



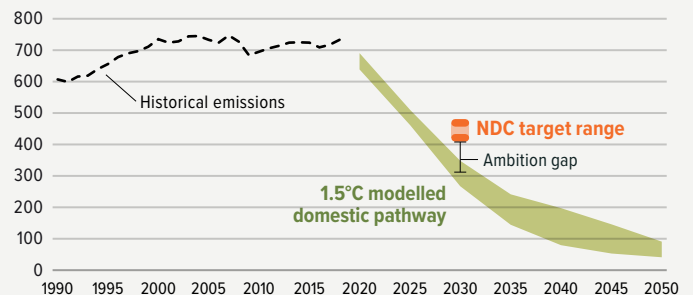
## NOT ON TRACK FOR A 1.5°C WORLD

1.5°C

Canada's NDC target is to reduce emissions 36-41% below 2005 levels, or to between 427-467 MtCO<sub>2</sub>e, by 2030. To keep below the 1.5°C temperature limit, Canada's 2030 emissions would need to be around 311 MtCO<sub>2</sub>e (or 57% below 2005 levels), leaving an ambition gap of 116 MtCO<sub>2</sub>e. All figures exclude land use emissions.

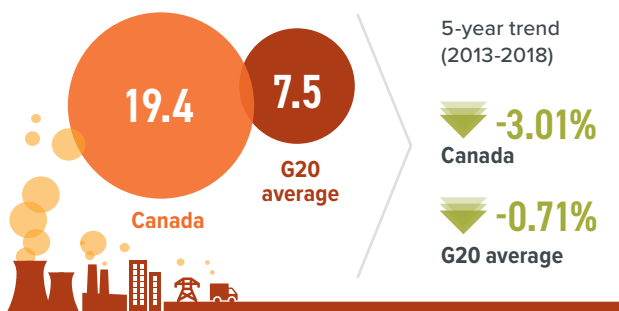
Gütschow et al., 2021; Climate Analytics, 2021

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



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

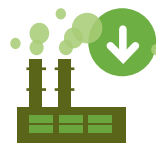
GHG emissions (incl. land use) per capita (tCO<sub>2</sub>e/capita)<sup>2</sup> in 2018



Canada's per capita emissions are 2.6 times the G20 average. Total per capita emissions have decreased by 3% between 2013 and 2018.

Climate Action Tracker, 2021; Gütschow et al., 2021; United Nations, 2019

## KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION



Maintain and strengthen policies to decarbonise electricity generation, including effectively phasing out natural gas-generated power and **support widespread electrification.**



**Increase public investment in direct climate adaptation action**, while creating signals to drive private sector and individual action through disclosure of physical climate risk.



Shift public investments **away from fossil fuels towards decarbonisation of industry**, and renewable energy.

*This profile was completed prior to the 2021 federal election and does not reflect the policies of the new government.*

## RECENT DEVELOPMENTS



Canada submitted a stronger NDC target to cut emissions by at least **40-45% below 2005 levels by 2030** and committed to achieving net zero emissions by 2050



Canada passed the **Net Zero Emissions Accountability Act**, requiring the adoption of the 2050 net zero target along with interim targets, regular progress reporting, and the creation of an independent advisory body.



During 2020, **Canada allocated an estimated USD 14.2bn to fossil fuel energy** as part of its energy-related funding commitments and COVID-19 economic response, much of which was not conditional on alignment with climate goals.

Energy Policy Tracker, 2020; Environment and Climate Change Canada, 2020a; Government of Canada, 2021b, 2021a; Transport Canada, 2021



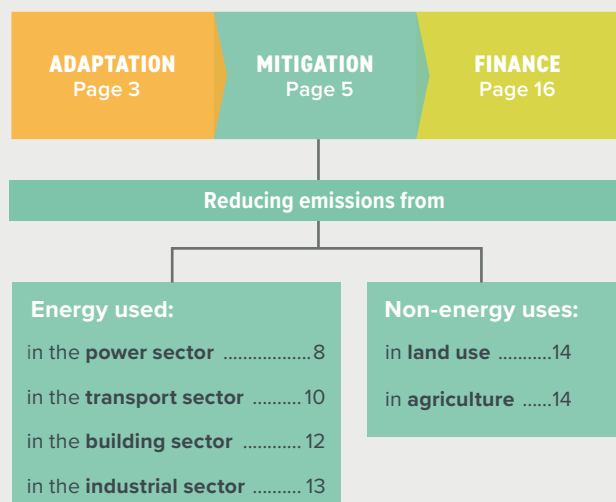
## CORONAVIRUS RESPONSE AND RECOVERY

Since the start of the pandemic, the federal government has implemented economic recovery measures to help individuals and businesses with the immediate financial and health impacts of COVID-19. As of July 1, Canada has allocated CAD 435.2bn (19.7% of GDP) in spending and tax measures to COVID-19 recovery. Overall, Canada has provided more funding for low-carbon energy compared to fossil fuels since the start of the pandemic.

Environment and Climate Change Canada, 2020a; Energy Policy Tracker, 2020; IMF, 2021; Vivid Economics, 2021

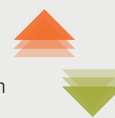
## CONTENTS

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

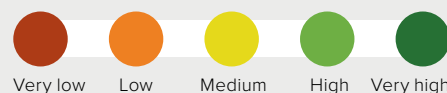


## LEGEND

**Trends** show developments over the past five years for which data are available. The colour-coded arrows indicate assessment from a climate protection perspective: Orange is bad, green is good.



**Decarbonisation Ratings**<sup>3</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.

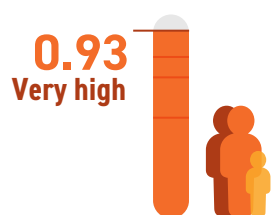


**Policy Ratings**<sup>4</sup> evaluate a selection of policies that are essential pre-conditions for the longer-term transformation required to meet the 1.5°C limit.



## SOCIO-ECONOMIC CONTEXT

### Human Development Index (HDI)

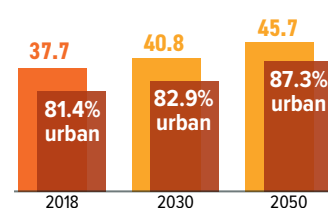


The HDI reflects life expectancy, level of education, and per capita income. Canada ranks very high.

Data for 2019. UNDP, 2020

### Population and urbanisation projections

(in millions)

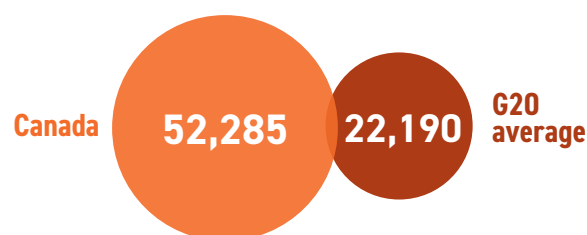


Canada's population is projected to increase by 21% by 2050, and become more urbanised. Climate change and urbanisation can increase the risk of hazards faced by cities, such as extreme heat and flooding.

United Nations, 2019; United Nations, 2018

### Gross Domestic Product (GDP) per capita

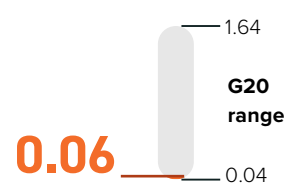
(PPP constant 2015 international \$) in 2019



World Bank, 2021; United Nations, 2019

### Death rate attributable to air pollution

Ambient air pollution attributable death rate per 1,000 population per year, age standardised in 2019



Over 4,380 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 one of the lower levels in the G20.

Institute for Health Metrics and Evaluation, 2020

This source differs from the source used in last year's profiles, and therefore the data are not comparable.

## A JUST TRANSITION

Canada has taken steps towards ensuring a just transition for coal power workers; however, much work remains for other fossil fuels and high carbon sector workers and communities. Canada is a co-founding member of the Powering Past Coal Alliance and is committed to phasing out unabated coal-fired electricity generation by 2030. In 2018, the federal government established a Task Force to engage with stakeholders on a just transition for workers as result of this phase-out. In response, the federal government established a CAD 150m infrastructure fund to support affected communities in addition to funding for coal worker transition centres. In September 2019, the federal government committed to passing a Just Transition Act. While legislation has not yet been tabled, the federal government launched an engagement process to consult with stakeholders on the potential elements of this legislation. Canada's 2020 updated climate strategy aims to support the federal government's employment goals by creating green jobs.

