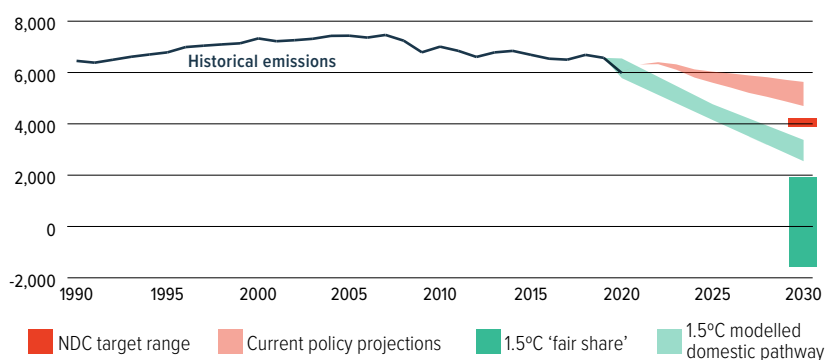




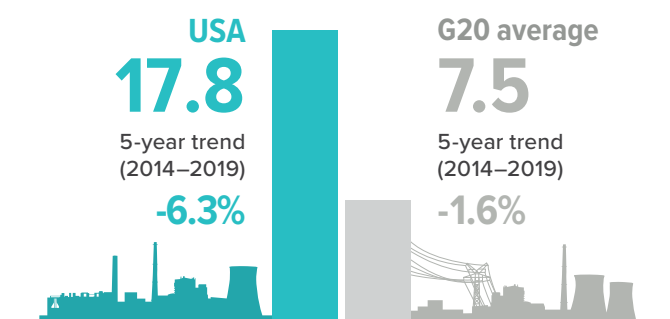
## NOT ON TRACK FOR A 1.5°C WORLD

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

The USA's updated NDC target would decrease emissions 37–41% below 1990 levels, or to approximately 3,907–4,179 MtCO<sub>2</sub>e (excl. LULUCF). To keep below the 1.5°C temperature limit, analysis by the 1.5°C Pathways Explorer shows that the USA's emissions would need to be around 2,844 MtCO<sub>2</sub>e by 2030, leaving a minimum ambition gap of about 1,063 MtCO<sub>2</sub>e. The USA's 2030 target is not 1.5°C 'fair share' compatible, which would require the USA to strengthen its domestic target and provide substantial support for emissions 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

The USA's per capita emissions are 2.4 times the G20 average. Total per capita emissions have decreased by 6.3% from 2014 to 2019.

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

## RECENT DEVELOPMENTS



In August 2022, the USA passed the Inflation Reduction Act (IRA), the most important piece of climate legislation in its history, which includes significant support for renewable energy, electric vehicles (EVs) and other climate measures.

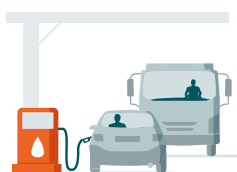


**The IRA includes provisions for fossil fuels**, including required oil and gas leasing. In negotiating the bill, Democratic leadership agreed to support separate legislation to speed up permitting for energy infrastructure.



In June 2022, the US Supreme Court curtailed the US Environmental Protection Agency's (EPA) ability to regulate carbon emissions, **instead requiring Congressional approval for "transformational" rules in West Virginia v. EPA.**

## KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION



Transport emissions per capita in the USA are over four times the G20 average. **The USA needs to adopt policies to encourage a shift to rail**, which was largely absent from the Inflation Reduction Act (IRA).



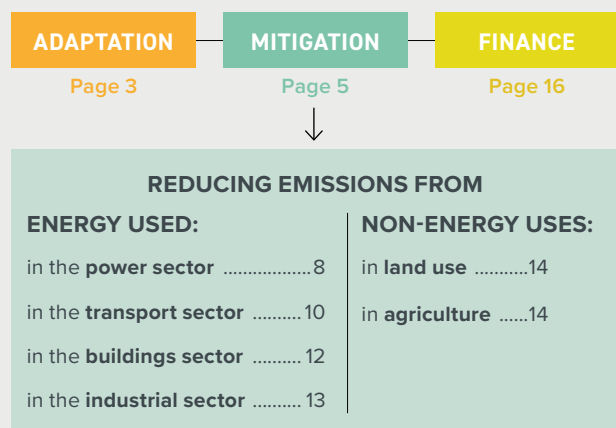
The USA risks missing the opportunity to **further invest in, and dramatically scale up, renewables** to address the energy crisis, by instead easing restrictions on new oil and gas fields on federal lands.



Congress approved only USD 1bn in international climate finance for 2022, far from President Biden's promised USD 11.4bn by 2024. **The USA needs to Rapidly scale up climate finance** to support developing countries' climate needs.

## Contents

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



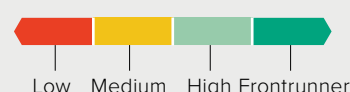
## Legend

**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



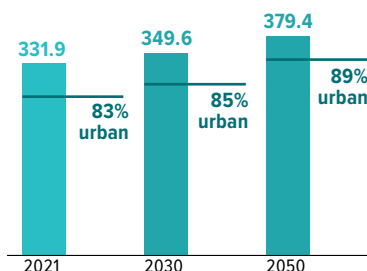
The Human Development Index (HDI) reflects life expectancy, level of education, and per capita income. The USA ranks very high.

very high

Data for 2019.  
UNDP, 2020

### Population and urbanisation projections

(in millions)

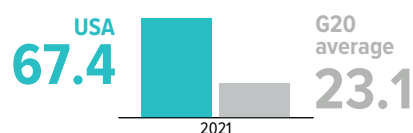


The USA's population is projected to increase by 14% by 2050, and become more urbanised.

United Nations, 2018; World Bank, 2022

### Gross Domestic Product (GDP) per capita

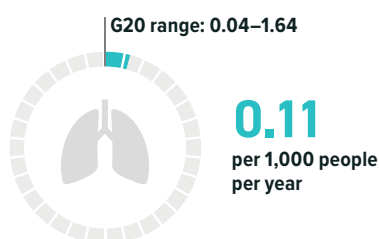
(thousand PPP constant 2015 international \$ per person) in 2021



World Bank, 2021

### Death rate attributable to ambient air pollution

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



Over 60,000 people die in the USA every year 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

In August 2022, the USA passed the IRA, which is expected to help move the USA toward achieving its climate targets. The IRA includes provisions that would support a just transition, such as USD 60bn for low-income communities and communities of colour disproportionately impacted by infrastructure projects and climate change. The Act also permanently extends funding for the Black Lung Disability Trust Fund, which has been at risk of diminishing funds as the coal industry decline and offers financing for communities impacted by the energy transition. While the Act limits certain benefits to homeowners, the IRA does include USD 1bn to improve low-income housing and makes it easier for affordable housing developers to access energy-efficiency tax credits.

Doshi and Morris, 2021; Kane et al., 2022; Plumer and Friedman, 2022; RMI, 2022; Urbanek and Lovaas, 2022

# ADAPTATION

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



Climate change is increasing the duration of wildfire season and driving larger fires. Nine of California's 20 largest wildfires occurred in 2020 and 2021.



The record for the **most weather and climate disasters was broken in 2020**, causing at least USD 1bn in damages, with 22 events (including cyclones, severe storms, drought and wildfires) together totalling USD 95bn.



Over the last 5 years (2017–2021), these billion-dollar weather and climate disasters have been **responsible for over 4,500 fatalities**.

