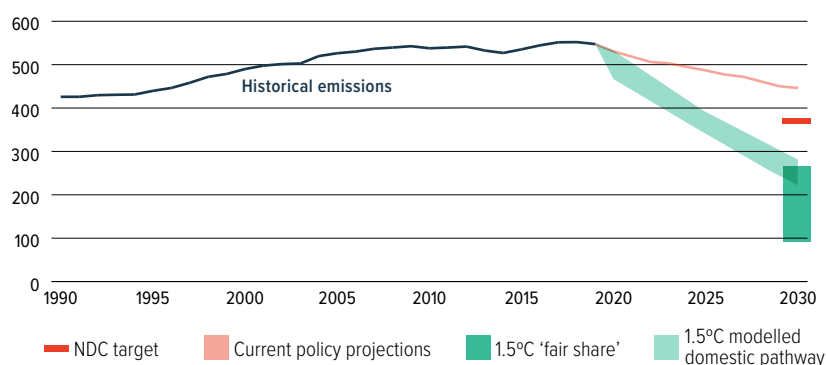


AUSTRALIA



NOT ON TRACK FOR A 1.5°C WORLD

1.5°C compatible emissions pathway (MtCO₂e/year)¹

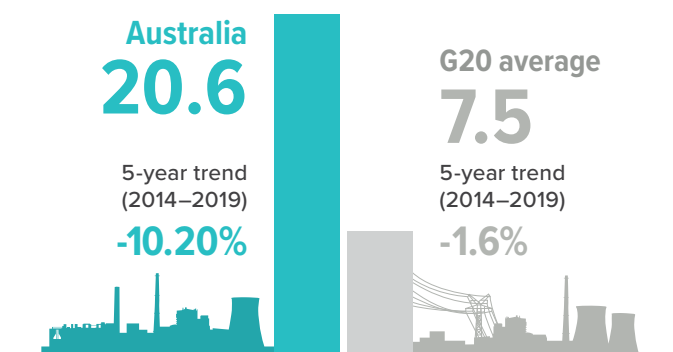


Australia updated its NDC with a target to decrease emissions 43% from 2005 by 2030 (incl. LULUCF). This would decrease emissions 12% below 1990 levels, or to 375 MtCO₂e (excl. LULUCF). To keep below the 1.5°C temperature limit, analysis by the 1.5°C Pathways Explorer shows that its emissions would need to be around 257 MtCO₂e by 2030, leaving an ambition gap of about 118 MtCO₂e. When compared with its 1.5°C 'fair share' contribution, Australia would need to strengthen its domestic emissions reductions and increase financial support for developing countries.

*Climate Action Tracker, 2022a, 2022b;
Climate Analytics, 2022; Gütschow et al., 2021
Converted from AR5 GWP to AR4 GWP

PER CAPITA GREENHOUSE GAS (GHG) EMISSIONS ABOVE G20 AVERAGE

tCO₂e/capita² in 2019



Australia's per capita emissions are 2.8 times the G20 average. Total emissions per capita have decreased by 10% from 2014-2019.

Gütschow et al., 2021; World Bank, 2022

RECENT DEVELOPMENTS



Since the election of May 2022, Australia has improved the ambition of its NDC target and enshrined it into legislation, but the new Climate Act does not halt the expansion of fossil fuel projects.



Australia is currently reforming the safeguard mechanism and reviewing the carbon credit system, providing an opportunity to improve climate policy.



The previous government's response to COVID-19 focused on a "gas-fired recovery" and the new government continues to support gas projects, which presents a mismatch between the new NDC target and policy direction.

KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION



Align NDC target with 1.5°C Paris Agreement compatibility and ramp up climate finance to support other countries to meet its 'fair share' requirements. One option would be for Australia to re-join the Green Climate Fund.



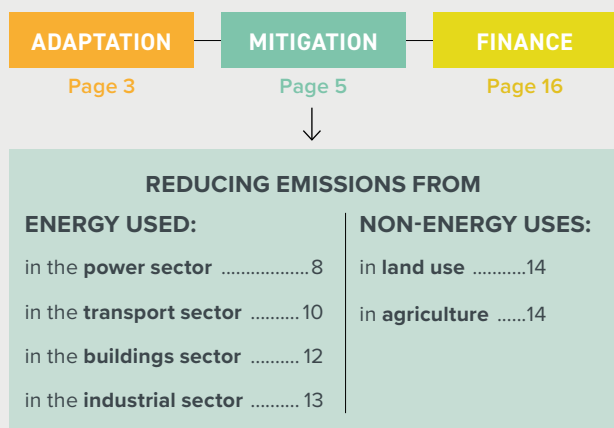
Government policies should focus on driving emissions down rather than relying on ineffective carbon offsets to compensate for the fossil-fuel-intensive industry sector. The carbon credit system is undergoing review.



Abandon support for new and existing fossil fuel projects and reduce emissions from industry. The Labor Government backs gas projects that will significantly add to the emissions mitigation burden.

Contents

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



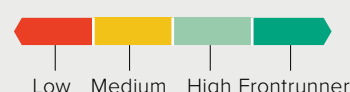
Legend

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 Ratings³ 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 Ratings⁴ 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

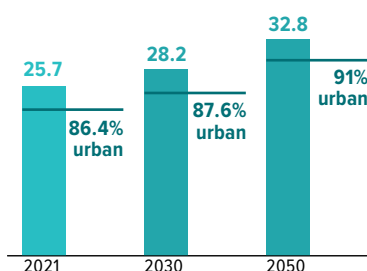


The Human Development Index (HDI) reflects life expectancy, level of education, and per capita income. Australia ranks very high.

Data for 2019.
UNDP, 2020

Population and urbanisation projections

(in millions)

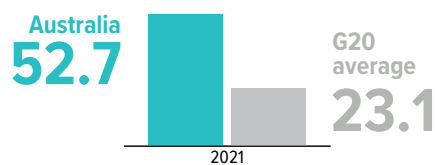


Australia's population is projected to increase by 27% by 2050, and become more urbanised. An increasing population is particularly problematic due to Australia's large per capita emissions, which are one of the world's highest.

United Nations, 2018; World Bank, 2022

Gross Domestic Product (GDP) per capita

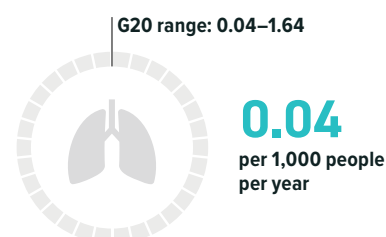
(thousand PPP constant 2015 international \$ per person) in 2021



World Bank, 2021

Death rate attributable to ambient air pollution

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



Less than one person per thousand dies in Australia 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 lowest levels in the G20.

Institute for Health Metrics and Evaluation, 2020

A JUST TRANSITION

The newly-elected government has the opportunity to transition from the “gas-fired” economic recovery pursued by the last government. Yet, support for new gas remains, such as for the Santos project in the Narrabri gas basin in New South Wales and Woodside's Scarborough gas project. Responding to the energy crisis, the Energy Security Board has sought consultation for a capacity mechanism, which would pay generators for capacity. The consultation responses list a number of concerns, including propping up an aging coal fleet, which in turn risks underinvestment in new generation, such as renewables and storage. Australia remains one of the largest exporters of coal and gas.

Some states have closed or have scheduled to close coal plants. Western Australia recently announced state-owned coal power stations will be retired by 2030, with an AUD 547.4m support package for the town of Collie's just transition. Another state-based just transition initiative is the Latrobe Valley Worker Transfer Scheme in Victoria.