Environment and Climate Change Canada, 2020a; Government of Canada, 2021c; Liberal Party of Canada, 2019; Natural Resources Canada, 2021a; PPCA, 2019



# 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.



Over the past decade, the frequency and **cost of catastrophic weather events** in Canada, such as wildfires and flooding, were twice as high as those in previous decades, with insured losses over CAD 18bn between 2010-2019.



**Temperature increases in Canada's Arctic and northern regions** are reducing sea ice as well as accelerating permafrost thaw and loss of glaciers, with considerable impacts on transportation, wildlife and important ecosystem services.



Canada's Indigenous Peoples provide **critical knowledge and leadership for climate change** adaptation, but systemic racism challenges their adaptation efforts.

## ADAPTATION NEEDS

### Climate Risk Index

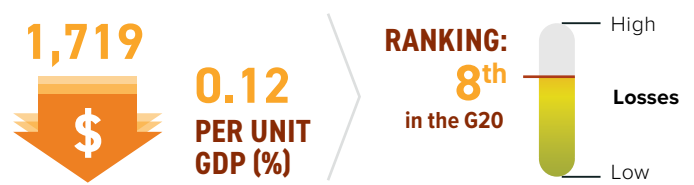
Impacts of extreme weather events in terms of fatalities and economic losses that occurred. All numbers are averages (1999-2018).

Annual weather-related fatalities



Based on Germanwatch, 2019

Annual average losses (US\$ millions PPP)



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

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 RESPONSE AND RECOVERY

Canada adopted an updated climate strategy in December 2020 that included developing its first National Adaptation Strategy, co-developing an Indigenous Climate Leadership agenda, and providing support to communities to respond to climate impacts. The 2021 Budget allocated resources to adaptation efforts, including the Disaster Mitigation and Adaptation Fund, flood and wildfire risk mapping, and wildfire preparedness in national parks; however, overall allocation of resources to support adaptation remains inadequate.

Environment and Climate Change Canada, 2020a; Warren and Lulham, 2021

## Adaptation Readiness

The figure shows 2000-2018 observed data from the Notre Dame Global Adaptation Initiative (ND-GAIN) Index overlaid with projected Shared Socioeconomic Pathways (SSPs) from 2020 to 2060.

Notre Dame Global Adaptation Initiative (ND-Gain) Readiness Index



At a national level, Canada scored well above the G20 average between 2000 and 2018 and is projected to continue doing so given its combination of social, economic and governance structures. However, **this national indicator may mask significant adaptation challenges at the regional level** (e.g. the North, coastal regions). 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 ND-GAIN encompasses social (social inequality, information and communications

technology infrastructure, education and innovation), 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 projections of future governance and, therefore, of possible adaptation readiness. The three scenarios shown here in dotted lines are described as a sustainable development-compatible scenario (SSP1), a middle-of-the-road (SSP2), and a 'Regional Rivalry' (SSP3) scenario.

Based on Andrijevic et al., 2020; ND-Gain Index, 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.

In December 2020, the government of Canada launched A Healthy Environment and a Healthy Economy – a strengthened climate plan which builds on the PCF. The federal government is in the process of developing a National Adaptation Strategy and has committed financial resources to supporting climate adaptation in the 2021 budget. However, these investments are small relative to the resources committed to mitigation. Support is largely limited to disaster relief and hard infrastructure projects rather than health and social adaptation, or systemic resilience building.

### Nationally Determined Contribution (NDC): Adaptation

#### TARGETS

None

#### ACTIONS

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

# 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 excluding LULUCF have increased by 20.8% (1990-2018) and the federal government's climate target for 2030 (-22 to -29% below 1990 levels) is **not in line with a 1.5°C pathway**.

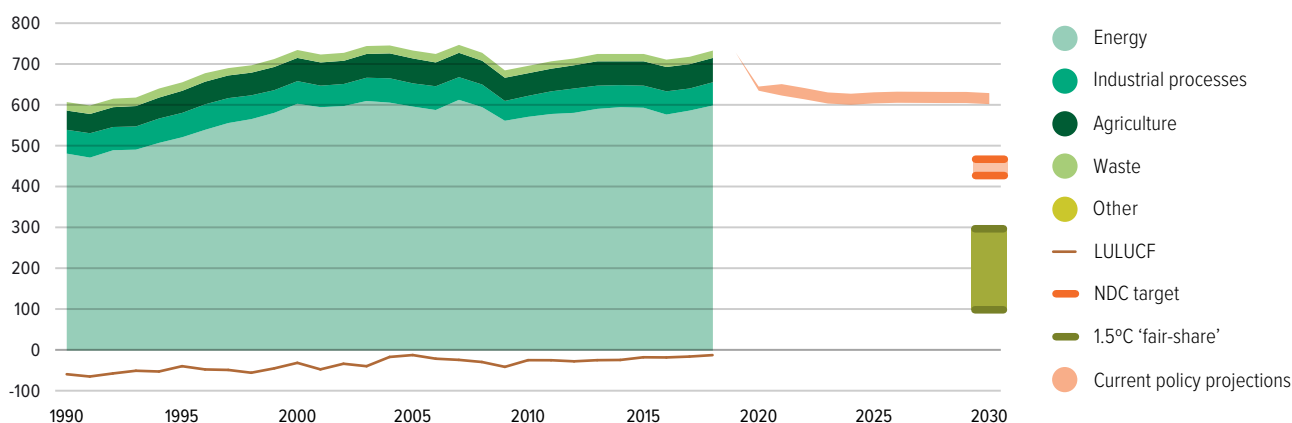


**In 2030, global CO<sub>2</sub> emissions need to be 45% below 2010 levels and reach net zero by 2050.** Global energy-related CO<sub>2</sub> emissions must be cut by 40% below 2010 levels by 2030 and reach net zero by 2060.

*Rogelj et al., 2018*

### GHG emissions across sectors and CAT 1.5°C 'fair-share' range (MtCO<sub>2</sub>e/year)<sup>5</sup>

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

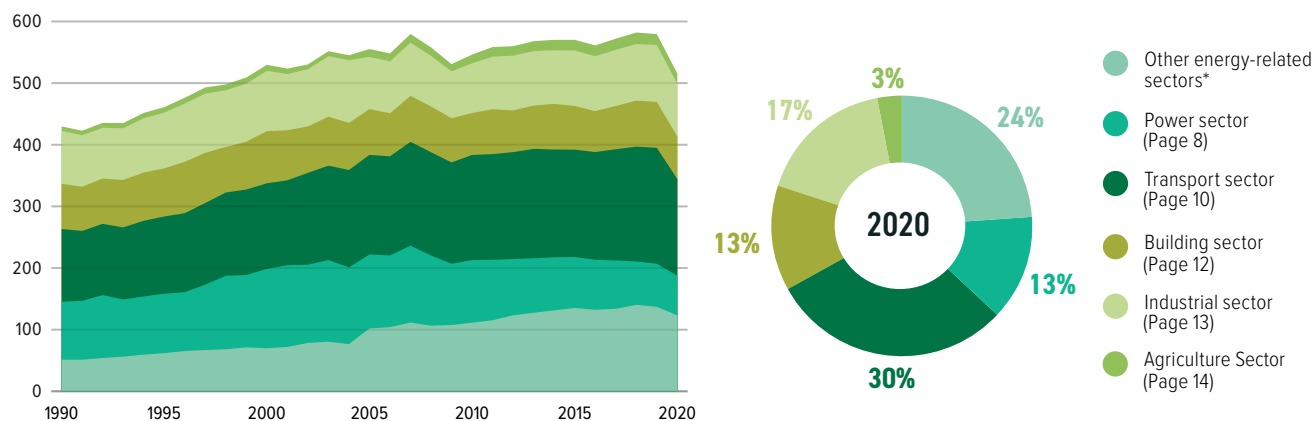


Canada's emissions (excl. land use) increased by 20.8% between 1990 and 2018 to 733 MtCO<sub>2</sub>e. Increases were largely due to a sustained increase in energy-related emissions, which increased by 24% in the same time period. Canada's 2030 target is not 1.5°C 'fair-share' compatible. To be 1.5°C 'fair-share' compatible, Canada would need to strengthen its domestic target and increase its international financial support.