## ADAPTATION NEEDS

### Impacts of a changing climate

#### Exposure to warming



**0.9°C**  
Higher

Between 2017 to 2021, the average summer temperatures experienced by people in the USA were 0.9°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



**2.5bn** Labour hours lost  
**36%** increase

In 2021, heat exposure in the USA led to the loss of 2.5 billion potential labour hours, a 36% increase from 1990–1999.

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



**68.8bn** Loss in labour capacity (USD)  
**0.3%** 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 68.8bn, or 0.3% of its 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> : +2.6% at 1.5°C warming	1.4 times	0.9 times	1.0 times
Local <b>snowfall</b> : -9.1% at 1.5°C warming	1.7 times	2.3 times	3.1 times

In the USA, local precipitation is projected to increase by 2.6% if global temperature rises by up to 1.5°C. More warming is projected to increase precipitation further: under a 2°C warming scenario, by 1.4 times. Local snowfall is expected to decrease under a 1.5°C scenario by 9.1% from snowfall levels in the reference period of 1986–2006. At 3°C of warming, the decrease is expected to be 3.1 times what the decrease would be under a 1.5°C scenario.

Fresh water	At 2°C	At 2.5°C	At 3°C
<b>Surface run-off</b> : +1.7% at 1.5°C warming	1.2 times	-0.2 times	-1.1 times
<b>River discharge</b> : -1.5% at 1.5°C warming	0 times	2.1 times	5.0 times
Total <b>soil moisture content</b> : -0.7% at 1.5°C warming	1.8 times	2.8 times	3.3 times

In the USA, the percentage of surface run-off is projected to increase by 1.7% from the average in the reference period of 1986–2006, if global temperature rises by up to 1.5°C, while total soil moisture is projected to decrease by 0.7%. This decrease of moisture content would be 3.3 times greater at 3°C of warming. Under 1.5°C of warming, river discharge would decrease by 1.5%. This decline would be 5 times greater under a 3°C warming scenario.

Agriculture	At 2°C	At 2.5°C	At 3°C
Reduction in <b>maize yield</b> : -4.4% at 1.5°C warming	1.3 times	2.8 times	3.8 times

Agricultural yields tend to decrease as the temperature increases. For example, maize yield is expected to decrease by 4.4% at 1.5°C of warming from the reference period of 1986–2006. This loss would be 3.8 times greater at 3°C of warming.

Hazards	At 2°C	At 2.5°C	At 3°C
Number of people annually exposed to <b>heatwaves</b> : 9,560,044 at 1.5°C warming	1.8 times	2.4 times	3.1 times
Number of people annually exposed to <b>wildfires</b> : 233,233 at 1.5°C warming	1.2 times	1.5 times	1.2 times

The number of people annually exposed to hazards is expected to rise as the temperature increases. For example, the number of people annually exposed to heatwaves in the USA is projected to be approximately 9.5 million at 1.5°C of warming, and 3.1 times greater if warming increases to 3°C.

Economic	At 2°C	At 2.5°C	At 3°C
Annual expected damage from <b>tropical cyclones</b> : +8.9% at 1.5°C warming	2.4 times	3.9 times	5.1 times
Annual expected damage from <b>river flood</b> : +32.7% at 1.5°C warming	0.6 times	0.6 times	0.6 times
<b>Labour productivity</b> due to heat stress: -2.5% at 1.5°C warming	1.6 times	2.2 times	2.9 times

The annual expected damage from tropical cyclones and river flooding at 3°C is 5.1 times and 0.6 times, respectively, what the increased damages compared to the reference period would be under a 1.5°C scenario. The labour productivity is projected to decrease by 2.5% under 1.5°C of warming, and this decrease would be 2.9 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
EPA Climate Adaptation Action Plan	2021				✓		✓		✓						The EPA will use performance measurement, data analysis, evaluation and other evidence-building activities
20 federal agencies released Climate Adaptation and Resilience Plans	2021	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	

## Nationally Determined Contribution (NDC): Adaptation

### TARGETS

N/A

### ACTIONS

Efforts to reduce wildfires, increase nature-based coastal resilience projects, and prioritise adaptation investments in historically disadvantaged communities

# 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.

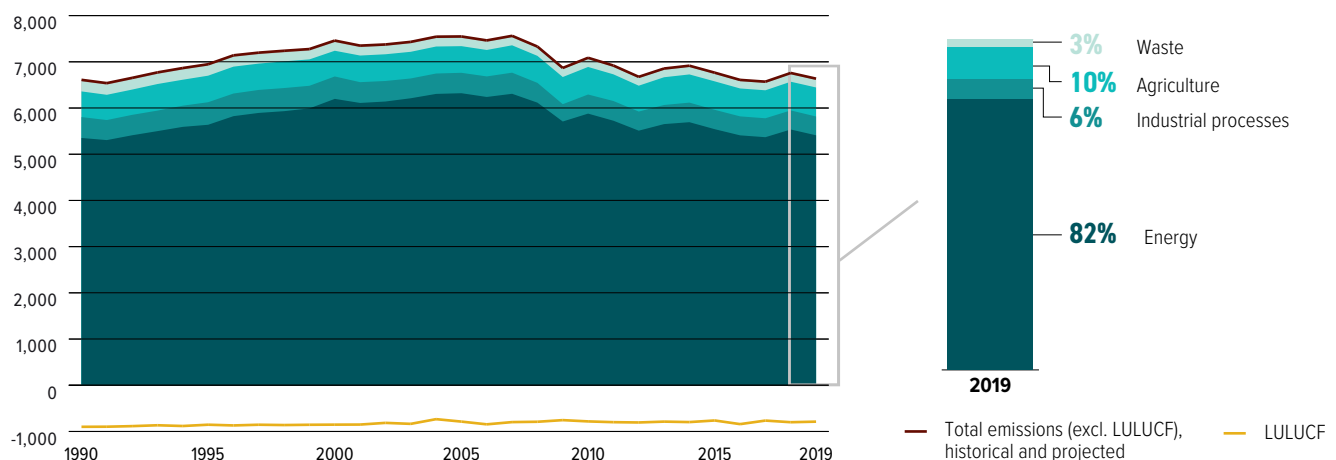
## EMISSIONS OVERVIEW



The USA's total **greenhouse gas emissions (excl. LULUCF)** have increased by **0.4%** (1990–2019). In the same period, its total methane emissions (excl. LULUCF) have decreased by 15%.

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

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

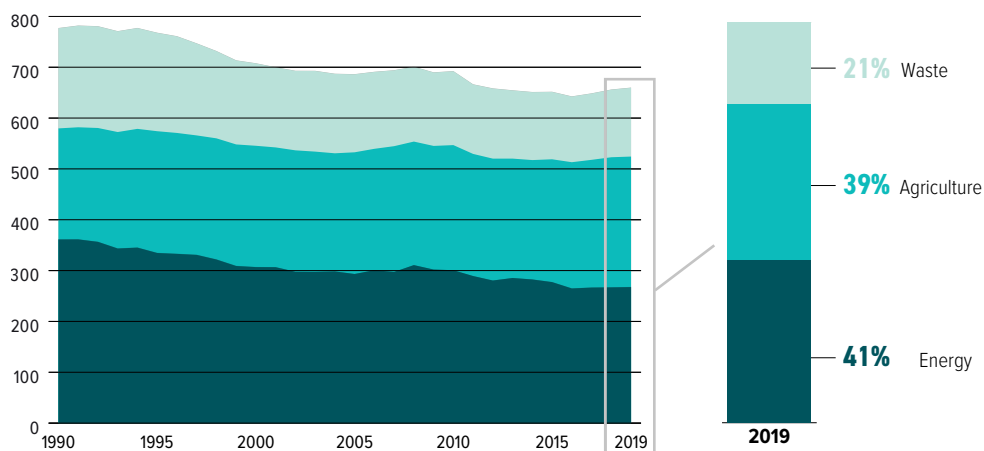


The USA's GHG emissions (excl. LULUCF) increased by 0.4% between 1990 and 2019 to 6,634 MtCO<sub>2</sub>e/yr, peaking in 2007. Since then, the decrease has largely been driven by a 15% decline of energy emissions. The only sector to have increasing emissions was the agriculture sector, which has increased 6% since 2007.

