Climateworks CENTRE

Government climate action:

Leading policies and programs in Australia

SUMMARY REPORT

DECEMBER 2022

ACKNOWLEDGEMENT OF COUNTRY

We acknowledge and pay respect to the Traditional Custodians and Elders – past and present – of the lands and waters of the people of the Kulin nation on which the Climateworks Centre office is located, and all of the Elders of lands across which Climateworks operates nationally. We acknowledge that sovereignty was never ceded and that this was and always will be Aboriginal land. More information.

ACKNOWLEDGEMENT OF SUPPORT

This report was supported by funding from the 2050 Pathways Platform.

Climateworks Centre, 2022, *Government climate action: Leading policies and programs in Australia*.

ISBN: 978 0 9924232 7 8

ABOUT US

Climateworks Centre bridges research and action, to achieve the system-level transitions required to reach net zero emissions across Australia, Southeast Asia and the Pacific. We act as trusted advisers, influencing decision-makers with the power to reduce emissions at scale. Co-founded by The Myer Foundation and Monash University in 2009, Climateworks is an independent non-profit working within the Monash Sustainable Development Institute.

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Executive summary

In September 2022, the Australian federal government legislated national emissions reduction targets of 43 per cent below 2005 levels by 2030 and net zero emissions by 2050 (Prime Minister of Australia 2022). This increase in ambition at the federal level builds on a strong history of emissions reduction ambition and action from state and territory governments. As of 2020, all states and territories have a net zero emissions target in place, and most states and territories have interim targets to lower emissions this decade.

In Climateworks Centre's 2021 report, *State and territory climate action: Leading policies and programs in Australia*, we found that when combined, state and territory interim targets translated to an estimated 37–42 per cent reduction below 2005 emissions by 2030, Australia-wide. State and territory interim targets remained unchanged in 2022.

The global Paris Agreement aims to limit global temperature rise this century to well below 2 degrees Celsius above pre-industrial levels, and to pursue efforts to limit temperature rise to 1.5°C. Since Paris, it has become increasingly evident that limiting global warming to 1.5°C will result in better outcomes for the planet and the economy. The recent United Nations Framework Convention on Climate Change Conference of the Parties reaffirmed the goal to limit global warming to 1.5°C. In *Decarbonisation Futures: Solutions, actions and benchmarks for a net zero emissions Australia*, Climateworks modelling shows that transformational action to rapidly reduce emissions this decade and achieve net zero well before 2050 would allow Australia to play its full part in achieving this goal.

In this report, we analyse the targets, policies and programs announced by Australian federal, state and territory governments, with a particular focus on policies introduced since the publication of our previous report on state and territory climate action.[i] States and territories have allocated billions of dollars to emissions reduction measures and have also made significant regulatory and legislative changes. Below are some examples of targets and policies announced since the last report.

Electricity

In electricity, state and territory renewable energy targets represent an implied Australia-wide target of 69 per cent by 2030 – a considerable improvement from last year's calculation of 55 per cent. The federal government has announced that it will invest $20 billion in improving the capacity of the transmission network and will implement a National Energy Performance Strategy to accelerate energy efficiency and action on the demand side.

Transport

In transport, state and territory targets represent an implied Australia-wide zero-emission vehicle sales target of 46 per cent by 2030 – an improvement from last year's calculation of 30 per cent. The federal government has opened a consultation on fuel efficiency standards, focusing on light and commercial vehicles but also including heavy vehicle classes.

Buildings

This year, federal, state and territory Building Ministers agreed to update the National Construction Code to improve the minimum energy performance of new homes from six to seven stars.

