased energy supply was mainly driven by increased oil and fossil gas from 1990 to 2010. Since 2010, energy supply has increased, with fossil gas rising more quickly and noticeably whereas renewables increased more slowly and only a little.

Enerdata, 2022

## Solar, wind, geothermal and biomass development

As a share of total primary energy supply (TPES) (PJ)

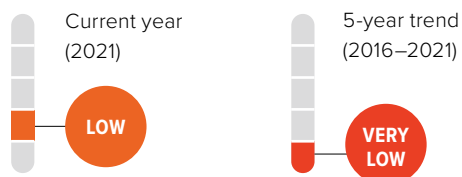


Solar, wind, geothermal and biomass, excluding traditional biomass, account for 4.7% of Canada's energy supply – the G20 average is 7.5%. The share in total energy supply has increased by around 8.6% in the last 5 years in Canada (2016–2021), substantially lower than the average G20 increase of 31%.

Enerdata, 2022

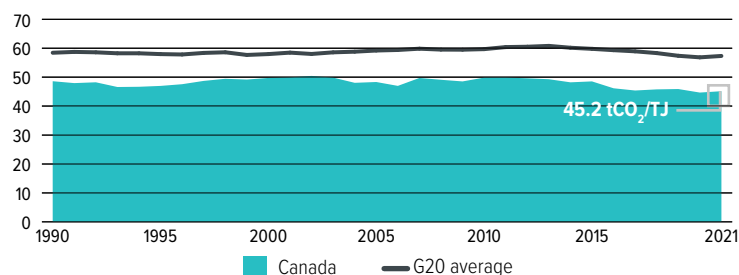
*Note: Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.*

**Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members**



## Carbon intensity of the energy sector

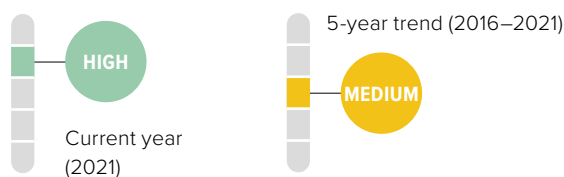
Tonnes of CO<sub>2</sub> per unit of TPES (tCO<sub>2</sub>/TJ)



Carbon intensity is a measure of how much CO<sub>2</sub> is emitted per unit of energy supply. Canada's energy sector carbon intensity is lower than the G20 average, but decreasing at a slightly slower rate. Decreasing intensity is driven by decreasing shares of coal and oil in the primary energy supply. Meeting net zero by 2050 would require phasing out fossil gas from the power sector in conjunction with a range of other measures.

Enerdata, 2022

**Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members**



## Energy supply per capita

TPES per capita (GJ/capita) in 2021

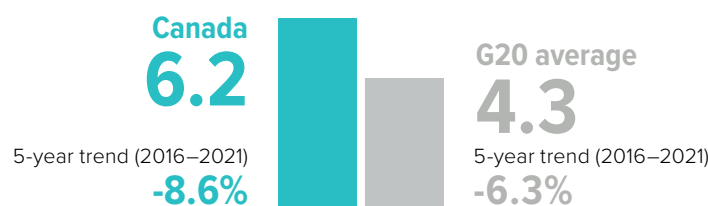


The level of energy supply per capita is closely related to economic development, climatic conditions and the price of energy. In 2021, energy supply per capita in Canada was 316.1 GJ, well above the G20 average of 99.4 GJ. Energy supply has decreased significantly between 2016 and 2021 (9.9%), while the G20 average has increased by 1.6% over the same period.

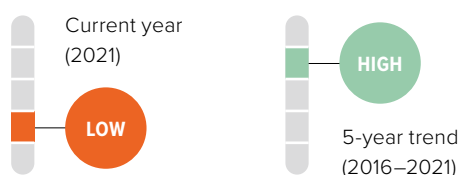
Enerdata, 2022; World Bank, 2022

## Energy intensity of the economy

(TJ/million US\$2015 GDP) in 2021



**Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members**



This indicator quantifies how much energy is used for each unit of GDP. This is closely related to the level of decarbonisation, efficiency achievements, climatic conditions or geography. Canada's energy intensity is higher than the G20 average but has been decreasing at a faster rate (8.6%) when compared to the average rate of decline of the G20 (6.3%).

Enerdata, 2022; World Bank, 2021

# POWER SECTOR

Emissions from energy used to make electricity and heat



With over **68% of electricity generated from renewable sources (mainly hydropower)**, the Canadian electricity system has one of the lowest carbon contents in the world, although fossil fuels still dominate the overall energy mix. Canada still produced 5% of its electricity from coal in 2021.

Power generation's share of energy-related CO<sub>2</sub> emissions in 2021:

**11%**

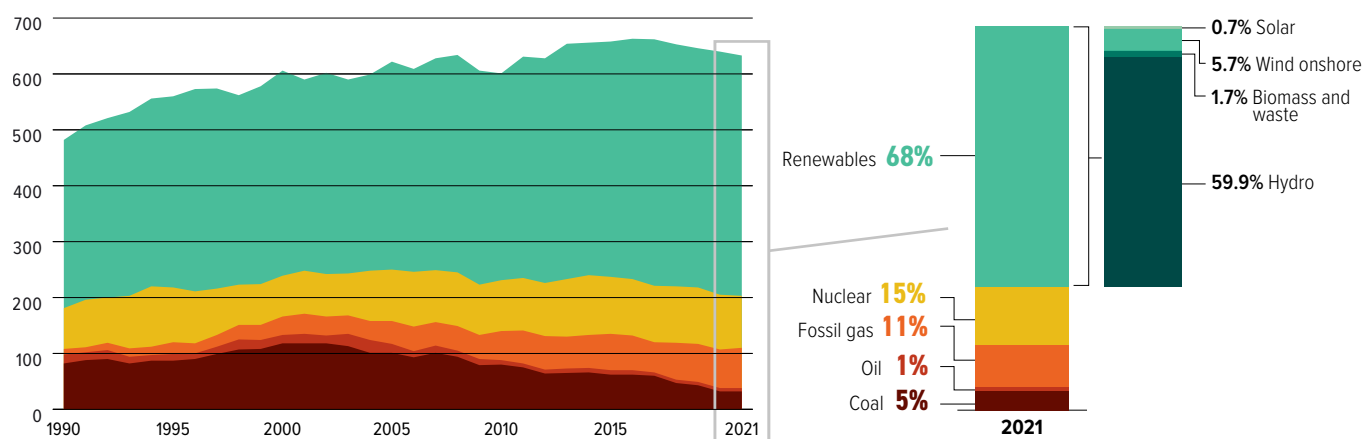


**Worldwide, coal use for power generation needs to peak by 2020**, and between 2030 and 2040, all the regions of the world need to phase out coal-fired power generation. By 2040, the share of renewable energy in electricity generation has to be increased to at least 75%, and the share of unabated coal reduced to zero.

*Climate Action Tracker, 2020; Rogelj et al., 2018*

## Electricity generation mix

Gross power generation (TWh)

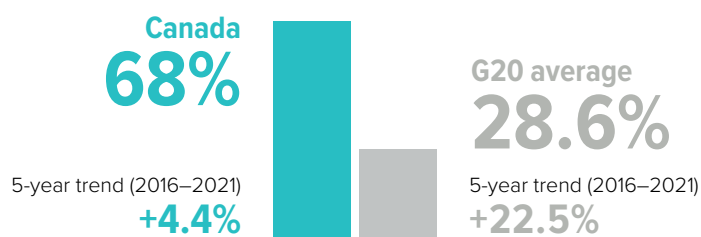


Canada generated only 17% of its electricity from fossil fuels in 2021. Coal will be phased out of the system by 2030. The share of renewable energy in Canada's power sector has been increasing, accounting for approximately 68% of the power mix in 2021, with 60% of renewables from hydropower. Nuclear power also has a significant share at 15%.

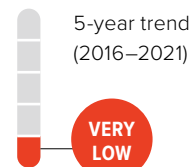
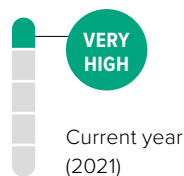
*Enerdata, 2022*

## Share of renewables in power generation

(incl. large hydro) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

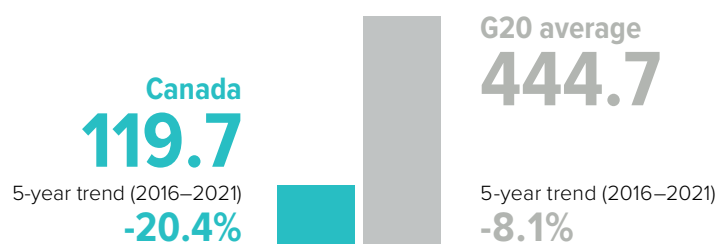


*Enerdata, 2022*

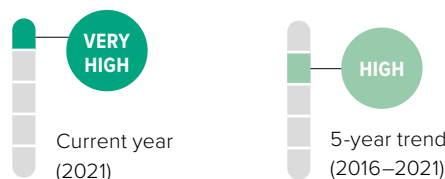


## Emissions intensity of the power sector

(gCO<sub>2</sub>/kWh) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

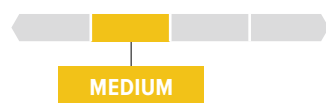


For each kilowatt hour of electricity, 119.7 g of CO<sub>2</sub> are emitted in Canada. Emissions intensity is decreasing due to the declining share of coal (5% in 2021) and increasing share of renewables in the power mix (68% in 2021).

Enerdata, 2022

## POLICY ASSESSMENT

### Renewable energy in the power sector



Canada's electricity generation produces fairly low emissions overall, though some individual provinces and territories continue to rely on coal and fossil gas. At COP26, Canada announced the goal to achieve a net-zero electricity grid by 2035. To this end, Canada's Emission Reduction Plan includes CAD 850m in investments for clean energy and aims to develop the Clean Electricity Regulations (CER), expected by the end of 2022 (see discussion under 'coal phase out' below). Federal carbon pricing and provincial-level policies also support renewable energy development.

Carss, 2022; Government of Canada, 2021a, 2022a, 2022b

### Coal phase-out in the power sector



In 2016, Canada announced the phase-out of coal-fired electricity generation by 2030 and adopted federal regulations in 2018. Some of the replacement capacity will come from fossil gas, which is not aligned with a net zero goal. The Clean Electricity Regulations under development would set an emissions performance standard for fossil fuel power generators to achieve net zero electricity generation by 2035, but provisions for plants commissioned before 2025 could allow some to operate above the standard beyond 2035.