Gütschow et al., 2021

### Methane emissions by sector

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



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

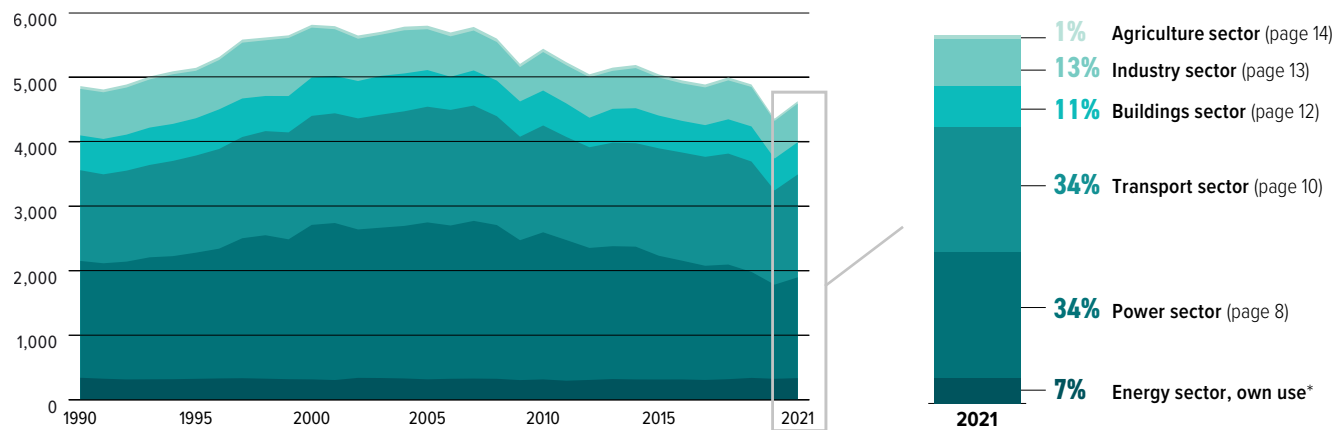
Participating countries pledged to undertake voluntary actions to contribute to a collective reduction of global methane emissions by at least 30% from 2020 levels by 2030. Further scrutiny of plans and implementation will be required.

Methane is a potent, though short-lived, greenhouse gas, accounting for an estimated third of global warming. The largest share of the USA's methane emissions (excl. LULUCF) came from the energy sector in 2019, followed closely by the agriculture sector, although actual emissions are likely to be higher than reported. Between 1990–2019, overall methane emissions decreased by 15% to 660 MtCO<sub>2</sub>e/yr, but while energy sector emissions have declined (361 to 268 MtCO<sub>2</sub>e), those from agriculture have increased (218 to 256 MtCO<sub>2</sub>e). The decline of methane emissions in the energy sector can be ascribed to a combination of measures like the reduction of flaring, venting, and leaking of methane, as well as changes in the composition of the energy mix.

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)

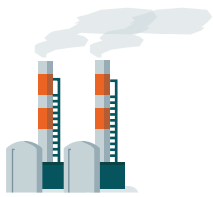


The largest driver of overall greenhouse gas emissions are CO<sub>2</sub> emissions from fuel combustion. In the USA, overall emissions have been decreasing since 2007. The transport and power sectors both contribute approximately 34%. They are followed by the industry and buildings sectors with a 13% and 11% contribution, respectively.

Enerdata, 2022

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

## ENERGY OVERVIEW



**Fossil fuels account for 81% of the USA energy mix, with a growing role for fossil gas.** While the coal industry has declined overall, in 2021 the use of coal increased for the first time since 2014, rebounding by 15%. **Renewables have continued to grow, but their share in the mix decreased in 2021.**

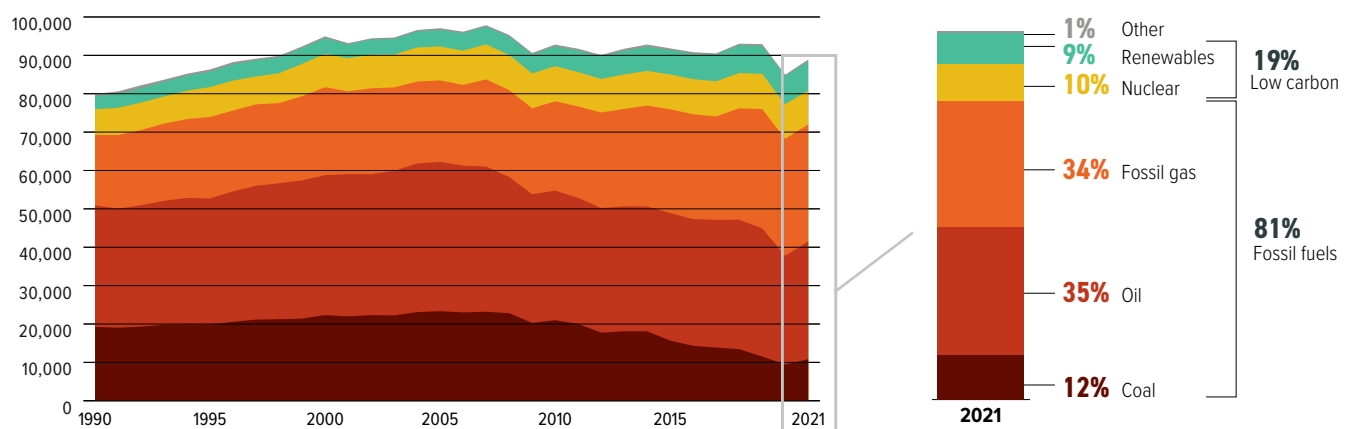


The share of fossil fuels globally needs to fall to 67% of global total primary energy by 2030 and to 33% by 2050, and to substantially lower levels without carbon capture and storage.

Rogelj et al., 2018

## Energy mix

Total primary energy supply (PJ)

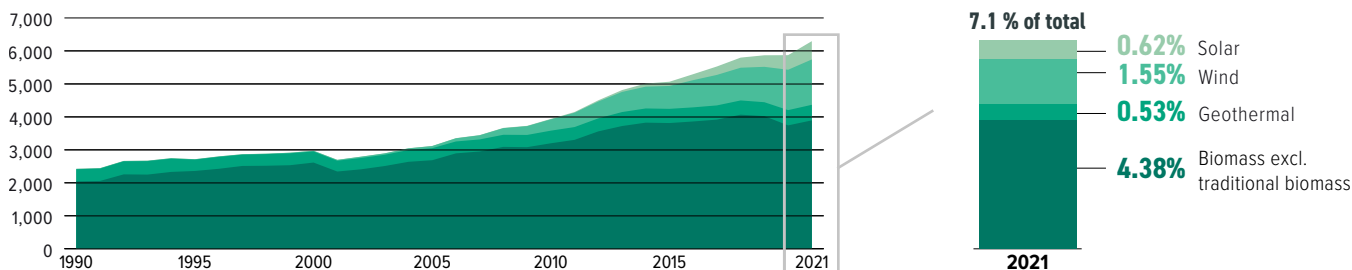


This graph shows the fuel mix for all energy supply, including energy used not only for electricity generation, heating and cooking, but also for transport fuels. Fossil fuels (oil, coal, and gas) make up 81% of the USA energy mix, which is around the G20 average. Since 2007, energy supply has stagnated, with renewable energy increasing the fastest but still playing a marginal role.