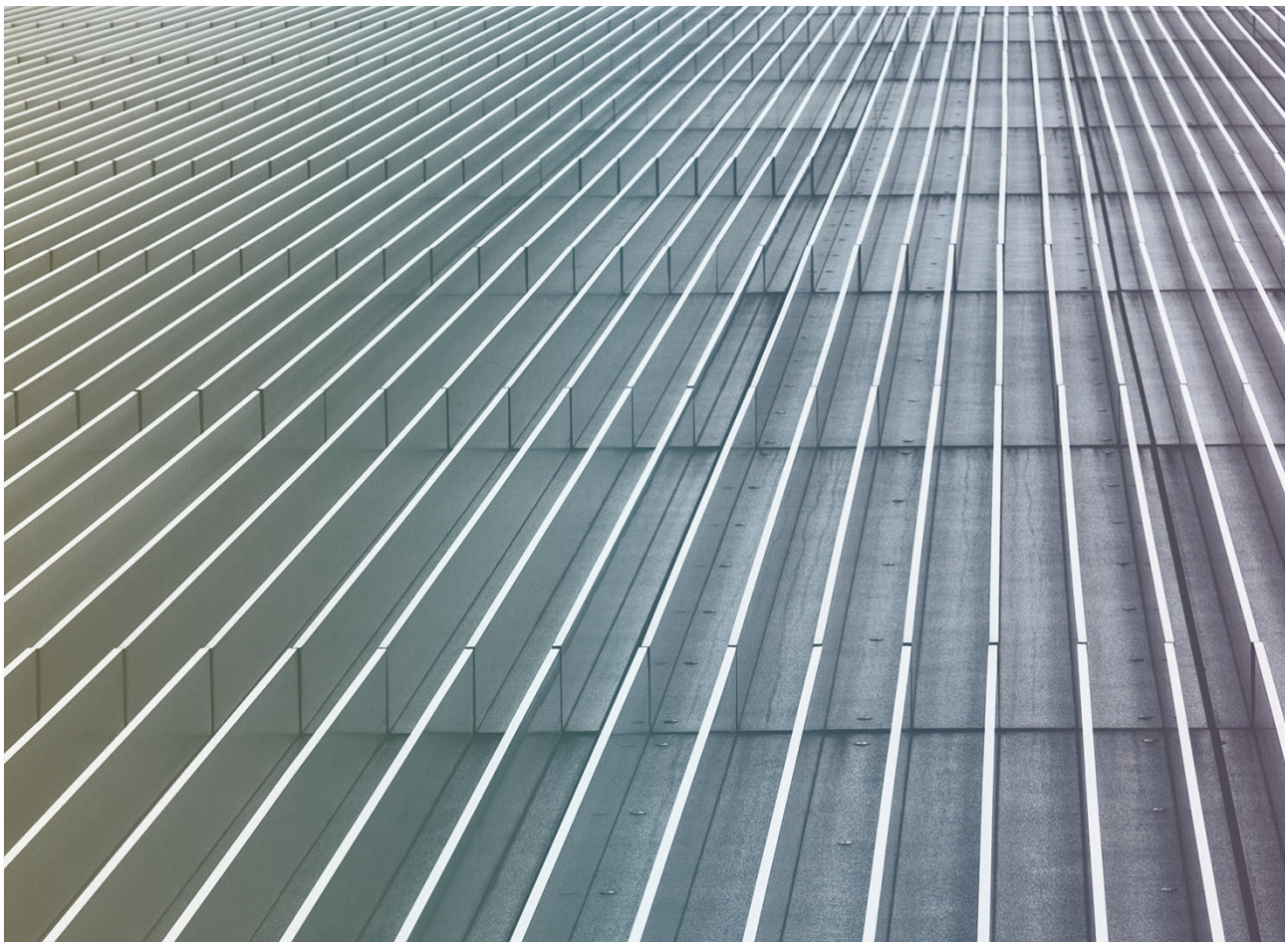
Industry

State and federal governments have announced funding for hydrogen hubs in Western Australia, Tasmania, South Australia, New South Wales and Queensland. To help decarbonise existing industries and develop new low-carbon industries, the federal government is investing $1.9 billion through the Powering the Regions fund and $3 billion through the National Reconstruction Fund.

Land and Agriculture

While progress in these sectors is less advanced, states and territories have begun introducing a range of initiatives, including biodiversity and carbon certification as well as research and development to reduce emissions from agriculture. The federal government has announced plans for a biodiversity certificates scheme.

i Last year's report *State and territory climate action: Leading polices and programs in Australia* provides details on state and territory action announced between January 2020 and October 2021. This year's report incorporates announcements of policies and initiatives from October 2021 to 26 November 2022.



The most noteworthy initiatives that federal, state and territory governments have implemented are presented in this report by sector – Electricity, Transport, Buildings, Industry, and Land and Agriculture. The report shows that policy strengths vary by jurisdiction. Governments – in Australia and around the world – have an opportunity to learn from and build on the progress of their counterparts and collaborate to address the emissions reductions and economic transformations needed to achieve net zero emissions.

The policies and programs detailed in this report demonstrate increased momentum in federal, state and territory climate policy. They also show how much more can and needs to be achieved for Australia to play its part in achieving the goals of the Paris Agreement. The window for keeping global temperature rise below 1.5°C is narrowing, but the goal is still possible if ambitious benchmarks are met this decade (Intergovernmental Panel on Climate Change 2018).

+ Climateworks' 1.5°C modelling in *Decarbonisation Futures* shows that by 2030 in Australia, total annual emissions are 74 per cent below 2005 levels.
+ Climateworks' 1.5°C modelling in *Decarbonisation Futures* shows that by 2030, renewables generate 79 per cent of electricity.
+ Climateworks' 1.5°C modelling in *Decarbonisation Futures* shows that electric vehicles represent 76 per cent of new car sales in 2030.

Currently, there is at least one jurisdiction in Australia that has set a target and introduced an implementation strategy aligned (or nearly aligned) to each of the *Decarbonisation Futures* benchmarks. But significant work is still needed to achieve these and other key transitions across the Australian economy.

A difference between this year's report and last year's report is the inclusion of federal policy. With the election of a new federal government this year, federal ambition on climate change has increased. State and territory governments have made significant progress in implementing policies and initiatives to reduce emissions, but there is still an important role for the federal government to play. In some areas, the federal government controls policy levers that have wider-reaching impacts than initiatives implemented by individual states. In other areas, the federal government can amplify the impact of state and territory initiatives by providing additional support to activities already underway. Throughout the report, we identify how federal, state and territory policies can work together to bring Australian climate action closer to the goals of the Paris Agreement.

2022 – the year of renewables

Governments have made significant progress on renewables in 2022

2022 has been a year of increased ambition, with governments investing heavily in renewable energy and grid capacity. State and territory governments have built on progress in the electricity sector with a string of announcements this year. Queensland has set a renewable generation target of 70 per cent by 2032[1] and committed $280 million for transmission infrastructure upgrades, identifying priority Renewable Energy Zones. Victoria has set renewable generation targets of 65 per cent by 2030 and 95 per cent by 2035[2] and is targeting 9 GW offshore wind capacity by 2040. New South Wales has committed $1.2 billion to accelerate transmission projects in Renewable Energy Zones[3]. Western Australia has announced the phase out of state-owned coal-fired power generation by 2030.[4] Tasmania is powering ahead with plans to export renewable energy to the National Energy Market.

With state and territory initiatives progressing, federal action is helping coordinate and accelerate the transition towards decarbonisation. Through the National Energy Transformation Partnership, the federal government aims to deliver Australia's first fully integrated energy and emissions reduction agreement.[5,6] The Rewiring the Nation Office will invest $20 billion through low-cost financing to help strengthen the transmission network in line with the Australian Energy Market Operator's (AEMO) Integrated System Plan.[7] Under this initiative, the federal government committed $2.25 billion in concessional finance for Victorian Renewable Energy Zone projects (including offshore wind projects) and the KerangLink interconnector between New South Wales and Victoria[8], and is jointly funding the Marinus Link and Battery of the Nation in Tasmania.[9] In addition, the federal government's proposal for six coastal offshore wind zones provides the enabling environment for developers to progress consultation and planning for their projects.[10]

Investment in renewables will enable the decarbonisation of the rest of the economy. Climateworks analysis shows that the collective impact of state and territory action represents an implied Australia-wide 2030 renewable target of 69 per cent. In addition, the release of the first Annual Climate Change Statement confirmed the federal government is aiming for a 82 per cent target for renewable energy generation by 2030 (Australian Government 2022a). These figures are close to being in line with 1.5°C pathways from *Decrabonsitation Futures* and our more recent industry-focused modelling.

Substantial action is still needed on the demand side

Using energy efficiently is a key enabler of decarbonisation (Climateworks 2020a). As grid demand increases, efficiency will be as important as electrification. Demand-side measures in all sectors can help reduce costs. Governments have a significant opportunity to take action and there are promising signs. The federal government's National Energy Performance Strategy will accelerate energy efficiency to support a least-cost pathway for energy transformation.[11] Building Ministers agreed to update the National Construction Code to improve new homes' minimum energy performance.

There is still much to be done. In transport, while action is underway on electric vehicles, there could be more focus on reducing per capita transport demand by shifting private transport to public and active transport.

As more and more of the transport task is powered by renewable electricity, mode-shifting – supported by smart urban planning – will help to lower system costs and meet the demands of a growing, urbanised population.