*Gütschow et al., 2021; Climate Action Tracker, 2020a, 2021*

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

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



**The largest driver of overall GHG emissions are CO<sub>2</sub> emissions from fuel combustion.** In Canada, emissions have been fluctuating since the early 2000s. CO<sub>2</sub> emissions from fuel combustion dropped notably in 2020, largely due to the impacts of COVID-19. The transport sector is the largest contributor with 30%, followed by emissions from other energy-related sectors (energy sector own use) and industry with 24% and 17%, respectively.

*Enerdata, 2021* Due to rounding, some graphs may sum to slightly above or below 100%

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

## ENERGY OVERVIEW



Fossil fuels dominate Canada's energy mix. **Natural gas recently overtook oil in the energy mix, reaching a share of 36% in 2020**, while the share of coal (5%) has continued to decline. The share of solar, wind, geothermal and biomass remained fairly steady during the 2015-2020 period, in contrast to the G20 average which shows a more than 30% growth over the same period.

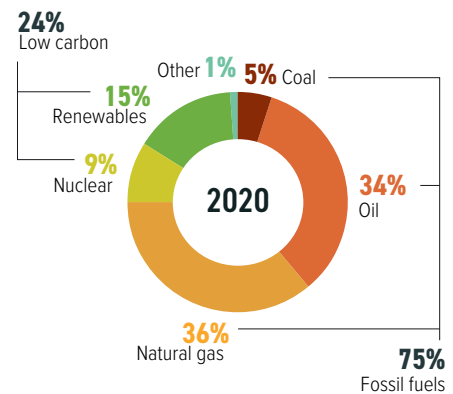
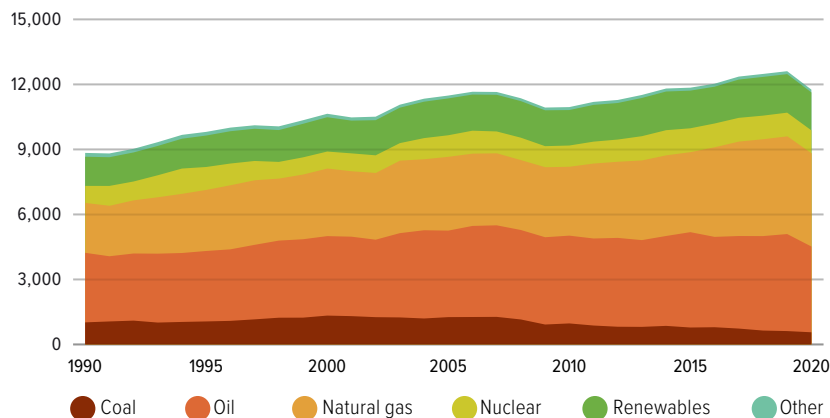


The share of fossil fuels globally needs to fall to 67% of global total primary energy by 2030 and to 33% by 2050, and to substantially lower levels without carbon capture and storage (CCS).

*Rogelj et al., 2018*

## Energy mix

Total primary energy supply (TPES) (PJ)

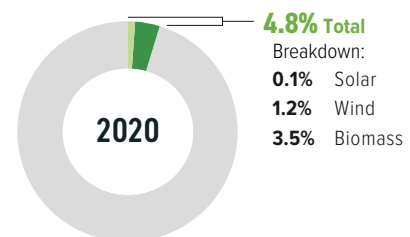
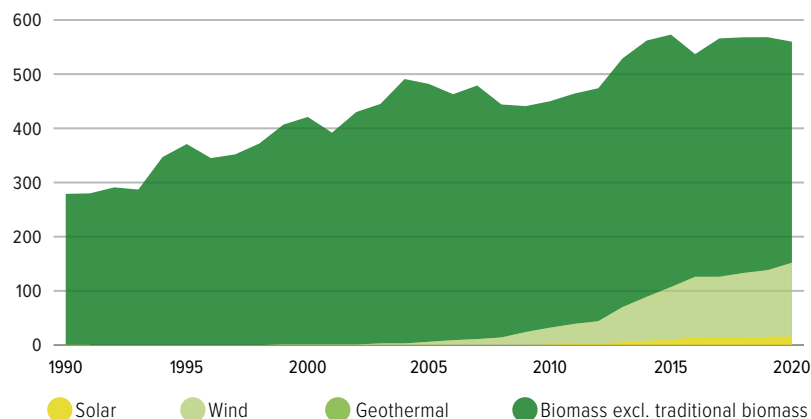


This graph shows the fuel mix for all energy supply, including energy used not only for electricity generation, heating, and cooking, but also for transport fuels. Fossil fuels (oil, coal, and gas) make up 75% of Canada's energy mix, which is lower than the G20 average. The share of renewable energy, including hydropower, in the energy mix has increased slightly since 2015.

*Enerdata, 2021 Due to rounding, some graphs may sum to slightly above or below 100%*

## Solar, wind, geothermal, and biomass development

TPES from solar, wind, geothermal and biomass (PJ)

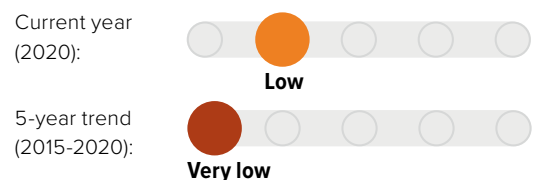


Solar, wind, geothermal and biomass account for 4.8% of Canada's energy supply – the G20 average is 7.1%. The share in total energy supply has decreased by around 1.6% in the last five years (2015-2020). Biomass (for electricity and heat) makes up the largest, though declining, share. Solar and wind have both increased in shares since 2015.

*Enerdata, 2021 Due to rounding, some graphs may sum to slightly above or below 100%*

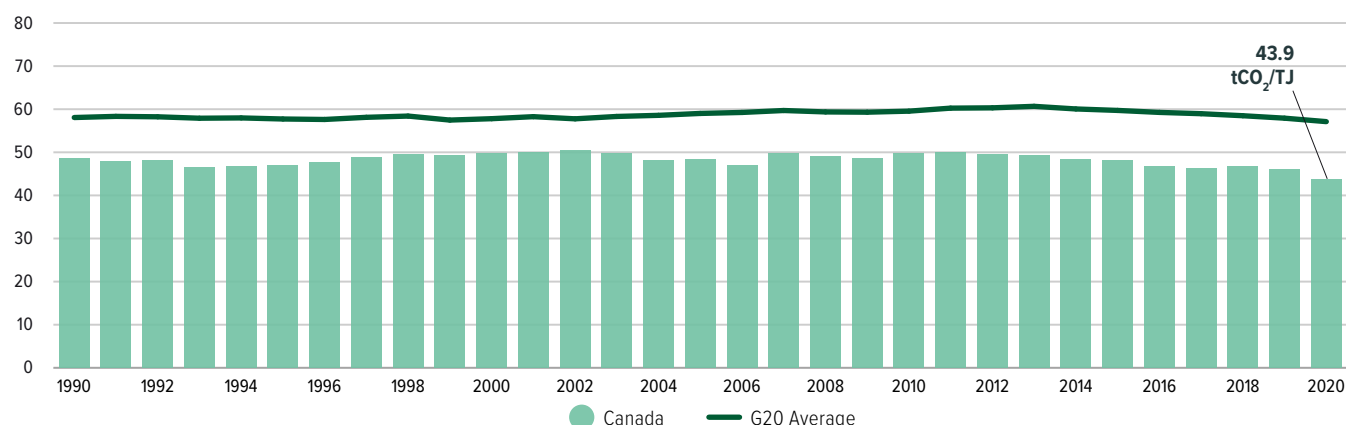
*Note: Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.*

Decarbonisation rating: renewable energy share of TPES compared to other G20 countries



## Carbon intensity of the energy sector

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

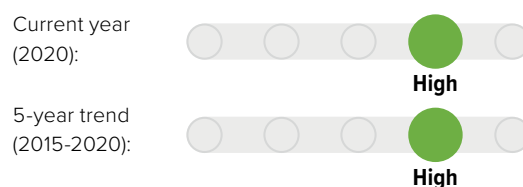


Carbon intensity is a measure of how much CO<sub>2</sub> is emitted per unit of energy supply.