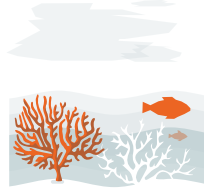
Australian Government 2022c; Bowyer, 2022; Edwards et al., 2022; ESB, 2022; Latrobe Valley Authority, 2022; WA Government, 2022

ADAPTATION

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



The State of the Environment Report released by the government details how **ecosystems are showing signs of collapse, with climate change playing a major role.**



The Great Barrier Reef suffered mass coral bleaching events in 2016, 2017, 2020 and 2022, while other reefs are also deteriorating.



Extensive bushfires ravaged parts of Australia in 2019–2020, and again in 2021. Eastern Australia experienced severe flooding in March 2021, February to April 2022, and July 2022.

ADAPTATION NEEDS

Impacts of a changing climate

Exposure to warming



0.8°C
Higher

Between 2017 to 2021, the average summer temperatures experienced by people in Australia were 0.8°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



20mil Labour hours lost
32% increase

In 2021, heat exposure in Australia led to the loss of over 20 million potential labour hours, a 32% increase from 1990–1999.

Loss of earnings from heat-related labour capacity reduction



2bn Loss in labour capacity (USD)
0.12% 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 over USD 2bn in 2021 in Australia, or 0.12% 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 precipitation : -3.8% at 1.5°C warming	0.7 times	0.6 times	1.2 times

In Australia, local precipitation is projected to decrease by 3.8% if global temperature rises by up to 1.5°C. More warming is projected to further decrease precipitation: under a 2°C warming scenario precipitation is projected to decrease just under 0.7 times. At 3°C warming, local precipitation is projected to decrease 1.2 times the 3.8% decrease projected under the 1.5°C scenario.

Fresh water

	At 2°C	At 2.5°C	At 3°C
Surface run-off : +4.1% at 1.5°C warming	1.5 times	3.9 times	2.2 times
River discharge : -2.5% at 1.5°C warming	-1.5 times	-2.0 times	0.6 times
Total soil moisture content : -2.8% at 1.5°C warming	1.1 times	1.3 times	1.7 times

The projected effects on fresh water vary greatly and somewhat unintuitively under different warming scenarios, underlining the uncertainties faced in relation to this vital resource. At 1.5°C of warming, surface run-off is expected to rise 4.1%, while river discharge and soil moisture content would decrease by 2.5% and 2.8%, respectively. At 3°C, surface run-off would be less extreme (2.2 times what the increase would be at 1.5°C) than at 2.5°C (3.9 times), making future infrastructure planning even more complex. River discharge is a complicating factor, both decreasing and increasing with warming: the negative signs (at 2°C and 2.5°C warming) indicate that the impact experienced is opposite to the impact at 1.5°C warming. Soil moisture content is projected to decrease by 2.8% at 1.5°C, with a decline 1.7 times greater under 3°C.

Agriculture	At 2°C	At 2.5°C	At 3°C
Reduction in maize yield : -2.7% at 1.5°C warming	1.4 times	1.8 times	2.9 times

Agricultural yields tend to decrease as the temperature increases. For example, maize yield is expected to decrease 2.7% below the reference period's yields, at 1.5°C of warming. This loss would be 2.9 times greater at 3°C of warming.

Hazards	At 2°C	At 2.5°C	At 3°C
Number of people annually exposed to heatwaves : 1,062,857 at 1.5°C warming	1.7 times	2.4 times	2.9 times
Number of people annually exposed to wildfires : 8,069 at 1.5°C warming	1.2 times	7.6 times	7 times

The number of people annually exposed to hazards is expected to rise as the temperature increases. Over a million more people than those affected during the baseline period are projected to be exposed to heatwaves at 1.5°C of warming. This increase is projected to be magnified by 2.4 times at 2.5°C. At 1.5°C of warming, wildfires are projected to affect 8,069 more people than affected between 1986–2006, while at 3°C even that increase in people exposed to wildfires is projected to be multiplied by 7 times.

Economic	At 2°C	At 2.5°C	At 3°C
Annual expected damage from tropical cyclones -11.8% at 1.5°C warming	2.3 times	3.7 times	4.8 times
Annual expected damage from river flood : +39.7% at 1.5°C warming	3.3 times	3.3 times	1.9 times
Labour productivity due to heat stress: -1.6% at 1.5°C warming	1.5 times	2 times	2.7 times

The annual expected damage from tropical cyclones and river flooding at 3°C is 4.8 times and 1.9 times, respectively, what the damage would be under a 1.5°C scenario. Labour productivity is projected to reduce by 1.6% under 1.5°C of warming, and twice as much at 2.5°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
National Climate Resilience and Adaptation Strategy (2015) and NDC (2022).	2022	✓	✓	✓		✓	✓	✓	✓	✓			✓	✓	Evaluation progress towards building resilience and adaptation to climate change and review plans and actions

Nationally Determined Contribution (NDC): Adaptation

TARGETS

No specific adaptation target is mentioned in NDC

ACTIONS

- Development of an urgent climate risk assessment of the implications of climate change for national security.
- Allocation of AUD 200m every year for disaster preparation and resilience projects.
- Establishing a Department of Climate Change, Energy, the Environment and Water Additional AUD 194.5m for protecting the Great Barrier Reef.
- National Climate Resilience and Adaptation Strategy 2021–2025, released on 29 October 2021 with the aim to better anticipate, manage and adapt to the impacts of climate change.

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.

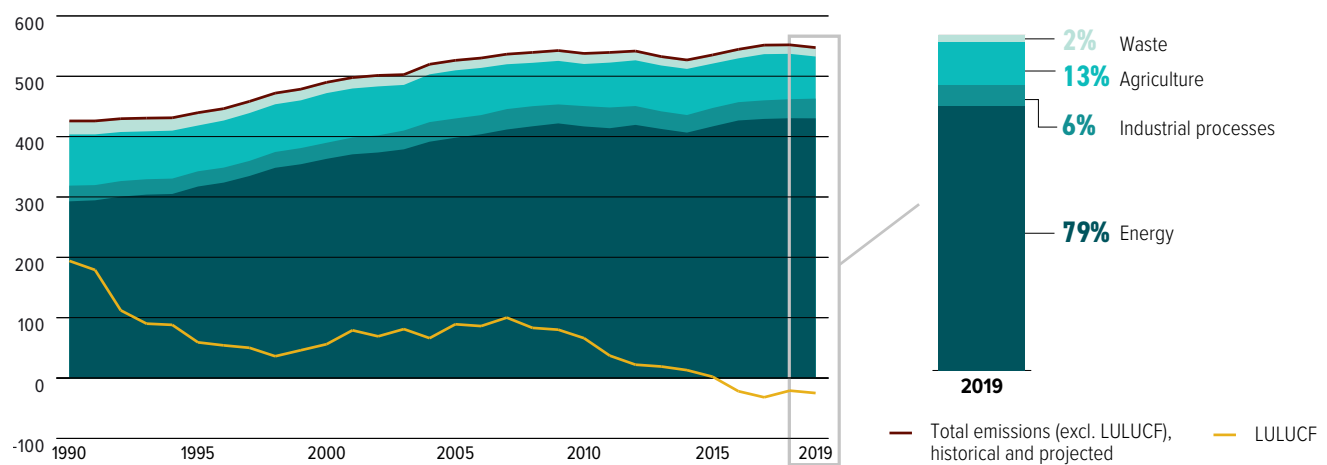
EMISSIONS OVERVIEW



Australia's total greenhouse gas emissions (excl. LULUCF) have increased by 29% (1990–2019). In the same period, its total methane emissions (excl. LULUCF) have decreased by 20%.