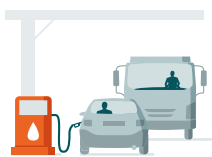
Coal power is still used in four provinces today: Alberta, Saskatchewan, Nova Scotia, and New Brunswick. Alberta will phase out coal power by the end of 2023, due to reinforcing federal and provincial policies and carbon pricing. Saskatchewan and Nova Scotia are committed to a 2030 phase-out, but opportunities exist to accelerate action towards a quicker phase-out. New Brunswick had attempted to get an extension for its coal power usage beyond 2030, but this has been rejected by the federal government.

Analysis shows Canada needs to phase out coal from its power mix by 2026 to be on a 1.5°C compatible emissions pathway.

Alberta Province, 2022; Carss, 2022; Climate Analytics, 2021; Government of Canada, 2022b, 2022c; Nova Scotia Power, 2022; Poitras, 2022; Thibault et al., 2021

# TRANSPORT SECTOR

Emissions from energy used to transport goods and people



Road transport dominated both passenger mobility (74%), and freight transport (49%) in 2021. Direct emissions from transport are still on the rise, and given that only 6.6% of cars sold in 2021 were electric vehicles (EVs), indirect emissions (from electricity use) remain minimal (0.02%).



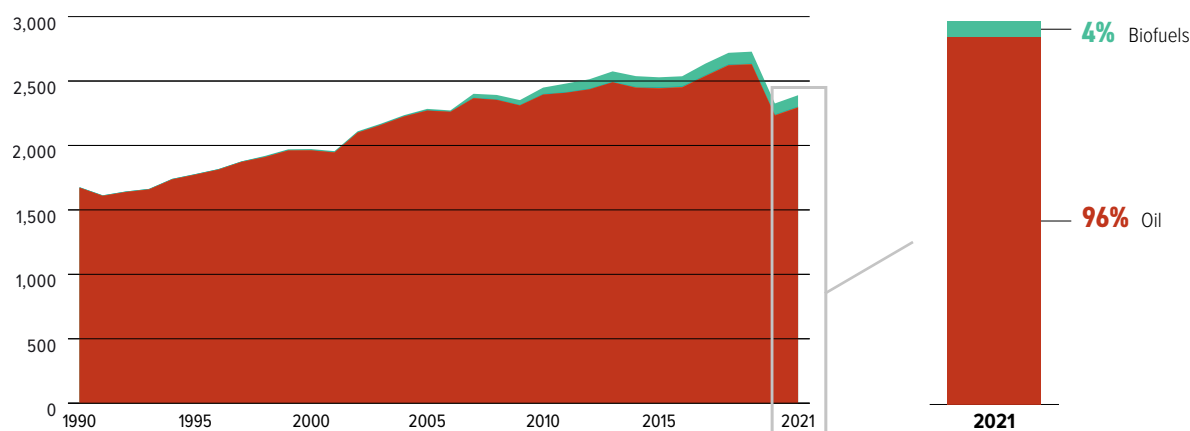
The share of low-carbon fuels in the transport fuel mix must **increase** to between 40% and 60% by 2040 and 70% to 95% by 2050.

*Climate Action Tracker, 2020; Rogelj et al., 2018*

Transport's share of energy-related CO<sub>2</sub> emissions in 2021: **29.9%** Direct

## Transport energy mix

Final energy consumption by source (PJ/year)



Electricity and biofuels make up only 4% of the energy mix in transport; the majority of that (3.7%) is biofuels.

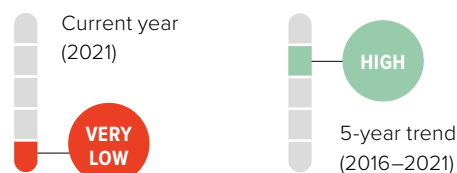
*Enerdata, 2022*

## Transport emissions per capita

(excl. aviation) (tCO<sub>2</sub>/capita) in 2021



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

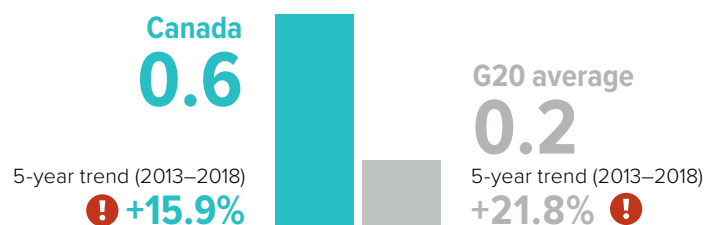


Per capita emissions in 2021 and the 5-year trend have been impacted by COVID-19 pandemic response measures and resulting economic slowdowns. For a discussion of broader trends in the G20 and the rebound of transport emissions in 2022, please see the Highlights Report at [www.climate-transparency.org](http://www.climate-transparency.org)

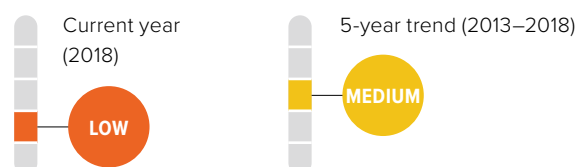
*Enerdata, 2022; World Bank, 2022*

## Aviation emissions per capita<sup>6</sup>

(tCO<sub>2</sub>/capita) in 2018

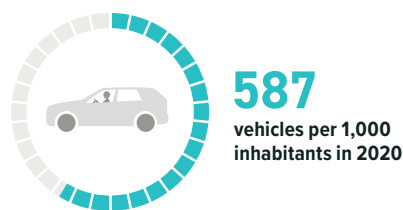


Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



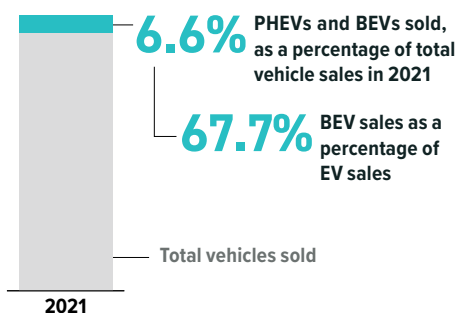
*Enerdata, 2022; IEA, 2021a; World Bank, 2022*