In the building sector, further focus on energy efficiency improvements for existing homes and new and existing commercial buildings would reduce emissions and provide co-benefits in health, comfort and lower energy bills (Climateworks 2020a).

And in industry, demand-side response initiatives can provide effective use of transmission, distribution and storage infrastructure. Governments have an opportunity to drive energy efficiency through policies that provide incentives for demand-side management (Australian Industry Energy Transitions Initiative 2022a), ultimately reducing system costs (Wood et al. 2021).

In 2022, Australian governments made rapid progress in transforming the electricity generation system. By taking further action on the demand side, governments can improve whole-of-economy energy efficiency while lowering the net cost of decarbonisation (Fischer 2021).

The federal government and all Australian states and territories are committed to net zero emissions by 2050

As of October 2021, all Australian state and territory governments and the federal government have set a target of net zero emissions by 2050 or earlier. These targets cover all emissions produced within jurisdictional borders.[i]

The federal government and most states and territories have also set interim emissions targets. The federal government has an interim target of 43 per cent below 2005 levels by 2030 and net zero emissions by 2050 (Prime Minister of Australia 2022). When combined, state and territory interim targets translate to an estimated 37–42 per cent reduction below 2005 emissions by 2030, Australia-wide (Climateworks Centre 2021).[ii]

While these emissions targets are not yet aligned with pathways to limit temperature rise to 1.5°C, they represent an important achievement in Australian climate policy.

Figure 1 details all state and territory emissions targets. The graphic outlines when each target was set and by what government; which targets are legislated; what interim targets are in place to support the achievement of net zero emissions; and what share of Australia's emissions are covered by each jurisdiction's target (Australian Government 2022b).

FIGURE 1: Australian emissions and emissions targets

AUSTRALIA

Target:	Net zero emissions by 2050
Target set:	2021 by Coalition government
Legislated:	In September 2022, the Labor government legislated national emissions reduction targets of 43% below 2005 levels by 2030 and net zero emissions by 2050
Interim target(s):	43% below 2005 levels by 2030
Emissions:	497.1* Mt (2020)

*Total emissions do not include external territories as they were not included in our analysis.

WESTERN AUSTRALIA

Target:	Net zero emissions by 2050
Target set:	2017 by Labor government
Legislated:	No
Interim target(s):	No, Western Australia expressed support for the previous federal government target of reducing emissions by 26–28% below 2005 levels by 2030. Western Australia has also set a whole-of-government 2030 emissions reduction target of 80% below 2020 levels.
Emissions:	82.1 Mt (2020), 16.4% of Aus total

i State and territory emissions targets do not cover Australia's scope three emissions – those that occur outside of the country's borders as a result of Australia's actions. These include emissions resulting from the use of Australian exports – such as coal, liquified natural gas and iron ore – as well as emissions from the production of goods that are imported into Australia.

ii This range reflects different assumptions for the state and territory targets - including that Victoria and ACT's targets themselves are for a range. The calculation combines the relative share of national emissions in 2005 with either targets (where these have been set) or scenarios for emissions pathways (that reflect current state and territory climate ambitions). Western Australia and Northern Territory are yet to set a 2030 target.

NORTHERN TERRITORY

Target:	Net zero emissions by 2050
Target set:	2020 by Labor government
Legislated:	No
Interim target(s):	Draft interim targets are expected to be released for consultation in 2023
Emissions:	17.3 Mt (2020), 3.5% of Aus total

QUEENSLAND

Target:	Net zero emissions by 2050
Target set:	2017 by Labor government
Legislated:	No
Interim target(s):	At least 30% reduction on 2005 levels by 2030, 'contingent on continued national and global action'
Emissions:	159.2 Mt (2020), 31.8% of Aus total

NEW SOUTH WALES

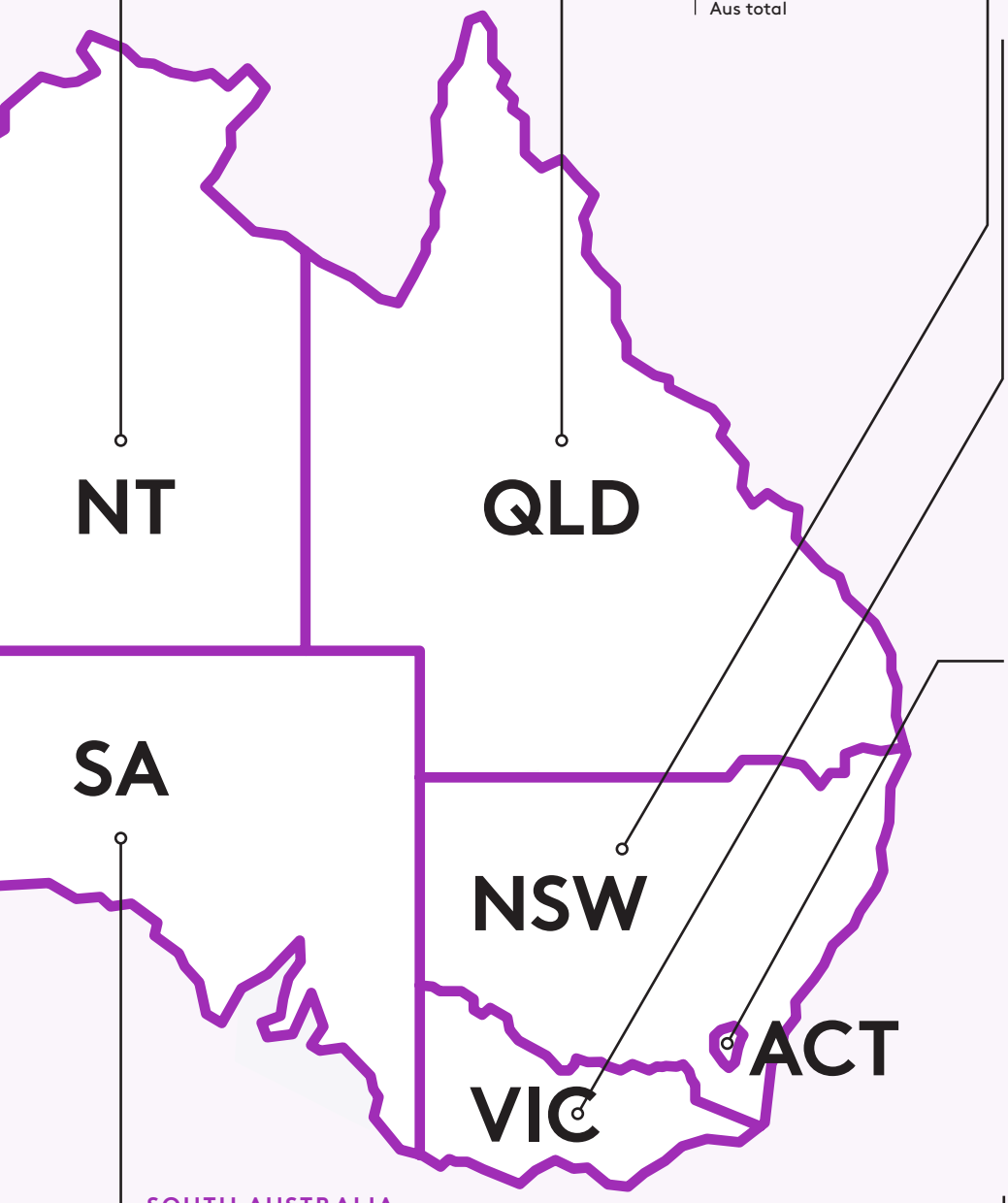
Target:	Net zero emissions by 2050
Target set:	2016 by Liberal-National coalition government
Legislated:	No
Interim target(s):	50% reduction on 2005 levels by 2030
Emissions:	132.4 Mt (2019), 26.4% of Aus total