GHG emissions across sectors⁵

Total sectoral GHG emissions (MtCO₂e/year)

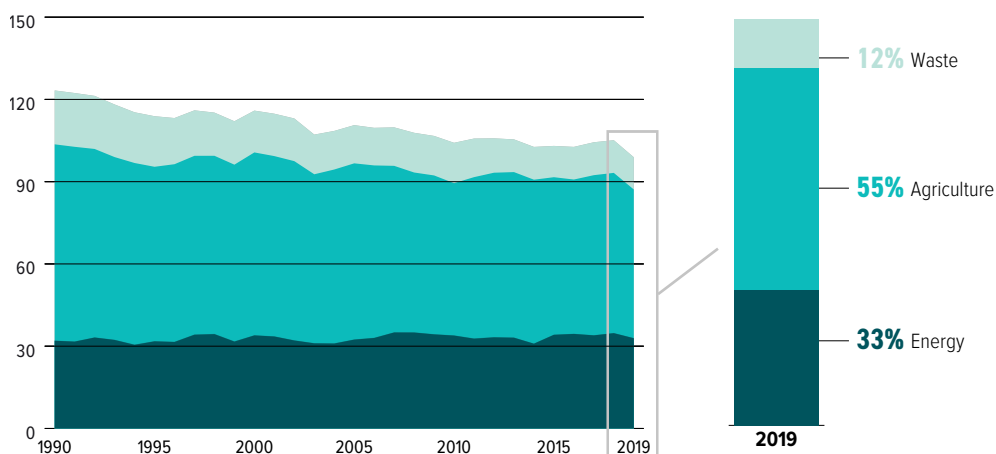


Australia's emissions (excl. LULUCF) increased by 29% between 1990–2019 to 547 MtCO₂e/yr. When considered by category, emissions from energy dominate (79% of total), followed by agriculture emissions (13%) and industrial processes (6%). The overall increase was largely due to sustained growth of emissions from energy – a 47% increase – and industrial processes (28% increase) from 1990–2019, whereas emissions from agriculture and waste dropped 18% and 38%, respectively, over the same period.

Gütschow et al., 2021

Methane emissions by sector

Total CH₄ emissions (MtCO₂e/year)



Australia did not sign the Global Methane Pledge at COP26 in November 2021.

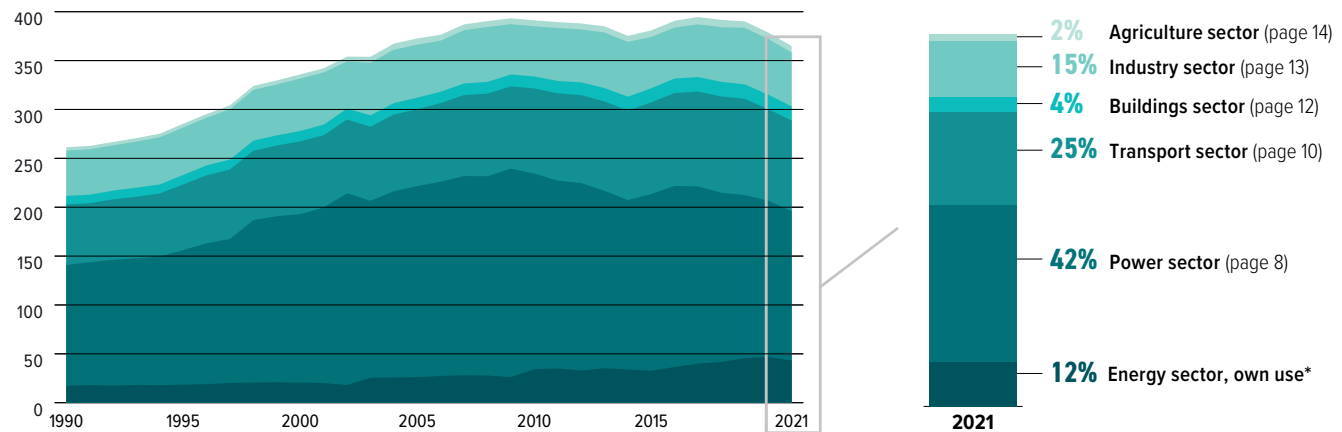
Participating countries pledged to undertake voluntary actions to contribute to a collective reduction of global methane emissions by at least 30% from 2020 levels by 2030. Further scrutiny of plans and implementation will be required.

Methane is a potent, though short-lived, greenhouse gas, accounting for an estimated third of global warming. Australia's methane emissions (excl. LULUCF) decreased by 20% between 1990–2019 to 99 MtCO₂e/yr. The majority of Australia's methane emissions came from the agriculture sector in 2019 (55%), followed by energy (33%) and waste (12%) sectors. Although the proportions have changed slightly over time, in 1990 the order was the same: agriculture (58%), energy (26%) and waste (16%).

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

Energy-related CO₂ emissions by sector

Annual CO₂ emissions (MtCO₂/year)



The largest driver of overall greenhouse gas emissions are CO₂ emissions from fuel combustion. In Australia, total emissions have been decreasing since 2017 due to a large decrease in the emissions from power generation and smaller decreases in the buildings and transport sectors. Despite the decrease, in 2021 the power sector was the largest contributor, at 42% of emissions, followed by the transport and industry sectors with 25% and 15%, respectively.

Enerdata, 2022

*Includes energy-related CO₂ emissions from extracting and processing fossil fuels.

ENERGY OVERVIEW



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.

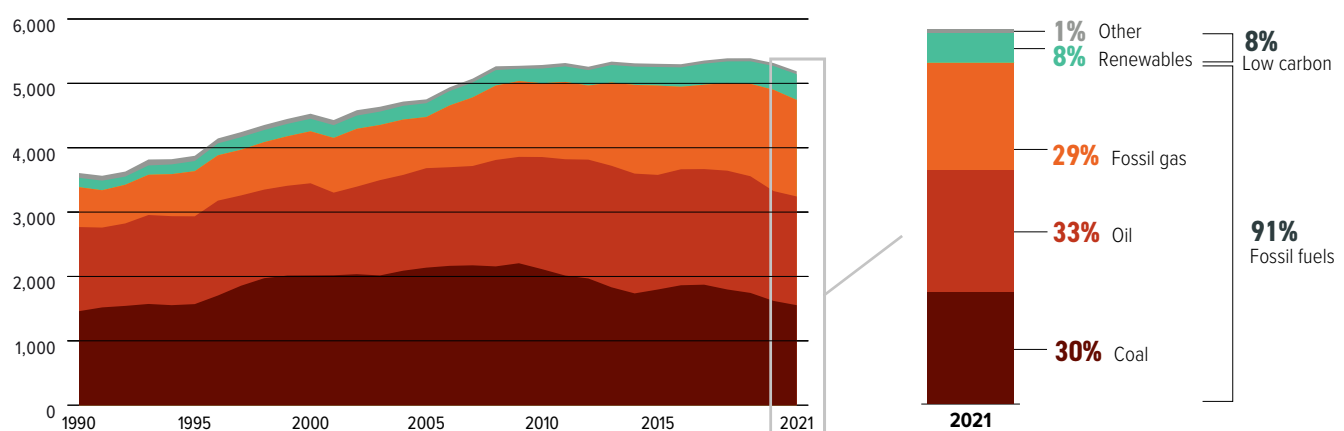
Rogelj et al., 2018



Fossil fuels make up 91% of Australia's energy mix, where the shares of coal, gas and oil are roughly a third each. The carbon-intensity of the energy mix has decreased over the past four years, but is still much higher than the G20 average. The share of renewables in the energy mix is only 8%.