Canada's energy sector carbon intensity is lower than the G20 average and decreasing at a faster rate. This is driven by decreasing shares of coal and oil in the primary energy supply. Meeting net zero by 2050 would require phasing out natural gas from the power sector.

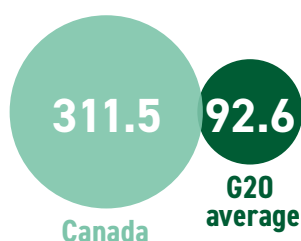
Enerdata, 2021

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

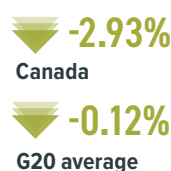


## Energy supply per capita

TPES per capita (GJ/capita) in 2020



TPES per capita (GJ/capita): 5-year trend (2015-2020)



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

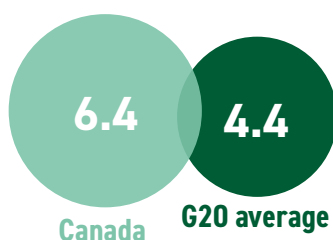


The level of energy use per capita is closely related to economic development, climatic conditions and the price of energy. Energy use per capita in Canada is well above the G20 average, at 311.51 GJ/capita in 2020. Between 2015 and 2020, in contrast to the decreasing G20 average of 0.12%, Canada's per capita energy supply decreased by nearly 3%.

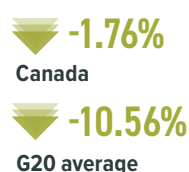
Enerdata, 2021; United Nations, 2019

## Energy intensity of the economy

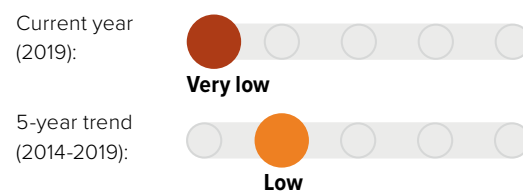
(TJ/million US\$2015 GDP) in 2019



Energy intensity of the economy: 5-year trend (2014-2019)



Decarbonisation rating: energy intensity compared to other G20 countries



This indicator quantifies how much energy is used for each unit of GDP. This is closely related to the level of industrialisation, efficiency achievements, climatic conditions or geography. Canada has a relatively energy-intensive economy. The country's energy intensity is higher than the G20 average and has been decreasing at the lower rate of 1.76% (2014-2019) as compared to the G20 (-10.56%).

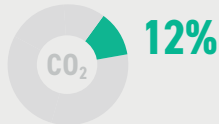
Enerdata, 2021; World Bank, 2021

## POWER SECTOR

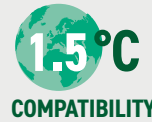
Emissions from energy used to make electricity and heat



**83% of Canada's electricity generation comes from low-carbon sources**, including nuclear, solar, and wind. Canada produced 7% of its electricity from coal in 2020. The federal government plans to phase-out unabated coal by 2030.



Share of energy-related CO<sub>2</sub> emissions from electricity and heat production in 2020.

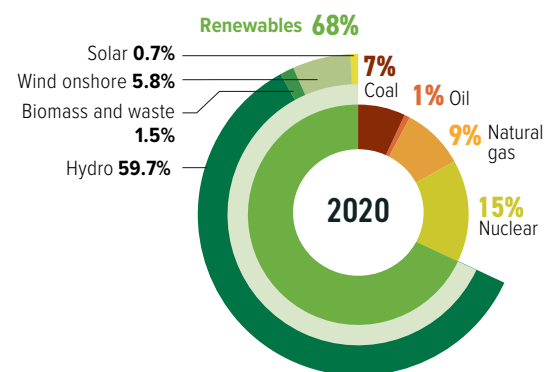
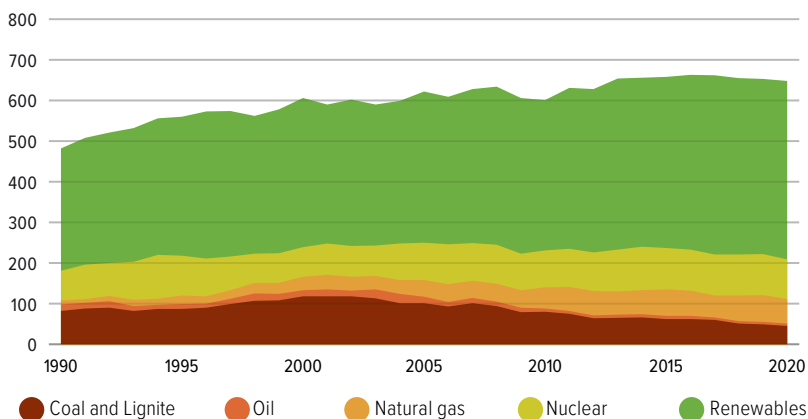


Worldwide, coal use for power generation needs to peak by **2020**, and between 2030 and 2040, all the regions of the world need to phase out coal-fired power generation. By 2040, the share of renewable energy in electricity generation has to be increased to at least 75%, and the share of unabated coal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

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

## Electricity generation mix

Gross power generation (TWh)

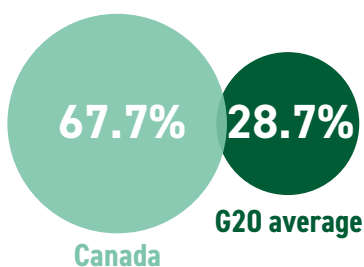


Canada **generated 17% of its electricity from fossil fuels in 2020**. The share of renewable energy in Canada's power sector has been increasing, accounting for approximately 68% of the power mix in 2020, with 60% of renewables from hydropower.

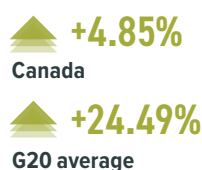
*Enerdata, 2021 Due to rounding, some graphs may sum to slightly above or below 100%*

## Share of renewables in power generation

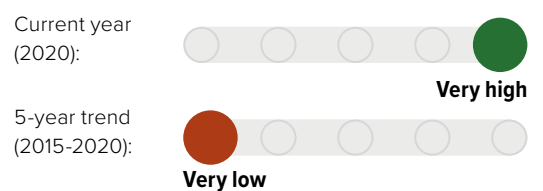
(incl. large hydro) in 2020



Share of renewables in power generation:  
5-year trend (2015-2020)



Decarbonisation rating: share of renewables compared to other G20 countries

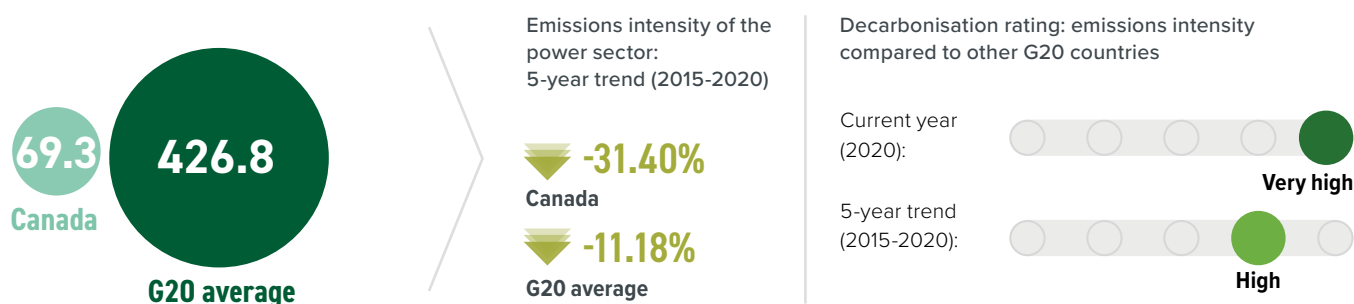


*Enerdata, 2021*



## Emissions intensity of the power sector

(gCO<sub>2</sub>/kWh) in 2020



For each kilowatt hour of electricity, 69.3 g of CO<sub>2</sub> are emitted in Canada. Emissions intensity is decreasing due to the declining share of coal (7% in 2020) and **increasing share of renewables in the power mix (68% in 2020)**.