VICTORIA

Target:	Net zero emissions by 2045
Target set:	2022 by Labor government (Updates net zero by 2050 target set in 2016 by Labor government)
Legislated:	Yes (Victoria's Climate Change Act 2017), including: + net zero emissions by 2050 + setting interim targets at five-year intervals to 2050 + new strategies at five-year intervals to 2050
Interim target(s):	Legislated 28-33% reduction on 2005 levels by 2025 and 45-50% reduction on 2005 levels by 2030, announced target of 75-80% reduction on 2005 levels by 2035
Emissions:	83.3 Mt (2020), 16.6% of Aus total

AUSTRALIAN CAPITAL TERRITORY

Target:	Net zero emissions by 2045
Target set:	2018 by Labor-Greens coalition government
Legislated:	Yes (Climate Change and Greenhouse Gas Reduction Act 2010)
Interim target(s):	Legislated 50-60% reduction on 1990 levels by 2025, 65-75% reduction by 2030, and 90-95% reduction by 2040
Emissions:	1.1 Mt (2020), 0.2% of Aus total



SOUTH AUSTRALIA

Target:	Net zero emissions by 2050
Target set:	2015 by Labor government
Legislated:	No, but 60% reduction on 1990 levels by 2050 is legislated. The South Australian Government has indicated its intention to legislate an updated emissions reduction target.
Interim target(s):	At least 50% reduction on 2005 levels by 2030
Emissions:	25.4 Mt (2020), 5.1% of Aus total

TASMANIA

Target:	Net zero emissions, or lower, by 2030 (achieved in 2015)
Target set:	2017 by Liberal government
Legislated:	Legislated target of net zero or lower from 2030
Interim target(s):	See net zero target
Emissions:	-3.7 Mt (2020)

Aiming for 1.5°C

In this report, we have chosen to include modelling figures for 1.5°C-aligned scenarios rather than also including our 2°C modelling. The 1.5°C-aligned benchmarks cited in this report are mainly based on Climateworks' *Decarbonisation Futures* modelling (2020).

Australian government and business initiatives and investments aligned with a goal of limiting global warming to 1.5°C above pre-industrial levels would create the best outcomes for our economy and the environment.

For example, compared to a rise of 1.5°C, a 2°C increase sees an additional 10 centimetres of sea level rise, the near-disappearance of many coral reefs and an additional 420 million people exposed to frequent heatwaves (IPCC 2018; Carbon Brief 2018).

Equally, action aligned with 1.5°C provides long-term economic benefits for Australia. Globally, GDP per capita would be 5 per cent higher by 2100 if the world manages to keep temperatures at 1.5°C above pre-industrial levels rather than 2°C (Timperley 2018). By limiting temperature rise to 1.5°C, Australia can reduce the amount of money spent repairing the damage caused by natural disasters and the impact of climate change on the health system.

Action aligned with a 1.5°C trajectory is increasingly the expectation for responsible climate action. More than 90 per cent of the world's GDP is now covered by net zero commitments (Net Zero Tracker 2022). At this year's United Nations Framework Convention on Climate Change Conference of the Parties, the final Sharm el-Sheikh Implementation Plan

reaffirmed the 1.5°C goal (United Nations Framework Convention on Climate Change 2022).

Many companies and investors around the world are setting their emissions targets based on the 1.5°C goal. For example, the Glasgow Financial Alliance for Net Zero (GFANZ) includes more than 550 member firms worldwide, representing trillions of dollars in managed assets. The overarching goal of GFANZ is to achieve net zero emissions by 2050 at the latest to support the global ambition to limit warming to 1.°5C. Members also set interim science-based targets reflecting maximum effort towards a fair share of a 50 per cent global reduction in emissions by 2030 (GFANZ 2022). These targets create momentum for change across members' assets and supply chains.

Governments are also increasingly working to align their emissions reductions with a 1.5°C trajectory. The United Kingdom promotes itself as being at the forefront of the 'green industrial revolution'. In 2021, it set a target of reducing emissions by 78 per cent on 1990 levels by 2035, an increase in ambition from its previous target of 68 per cent on 1990 levels by 2030 (United Kingdom Government 2021). The United States has a goal of a net zero emissions electricity system by 2035. President Biden used his Leadership Summit and the 2022 Major Economies Forum to emphasise the importance of limiting warming to 1.5°C (United States Government 2022). All countries are expected to increase their 2030 targets until they align with the Paris Agreement's temperature goal (United Nations Climate Change 2022).