Energy mix

Total primary energy supply (PJ)

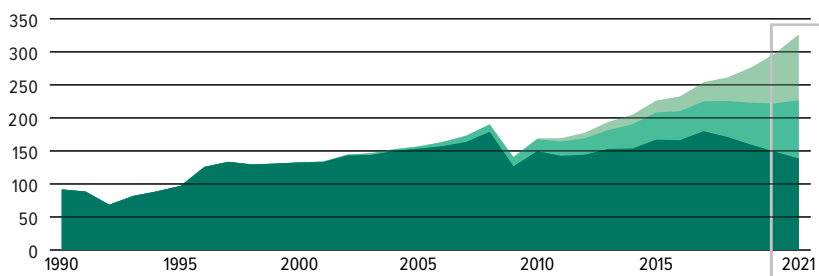


This graph shows the fuel mix for all energy supply, including energy used not only for electricity generation, heating and cooking, but also for transport fuels. Fossil fuels (oil, coal, and gas) make up 91% of the Australia energy mix, which is higher than the G20 average. Increased energy supply was mainly driven by increased coal and oil between 1990–2010. Since 2010, energy supply has stagnated, with renewable energy increasing the fastest, but still playing a marginal role.

Enerdata, 2022

Solar, wind, geothermal and biomass development

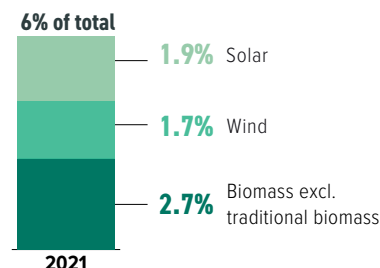
As a share of total primary energy supply (TPES) (PJ)



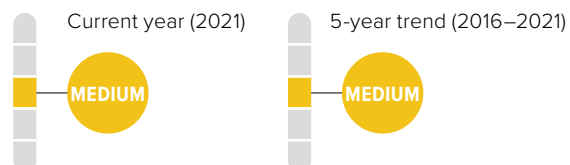
Solar, wind, geothermal and biomass excluding traditional biomass account for 6% of Australia's energy supply – the G20 average is 7.5%. The share in total energy supply has increased by around 43% in the last 5 years in Australia (2016–2021). Bioenergy (for electricity and heat) makes up the largest share.

Enerdata, 2022

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

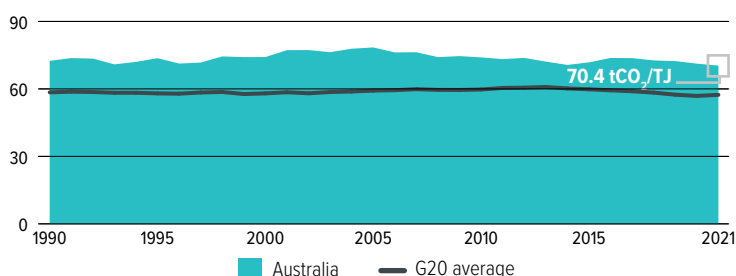


Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members

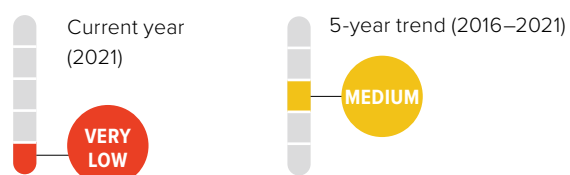


Carbon intensity of the energy sector

Tonnes of CO₂ per unit of TPES (tCO₂/TJ)



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



Carbon intensity is a measure of how much CO₂ is emitted per unit of energy supply.

Enerdata, 2022

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. Energy supply per capita in Australia was 201.5 GJ in 2021, substantially above the G20 average of 99.4 GJ. Between 2016 and 2021, energy use per capita decreased by 8%, whereas the G20 average increase was 1.6%.

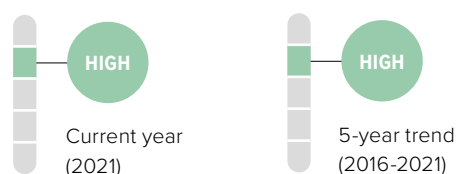
Enerdata, 2022; World Bank, 2022

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. Australia's energy intensity is lower than the G20 average and has been decreasing at a faster rate of 10% (2016–2021) compared to the G20 average decrease of 6%.

Enerdata, 2022; World Bank, 2021

POWER SECTOR

Emissions from energy used to make electricity and heat



Australia produced 53% of its electricity from coal in 2021. The share of gas in the power sector has increased consistently over the years, and in 2021, it reached 19% of total electricity generation.

Power generation's share of energy-related CO₂ emissions in 2021: **42% Direct**

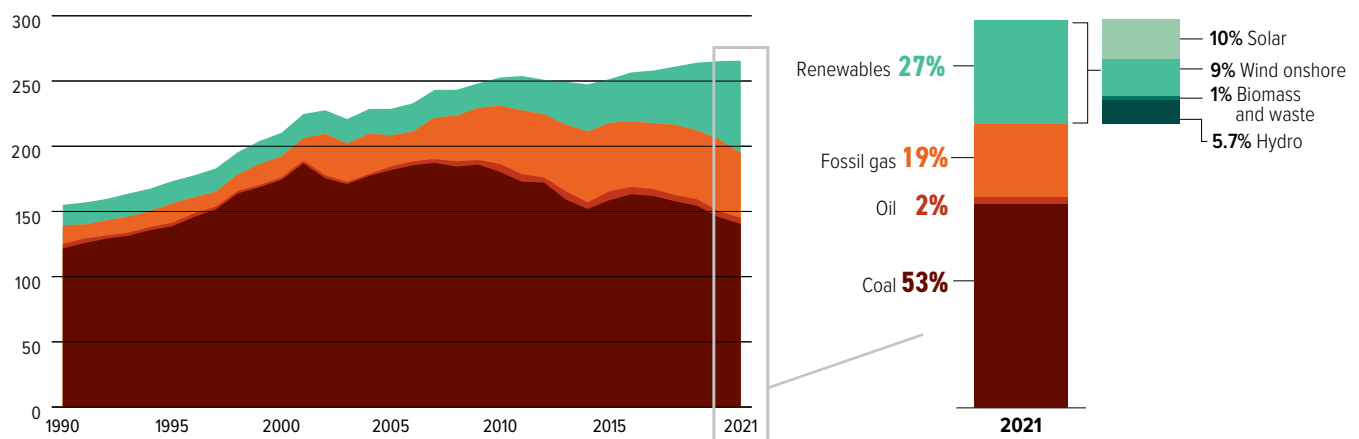


Worldwide, coal use for power generation needs to peak by 2020, and between 2030 and 2040, all the regions of the world need to phase out coal-fired power generation. By 2040, the share of renewable energy in electricity generation has to be increased to at least 75%, and the share of unabated coal reduced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

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

Electricity generation mix

Gross power generation (TWh)

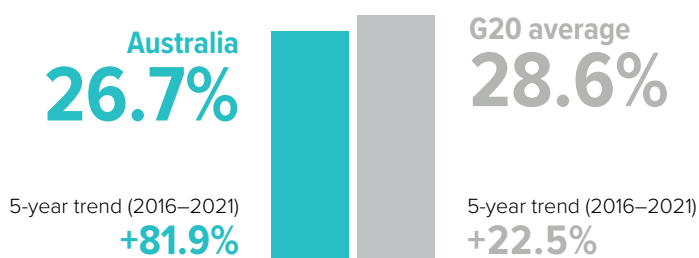


Australia generated 73% of its electricity from fossil fuels in 2021. The share of renewable energy in Australia's power sector has been increasing and accounted for 27% of the power mix in 2021.