## Motorisation rate



Enerdata, 2022

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

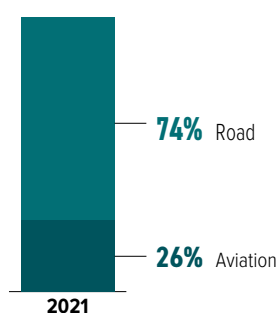


IEA, 2022

Battery-Electric Vehicles (BEVs) have greater emissions mitigation potential when they are powered by electricity produced by renewables because they have no internal combustion engine (ICE), whereas plug-in hybrids (PHEVs) still produce emissions when using the ICE.

## Modal split passenger transport

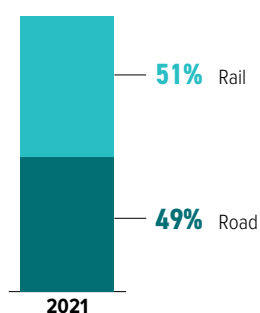
(% of passenger-km): road, rail and air



Enerdata, 2022

## Modal split freight transport

(% of tonne-km): road, rail



Enerdata, 2022

Due to data availability, only road and rail transport are included in the freight transport category. Other freight modes, e.g. waterways, are excluded due to lack of data for all countries.

# POLICY ASSESSMENT

## Phase out fossil fuel cars

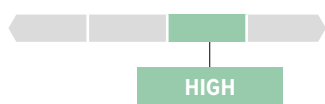


In June 2021, the federal government strengthened its target, mandating that 100% of sales of passenger vehicles must be zero emissions vehicles (ZEVs) by 2035, rather than 2040. In the Emissions Reduction Plan (ERP), the government plans to develop a regulated sales mandate to support this target, with interim targets of at least 20% by 2026 and at least 60% by 2030.

The ERP has programmes supporting EV-related infrastructure funding. The Clean Fuel Regulations, adopted in June 2022, include annual carbon intensity reduction requirements for liquid fuels.

Government of Canada, 2022e; Prime Minister of Canada, 2022; Task Force for a Resilient Recovery, 2020

## Phase out fossil fuel heavy-duty vehicles



The 2030 ERP includes a provision to launch an integrated strategy to reduce emissions from medium- and heavy-duty vehicles (MHDVs). The provision aims to reach 25% of total MHDV sales being ZEVs by 2030 and to have a subset of MHDV sales reach 100% ZEVs based on feasibility by 2040. Along with investments in charging infrastructure, the plan also includes CAD 547.5m for a purchase incentive programme for MHDVs. In 2018, Canada launched the Green Freight Assessment Programme to support carriers in reducing emissions, and revised its emissions regulations for HDVs.

Government of Canada, 2022e, 2022f

## Modal shift in (ground) transport



The ERP focuses on ZEVs and does not specify any investments in rail. The plan only “commits to explor[ing] additional opportunities” for rail, including developing a rail decarbonisation action plan.

The Investing in Canada Plan, Long-term Infrastructure Plan (2016) and Transportation 2030 Strategy (2017) have all included funding for lower emitting modes of transport. COVID-19 recovery measures included both support for public transport measures and non-motorised transport. In February 2021, the federal government announced CAD 15bn (USD 11bn) for road and green transportation infrastructure.

Government of Canada, 2022e

# BUILDINGS SECTOR

Emissions from energy used to build, heat and cool buildings



Direct emissions and indirect emissions from the buildings sector in Canada account for 12.3% and 5.8% of total energy-related CO<sub>2</sub> emissions, respectively. Per capita emissions from the buildings sector are almost twice the G20 average.

Buildings sector's share of energy-related CO<sub>2</sub> emissions in 2021:

**12.3%** Direct **5.8%** Indirect



**By 2040, global emissions from buildings need to be reduced by 90% from 2015 levels, and be 95–100% below 2015 levels by 2050, mostly through increased efficiency, reduced energy demand and electrification in conjunction with complete decarbonisation of the power sector.**

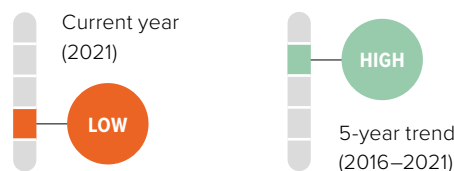
*Climate Action Tracker, 2020; Rogelj et al, 2018*

## Buildings sector emissions per capita

incl. indirect emissions (tCO<sub>2</sub>/capita) in 2021



**Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members**

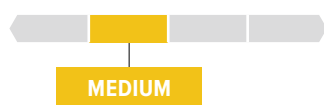


Buildings emissions occur directly (burning fuels for heating, cooking, etc) and indirectly (from grid-electricity for air conditioning, appliances, etc.) Buildings-related emissions per capita are almost twice the G20 average as of 2021, despite the relatively low fossil fuel share of the electricity mix. In contrast to the G20 average, Canada has decreased the level by 12.3% (2016–2021).