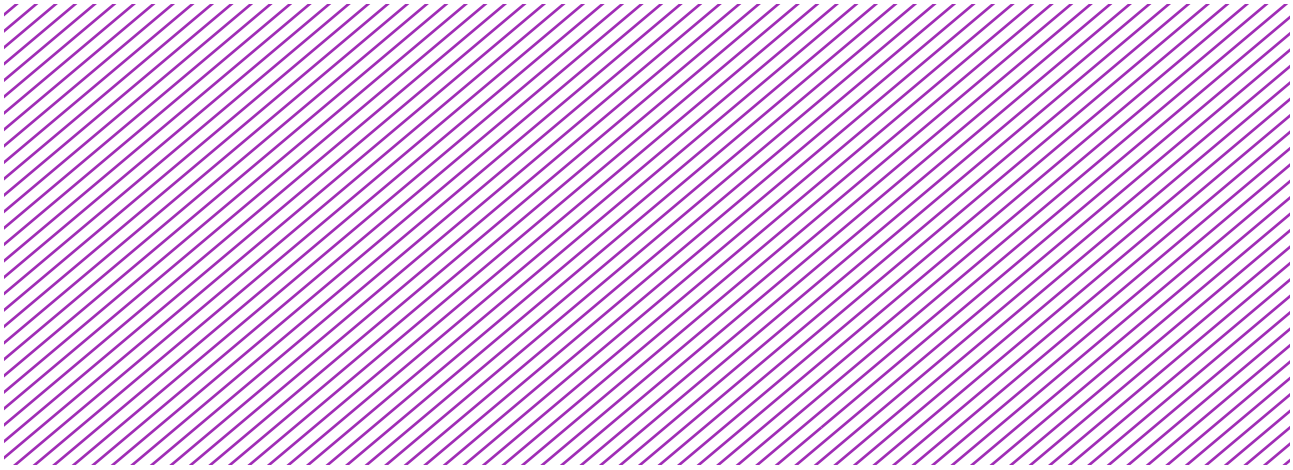
Australia faces significant economic risks if it does not keep pace with increasing global ambition for a 1.5°C-aligned pathway. Australia's economic output is 43 per cent more carbon-intensive than the OECD average due to exports such as iron ore, coal, meat, aluminium and steel (World Bank 2020). Unless Australia moves quickly to modernise and decarbonise these sectors, demand for Australian exports may decline as countries and companies seek to reduce their supply chain emissions.

For example, the European Union's Carbon Border Adjustment Mechanism (CBAM) will require importers to purchase carbon certificates corresponding to the carbon price that would have been paid had the goods been produced under the European Union's carbon pricing rules (Australian Trade and Investment Commission n.d.). Over the long term, the CBAM and similar potential schemes in other jurisdictions will incentivise Australia to keep up with the global pace of industry decarbonisation to remain competitive (AiGroup 2021).

In addition, reducing emissions in line with 1.5°C could help to build Australia's global competitiveness. With its abundant renewable energy potential and skilled workforce, Australia is well-placed to benefit from a global energy transition and establish itself as a producer and exporter of green energy and materials. Major opportunities exist for Australia to develop green iron and steel industries, green aluminium, and green energy carriers such as ammonia and hydrogen (Australian Industry ETI 2022).

As outlined in Climateworks' *Decarbonisation Futures* report, achieving global net zero emissions by 2050 is essential to limiting global warming to less than 2°C. The report also maps a 1.5°C pathway for Australia, showing that to do its 'fair share' to limit warming to 1.5°C, the country would reach net zero by 2035. This means moving faster this decade: in *Decarbonisation Futures*' 1.5°C scenario, Australia's emissions in 2030 are 74 per cent below 2005 levels. Our more recent modelling shows that, given global trends and technological advances, even greater emissions reductions are possible this decade. In practice, 1.5°C-aligned trajectories mean faster decarbonisation of the electricity grid, rapid decarbonisation of transport – including stronger uptake of electric vehicles – and rapidly improving material and energy efficiency for industry.

In the next decade, action in line with limiting warming to 1.5°C is imperative. Now is the time for Australian governments to align their targets, policies and actions with this goal.



Electricity

Electricity generation makes up about 35 per cent of Australia's emissions. While electricity sector emissions have been declining since 2016, the sector continues to be Australia's largest source of emissions (Australian Government 2022c). Decarbonising the electricity sector is a prerequisite for achieving emissions reductions across all sectors of Australia's economy.

Aiming for 1.5°C

In Climateworks' *Decarbonisation Futures* 1.5°C scenario, 79 per cent of electricity is generated from renewable sources by 2030, and electricity emissions reach near zero by 2035.[i] Additional renewable generation capacity – an estimated 29 GW increase by 2030 – will be needed to meet the demands of a growing population and an increasingly electrified economy (ClimateWorks 2020a).

Our more recent industry-focused modelling shows faster growth in renewable-generated electricity, supporting significant deployment of renewable hydrogen and electrification of industrial processes.

Substantial investment to firm up the electricity grid – through battery deployment and demand response measures – is necessary to provide an affordable and reliable supply. Improvement in the efficiency of electricity use across all sectors is also important to decarbonisation (energy efficiency is discussed in further detail in the proceeding sections of the report).

This chapter summarises policy action in the electricity sector from state, territory and federal governments. The examples included are primarily new policies introduced since the last version of this report, or in some cases, policies that are particularly important for the sector.

Highlighted text below represents new policies and programs announced since last year's report, published October 2021.

State and territory action

Investment in large-scale renewables is a strength for state and territory climate policy. Most states and territories have a renewable energy target (Table 1). In aggregate, current state and territory 2030 renewable energy targets represent an implied Australian renewable energy target of approximately 69 per cent (a considerable improvement on 55 per cent calculated in last year's report).

i In Climateworks' Decarbonisation Futures 1.5°C scenario, renewable generation reaches 79 per cent in 2030, contributing to Australian emissions reductions of 74 per cent on 2005 levels by 2030. In the federal government's modelling of its emissions reduction target of 43 per cent on 2005 levels by 2030, renewable generation reaches 82 per cent in 2030. The difference between the two scenarios is due to a greater magnitude of emissions reductions from the land, agriculture and industry sectors in our Decarbonisation Futures modelling.

TABLE 1: Renewable energy shares and targets by state and territory (as of December 2022)

NEW POLICIES

STATE OR TERRITORY	RENEWABLE TARGET OR CALCULATION OF RENEWABLE SHARE BASED ON POLICIES AND INITIATIVES
Queensland	Target of 70 per cent renewable generation by 2032[12]
Victoria	Target of 65 per cent renewable generation by 2030 and 95 per cent by 2035[13]
Australian Capital Territory	Since 2020, 100 per cent of electricity in the ACT has come from renewable sources[14]
New South Wales	Not an explicit renewable energy target, but Climateworks estimates 68 per cent renewable generation by 2030 based on current generation assets, retirement schedules and new generation announced as part of the Electricity Infrastructure Roadmap
Northern Territory	Target of 50 per cent renewable electricity consumption by 2030[15]
South Australia	Target of 100 per cent net renewables by 2030[16]
Tasmania	Target of 200 per cent renewable electricity by 2040 (based on current electricity demand)[17]
Western Australia	Not an explicit renewable energy target, but Climateworks estimates 56 per cent renewable generation by 2030, based on the Western Australian Government's announcement on phasing out state-owned coal generation by 2030

In conjunction with setting renewable energy targets, states and territories are focusing on phasing out fossil-fuel-generated electricity.