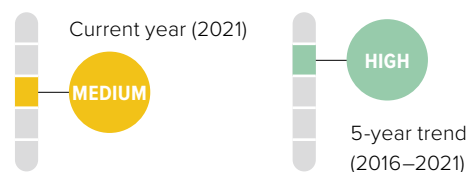
Enerdata, 2022

Share of renewables in power generation

(incl. large hydro) in 2021



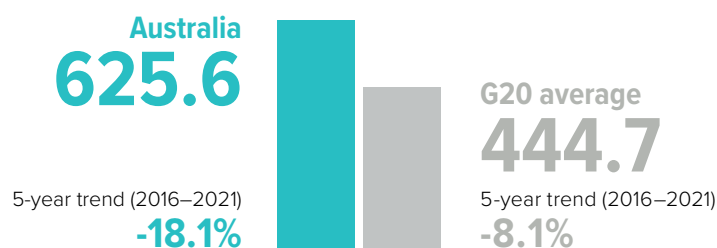
Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



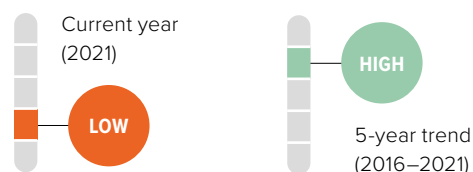
Enerdata, 2022

Emissions intensity of the power sector

(gCO₂/kWh) in 2021



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

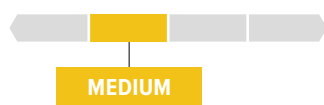


For each kilowatt hour of electricity, 625.6 g of CO₂ are emitted in Australia, far higher than the G20 average, but decreasing at a faster rate (18%) compared to the G20 average decline (8%). The high emissions intensity is because fossil fuels dominate the power mix, especially coal.

Enerdata, 2022

POLICY ASSESSMENT

Renewable energy in the power sector



In Australia, renewable energy generation has recently increased from 9% of total electricity generation in 2005 to 27% in 2021. Government projections show renewable energy in electricity generation could be 61% by 2030. The government has announced a AUD 20bn investment in the electricity grid to allow for renewable energy, and AUD 300m for community batteries and solar banks. This should increase the share of renewables in the National Electricity Market, which covers just the east coast grid, to 82% by 2030. This target excludes other grids, such as in Western Australia.

Australian Government, 2021a, 2022b; Clean Energy Council, 2020a, 2020b

Coal phase-out in the power sector



Australia has no national target nor policy to phase out coal. The coal industry is traditionally the major beneficiary of government spending, receiving AUD 770m budgetary allocation in 2021–2022. However, the Office of the Chief Economist pointed out a growing investor reluctance to fund thermal power plants.

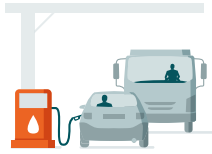
Despite no national policy, States are leading the way, as Western Australia plans a coal plant phase-out by 2030, Queensland by 2035, and the Energy Minister for New South Wales suggests the State could phase out coal by 2030. Australia's biggest coal plant will close by 2025 in New South Wales, while an energy company announced plans to close a Victoria coal power station a decade early.

The national energy crisis has led to the consideration of a new capacity mechanism where all generators (including coal power) would be paid to have capacity available at certain periods.

Australian Government, 2021b; Beer, 2022; ESB, 2022; Hannam, 2022; Hannam et al, 2022; Morton, 2022; Queensland Government, 2022

TRANSPORT SECTOR

Emissions from energy used to transport goods and people



Transport emissions began to rebound in 2021 after a dip driven by COVID-19 pandemic-related lockdowns. **The sector is almost exclusively reliant on oil (98%), and 578 people per 1,000 have a car.** Transport CO₂ per capita is very high compared to the G20 average. Electric vehicles (EVs) made up only 2.8% of total new car sales in 2021, a tiny fraction of Australia's car fleet.

Transport's share of energy-related CO₂ emissions in 2021:

25.4% Direct **1.1%** Indirect

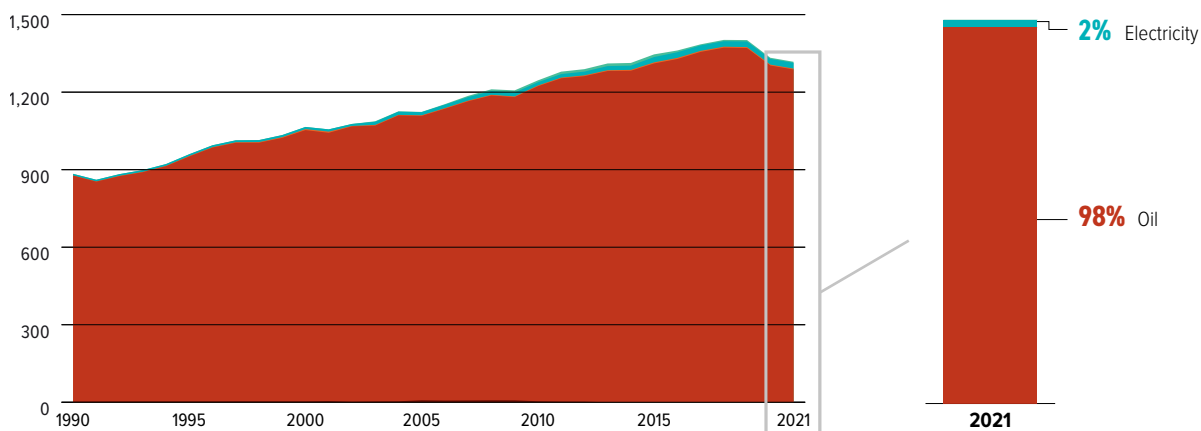


The share of low-carbon fuels in the transport fuel mix must increase to between 40% and 60% by 2040 and 70% to 95% by 2050.

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

Transport energy mix

Final energy consumption by source (PJ/year)

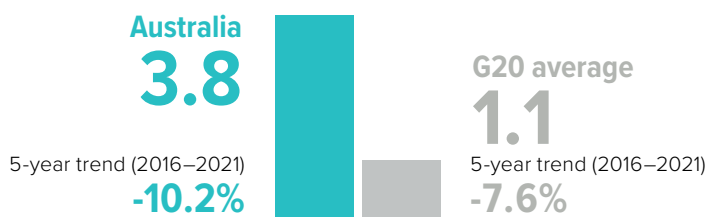


Electricity and biofuels make up only 2% of the energy mix in transport.