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 7.1% of the USA energy supply – the G20 average is 7.5%. The share in total energy supply has increased by around 21.5% in the last 5 years in the USA (2016–2021). Bioenergy (for electricity and heat) makes up the largest share.

Enerdata, 2022

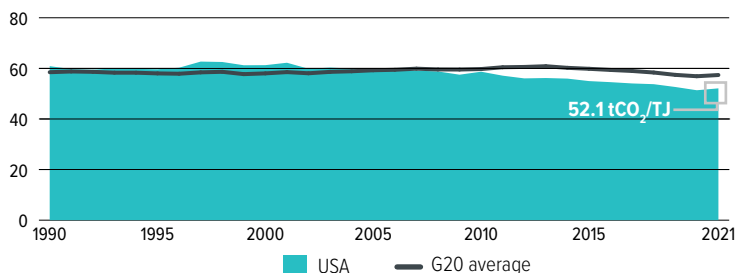
*Note: Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.*

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



## Carbon intensity of the energy sector

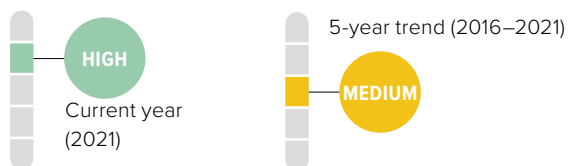
Tonnes of CO<sub>2</sub> per unit of TPES (tCO<sub>2</sub>/TJ)



Carbon intensity shows how much CO<sub>2</sub> is emitted per unit of energy supply. The carbon intensity of the USA energy supply was 52.1 tCO<sub>2</sub>/TJ in 2021, lower than the G20 average of 57.4 tCO<sub>2</sub>/TJ. The overall decrease from 2013 was driven by the decreasing share of coal and oil and an increasing share of renewables in the energy mix. The 2021 increase is, in part, due to increased coal in the energy mix.

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 the USA was 267.9 GJ above the G20 average of 99.4 GJ, and supply has decreased significantly faster between 2016 and 2021 (6.8%) than the G20, which has increased with an average of 1.65% over the same period.

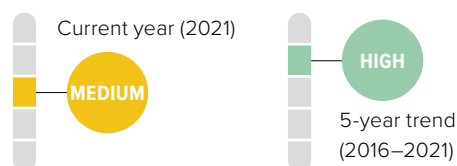
Enerdata, 2022; World Bank, 2022

## 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. The USA's energy intensity is marginally lower than the G20 average but has been decreasing faster – 11.3% between 2016–2021 – as compared to the G20's average decrease.

Enerdata, 2022; World Bank, 2021

# POWER SECTOR

Emissions from energy used to make electricity and heat



The USA produced **23% of its electricity from coal and 21% from renewables in 2021**. The share of fossil gas has about doubled since the early 2000s and contributed 37% in 2021. Coal increased in the power sector in 2021 for the first time since 2013.

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

**34%** Direct

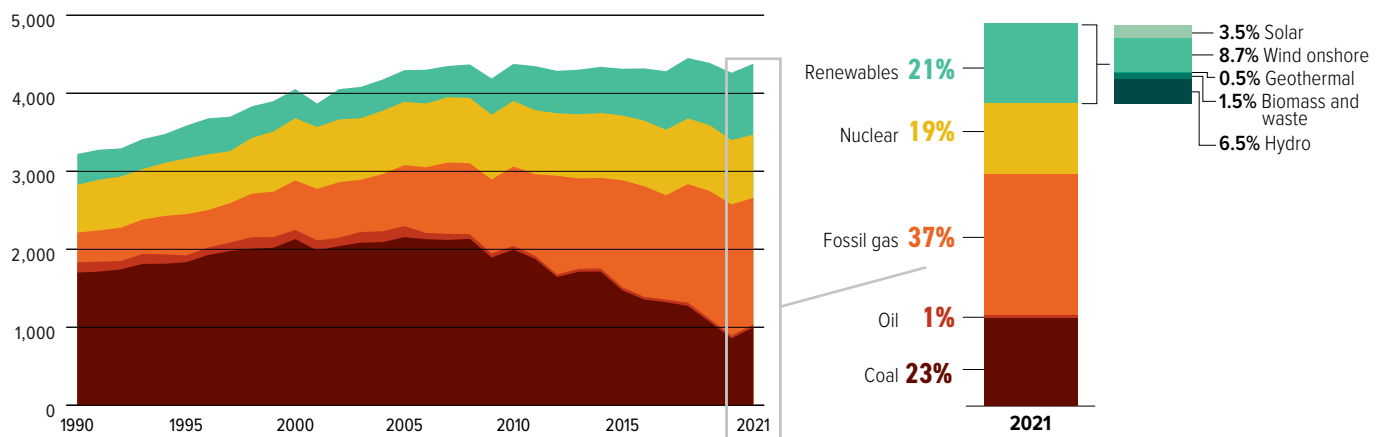


**Worldwide, coal use for power generation needs to peak by 2020**, and between 2030 and 2040, all the regions of the world need to phase out coal-fired power generation. By 2040, the share of renewable energy in electricity generation has to be increased to at least 75%, and the share of unabated coal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

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

## Electricity generation mix

Gross power generation (TWh)

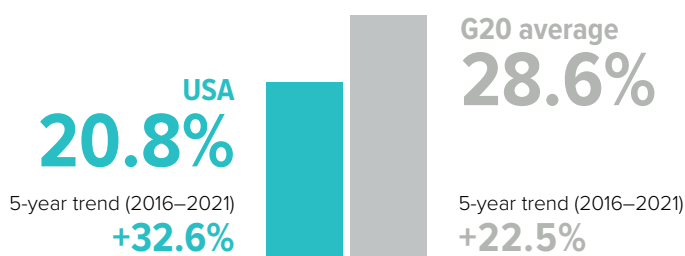


The USA generated 61% of its electricity from fossil fuels in 2021, down only slightly from 69% in 1990. The share of renewable energy increased from 12% of the power generation mix in 1990 to 21% in 2021. Nuclear has been a stable feature at around 19–20% over that timeframe.