NEW POLICIES

+ Western Australia announced that it would phase out state-owned coal-fired power generation by 2030[18] and has developed a transition plan for affected communities, committing $574 million to the Collie Transition Package.
+ Queensland announced that all publicly-owned, coal-fired power stations will operate as clean energy hubs by 2035.[19] Queensland is also planning to develop a Job Security Guarantee with unions.

Many policies have been implemented to support the shift to zero-emissions electricity. This includes investment in renewable energy zones,[20,21,22] reverse auctions for renewable energy[23,24] and investment in off-grid renewable generation.[25,26] Recent initiatives to support renewable deployment include:

+ The Victorian Government announced a $1 billion investment for new renewable energy projects, delivering 4.5 GW of power. These projects will be delivered by the reinstated State Electricity Commission.[27]
+ Victoria is targeting 4 GW of offshore wind capacity for 2035 and 9 GW for 2040.[28] Three different offshore wind projects are already being supported with nearly $40 million in funding.
+ In its 2022–23 Budget, New South Wales announced $1.2 billion over 10 years for a Transmission Acceleration Facility to serve Renewable Energy Zones.[29]

- Tasmania is progressing its plans to export renewable energy to the National Energy Market, signing an agreement with the federal government on the Marinus Link and Battery of the Nation initiatives and committing matched funding of $75 million.[30]
- Queensland's 2022–23 Budget committed $280 million for transmission infrastructure upgrades.[31]

States and territories are also investing in storage. Each state and territory has at least one 'big battery' proposed, under construction or in operation (RenewEconomy n.d.). There is currently 3757 MW of large-scale battery storage in the project pipeline, almost four times the capacity currently installed (Clean Energy Council 2022). Recent policies implemented in this area include:

- Victoria is targeting 6.3 GW of energy storage by 2035 and announced $157 million in funding for renewable energy generation and storage.[32]
- Queensland is providing $500 million to fund large-scale and community batteries and $203.5 million of new funding to assess two potential pumped hydro storage projects, which could provide 7 GW of storage capacity.[33]
- New South Wales announced a 500 MW battery as part of Liddell Power Station's transition to a renewable energy hub[34] and the 700 MW Waratah Super Battery.[35]
- The Victorian Government is providing $42 million to install 100 neighbourhood batteries across the state.[36]

Microgrids and demand response have been less of a focus for states and territories. However, South Australia has pioneered the development of 'virtual power plants' in Australia (virtual power plants aggregate home solar and storage systems so that they can provide energy services),[37] and examples of supportive initiatives are increasing. For example:

- Queensland committed an additional $10 million in its 2022–23 Budget for the Queensland Microgrid Pilot Fund in regional and remote communities.[38]
- Western Australia has commissioned the $15 million Kalbarri microgrid.[39]
- New South Wales' Peak Demand Reduction Scheme (PDRS) began operating in November 2022. The PDRS is a certificate scheme to incentivise households and businesses to reduce energy consumption during peak demand periods.[40]

Another area that has had less attention from states and territories is whole-of-economy energy performance. Whole-of-economy energy performance targets can help states and territories prepare for increases in demand from electrification. Victoria has an aspirational target for a 50 per cent improvement in energy productivity between 2015 and 2030.[41]

Federal action

The first annual Climate Change Statement confirmed a federal government target of 82 per cent renewable energy generation by 2030.[42] The federal government has also introduced a number of policies in the electricity sector. In some cases, these policies focus on coordinating action from state and territory governments and the private sector:

- In August, federal, state and territory Energy Ministers agreed to establish a National Energy Transformation Partnership,[43] and the federal government's October 2022–23 Budget designated $157.9 million for the partnership.[44] Priorities include delivering

Australia's first fully integrated energy and emissions reduction agreement, integrating emissions in the National Energy Objective, progressing a co-designed First Nations Clean Energy Strategy, and accelerating mechanisms for the uptake of flexible energy supply.

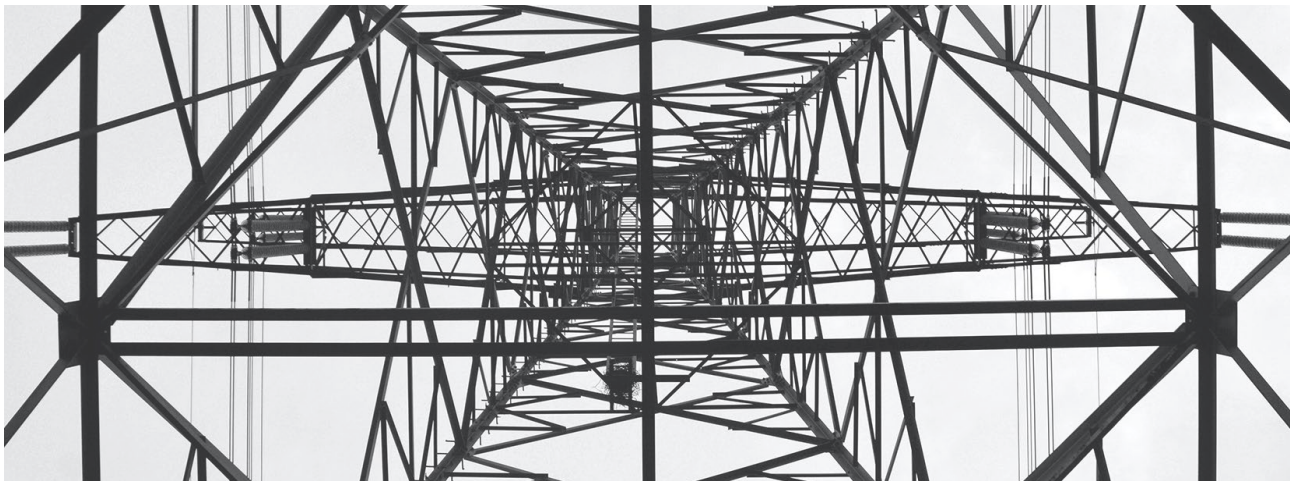
+ The Rewiring the Nation Office will provide $20 billion in low-cost finance to improve the transmission network in line with AEMO's Integrated System Plan.[45] For Victoria, the federal government committed $2.25 billion for offshore wind projects, Renewable Energy Zones and the Victoria-to-New South Wales Interconnector West (KerangLink).[46] For Tasmania, the federal government is providing low-cost financing to deliver the Marinus Link and for Battery of the Nation projects.[47]