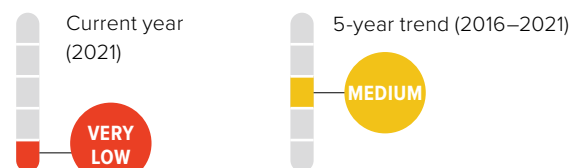
Enerdata, 2022

Transport emissions per capita

(excl. aviation) (tCO₂/capita) in 2021



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

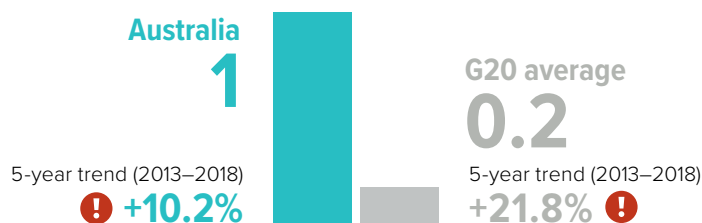


Per capita emissions in 2021 and the 5-year trend have been impacted by COVID-19 pandemic response measures and resulting economic slowdowns. For a discussion of broader trends in the G20 and the rebound of transport emissions in 2022, please see the Highlights Report at www.climate-transparency.org

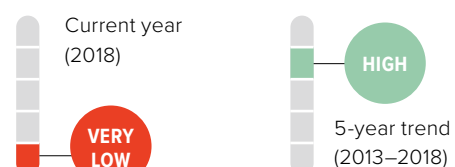
Enerdata, 2022; World Bank, 2022

Aviation emissions per capita⁶

(tCO₂/capita) in 2018

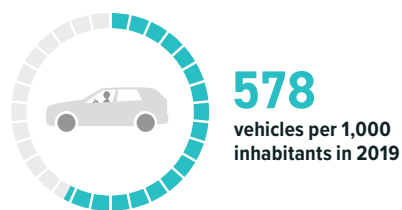


Decarbonisation: a high rating indicates more effort to decarbonise compared to other G20 Members



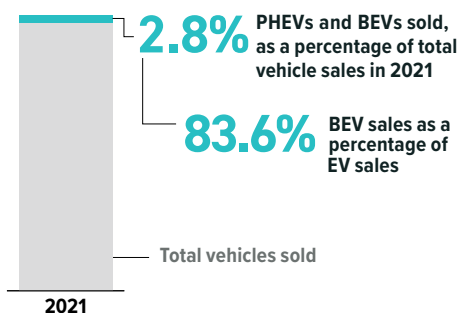
Enerdata, 2022; IEA, 2021a; World Bank, 2022

Motorisation rate



Enerdata, 2022

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

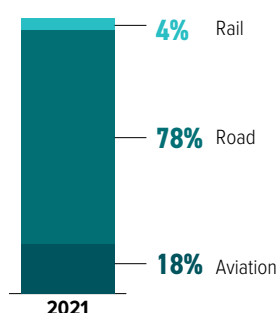


IEA, 2022

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

Modal split passenger transport

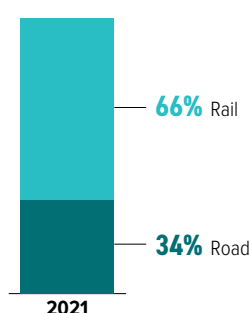
(% of passenger-km): road, rail and air



Enerdata, 2022

Modal split freight transport

(% of tonne-km): road, rail



Enerdata, 2022

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

POLICY ASSESSMENT

Phase out fossil fuel cars



In 2021, transport emissions represented 18% of total emissions (excl. LULUCF) and were projected to increase 6% by 2030. Recently, the Australian government has announced plans for a National Electric Vehicle Strategy and a Driving the Nation Fund, dedicated to building a national EV charging network and investing in hydrogen highways for heavy transport. Key to the phase-out of fossil fuel cars is a modal shift to other forms of (electrified/renewable) transport. The government plans to implement an electric car tax discount and an emissions testing programme to inform consumer choice. The Australian Capital Territory has announced the end of petrol car sales and phase-out of internal combustion engines by 2035.

Albanese, 2022; Australian Government, 2022a; Kurmelovs, 2022

Phase out fossil fuel heavy-duty vehicles



Australia has no plans to phase out heavy-duty vehicles (HDVs). There are no fixed plans to reduce emissions or improve efficiency for HDVs. Australia requires the Euro 5 and Euro V noxious emissions standards for HDVs and is considering Euro 6 and Euro VI standards.

The government plans to roll out a Hydrogen Highways refuelling network across the country for HDVs. With an estimated investment of up to AUD 80m, this project will develop up to 16 stations on Australia's busiest freight routes.

Albanese, 2022; Australian Government, 2022a; Department of Infrastructure, 2022; Kurmelovs, 2022

Modal shift in (ground) transport



In 2020–2021, budget was allocated to road upgrades and rail projects. A report by the Australian Railway Association highlighted the opportunity of modal shift in freight transport from road to rail. However, there remains no longer-term strategy for promoting a modal shift, and no significant progress has been made in this area in the past year.

Pettit, 2022

BUILDINGS SECTOR

Emissions from energy used to build, heat and cool buildings



Direct emissions and indirect emissions from the buildings sector in Australia account for 4% and 21% of total energy-related CO₂ emissions, respectively. Per capita emissions from the buildings sector are almost 2.5 times the G20 average.

Buildings sector's share of energy-related CO₂ emissions in 2021:

3.7% Direct **21.2%** Indirect

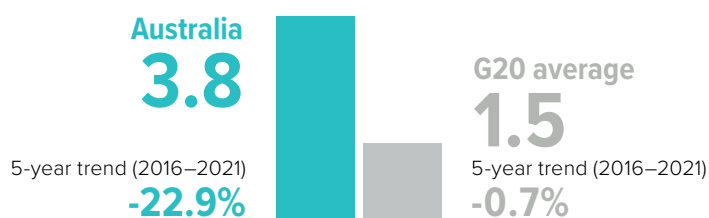


By 2040, global emissions from buildings need to be reduced by 90% from 2015 levels, and be 95–100% below 2015 levels by 2050, mostly through increased efficiency, reduced energy demand and electrification in conjunction with complete decarbonisation of the power sector.

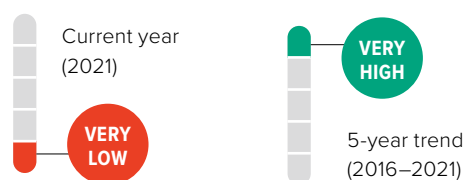
Climate Action Tracker, 2020; Rogelj et al, 2018

Buildings sector emissions per capita

incl. indirect emissions (tCO₂/capita) in 2021



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

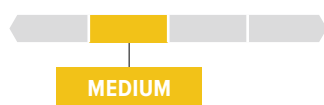


Buildings emissions occur directly (burning fuels for heating, cooking, etc) and indirectly (from grid-electricity for air conditioning, appliances, etc.). At 3.8 tCO₂/capita Australia's buildings-related emissions per capita were nearly 2.5 times the G20 average in 2021, reflecting the high fossil fuel share of the electricity mix. Per capita buildings emissions in Australia have decreased by 23% between 2016–2021 far faster than the G20 average decline of just under 1% in that period.

Enerdata, 2022; World Bank, 2022

POLICY ASSESSMENT

Near zero energy new buildings



The Trajectory for Low-Emissions Buildings policy aims to achieve zero energy and carbon-ready commercial and residential buildings in Australia. Australia's buildings policies focus on the commercial sector. The National Construction Code focuses on commercial properties, and the 2022 update is expected to incorporate rental properties. Sellers and lessors are required to disclose the energy efficiency rating of large office spaces under the Commercial Buildings Disclosure Programme. Businesses can voluntarily reduce or offset emissions through the National Carbon Offset Standard. The Energy Efficient Communities Programme offers grants to support businesses and community groups to lower their energy bills.

Department of Climate Change, Energy, the Environment and Water, 2019

Renovation of existing buildings



There is no national strategy for energy retrofits for buildings.

INDUSTRY SECTOR

Emissions from energy use in industry

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

Rogelj et al., 2018

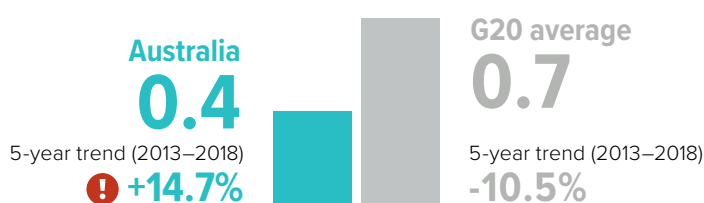


Direct and indirect emissions from industry make up 15% and 13% of energy-related CO₂ emissions, respectively. Australia has no effective policies to improve energy efficiency, reduce emissions, or decarbonise the sector. Industry leaders have been calling for more government support to facilitate the switch to renewables in the industry sector; however, government action is currently limited to revising the ineffective Safeguard Mechanism, which has allowed industry emissions to rise.