*Enerdata, 2022; World Bank, 2022*

## POLICY ASSESSMENT

### Near zero energy new buildings



In March 2022, Canada released model federal codes for new buildings, aiming to have all new buildings net zero energy ready by 2030. However, to gain legal standing, they need to be adopted by the provinces. The Emissions Reduction Plan includes CAD 150m to develop a national net zero by 2050 buildings strategy, including a Low Carbon Building Materials Innovation Hub to drive research in lower carbon construction materials. The Pan-Canadian Framework on Clean Growth and Climate Change aimed to adopt a mandatory energy use labelling scheme, but this has not been set up.

*Beer, 2022b; Behan, 2022; Logan, 2022*

### Renovation of existing buildings



Canada does not have a target for energy retrofitting and has pushed back its goal in the Pan-Canadian Framework on Clean Growth and Climate Change to adopt a national retrofit code from 2022 to 2024. Federal building codes are model codes and must be adopted by the provinces to be implemented. The Emissions Reduction Plan includes investments to accelerate retrofits, such as CAD 458.5m to support energy savings in low-income homes and CAD 200m to support the retrofit of large buildings.

*Prime Minister of Canada, 2021*

## INDUSTRY SECTOR Emissions from energy use in industry



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

*Rogelj et al., 2018*



Direct emissions and indirect emissions from industry in Canada made up 16.3% and 3.6% of energy-related CO<sub>2</sub> emissions, respectively in 2021. Canada has established a carbon pricing system for industrial emitters to support industrial decarbonisation.

Industry sector's share of energy-related CO<sub>2</sub> emissions in 2021:

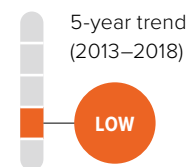
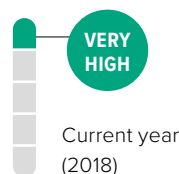
**16.3%** Direct **3.6%** Indirect

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

(kgCO<sub>2</sub>e/USD2015 GVA) in 2018



Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



*Enerdata, 2021; World Bank, 2022*

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

(kgCO<sub>2</sub>/tonne product) in 2019



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

*Enerdata, 2022; World Steel Association, 2021*

## POLICY ASSESSMENT

### Energy efficiency



Canada's Emissions Reduction Plan (ERP) aims to reduce emissions from heavy industry through the expansion of the Industrial Energy Management Programme to support energy efficiency measures and through developing a comprehensive carbon capture, utilisation and storage (CCUS) strategy. Canada has also launched the CAD 8bn Net Zero Accelerator to support industrial decarbonisation.

In 2019, Canada adopted a federal carbon price and emissions trading system – the Output-Based Pricing System (OBPS), which provides a price incentive for industrial emitters to reduce emissions while protecting against “carbon leakage”.

*Government of Canada, 2022e*

## LAND USE SECTOR

Emissions from land use change and forestry



Canada is one of the most forested countries in the world. To stay within the 1.5°C limit, Canada needs to make the land use and forestry sector a net sink of emissions, e.g. by discontinuing the degradation of peatlands, and by creating new forests.

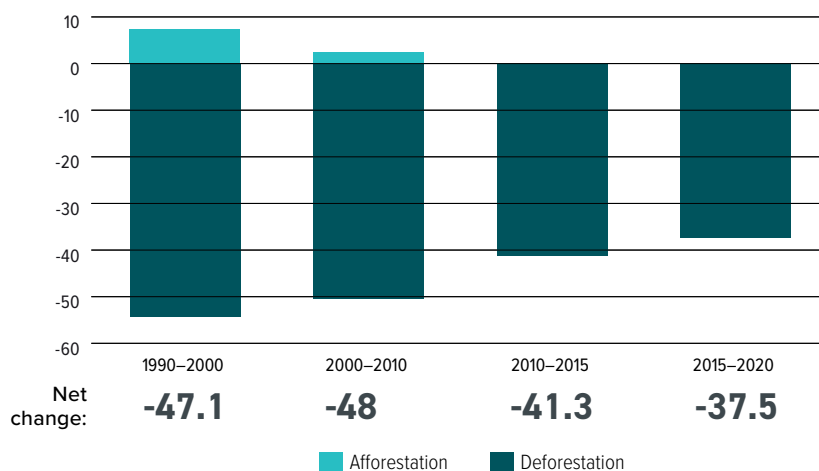


**Global deforestation needs to be halted and changed to net CO<sub>2</sub> removals by around 2030.**

*Rogelj et al., 2018*

### Annual forest expansion, deforestation and net change

Forest area change in 1,000 ha/year

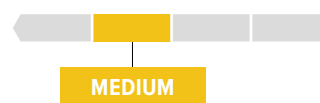


Between 2015–2020, Canada lost 37.5 kha of forest area per year, following a trend of decreasing rates of deforestation. Canadian forests have huge economic, cultural, and environmental value. Over 40% of primary forests are still intact, acting as a precious sanctuary for biodiverse ecosystems.

*Global Forest Assessment, 2020*

### POLICY ASSESSMENT

#### Target for net zero deforestation



The government announced a CAD 4bn Natural Climate Solutions Fund (NCSF) in 2020 to invest in three programmes over 10 years, including the Two Billion Trees programme. However, implementation of the initiative since it was first announced in 2019 has been slow. The government estimates the NCSF will reduce emissions by 4–7 MtCO<sub>2</sub>e annually by 2030. The ERP provides an additional CAD 780m to the NCSF; however, it largely disregards timber industry emissions. In June 2022, the government also launched the federal GHG Offset system, while protocols for voluntary forest management projects are under development.