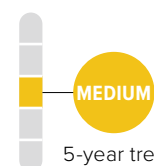
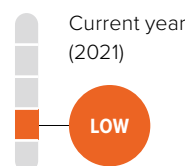
*Enerdata, 2022*

## Share of renewables in power generation

(incl. large hydro) in 2021



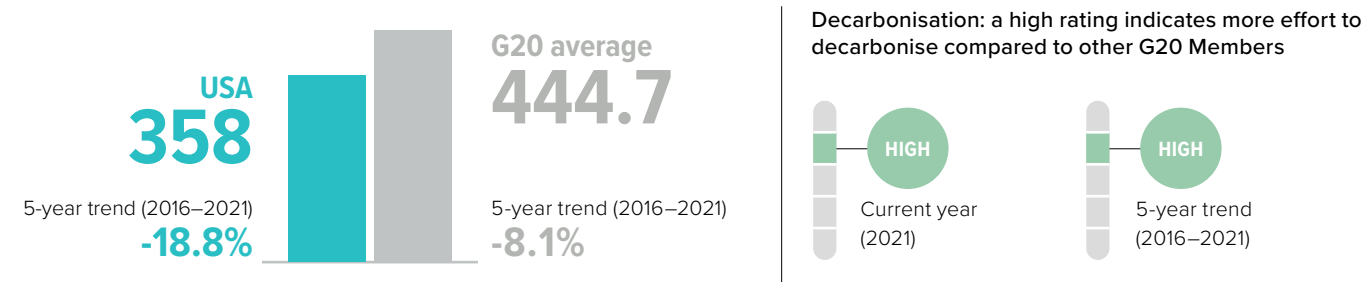
**Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members**



*Enerdata, 2022*

Emissions intensity of the power sector

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

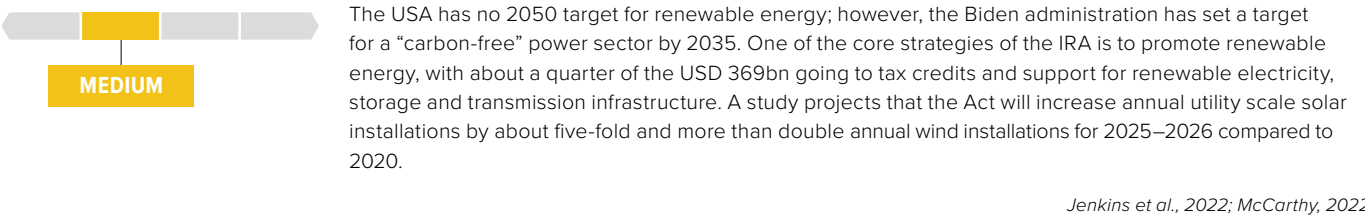


For each kilowatt hour of electricity, 358 g of CO<sub>2</sub> were emitted in the USA in 2021. The emissions intensity of power generation in the USA has dropped 18.8%, faster than the G20 average (of 8.1%), as fossil gas increasingly replaced coal in the mix from about 2008.

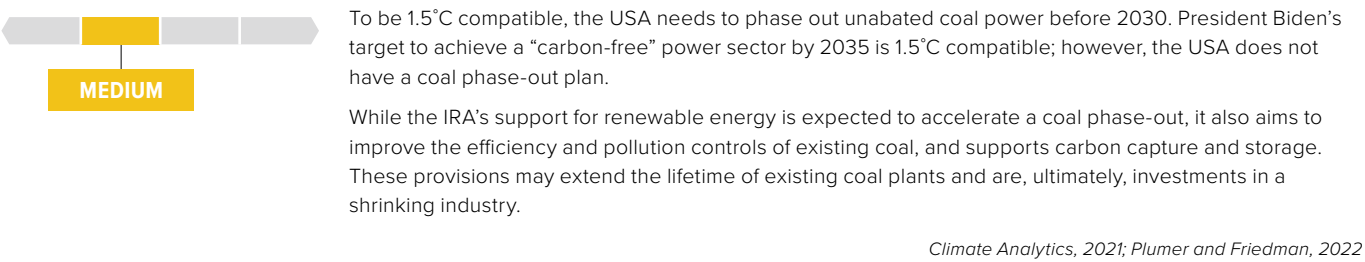
Enerdata, 2022

POLICY ASSESSMENT

Renewable energy in the power sector

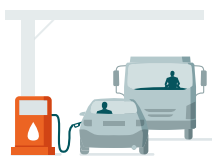


Coal phase-out in the power sector



# TRANSPORT SECTOR

Emissions from energy used to transport goods and people



Emissions from transport are still on the rise. In 2019, 88% of passenger transport was by road, and in 2018, 54% of freight transport was by road. Both sectors are still dominated by fossil fuels and, in 2021, only 5% of car sales were EVs.



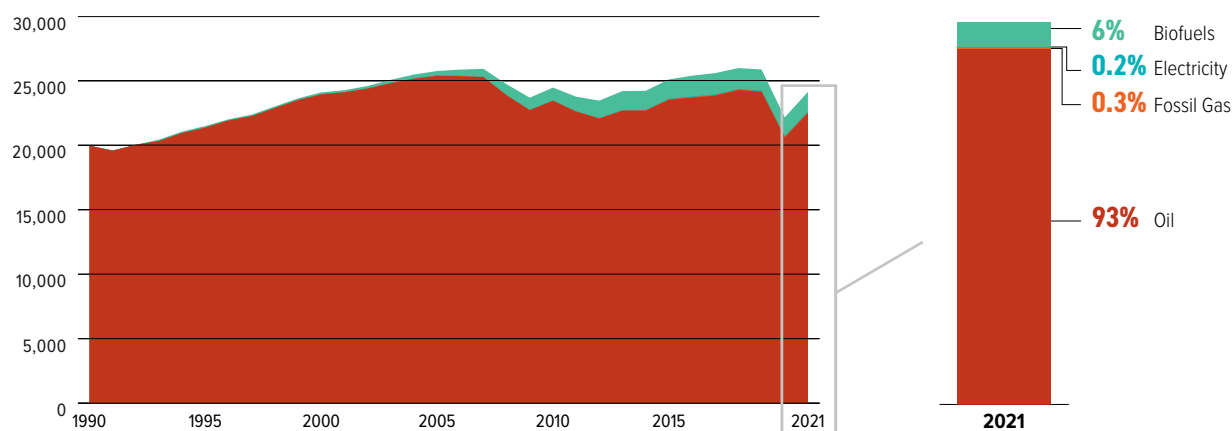
The share of low-carbon fuels in the transport fuel mix must **increase** to between 40% and 60% by 2040 and 70% to 95% by 2050.

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

Transport's share of energy-related CO<sub>2</sub> emissions in 2021: **34.5%** Direct **0.1%** Indirect

## Transport energy mix

Final energy consumption by source (PJ/year)



Electricity and biofuels make up only 6% of the energy mix in transport.

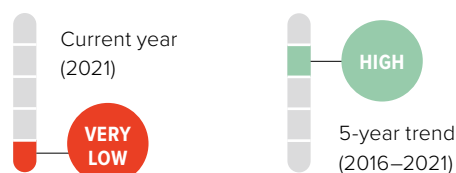
*Enerdata, 2022*

## 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

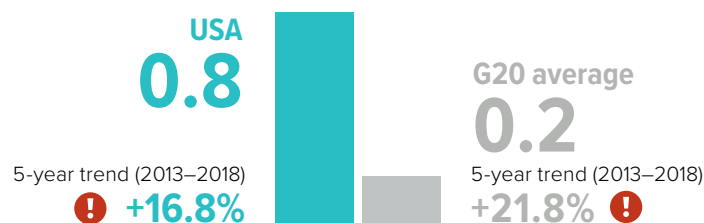


Per capita emissions in 2021 and the 5-year trend have been impacted by COVID-19 pandemic response measures and resulting economic slowdowns. For a discussion of broader trends in the G20 and the rebound of transport emissions in 2022, please see the Highlights Report at [www.climate-transparency.org](http://www.climate-transparency.org)