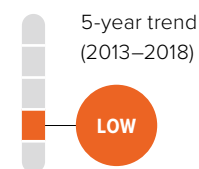
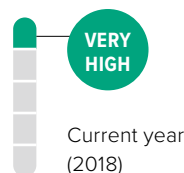
Industry sector's share of energy-related CO₂ emissions in 2021: **15.1%** Direct **13.3%** Indirect

Industry emissions intensity⁷

(kgCO₂e/USD2015 GVA) in 2018



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



Enerdata, 2021; World Bank, 2022

Carbon intensity of steel production⁸

(kgCO₂/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



There is no overall strategy to decarbonise the industry sector, nor mandatory energy efficiency policies. The government has announced a Powering the Regions Fund to provide direct financial support for measures that improve energy efficiency within existing industries and develop new industries. This fund also extends financial support for green metals (steel, alumina and aluminium) and clean energy component manufacturing.

Green hydrogen could be an important alternative fuel for the hard-to-abate manufacturing sector. The 2022–2023 federal budget has a large allocation to expand hydrogen, with financial support for hydrogen electrolyser development, but this should be supplemented with a clear policy roadmap, focused on “green hydrogen”. The current hydrogen strategy focuses on a “technology-neutral” approach, including fossil fuels with CCS.

ALP, 2022; Armistead, 2022

LAND USE SECTOR

Emissions from land use change and forestry



To stay within the 1.5°C limit, Australia needs to halt deforestation and ensure the land use and forest sector remains a net sink of emissions. It also needs to increase the level of the carbon sink. Emissions from this sector are highly uncertain.

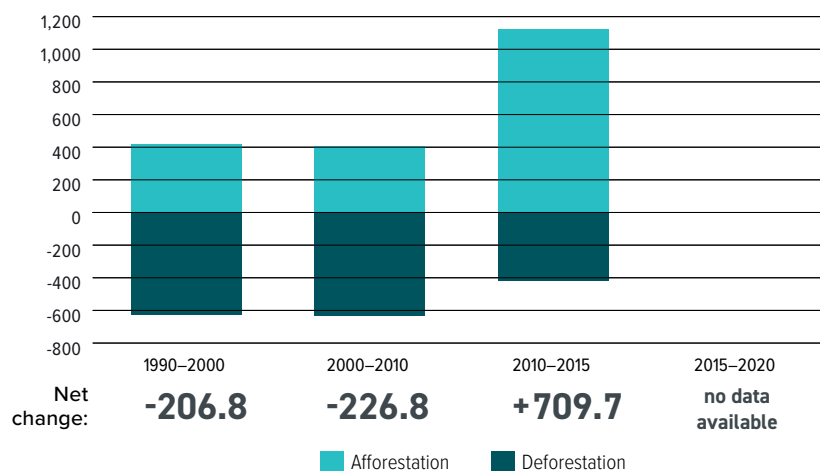


Global deforestation needs to be halted and changed to net CO₂ removals by around 2030.

Rogelj et al., 2018

Annual forest expansion, deforestation and net change

Forest area change in 1,000 ha/year



Between 2010–2015, Australia lost 417 kha of forest area per year. There is no data available for 2015–2020.

Global Forest Assessment, 2020

POLICY ASSESSMENT

Target for net zero deforestation



While the forest sector is currently a net sink, and afforestation has increased significantly, the rate of forest clearing remains high. **Australia is the world's only developed country classified as a deforestation hotspot.** Although Eastern Australia's forests are a global biodiversity hotspot, the area is increasingly under pressure from livestock farming development, timber harvesting, bushfires and drought. There is no integrated policy to deal with this deforestation. Forest fire is an important issue for Australia: in 2020 it contributed 830 MtCO₂e of net emissions.

Australian Government, 2021a; Climate Action Tracker, 2022a; WWF, 2021

AGRICULTURE SECTOR

Emissions from agriculture



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

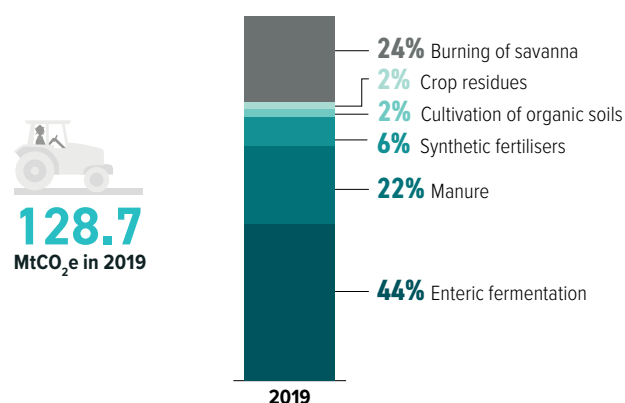


Methane emissions need to decline by 10% by 2030 and by 35% by 2050 (from 2010 levels). Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).

Rogelj et al., 2018

Emissions from agriculture

excluding energy emissions, in 2019



In Australia, the largest sources of GHG emissions in the agricultural sector are digestive processes of animals (enteric fermentation, 44%), burning of savanna/grasslands (24%), and livestock manure (22%). Adapting animal feed, reducing grassland burning, improving manure handling and storage, and making dietary changes in favour of vegetables and fruits, 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

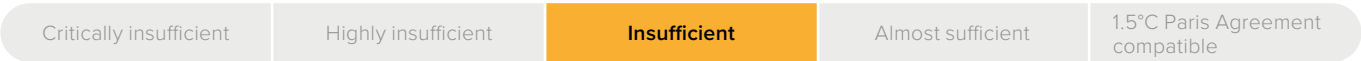
43% reduction of GHG emissions by 2030 below 2005 levels (including LULUCF). This target will be implemented as a point target, and as an emissions budget of 4,381 MtCO₂e covering the period 2021–2030.

Achieve net zero emissions by 2050.

ACTIONS

- The introduction of declining emissions baselines for Australia’s major emitters.
- Investment to accelerate decarbonisation of the grid, community batteries and solar banks.
- Financial support for renewables manufacturing and the deployment of low emissions technologies.
- Acceleration of the uptake of EVs.
- The application of new standardised and internationally-aligned reporting requirements for climate risks and opportunities for large businesses.

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 “insufficient” rating indicates that Australia’s targets, policies and climate finance are not Paris Agreement compatible.

Australia’s 2030 domestic emissions reduction target is consistent with warming of 2°C if all other countries followed a similar level of ambition. Under current policies, emissions will continue to rise and are consistent with more than 3°C warming. To achieve a better rating, Australia needs to set a more ambitious target for emissions reductions with associated policies, and provide finance to support other 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

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	October 2021
Net zero target	Achieve net zero by 2050
Interim steps	Not available
Sectoral targets	No

FINANCE

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



Australia spent USD 7.3bn on fossil fuel subsidies in 2019, nearly 80% on petroleum and 20% on electricity. Australia's carbon tax was repealed in 2014 leading to a lack of carbon pricing from 2015 onwards.