*Environment and Climate Change Canada, 2020; Government of Canada, 2022g*

## AGRICULTURE SECTOR

Emissions from agriculture



Canada's agricultural emissions are primarily from the cultivation of organic soils, the digestive processes and manure of livestock (mainly cattle), and synthetic fertilisers. A 1.5°C compatible pathway requires behavioural and dietary shifts, and less fertiliser use.

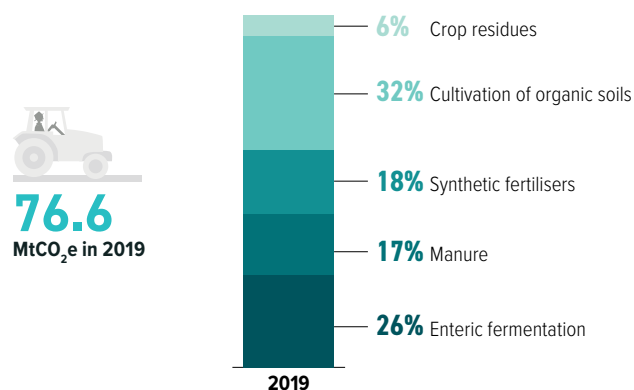


**Methane emissions need to decline by 10% by 2030 and by 35% by 2050 (from 2010 levels). Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).**

*Rogelj et al., 2018*

### Emissions from agriculture

excluding energy emissions, in 2019



In Canada, the largest sources of GHG emissions in the agriculture sector are cultivation of organic soils (32%), enteric fermentation (26%), and synthetic fertilisers (18%). Livestock manure is also an important source of emissions (17%). Adapting the diets of livestock, switching to farming approaches that facilitate soil carbon sequestration, making dietary changes in favour of vegetables and fruits, and reducing or more efficiently using synthetic fertilisers could help reduce emissions from this sector.

*FAO, 2022*

# MITIGATION: TARGETS AND AMBITION



The science from the IPCC on the risks of exceeding 1.5°C warming is clear. The UN science body has projected that to keep the 1.5°C goal alive, the world needs to roughly halve emissions by 2030.

However, despite the Glasgow Climate Pact (1/CMA.3) agreement to “revisit and strengthen” 2030 targets this year, progress on more ambitious targets has stalled. Without far more ambitious government action, the world is heading to a warming of **2.4°C with the current 2030 targets** and even higher warming of **2.7°C with current policies**.

*Climate Action Tracker, 2021a, 2022c; IPCC, 2022; UNFCCC, 2021*

## AMBITION: 2030 TARGETS

### Nationally Determined Contribution: Mitigation

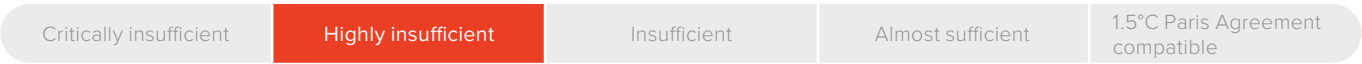
#### TARGETS

At least 40-45% below 2005 levels by 2030

#### ACTIONS

Actions included for energy, industry, agriculture, waste and forestry sectors and outlined for provinces, territories and indigenous groups

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



The CAT evaluates and rates several elements of climate action: policies and actions, targets, and a country’s contribution to climate finance (where relevant) and combines these into an overall rating.

The CAT rates Canada’s climate target, policies and finance as “highly insufficient”. The “highly insufficient” rating indicates that Canada’s climate policies and commitments are not consistent with the Paris Agreement’s 1.5°C temperature limit. Canada’s 2030 emissions reduction target is consistent with 2°C of warming when compared to modelled domestic emissions pathways. If fully implemented, Canada’s current policies are not enough to achieve this target and are only in line with 4°C warming. Canada is also not meeting its ‘fair share’ contributions to climate action. In addition to strengthening its targets and policies, it also needs to provide support to developing countries.

This CAT analysis was updated in September 2021.

For the full assessment of the country’s targets and actions, and the explication of the methodology, see [www.climateactiontracker.org](http://www.climateactiontracker.org)

*Climate Action Tracker, 2022a*

## AMBITION: LONG-TERM STRATEGIES

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

Status	Submitted to UNFCCC, last update in 2016
Net zero target	2050
Interim steps	Yes: at least 40-45% below 2005 by 2030, though this updated 2030 goal is not reflected in the LTS
Sectoral targets	No

# FINANCE

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



In 2020, Canada spent USD 3.352bn on fossil fuel subsidies, largely on petroleum (51%) and fossil gas (43%). It introduced a federal carbon pricing initiative in 2019, which generated USD 4.9bn in revenue in 2021.