The federal government is also filling gaps in state and territory energy policies. In November, the federal government released a consultation paper on a National Energy Performance Strategy, which will accelerate energy efficiency to support a least-cost pathway for energy transformation.[48] The October 2022–23 Budget included $15.2 million for the development of the strategy.[49]

Other actions by the federal government establish an enabling regulatory environment. In August, the federal government proposed six coastal areas across Australia as offshore wind zones, allowing developers to move forwards with planning and consultation on their projects. The consultation for the first offshore wind zone on the Gippsland coast is already underway.[50] This announcement built on the legislation of the Offshore Electricity Infrastructure Act 2021.[51] The federal government's October 2022–23 Budget included $500,000 to develop an offshore renewable energy industry growth strategy.[52]

More to be done

Substantial investment in renewable energy means that Australian jurisdictions are well on the way to alignment with Climateworks' 1.5°C benchmark for renewable generation from *Decarbonisation Futures*. However, demand-side measures have not received the same policy attention. Ambitious energy performance – including energy efficiency, load shifting, fuel switching and behaviour change – is an essential part of Australia's transition to net zero emissions as it can help to reduce the costs of transitioning the grid to 100 per cent renewable generation. The upcoming National Energy Performance Strategy will fill some of this gap but achieving the aims of this strategy will require concerted action from all levels of government.



Transport

The transport sector makes up about a fifth of Australia's emissions. The sector is Australia's fastest-growing source of emissions (Australian Government 2022c), but solutions are available to counteract this trend. The majority of sector emissions come from freight and private passenger transport (more than 40 per cent each), with the remainder from public transport and domestic shipping and aviation.

Aiming for 1.5°C

In Climateworks' *Decarbonisation Futures* 1.5°C scenario, electric vehicles reach 76 per cent of new car sales by 2030 in Australia and account for 28 per cent of the total vehicle fleet. There is also considerable uptake of zero-emissions trucks and buses. Passengers and freight shift to lower-emissions modes such as rail, where possible, through improved infrastructure and services. The use of zero-emissions fuels more than quadruples, mainly in the freight sector. Infrastructure, improved city planning and behaviour change are also needed to reduce overall per capita demand for transport modes and thus offset demand from population increases. State, territory and federal governments have important roles in enabling each of these transitions.

This chapter summarises policy action in the transport sector from state, territory and federal governments. The examples included are primarily new policies introduced since the last version of this report, or in some cases, policies that are particularly important for the sector.

State and territory action

One area which has seen substantial policy action is the uptake of electric vehicles. Most states and territories have set targets for zero-emissions vehicle uptake (Table 2). Taken together, these would be equivalent to a 46 per cent target for new car sales by 2030 (Climateworks Centre 2022b).[i] Most states and territories have financial incentives to encourage the purchase of zero-emissions vehicles, including waiving stamp duty and registration fees.[53,54,55,56,57,58,59]

Highlighted text below represents new policies and programs announced since last year's report, published October 2021.

TABLE 2: State and territory uptake targets for zero-emissions vehicles

STATE OR TERRITORY	TARGET FOR ZERO-EMISSIONS OR ELECTRIC VEHICLE UPTAKE
Australian Capital Territory	80 to 90 per cent of new light vehicle sales to be zero-emissions vehicles by 2030[60]
Queensland	50 per cent of new passenger vehicle sales to be zero-emissions vehicles by 2030 and 100 per cent of sales by 2036[61]
New South Wales	52 per cent of new car sales to be electric vehicles by 2030–31[62]
South Australia	Electric vehicles to be the 'common choice' for motorists by 2030 and the 'default choice' by 2035[63]
Victoria	50 per cent of all light vehicle sales to be zero-emissions vehicles by 2030[64]

NEW POLICIES

i This calculation accounts for the percentage targets of New South Wales, Victoria, Queensland and the Australian Capital Territory. For jurisdictions without percentage targets, the national projected electric vehicle uptake of 26 per cent has been used as the default target.

NEW POLICIES

States and territories continue to invest in electric vehicle charging infrastructure. Recently announced initiatives in this area include:

- The Australian Capital Territory provided $1.4 million in grant funding for 77 new public chargers.[65]
- New South Wales committed $38.2 million for 500 public chargers, electrical upgrades for 125 apartment buildings and additional grants to increase the number of fast charging points.[66]
- Queensland is providing $10 million in co-funding for charger installation under the Electric Vehicle Charging Infrastructure Scheme.[67]
- South Australia is providing $12.35 million for the RAA to construct and operate a statewide electric vehicle charging network.[68]
- Western Australia committed $22.6 million to expand the state's charging network, co-funding charger installations with non-profits, small to medium businesses, local governments and the Public Transport Authority.[69]
- The Northern Territory is providing $300,000 in grants for individuals and businesses to install electric vehicle chargers.[70]

Another area with significant policy progress is zero-emissions public transport. All states and territories are working on shifting to a zero-emissions bus fleet. The Australian Capital Territory,[71] New South Wales,[72] Queensland[73] and Victoria[74] have all set targets regarding the purchase of new electric buses, while Tasmania[75] and Western Australia[76] have electric bus trials under way. South Australia[77] has one battery electric bus in operation, and is targeting future bus purchases to be hybrid or fully electric. The Northern Territory[78] is looking into the feasibility of electric bus trials.

At the state and territory level, there has been less focus on shifting private passenger transport to public and active transport. However, there are some positive examples from early movers. In South Australia, the '30-Year Plan for Greater Adelaide' includes a target to increase the share of work trips made by active transport by 30 per cent by 2035.[79] The South Australian Government has supported this through more than 60 cycling projects, expanding or improving more than 50 kilometres of the state's cycling infrastructure.[80] The Australian Capital Territory is also restructuring its public transport network to provide more flexible, demand-responsive services.[81]

State and territory policy has made less progress in reducing freight transport emissions, but positive examples include:

- New South Wales, Queensland, Victoria and the federal government are collaborating to develop a hydrogen refuelling network (see Box 2).
- In 2021, Australia's first public hydrogen refuelling station opened in Canberra, with support from the Australian Capital Territory Government.[82]
- The Western Australian Government's COVID-19 recovery plan included funding for a hydrogen mobility project for the Christmas Creek iron ore mine.[83]
- The Victorian Government has a Mode Shift Incentive Scheme, which provides incentives for freight operators to move containers by rail rather than road.[84] The Victorian Government has also invested in the Port Rail Shuttle Network, to connect the Port of Melbourne to major freight hubs using the existing rail network.[85]