Enerdata, 2021

## POLICY ASSESSMENT

### Renewable energy in the power sector



Canada's electricity generation remains largely decarbonised overall, though some individual provinces and territories continue to rely on coal and natural gas. Federal carbon pricing and provincial-level policies support renewable energy development. As of August 2021, Canada has not set long-term targets beyond 2030 for renewable energy, nor for the achievement of full decarbonisation of electricity generation. The establishment of this long-term target would help align the electricity system with Canada's 2050 net zero goal.

Responsibility for renewable energy development lies largely at the provincial and territorial levels, leading to large differences in renewable policy development and implementation across regions. Federally, Canada's updated climate strategy includes plans to invest in renewables.

Canada Energy Regulator, 2020; Environment and Climate Change Canada, 2020a

### 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, some of the replacement capacity will come from natural gas, which is not aligned to a net zero goal. Analysis shows Canada needs to phase out coal from its power mix by 2026 to be 1.5°C compatible. In June 2021, Canada clarified its policy position on thermal coal mining in the country, finding that any new mines or mine expansions would likely cause unacceptable environmental effects.

Government of Canada, 2021c, 2018d; Climate Analytics, 2020

These policy assessments predominantly focus on policies in place in 2020 and were completed prior to the 2021 federal election.

## CORONAVIRUS RESPONSE AND RECOVERY

Canada's updated climate strategy released in 2020 aims to help the country recover from the economic impacts of COVID-19 and reduce emissions through increasing the carbon price, promoting low- and zero-carbon fuels and zero emission vehicle use. Canada has invested in green recovery measures, such as the Emissions Reduction Fund, to reduce methane emissions from the oil and gas sector, and public spending can better align with net zero goals by supporting transformation and diversification of sectors relying on fossil fuels.

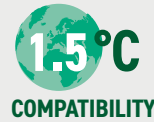
Environment and Climate Change Canada, 2020a; Vivid Economics, 2021

## TRANSPORT SECTOR

Emissions from energy used to transport goods and people



Emissions from transport dropped in 2020 due to COVID-19, but had increased every previous year since 2015. In 2017, 74% of passenger transport, and 49% of freight was by road. Both sectors are **still dominated by fossil fuels**, and electric vehicles (EVs) made up only 4.2% of car sales in 2020. In order to stay within a 1.5°C temperature limit, passenger and freight transport need to be decarbonised.



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

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

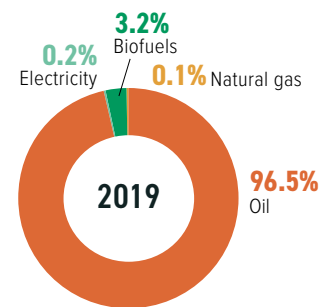
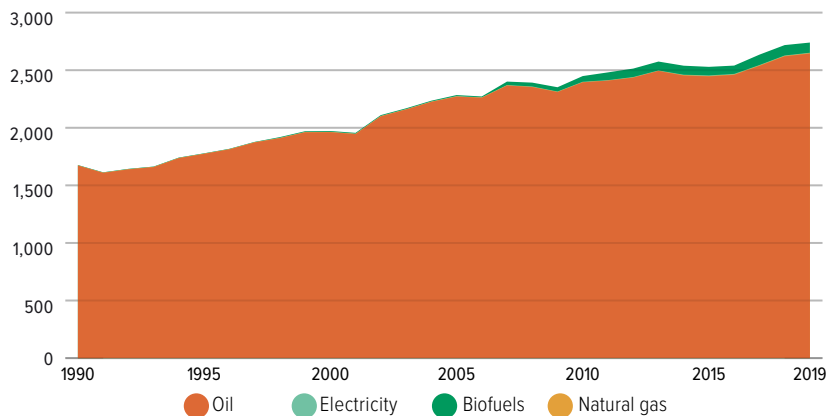


**0.03%**  
Indirect emissions  
**30.41%**  
Direct emissions

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

## Transport energy mix

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

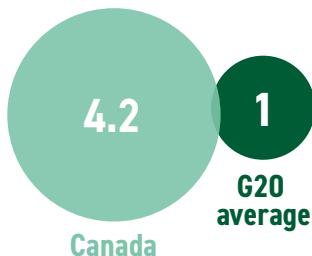


Electricity and biofuels make up only 3.4% of the energy mix in transport.

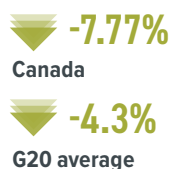
Enerdata, 2021 Due to rounding, some graphs may sum to slightly above or below 100%

## Transport emissions per capita

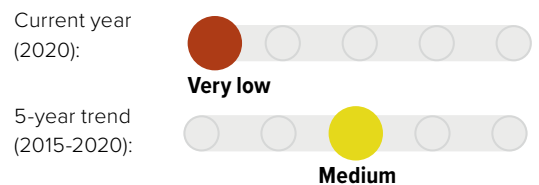
excl. aviation (tCO<sub>2</sub>/capita) in 2020



Transport emissions:  
5-year trend (2015-2020)



Decarbonisation rating: transport emissions  
compared to other G20 countries

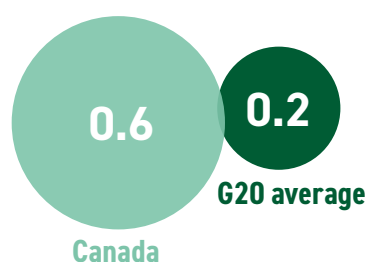


Reductions in transport emissions per capita in 2020, and concomitant changes in the 5-year trends and decarbonisation ratings, reflect widespread economic slowdowns and transport restrictions imposed in response to the COVID-19 pandemic. For a discussion of broader trends in the G20 and the rebound of transport emissions in 2021, please see the Highlights Report at [www.climate-transparency.org](http://www.climate-transparency.org)

Enerdata, 2021; United Nations, 2019

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

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



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



Decarbonisation rating: aviation emissions  
compared to other G20 countries

Current year  
(2018):



5-year trend  
(2013-2018):



Enerdata, 2021; International Energy Agency, 2020; United Nations, 2019

## Motorisation rate

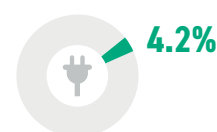


**623 VEHICLES**  
per 1,000 inhabitants in  
2019 in Canada\*

Enerdata, 2021

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

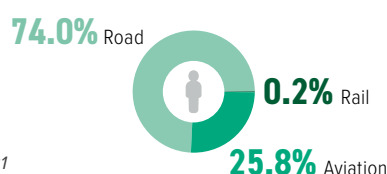
Share of EV sales in  
2020 was 4.2%.



IEA, 2021

## Passenger transport

(modal split in % of passenger-km) in 2017\*



Enerdata, 2021

## Freight transport

(modal split in % of tonne-km) in 2017\*



Freight transport by air, pipelines  
and waterways are excluded due  
to lack of data.

Enerdata, 2021

\*Owing to the variety of sources and data years available, these data are not comparable across G20 countries.

## POLICY ASSESSMENT

### Phase out fossil fuel cars



In June 2021, the federal government strengthened its target to reach 100% of sales of passenger vehicles to be zero emissions vehicles (ZEVs) by 2035, rather than 2040. A ZEV mandate or other policy tools to meet this target have yet to be established. The federal government has two ongoing programmes for EV-related infrastructure funding and provided an additional CAD 150m in November 2020; however, this falls short of the funding recommended by an independent expert task force. The Draft Clean Fuel Regulations published in December 2020, including annual carbon intensity reduction requirements for liquid fuels, are expected to be finalised in late 2021.