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

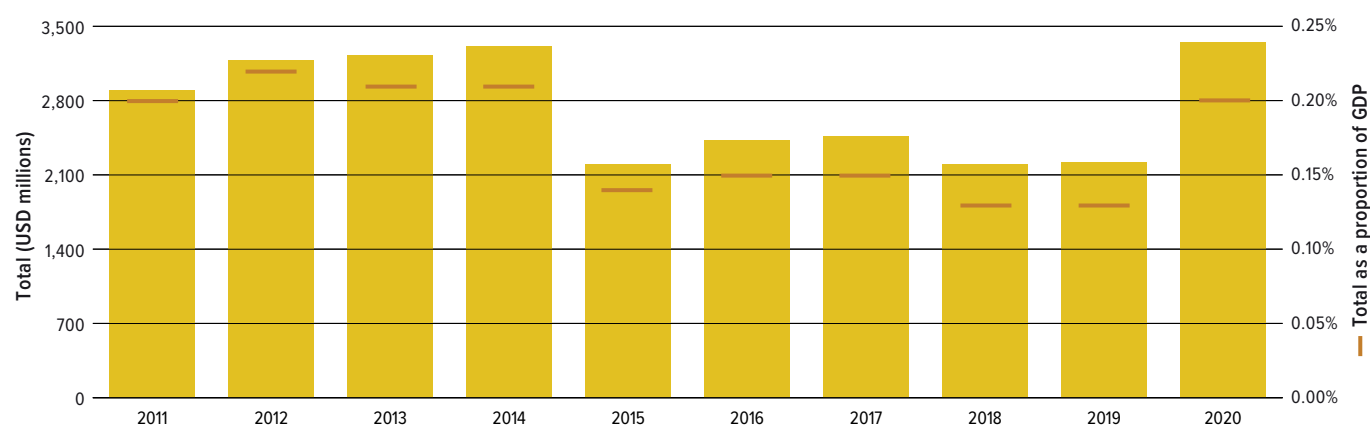
*Rogelj et al., 2018*

## 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 relative to national budgets

(USD millions)



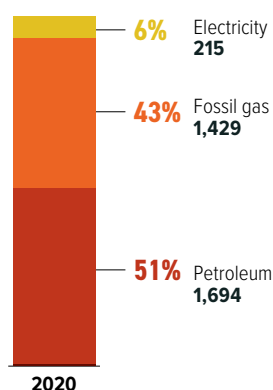
*OECD-IEA Fossil Fuel Support Database, 2022*

### Fossil fuel subsidies by fuel type

(USD millions) in 2020



**3,352**  
USD millions



Fossil fuel subsidies in Canada increased rapidly in 2020 to reach USD 3.35bn, more than in any other year between 2011–2020. Subsidies for production made up 64% of this amount and were targeted primarily at petroleum and fossil gas.

By far the largest subsidy measure introduced in 2020 was in response to the COVID-19 pandemic: USD 1.26bn in funding was provided for the clean-up of orphan and inactive oil and gas wells. Other significant measures included tax credits for high cost, deep drilling for fossil gas in British Columbia, accounting for 9% of the total in 2020. The government has promised to end “inefficient” fossil fuel subsidies by 2023; however, it has not defined “inefficient”, and subsidies increased in 2020.

*Cameron and Boisseau-Bouvier, 2022; Energy Policy Tracker, 2022; OECD-IEA Fossil Fuel Support Database, 2022*



### Carbon pricing and revenue

A federal carbon pricing initiative was introduced in 2019, in the dual form of a federal fuel charge and a performance-based system for industry (known as the Output-Based Pricing System). Pricing started at CAD 20/tCO<sub>2</sub>e in 2019, increases annually, and will reach CAD 170/tCO<sub>2</sub>e by 2030. In 2021, the federal carbon price mechanisms generated over USD 4.9bn revenue.

I4CE, 2022

## 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.

Canada is moving towards greening its financial system through regulations and policies. The federal government is “committed to moving towards mandatory reporting of climate-related financial risks across the economy”, based on the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), which was established in 2015 by the Financial Stability Board. Financial institutions will lead the way, starting in 2024, and will also be expected to collect and assess information on climate risks and emissions from their clients. The International Sustainability Standards Board, which is working to set up global climate-related disclosure standards, has an office in Montreal which the Canadian government has pledged to support.

The Sustainable Finance Action Committee, formed in 2021 and comprised of the 25 largest financial institutions in Canada, will work to align private sector capital with the transition to net zero. Meanwhile, in January 2022, the Bank of Canada and the Office of the Superintendent of Financial Institutions (OSFI) completed a project to improve the financial sector’s ability to assess climate-related risks and to build capability to conduct climate transition scenario analyses. The Government of Canada is a member of the Task Force on Nature-Related Financial Disclosures, which plans to issue a framework for disclosing nature-based risks in 2023.

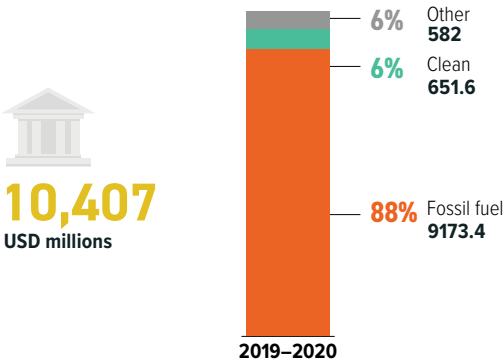
Bank of Canada, 2022; Government of Canada, 2022h; Task Force on Nature-Related Financial Disclosures, 2022

## 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 Members 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 energy

USD millions (2019–2020 average)



Between 2019 and 2020, Canada provided an average of USD 10bn in public finance per year to energy projects – 88% of which went to oil and gas. Export Development Canada (EDC) is the primary vehicle of public finance, of which the Trans Mountain Pipeline has been the most significant beneficiary in this period. The largest support to clean energy projects was extended to Eolia renewable infrastructure in Canada and the EU, and a separate project to build 600 MW of offshore wind capacity in Taiwan. Both projects received over USD 150m.