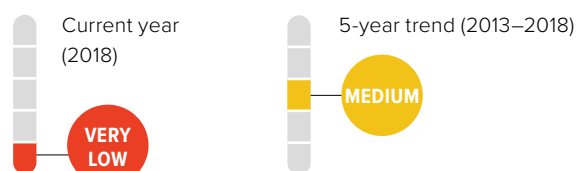
*Enerdata, 2022; World Bank, 2022*

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

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

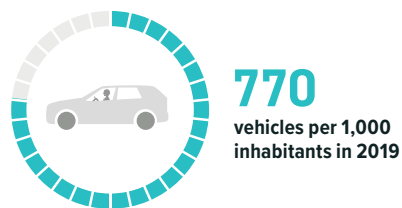


Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



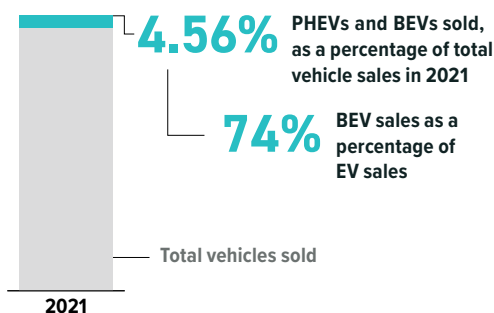
*Enerdata, 2022; IEA, 2021a; World Bank, 2022*

## Motorisation rate



Enerdata, 2022

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

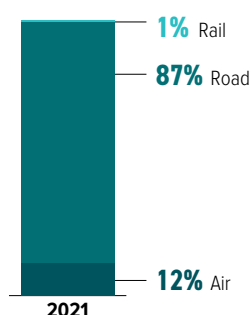


Battery-Electric Vehicles (BEVs) have greater emissions mitigation potential when they are powered by electricity produced by renewables because they have no internal combustion engine (ICE), whereas plug-in hybrids (PHEVs) still produce emissions when using the ICE.

IEA, 2022

## Modal split passenger transport

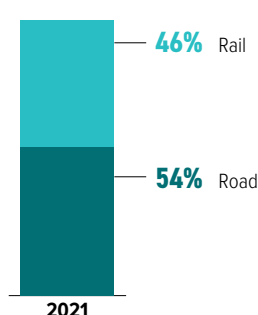
(% of passenger-trips): road, rail and air



Enerdata, 2022

## Modal split freight transport

(modal split in % of tonne-km)

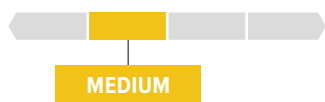


Due to data availability, only road and rail transport are included in the freight transport category. Other freight modes, e.g. waterways, are excluded due to lack of data for all countries.

Enerdata, 2022

# POLICY ASSESSMENT

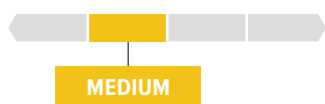
## Phase out fossil fuel cars



In 2021, President Biden announced a target for half of all USA vehicle sales to be electric by 2030. For the USA to be 1.5°C compatible, 95–100% of light-duty vehicle sales need to be electric by 2030. The IRA renews the EV tax credit for 2023–2031, removes the cap on eligible cars, and allows the credit to be applied at the point of sale. It also includes requirements for the sourcing and assembly of batteries to encourage domestic supply chain development and reduce dependence on Chinese imports, but some argue the timeline may slow EV uptake.

Climate Action Tracker, 2021b; House Committee on Rules, 2022; The White House, 2021

## Phase out fossil fuel heavy-duty vehicles



The USA does not have a strategy for reducing emissions from freight transport, but does have energy efficiency standards for heavy-duty vehicles (HDVs). The HDV National Program sets GHG emissions and fuel efficiency standards for HDVs, which the EPA estimates will reduce emissions by 200 MtCO<sub>2</sub>/year by 2050. The IRA includes tax credits for the purchase of medium- and heavy-duty EVs, and for the installation of charging infrastructure.

House Committee on Rules, 2022; Spiller, 2022; US EPA and US National Highway Safety Administration, n.d.

## Modal shift in (ground) transport



The USA does not have a long-term modal shift strategy but has adopted some policy measures that support it. In February 2021, the Department of Transportation allocated USD 180m in grants to fund low and zero-emission buses and promote walkable and bikeable “complete streets”. The Department plans to collaborate with other departments to encourage a modal shift and transit-oriented development. Provisions for the largest federal investment in passenger rail since the creation of Amtrak were included in the Build Back Better Act passed by the House (but not the Senate) and were ultimately removed from the IRA.

Federal Transit Administration, 2021; House Committee on Rules, 2022; Wilson, 2022

# BUILDINGS SECTOR

Emissions from energy used to build, heat and cool buildings



Direct emissions and indirect emissions from the buildings sector in the USA account for 10.3% and 24.8% of total energy-related CO<sub>2</sub> emissions, respectively. Per capita emissions from the buildings sector are more than 3 times the G20 average. The USA's policies are not sufficient for a 1.5°C pathway.

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

**10.3%** Direct **24.8%** 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.**

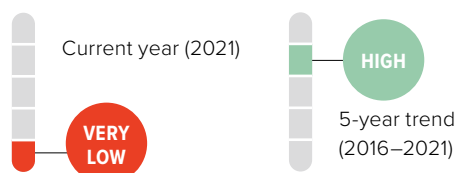
*Climate Action Tracker, 2020; Rogelj et al, 2018*

## 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 over 3 times the G20 average as of 2021, reflecting the high fossil fuel share of the electricity mix. In contrast to the G20 average, however, the USA has decreased the level by 14.8% (2016–2021).

*Enerdata, 2022; World Bank, 2022*

## POLICY ASSESSMENT

### Near zero energy new buildings



The USA has no strategy for near zero energy new buildings, although California and Massachusetts do. The IRA includes a tax credit for builders of new homes meeting Energy Star New Homes specifications, which doubles for homes that qualify as zero energy ready, i.e., energy efficient enough that a renewable energy system can offset all or most consumption. The IRA includes USD 1bn for states and local governments to implement stringent energy codes, with most of the funding designated for those who adopt zero energy codes.

Most states have building codes, but some are quite dated, not all codes are mandatory, and the level of enforcement varies.

*California Energy Commission, 2021; House Committee on Rules, 2022; Urbanek and Lovaas, 2022; Zero Energy Project, n.d.*

### Renovation of existing buildings



The USA has no long-term strategy for energy retrofitting existing buildings. In August 2022, the White House launched the Climate Smart Buildings Initiative to retrofit federal buildings. The IRA further allocates billions to incentivise improvements in residential buildings efficiency, including for home energy retrofits; efficient electrification of low- and moderate-income households; and upgrading appliances, air conditioning systems and heat pumps along with measures targeting affordable housing. Additional provisions target commercial and federal buildings efficiency.


*House Committee on Rules, 2022; The White House, 2022*

# INDUSTRY SECTOR

Emissions from energy use in industry



Direct emissions and indirect emissions from industry in the USA make up 12.9% and 6.8% of energy-related CO<sub>2</sub> emissions, respectively. The USA lacks effective policies to increase the energy efficiency of the industry sector, but the 2022 IRA includes investments to reduce industrial emissions.