Bologaro, 2020; Government of Canada, 2021e; Natural Resources Canada, 2021b; Task Force for a Resilient Recovery, 2020

### Phase out fossil fuel heavy-duty vehicles



In 2018, Canada launched the Green Freight Assessment Programme to support carriers in implementing emissions reduction strategies. Canada revised its emissions regulations for heavy-duty vehicles in 2018, tightening standards for model year 2021 and then again for 2027. Canada's updated climate strategy includes measures to support green freight, including fuel switching, electrification, and energy efficiency actions.

Environment and Climate Change Canada, 2018, 2020a; Government of Canada, 2021d

### Modal shift in (ground) transport



The Investing in Canada Plan commits CAD 25.3bn over 10 years to supporting public transportation and active transportation projects. Canada's Long-term Infrastructure Plan (2016) promises CAD 28.7bn (USD 22bn) until 2030 to spur investment 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. COVID-19 recovery measures included both support for public transport measures and non-motorised transport. In February 2021, the federal government announced about CAD 15bn (USD 11bn) over several years for green transportation infrastructure, and it also provided significant support for road infrastructure.

Energy Policy Tracker, 2020; Government of Canada, 2018c; Transport Canada, 2019

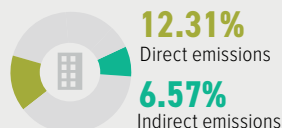
These policy assessments predominantly focus on policies in place in 2020 and were completed prior to the 2021 federal election.

## BUILDING SECTOR

Emissions from energy used to build, heat and cool buildings



Direct and indirect emissions from the building sector in Canada account for 12.31% and 6.57% of total energy-related CO<sub>2</sub> emissions, respectively. Per capita emissions from the building sector are twice the G20 average. **Canada's policies are not sufficient for a 1.5°C pathway.**



Share of buildings in energy-related CO<sub>2</sub> emissions. Building emissions occur directly (burning fuels for heating, cooking, etc) and indirectly (grid-electricity for air conditioning, appliances, etc.)

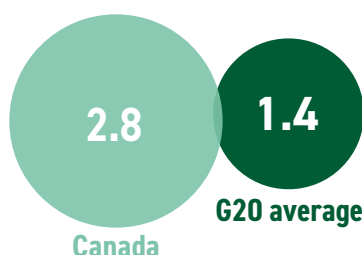


**By 2040, global emissions from buildings need to be reduced by 90% from 2015 levels, and be 95-100% below 2015 levels by 2050, mostly through increased efficiency, reduced energy demand, and electrification in conjunction with complete decarbonisation of the power sector.**

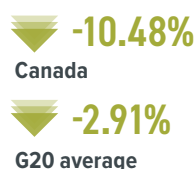
*Rogelj et al., 2018; Climate Action Tracker, 2020b*

## Building emissions per capita

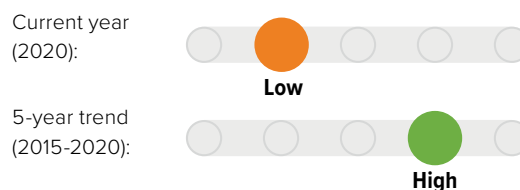
(incl. indirect emissions) (tCO<sub>2</sub>/capita) in 2020



Building emissions:  
5-year trend (2015-2020)



Decarbonisation rating: building emissions compared to other G20 countries



Building-related emissions per capita are two times the G20 average as of 2020, despite the relatively low fossil fuel share of the electricity mix. In contrast to the G20 average, Canada has managed to decrease per capita building emissions by 10.5% (2015-2020).

*Enerdata, 2021; United Nations, 2019*

## POLICY ASSESSMENT

### Near zero energy new buildings



Different levels of government are working together on a nationwide "net zero energy building code" by 2030 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.

*Government of Canada, 2018b; Province of British Columbia, 2021*

### Renovation of existing buildings



Canada has no target for energy retrofitting, and the existing building stock is not being retrofitted quickly enough to support net zero goals. However, different levels of government are working together on a model code for energy retrofitting existing buildings by 2022. The updated climate strategy and 2021 budget both include support for energy efficiency renovations and retrofits.

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

*Environment and Climate Change Canada, 2020a; Natural Resources Canada, 2018; Haley and Torrie, 2021*

*These policy assessments predominantly focus on policies in place in 2020 and were completed prior to the 2021 federal election.*

## INDUSTRY SECTOR

### Emissions from energy use in industry



Direct and indirect emissions from industry in Canada make up 16.7% and 4.1% of energy-related CO<sub>2</sub> emissions, respectively. **Canada has established a carbon pricing system for industrial emitters support industrial decarbonisation.**



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

*Rogelj et al., 2018*

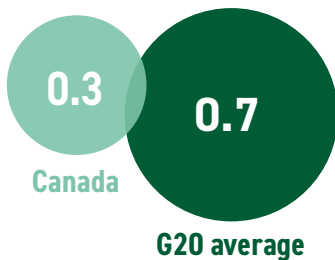


**16.66%**  
Direct emissions  
**4.09%**  
Indirect emissions

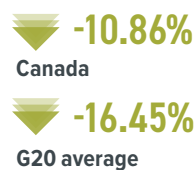
Share of industry in energy-related CO<sub>2</sub> emissions.

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

(tCO<sub>2</sub>e/USD2015 GVA) in 2017



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



Decarbonisation rating: industry emissions intensity compared to other G20 countries

Current year (2017):



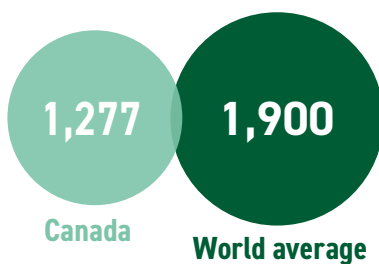
5-year trend (2012-2017):



*Enerdata, 2021; World Bank, 2021*

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

(kgCO<sub>2</sub>/tonne product) in 2016



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

*World Steel Association, 2018; Climate Action Tracker, 2020c*

## POLICY ASSESSMENT

### Energy efficiency



GHG emissions from the industry sector are mainly driven by the oil and gas industries. Passed in July 2019, the federal-level Greenhouse Gas Pollution Pricing Act establishes a federal carbon price and a federal emissions trading system – the Output-Based Pricing System (OBPS). The OBPS provides a price incentive for industrial emitters to reduce GHG emissions while maintaining competitiveness and protecting against “carbon leakage”. While a good first step, a further increase in policy stringency will be required to support net zero goals. Canada has established a carbon pricing system for industrial emitters and has announced up to CAD 8bn through the Net Zero Accelerator Fund to support industrial decarbonisation.

*Environment and Climate Change Canada, 2020a; Government of Canada, 2018a*

*These policy assessments predominantly focus on policies in place in 2020 and were completed prior to the 2021 federal election.*

## LAND USE SECTOR

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



To stay within the 1.5°C limit, **Canada needs to align land sector emissions with net zero goals.** Key measures to achieve this include better protecting ecosystems to maintain sequestered carbon, improving forest and agricultural land management, and planting new trees.

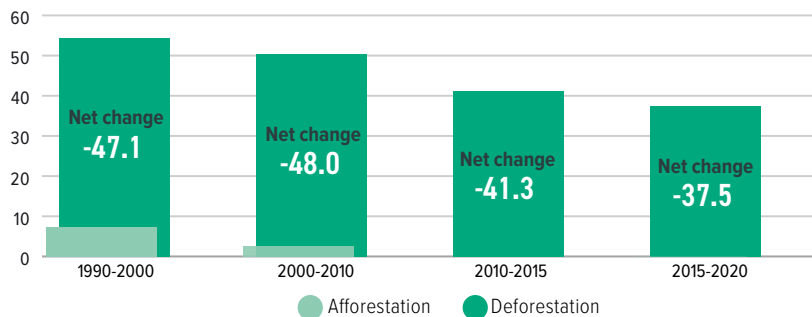


**Global deforestation needs to be halted and changed to net CO<sub>2</sub> removals by around 2030.**

*Rogelj et al., 2018*

## Annual forest expansion, deforestation and net change

Forest area change in 1,000 ha/year



Between 2015-2020, Canada lost 37.52 kha of forest area per year following a trend of decreasing rates of deforestation.