Oil Change International, 2022

## Provision of international public support

USD millions, annual average 2017 and 2018

Bilateral, regional and other channels:

Annual average contribution

**307.31**

Multilateral climate finance contributions:

Annual average contribution

**53.97**

Core/general contributions:

Annual average contribution

**139.3**

Annex II countries to the UNFCCC, including Canada, are obligated to provide climate finance and have committed to collectively mobilise USD 100bn a year to 2025, when this goal will be renewed, even though the target has never been met.

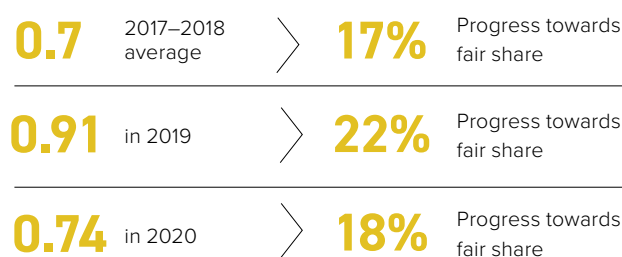
Canada's bilateral finance increased seven-fold in the 2017-2018 period compared to 2015-2016. It has significant amounts of cross-cutting spending across bilateral and multilateral climate finance flows. However, it ranked eighth in terms of bilateral flows and last for multilateral and core contributions, out of the nine G20 Members obligated to provide climate finance.

### Fair share of the USD 100bn climate finance goal:

This fair share analysis allocates responsibility for provision of climate finance to each Annex II country based on their gross national income (GNI), cumulative territorial CO<sub>2</sub> emissions since 1990, and population size. It uses the UNFCCC Biennial Report data for 2017–2018 and climate-related finance data provided by the OECD Development Assistance Committee for 2019 and 2020.

Canada is not providing its fair share of the USD 100bn climate finance goal, contributing about a fifth of what it should pay in 2017–2018, 2019 and 2020. **It ranks as one of the countries most responsible for the climate finance gap, along with the USA and Australia.**

Climate finance provided (USD billion) by Canada and its fair share of the USD 100bn goal:



Looking ahead, **the country seems set to remain responsible for a large climate finance gap.** While Canada did not increase its

replenishment amount to the Green Climate Fund beyond the amount of its first resource mobilisation, it committed at the G7 meeting in July 2021 to double its climate finance pledge to CAD 5.3bn (USD 4.4bn) in the next 5 years. Although this is a step in the right direction, this amount is still below its fair share of the 100bn goal. The government made no announcements of additional funds at COP26 in 2021 either.

*Colenbrander et al., 2022; COP26 Presidency, 2021*

*Note: Data on the 'provision of international public support' corresponds to 2017–2018 as per the UNFCCC Fourth Biennial Report (BR). Parties are to submit data by December 2022 for subsequent years in the Fifth BR.*

## Endnotes

For more detail about sources and methodologies, please download the CTR Technical Note at: [www.climate-transparency.org/g20-climate-performance/g20report2022](http://www.climate-transparency.org/g20-climate-performance/g20report2022)

Where referenced, "Enerdata, 2022" refers to data provided in July 2022 and, due to rounding, graphs may sum to slightly above or below 100%.

- The '1.5°C compatible pathway' is derived from global cost-effective pathways assessed by the IPCC's SR15, selected based on sustainability criteria, and defined by the 5th–50th percentiles of the distributions of such pathways achieving the long-term temperature goal of the Paris Agreement. Negative emissions from the land sector and novel negative emissions technologies are not included in the assessed models, which consider one primary negative emission technology (BECCS). In addition to domestic 1.5°C compatible emissions pathways, the 'fair share' emissions reduction range would almost always require a developed country to provide enough support through climate finance, or other means of implementation, to bring the total emissions reduction contribution of that country down to the required 'fair share' level.
- '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) data tables, converted to the categories from the IPCC 1996 guidelines, in particular separating Agriculture from LULUCF, which under the IPCC 2006 Guidelines is integrated into Agriculture, Forestry, and Other Land Use (AFOLU).
- The Decarbonisation Ratings assess the current year and average of the most recent 5 years (where available) to take account of the different starting points of different G20 Members.
- The selection of policies rated and the assessment of 1.5°C compatibility are primarily informed by the Paris Agreement and the IPCC's 2018 SR15. The Policy Assessment Criteria table below (on page 19) displays the criteria used to assess a country's policy performance.
- In order to maintain comparability across all countries, this report harmonises all data with PRIMAP 2021 dataset to 2018. However, note that CRF data is available for countries which have recently updated GHG inventories.
- 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.
- This indicator includes only direct energy-related emissions and process emissions (Scope 1) but not indirect emissions from electricity.
- This indicator includes emissions from electricity (Scope 2) as well as direct energy-related emissions and process emissions (Scope 1).

## Policy Assessment Criteria

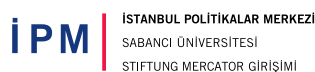
	LOW	MEDIUM	HIGH	FRONTRUNNER
<b>Renewable energy in power sector</b>	No policies to increase the share of renewables	Some policies	Policies and longer-term strategy/target to significantly increase the share of renewables	Short-term policies + long-term strategy for 100% renewables in the power sector by 2050 in place
<b>Coal phase-out in power sector</b>	No targets and policies 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 policies 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 fuel-based light-duty vehicles by 2035 worldwide
<b>Phase out fossil fuel heavy-duty vehicles</b>	No policies	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>	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
<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 policies or incentives 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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