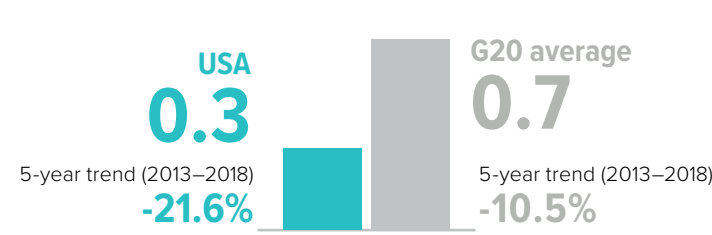
**Industrial emissions need to be reduced by 65–90% from 2010 levels by 2050.**

*Rogelj et al., 2018*



## 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

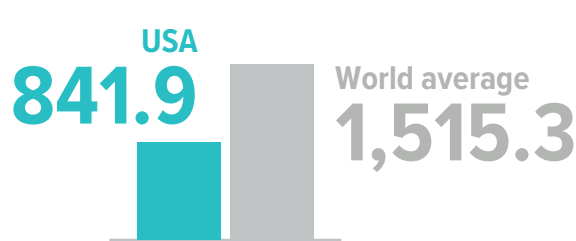
**VERY HIGH**  
Current year (2018)

**VERY HIGH**  
5-year trend (2013–2018)

*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



At the federal level, the USA government has established both mandatory and voluntary minimum performance standards for equipment used by the industrial sector and voluntary energy efficiency certification for industry. Several states have emissions trading schemes (ETs) in place. The IRA includes almost USD 6bn to establish the Advanced Industrial Facilities Deployment Program to reduce emissions from industries such as chemical, steel and cement.

*House Committee on Rules, 2022; IEA, 2019; Senate Democrats, 2022*

## LAND USE SECTOR

Emissions from land use change and forestry



To stay within the 1.5°C limit, the USA needs to make the land use and forestry sector a net sink of emissions, e.g., by creating new forests.

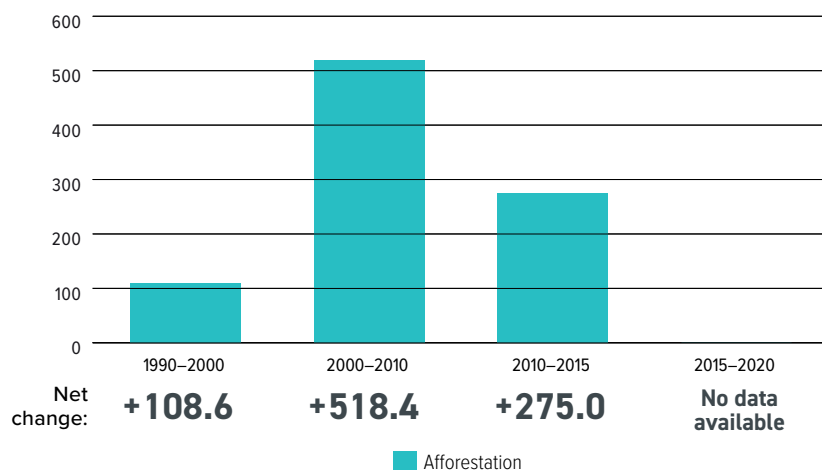


**Global deforestation needs to be halted and changed to net CO<sub>2</sub> removals by around 2030.**

*Rogelj et al., 2018*

### Annual forest expansion, deforestation and net change

Forest area change in 1,000 ha/year

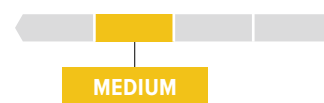


No data is available for the period between 2015–2020. Between 2010–2015, however, the USA gained a net 275 kha of forest area per year.

*Global Forest Assessment, 2020*

### POLICY ASSESSMENT

#### Target for net zero deforestation



In its updated NDC, the USA commits to reduce emissions from forests and enhance carbon sinks through a range of programmes and measures for ecosystems. The IRA allocates funds for forest programmes, including USD 2.2bn for non-federal forest conservation grants, USD 1bn for national parks and public lands, and USD 225m for federal forest restoration investments. President Biden also reversed a Trump rollback of protections for Alaska's Tongass National Forest, enacting further protections that end large-scale logging of old growth timber.

*Law, 2021; McCarthy, 2022; US Government, 2021*

## AGRICULTURE SECTOR

Emissions from agriculture



The USA's agricultural emissions are primarily from the digestive processes and manure of livestock. A 1.5°C compatible pathway requires behavioural and dietary shifts and less fertiliser use.

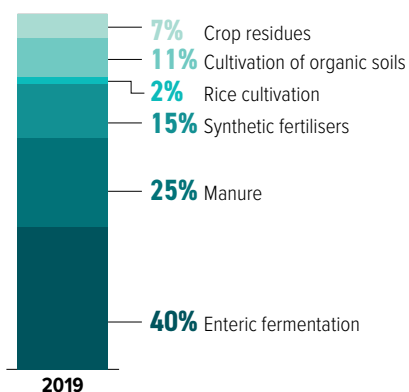


**Methane emissions need to decline by 10% by 2030 and by 35% by 2050 (from 2010 levels).** Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).

*Rogelj et al., 2018*

### Emissions from agriculture

excluding energy emissions, in 2019



In the USA, the largest sources of GHG emissions in the agriculture sector are the digestive processes and storage and handling of livestock manure (mainly cattle), and the use of synthetic fertilisers. Adapting and improving livestock diets, improving manure storage and handling, reducing or more efficiently using synthetic fertilisers, and making dietary changes in the general population in favour of vegetables and fruit 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

50–52% below 2005 levels by 2030 (incl. LULUCF)

ACTIONS

Actions specified for electricity, transportation, buildings, industry, and agriculture and lands.

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 the combination of the USA’s 2030 climate targets, policies, and climate finance as “insufficient”. This rating indicates that it needs to substantially improve its policies and commitments to be consistent with the Paris Agreement’s 1.5°C temperature limit and are not consistent with any interpretation of a ‘fair share’ contribution. The USA’s 2030 domestic emissions reduction target (NDC) is only consistent with 2°C of warming when compared to modelled domestic emissions pathways. Under current (August 2022) policies, USA emissions will decline to 2030 but are still not sufficient to achieve its NDC target. The USA is also not meeting its ‘fair share’ contributions to climate change and, in addition to strengthening targets and policies, needs to provide additional support to developing countries.

This CAT analysis was updated in August 2022.

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 2021
Net zero target	The LTS includes a target for net zero emissions by 2050
Interim steps	Yes: 26–28% below 2005 levels by 2025 and 50–52% below 2005 levels by 2030
Sectoral targets	Yes

# FINANCE

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



In 2019, the USA spent USD 8.9bn on fossil fuel subsidies, with almost half going to petroleum and a quarter to fossil gas. At the federal level, the USA has failed to introduce a carbon tax, but state and regional initiatives continue to expand.