*Global Forest Resources Assessment, 2020*

*Note: There is a change of source and methodology for measuring this indicator from last year's profiles, which means the two years may not be directly comparable.*

## POLICY ASSESSMENT

### Target for net zero deforestation



Canada's updated climate strategy aims to provide significant support to nature-based solutions, including CAD 3.16bn over 10 years to plant two billion trees. Overall, these activities are estimated to reduce emissions by 4-7 MtCO<sub>2</sub>e annually by 2030. The federal GHG Offset system currently under development will also cover voluntary projects in the forestry sector.

*Environment and Climate Change Canada, 2020a, 2020b*

*These policy assessments predominantly focus on policies in place in 2020 and were completed prior to the 2021 federal election.*

## AGRICULTURE SECTOR

### Emissions from agriculture



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

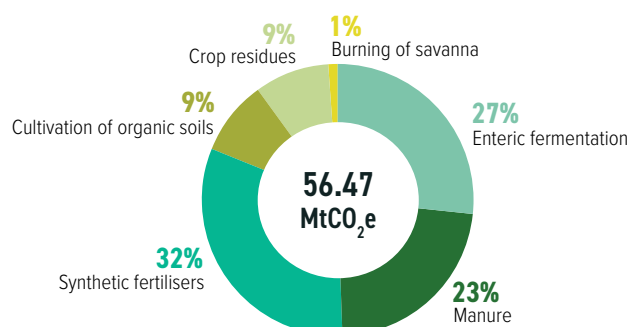


**Methane emissions (mainly enteric fermentation) need to decline by 10% by 2030 and by 35% by 2050 (from 2010 levels).** Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).

*Rogelj et al., 2018*

## Emissions from agriculture (excluding energy)

Emissions from the agriculture sector in 2018



In Canada, the largest sources of GHG emissions in the agriculture sector are synthetic fertilisers (32%), digestive processes of livestock (mainly cattle) (27%) and livestock manure (23%). Dietary changes and efficient use of fertilisers as well as reductions in food waste could help reduce emissions from this sector.

*FAO, 2021*

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

## MITIGATION: TARGETS AND AMBITION

WARMING OF

2.4°C

The combined mitigation effect of Nationally Determined Contributions (NDCs) assessed by April 2021 is **not sufficient and will lead to a warming of 2.4°C by the end of the century**. This highlights the urgent need for all countries to submit more ambitious targets by COP26, as they agreed to do in 2015, and to **urgently strengthen their climate action to align to the Paris Agreement's temperature goal**.

*Climate Action Tracker, 2021a*

### AMBITION: 2030 TARGETS

#### Nationally Determined Contribution (NDC): Mitigation

##### TARGETS

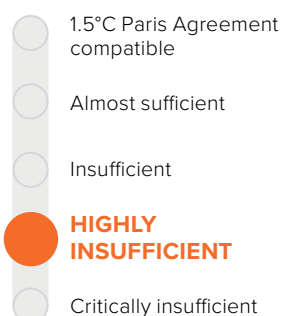
At least 40-45% below 2005 levels by 2030

##### 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

#### CANADA'S OVERALL RATING



This CAT evaluation is a **new, overall rating**, that combines the several, separately rated elements, of policies and actions, domestic and internationally supported targets, 'fair-share target' and the country's contribution to climate finance. 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 change and, in addition to strengthening its targets and policies, also needs to provide additional support to others. For the full assessment of the country's target and actions, and the explication of the methodology see [www.climateactiontracker.org](http://www.climateactiontracker.org)

*Climate Action Tracker, 2021*

### 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, which sets out the "information to facilitate clarity, transparency and understanding" as crucial elements of NDCs.

#### NDC Transparency Check recommendations

Canada's first NDC was submitted to the UNFCCC in October 2016, elaborated on in May 2017, and updated on 12 July 2021. Comparing its last NDC update with its first NDC around the Annex elements, which further enhances clarity, transparency, and understanding, Canada has provided additional information in its most recent NDC update, including:

- Explicitly stating the timeframe and implementation period of the NDC.
- Providing more detailed information on the planning process, including domestic institutional arrangements, public participation, and engagement.
- Including an approach to addressing emissions and subsequent removals from natural disturbances, harvested wood products, and the effects of age-class structure in forest.
- Sustaining fairness considerations in numerous plans and programmes aiming to guarantee that climate policy programmes maximise positive benefits for those most vulnerable and impacted by climate change.

There is still room for improvement to increase comparability, transparency, and understanding in Canada's successive NDC or NDC update, including:

- Providing information on the circumstances under which values of the reference indicators may be updated.
- Including information on how Canada plans to account for its NDC.
- Providing information on considerations of fairness and ambition of the NDC sustained by mitigation potential analysis.

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

### AMBITION: LONG-TERM STRATEGIES

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. Canada's mid-century strategy has not been updated to reflect higher 2030 and 2050 targets and other key policy developments since its release in 2016.

Status	Submitted to UNFCCC in 2016
Interim steps	40-45% below 2005 by 2030, though this updated 2030 goal is not reflected in the LTS
Sectoral targets	No
Net zero target	80% emission reduction goals below 2005 levels by 2050 (65% below 2005 levels excl. LULUCF). In June 2021, Canada passed legislation adopting a net zero 2050 goal. Its LTS has not yet been updated to reflect these developments.
Net zero year	2050

# FINANCE

## MAKING FINANCE FLOWS CONSISTENT WITH CLIMATE GOALS



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



In 2019, Canada spent USD 2.3bn on fossil fuel subsidies, primarily directed to the oil and gas industry. **Fossil fuel subsidies by federal and provincial governments have halved since 2010, but have remained stagnant since 2015.** The federal government introduced a carbon tax in 2019 and in 2020, which generated over USD 3.2bn in revenue.



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

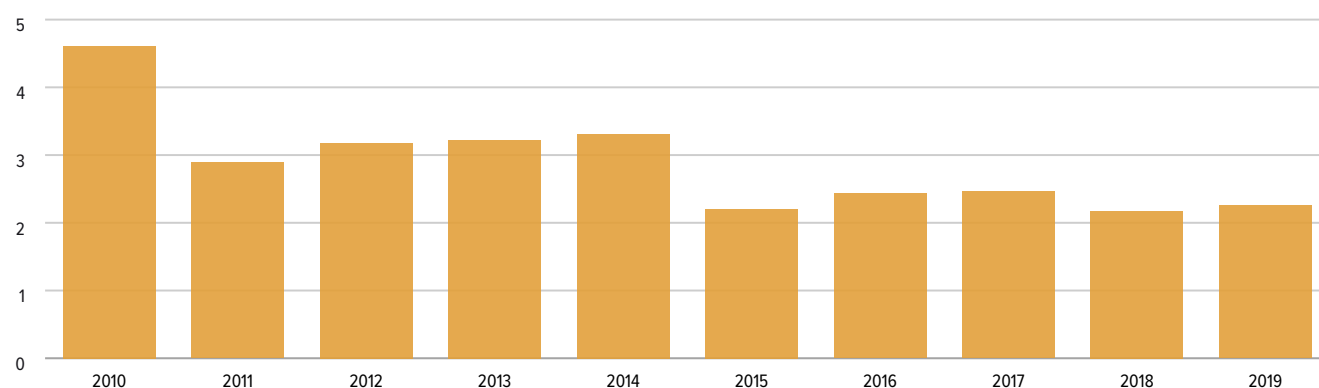
*Rogelj et al., 2018*

### 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

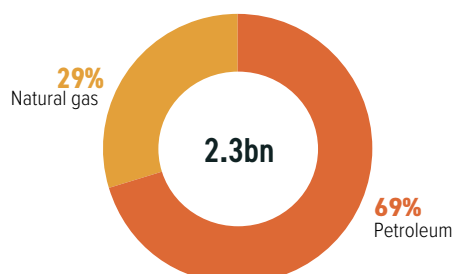
(USD billions)



OECD-IEA Fossil Fuel Support database, 2020

### Fossil fuel subsidies by fuel type

USD in 2019



Over the past decade (2010-2019), Canada's fossil fuel subsidies (as provided by federal and provincial governments) have reduced slightly after the 2010 peak, reaching a value of USD 2.3bn in 2019. Over this period, most of the subsidies were directed to supporting the production and consumption of petroleum, followed by natural gas.