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

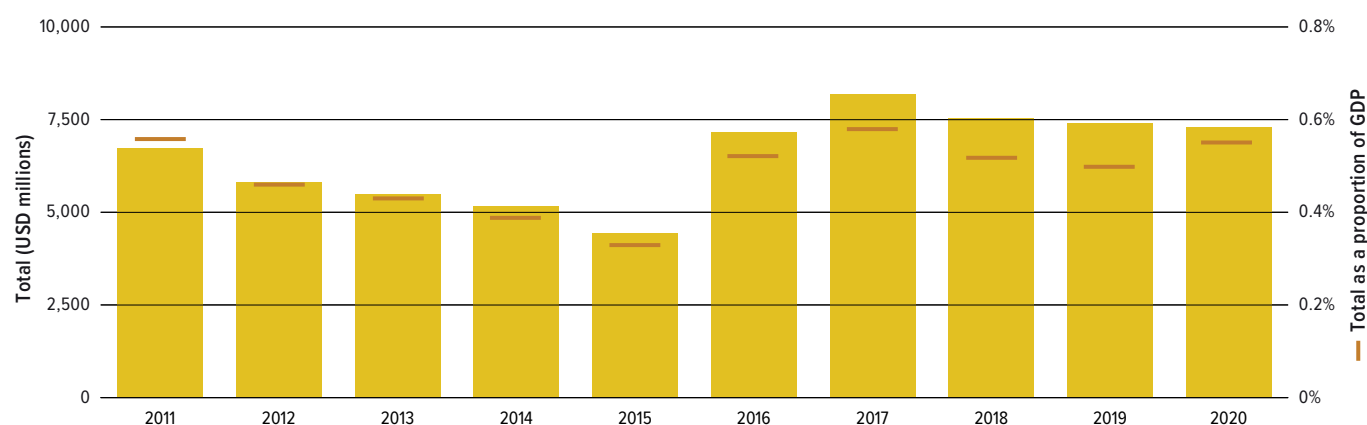
Rogelj et al., 2018

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

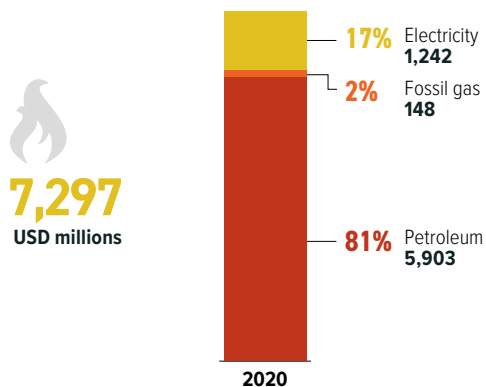
(USD millions)



OECD-IEA Fossil Fuel Support Database, 2022

Fossil fuel subsidies by fuel type

(USD millions) in 2020



Australia's fossil fuel subsidies in 2020 remained above the country's average over the past decade (2011–2020), with USD 7.3bn to support both consumption and production. Over 80% went to petroleum and 17% to the generation of electricity.

Fuel tax credits to the industrial sector accounted for 72% of the subsidies in 2020 and are provided through diesel rebates for heavy industry. In recent years, the mining sector has been the biggest recipient, receiving around a third of these tax credits.

While comparable data is not yet available, the Australia Institute measured a 12% increase in fossil fuel subsidies for 2021–2022 over the previous financial year, noting that this amounted to 56 times the budget of the National Resilience and Recovery Agency, responsible for a just and sustainable recovery from national disasters. Large subsidies for long-term gas and oil extraction and coal-fired power have also been committed.

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

Carbon pricing and revenue

In 2015, Australia phased out its national carbon pricing system. Australia has an Emissions Reduction Fund (ERF), a voluntary scheme that involves the government purchasing carbon credit units using a reverse auction to select projects that are seeking to generate such credits. The credit (ACCU) spot price varied quite widely between USD 12/tCO₂ and 42/tCO₂ during the period from March 2021 to March 2022. The government is currently reviewing the Safeguard Mechanism, including considering Safeguard Mechanism Credits (SMCs). The government is also considering the use of SMCs to be credited to facilities that fall below their baseline emissions limit, and traded to other facilities to stay within their baseline.

Climate Change Authority, 2020; 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.

Some progress has been made by Australia to bring in green financial policies and regulations. In June 2021, an Investor Group released a plan to make financial disclosure on climate risk mandatory. However, in November 2021, the Australian Prudential Regulation Authority (APRA) released guidelines for only voluntary disclosure. Instead, this guidance has since been followed by a voluntary survey of APRA-regulated entities, announced in March 2022, to understand how those entities are managing climate-related financial risks. APRA is also conducting a Climate Vulnerability Assessment of Australia's five largest banks, concerning which the latest information was released in September 2021.

The Government of Australia is a member of the Task Force on Nature-Related Financial Disclosures, which plans to issue a framework for disclosing nature-based risks in 2023.

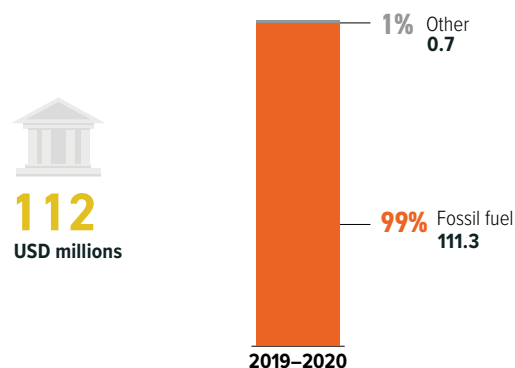
Australian Prudential Regulation Authority, 2021a; 2021b; Byres, 2022; Investor Group on Climate Change, 2021; Task Force on Nature-Related Financial Disclosures, 2022

PUBLIC FINANCE

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

Public finance for energy

USD millions (2019–2020 average)



Between 2019 and 2020, Australia provided an average of over USD 110m in public finance per year to fossil fuels, with 41% of this amount going to coal. This includes, most notably, USD 90m financing for the Wiggins Island Coal Export Terminal in Australia in 2019, and USD 114m for financing the Ichthys LNG located in the Browse Basin off the coast of Western Australia in 2020, both refinanced through the Export Finance and Insurance Corporation (EFIC). In comparison, clean energy received only USD 123,000 of public finance, while other energy projects – including transmission, nuclear power, large hydropower and biofuels – received USD 660,000.

Australia also finances renewable projects through the Clean Energy Finance Corporation and other national institutions. Data for these institutions have not been included, however, because they have not been consistently updated and are often not sufficient to make complete assessments of the projects.

Also not included is the recent Labor government commitment to an AUD 20bn investment in Australia's electricity grid to increase renewable penetration, and the Powering the Regions Fund to support new clean energy industries.

Australian Government, 2022b; Oil Change International, 2022

Provision of international public support

USD millions, annual average 2017 and 2018

Bilateral, regional and other channels:

Annual average contribution

118.82

Multilateral climate finance contributions:

Annual average contribution

120.85

Core/general contributions:

Annual average contribution

393.06

Annex II countries to the UNFCCC, including Australia, 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.

Out of the nine G20 Members obligated to provide climate finance, Australia ranked ninth in 2017–2018 in terms of bilateral flows and eighth in absolute values, to the multilateral climate funds; though its performance is much better relative to GDP for its multilateral climate fund contributions (where it falls fourth). Australia has seen an increase in bilateral funds and a small decrease in multilateral climate funds since the 2015–2016 period.

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 CO₂ 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.

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

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

0.48 2017–2018 average > 16% Progress towards fair share

0.64 in 2019 > 22% Progress towards fair share

0.68 in 2020 > 23% Progress towards fair share

Australia did not contribute to the Green Climate Fund’s replenishment and withdrew from the fund in 2019, but announced at COP26 a contribution of AUD 2bn over 2021–2025, including AUD 700m to Pacific nations, which is still far below what it should pay. The newly-elected government in 2022 announced more stringent climate action, which, at the time of publication, has not translated into new and increased climate finance commitments.

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

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
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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