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

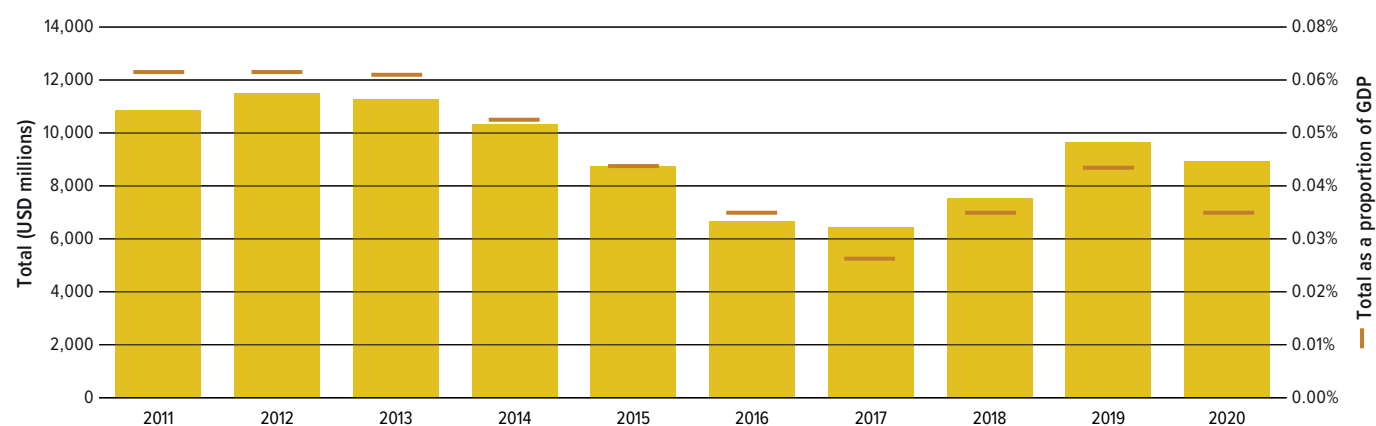
*Rogelj et al., 2018*

## 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)



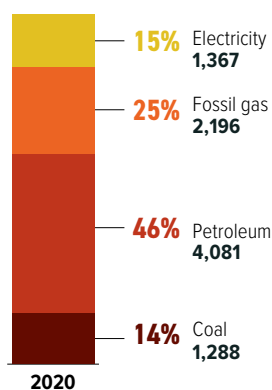
*OECD-IEA Fossil Fuel Support Database, 2022*

### Fossil fuel subsidies by fuel type

(USD millions) in 2020



**8,932**  
USD millions



Fossil fuel subsidies in the USA rose from a low of USD 6.4bn in 2017 to USD 8.9bn in 2020. Of this amount, 60% was directed at consumption, and the remainder at production. Petroleum received 46% and fossil gas 25% of the support, while coal and electricity generation received 14% and 15%, respectively.

The largest single subsidy measure aimed at encouraging production in Alaska's North Slope through tax credits, and doubled between 2017–2020.

The COVID-19 pandemic and the ensuing energy demand crash led the USA government to offer unconditional support to many struggling oil firms, at both federal and state levels. In August 2022, the USA passed the IRA, which is expected to help move the USA towards achieving its climate targets, but also includes concessions to the fossil fuel industry, such as support for efficiency and pollution controls of existing coal and carbon capture and storage.

*Energy Policy Tracker, 2022; OECD-IEA Fossil Fuel Support Database, 2022*

## Carbon pricing and revenue

To date, ETSs have become operational in three states (California, Massachusetts and Oregon) along with the Regional Greenhouse Gas Initiative (RGGI), covering 11 states. Three more schemes are under development, in the states of Washington (coming online in 2023) and Pennsylvania, and a regional initiative covering the transport sector in three states plus D.C.. Emissions are currently priced between USD 7/tCO<sub>2</sub>e and USD 24,6/tCO<sub>2</sub>e. In 2021, the schemes generated USD 4.3bn in California, USD 34m in Massachusetts, and USD 1bn as part of the RGGI. At the federal level, lawmakers unsuccessfully presented a variety of bills in the last years for a price on carbon.

IACE, 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.

The USA has recently started to move on greening its financial sector. Some regulation has been put in place by state governments, rather than at the federal level, but are nationally significant – such as the New York Stock Exchange (NYSE) guidelines for voluntary disclosure of climate risks.

More significantly, in March 2022 the Securities Exchange Commission announced a proposal to make disclosure mandatory, based on, but considerably extending, the recommendations of the Task Force on Climate-Related Financial Disclosure (TCFD), established in 2015 by the Financial Stability Board. However, this is likely to see legal challenges.

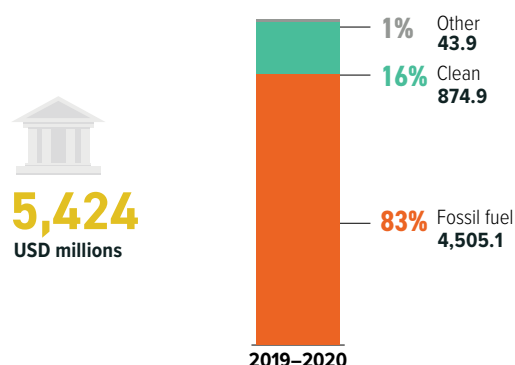
Federal Register, 2022; Official Monetary and Financial Institutions Forum, 2022; US Securities and Exchange Commission, 2022

## 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 2019–2020 the USA provided an average of USD 5.4bn in public finance per year to energy projects. Of this amount, 83% supported fossil fuels, from which 82% went to fossil gas. The largest single support measure, at USD 4.7 billion, financed the development of Mozambique's Rovuma Basin LNG processing facilities in 2019. This was followed in 2020 by a further USD 1.5bn. Other significant investments include USD 400m in financing for oil and gas equipment in Mexico, and a USD 350m loan to support renewables in India, including wind and the National Solar Mission.

At COP26 in Glasgow, 30 governments, including the USA pledged to end direct international public finance to fossil fuels by the end of 2022 and reaffirmed its pledge as part of a G7 commitment in May 2022.

Oil Change International, 2022

Provision of international public support

USD millions, annual average 2017 and 2018

Bilateral, regional and other channels:	Multilateral climate finance contributions:	Core/general contributions:
Annual average contribution	Annual average contribution	Annual average contribution
1,448.63	151.21	1,811.39

Annex II countries to the UNFCCC, including the USA, 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 and has been criticised as inadequate.

The USA provided a Fourth Biennial Report to the UNFCCC. The USA is the fifth largest bilateral climate finance contributor in absolute terms, but only eighth out of the nine G20 Members obligated to provide climate finance (relative to GDP). The country is in second-last place as the eighth (out of nine) largest contributor to multilateral climate change funds in both absolute and relative to GDP terms, a sharp fall from second place in the 2015–2016 reporting period, reflecting the Trump administration policy of cutting funding to several multilateral organisations.

Fair share of the USD 100bn climate finance goal:

This fair share analysis allocates responsibility for provision of the USD 100bn climate finance goal 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.

In relative and absolute terms, the USA is responsible for the vast majority of the climate finance gap. **The country has repeatedly contributed about 5% of what it should, and is responsible for a gap of about USD 40bn out of the USD 100bn target.**

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

1.86	2017–2018 average	>	4%	Progress towards fair share
2.14	in 2019	>	5%	Progress towards fair share
2.30	in 2020	>	5%	Progress towards fair share

At COP26, the Biden administration committed to increase its annual provision to more than USD 11bn by 2024, including USD 3bn for adaptation finance. But this pledge does not yet correspond to the USA paying its fair share and the country seems set to still account for a large share of the climate finance gap in absolute terms. Furthermore, in 2022, Congress approved only a slight increase in international climate finance compared to under the Trump administration and only about one-tenth of the adaptation finance goal.

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%.

- 1 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.

2 ‘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).
- 3 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.

4 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.

5 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.

6 This indicator adds up emissions from domestic aviation and international aviation bunkers in the respective country. In this Country Profile, however, only a radiative forcing factor of 1 is assumed.

7 This indicator includes only direct energy-related emissions and process emissions (Scope 1) but not indirect emissions from electricity.

8 This indicator includes emissions from electricity (Scope 2) as well as direct energy-related emissions and process emissions (Scope 1).

## 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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