Comparable data is not yet available for 2020. However, according to the Energy Policy Tracker data, during 2020 Canada has pledged at least USD 14.2bn to fossil fuel energy as part of its energy-related funding commitments (encompassing energy investments more broadly, not just subsidies) and COVID-19 economic response. The biggest funding commitments directed at fossil fuels were the loan guarantee and equity investment from the Alberta government for the TC Energy's (now cancelled) Keystone XL oil pipeline, for a total value of around USD 5.6bn. This was followed by the purchase of three natural gas power plants by Ontario Power Generation (a for-profit business entity owned by Ontario province) from the energy infrastructure company TC Energy, for a total value of around USD 2.1bn.

*Energy Policy Tracker, 2021; OECD-IEA Fossil Fuel Support database, 2020*

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



### CORONAVIRUS RESPONSE AND RECOVERY

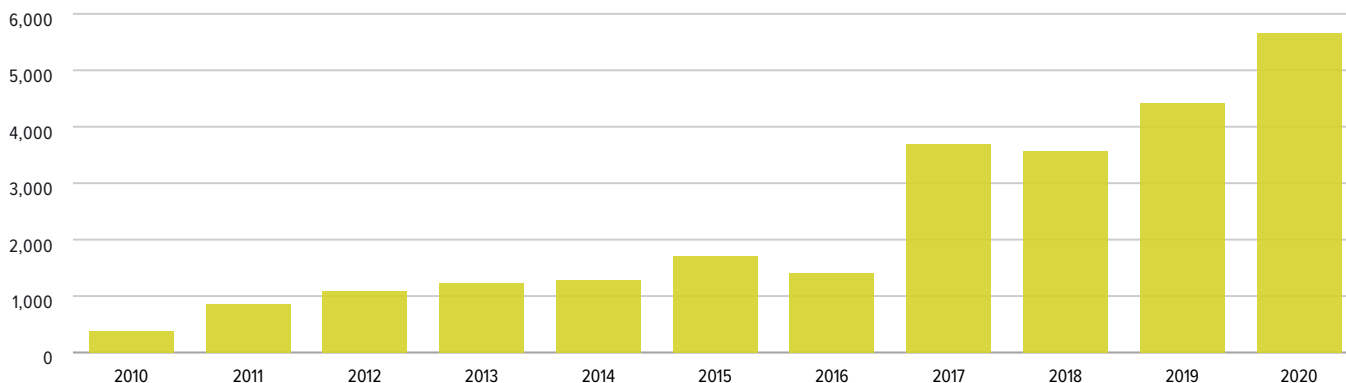
Any large employers that request support from the federal government's COVID-19 Economic Recovery Plan must publish annual climate-related financial disclosure reports and outline how they will contribute to meeting the country's climate targets. Through the 2020 Fall Economic Statement, CAD 7.3m was provided to establish a public-private Sustainable Finance Action Council to make recommendations to attract and scale-up sustainable finance. It was launched in May 2021.

*Department of Finance, 2021a; Vivid Economics, 2021*



## Carbon pricing and revenue

(USD millions)



Since 2007, several subnational carbon taxes and emissions trading schemes (ETS) have emerged in Canada. In 2019, a federal carbon pricing initiative was introduced 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 USD 15 (CAD 20) /tCO<sub>2</sub>e in 2019, increasing by USD 7.5 (CAD 10) /tCO<sub>2</sub>e per year until ultimately reaching USD 37 (CAD 40) /tCO<sub>2</sub>e in 2022. By 2030, prices are set to reach USD 134 (CAD 170) /tCO<sub>2</sub>e. In 2020, the federal carbon price generated over USD 3.2bn in revenue.

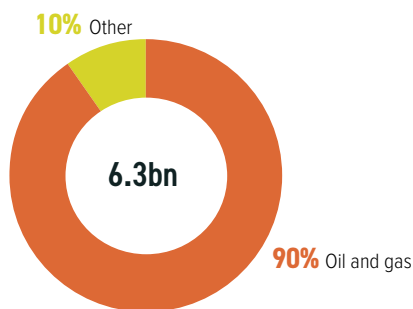
I4CE, 2021; Energy Policy Tracker, 2021

## 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

USD per annum (2018-19 average)



Between 2018 and 2019, Canada provided an average of USD 6.3bn per year in public finance for the oil and gas sector through its export credit agency, Export Development Canada (EDC). The vast majority, USD 5.7bn, was for oil and gas, with only USD 20m for coal finance, and USD 602m was for unidentified multiple fossil fuels. The most notable project financed was the Kinder Morgan's Trans Mountain oil pipeline and tanker expansion project, acquired by the federal government for USD 3.4bn in 2018.

The project received additional loans - including USD 770m from the EDC in 2018, and another USD 760m in 2019.

Oil Change International, 2020

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

### 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:

**139.30**

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 the other G20 countries. 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 five years.

## 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.



**The Canadian government has taken some steps over the past couple of years to promote green finance.** In August 2019, Canada's Securities Administrator released guidance on preparing disclosures of material risks of climate change. Canada's large Crown corporations will be required to report climate-related financial risks starting in 2022.

In June 2021, Canada passed the Canadian Net-Zero Emissions Accountability Act, which requires the Ministry of Finance to annually report key measures undertaken by the federal administration to manage climate change-related financial risks and opportunities.

In May 2020, the Bank of Canada tabled the paper Scenario Analysis and the Economic and Financial Risks From Climate Change on climate policy pathways and their macroeconomic transition and physical risks. This was followed by a pilot project aimed at creating a better understanding of the risks to the financial system related to a transition to a low-carbon economy. A final report will be published by the end of 2021.

In May 2021, the federal government launched the Sustainable Finance Action Council comprising of 25 member organisations. The Council's principal mandate includes: enhanced assessment and disclosure of climate risks and opportunities; better access to climate data and analytics; and common standards for sustainable and low-carbon investments.

*Bank of Canada, 2020; Ens and Johnston, 2020; Ministry of Environment, 2020; Department of Finance, 2021a, 2021b*

### Nationally Determined Contribution (NDC): Finance

Conditionality	Not applicable
Investment needs	Not specified
Actions	Not mentioned
International market mechanisms	Prioritises domestic action, though may consider use of international markets

## ENDNOTES

Where referenced, “Enerdata, 2021” refers to data provided in July 2021. 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/g20report2021](http://www.climate-transparency.org/g20-climate-performance/g20report2021)

- 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) reporting tables data converted to the categories from the IPCC 1996 guidelines, in particular separating Agriculture from LULUCF, which under the new 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 five years (where available) to take account of the different starting points of different G20 countries.
- 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 table below displays the criteria used to assess a country’s policy performance.
- The 1.5°C ‘fair-share’ ranges for 2030 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, 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. In order to maintain comparability across all countries, this report harmonises all data with PRIMAP, 2021 dataset to 2018. However, note that Common Reporting Format (CRF) data is available for countries which have recently updated GHG inventories. Where countries submitted updated NDC targets before August 2021, these have been analysed and included.
- 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).

On endnote 4.	Low	Medium	High	Frontrunner
Renewable energy in power sector	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
Coal phase-out in power sector	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)
Phase out fossil fuel cars	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
Phase out fossil fuel heavy-duty vehicles	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
Modal shift in (ground) transport	No policies	Some policies (e.g. support programmes to shift to rail or non-motorised transport)	Policies + longer-term strategy	Policies + longer-term strategy consistent with 1.5°C pathway
Near zero energy new buildings	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + national strategy for near zero energy new buildings	Policies + national strategy for all new buildings to be near zero energy by 2020 (OECD countries) or 2025 (non-OECD countries)
Energy efficiency in industry	No policies	Mandatory energy efficiency policies cover more than 26-50% of industrial energy use	Mandatory energy efficiency policies cover 51-100% of industrial energy use	Policies + strategy to reduce industrial emissions by 75-90% from 2010 levels by 2050
Retrofitting existing buildings	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + retrofitting strategy	Policies + strategy to achieve deep renovation rates of 5% annually (OECD) or 3% (non-OECD) by 2020
Net zero deforestation	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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