Federal action

One of the most important levers for increasing the supply of electric vehicles and reducing emissions from private transport is fuel efficiency standards (Climateworks Centre 2022b). Responsibility for this policy lies with the federal government. In September, the federal government opened a consultation on fuel efficiency standards, initially focusing on light and commercial vehicles but also indicating interest in addressing heavy vehicle emissions.[86]

The federal government is also implementing the following initiatives:

- A National Electric Vehicle Charging Network ($39.8 million) with 117 fast charging stations on highways across Australia aims to fill in the gaps in the charging network, connecting across state and territory borders.[87,88]
- The Treasury Laws Amendment (Electric Car Discount) Bill 2022, introduced to Parliament in July, would exempt electric cars below the luxury car tax threshold from fringe benefits tax. The Government will also introduce changes to remove the five per cent import tariff on electric cars.[89] These changes were funded in the October Budget.
- The federal government is collaborating with New South Wales, Queensland and Victoria to develop a hydrogen refuelling network (see Box 2).
- Australia's first National Electric Vehicle Strategy, developed in collaboration with states and territories,[90] will consult on ways to increase both demand for and supply of electric vehicles, as well as systems and infrastructure, to enable electric vehicle uptake. This strategy includes the consultation on fuel efficiency standards.[91]
- Through the Australian Renewable Energy Agency (ARENA), the federal government is co-investing $146.1 million over five years in projects that reduce emissions from Australia's road transport sector.[92]
- Targets for federal government fleet purchases and leases have been set at 75 per cent electric by 2025 with positive flow-on effects for the second-hand electric vehicle market.[93]

More to be done

At both the federal and state and territory level, transport policy has so far focused on increasing electric vehicle uptake with less focus on mode-shifting or reducing overall per capita demand for transport, for example through good city planning. Mode-shifting is an important aspect of the transport sector's transition to net zero emissions. Shifting private passenger vehicle use to public and active transport can help to reduce emissions while still meeting the demands of a growing and urbanising population (Climateworks Centre 2020b).

There is an opportunity for federal, state, territory and local governments to collaborate on this important area. Responsibility for city planning lies with state and local rather than federal government. However, in its election commitments, the federal government identified a plan to build on the previous government's City Deals initiative.[94] If this policy follows the United Kingdom's City Deals model, it could include agreements between federal, state and local governments to deliver major infrastructure projects. These agreements would be linked to targets for policy outcomes such as emissions reductions, economic growth, jobs creation and housing affordability. This could result in changes in city planning that reduce the need for travel and enable more mode-shifting, addressing a policy area that has had less attention to date.

BOX 1:

Hydrogen Highway

In an important step in decarbonising heavy transport, state and federal governments are working together on a renewable hydrogen refuelling network. The Queensland, New South Wales and Victorian Governments have signed a Memorandum of Understanding to develop this network, focusing on the Hume Highway, the Pacific Highway and the Newell Highway.[95] In addition, the Victorian and New South Wales Governments are investing $10 million each in grant funding for at least four hydrogen refuelling stations along the Hume Highway and 25 hydrogen-powered, long-haul heavy freight vehicles.[96]

The federal government is working with states and territories to develop hydrogen highways nationally, matching the funding already committed by New South Wales and Victoria and making the same amount available to other jurisdictions on a matching basis.[97] The federal government committed $89.5 million for the Hydrogen Highways initiative in the October 2022–23 Budget.[98]

Buildings

The building sector accounts for more than a fifth of Australia's total emissions when electricity use is considered, as of 2020. Residential and non-residential buildings split the sector's emissions nearly down the middle (Australian Government 2022c). Energy efficiency and electrification across both new and existing buildings will underpin emissions reductions in the sector. The sector's role in renewable generation and storage provides further potential benefits.

Aiming for 1.5°C

In Climateworks' *Decarbonisation Futures* 1.5°C scenario, energy performance improves this decade by 49 per cent in residential buildings and by 28 per cent in non-residential buildings. There is a transition away from gas, especially in the residential sector, with full electrification occurring in all buildings by 2040. The *Decarbonisation Futures* 1.5°C scenario shows a more than doubling of rooftop solar generation by 2030, while more recent industry-focused modelling shows an even greater increase over the same timeframe.

These changes reduce emissions and have co-benefits in terms of health, energy costs and comfort. The technologies required for a zero-emissions building sector – deep energy efficiency and electrification powered by renewables – are available. The key challenge is widespread deployment.

This chapter summarises policy action for buildings from the state, territory and federal governments. The examples included are primarily new policies introduced since the last version of this report, or in some cases, policies that are particularly important for the sector.

Highlighted text below represents new policies and programs announced since last year's report, published October 2021.

State and territory action

Much has been done recently to strengthen energy efficiency standards for new homes. In August 2022, Building Ministers agreed to update the National Construction Code to improve the minimum energy performance of new homes from six to seven stars (see Box 3). And while states and territories have a range of policies to help homeowners improve the energy efficiency of Australia's 10.9 million existing homes (Armstrong, G et al 2022), stronger energy efficiency requirements for rentals and policies to encourage energy-efficient retrofits can help reduce emissions consistent with a 1.5°C trajectory. Positive government initiatives for existing homes include:

NEW POLICIES

+ The Australian Capital Territory introduced new regulation requiring rental homes meet a minimum energy efficiency standard for ceiling insulation. The Australian Capital Territory Government will also offer zero-interest loans to help rental providers undertake the necessary retrofits.[99]
+ New South Wales and Western Australia announced new energy-efficiency rebates this year.[100,101]
+ Over the last year, four states expanded existing on-site solar, energy efficiency or storage programs.[102,103,104,105]
+ Victoria has minimum energy efficiency requirements for fixed heaters in rental homes.[106]
+ Four states have retailer energy efficiency schemes in place.[107,108,109,110]

For new and existing non-residential buildings – including commercial, retail and healthcare – state and territory policy will require further effort to align with a 1.5°C trajectory. However, some policy initiatives from states and territories are beginning to address non-residential emissions:

- New South Wales introduced the Sustainable Buildings State Environmental Planning Policy, requiring embodied emissions reporting, energy performance verification after a building is occupied, and, in some cases, that buildings be 'all electric' or capable of converting by 2035.[111]
- New South Wales introduced the Accelerating Net Zero Buildings program, which will develop a framework to include embodied emissions in the National Australian Built Environment Rating System (NABERS), incentivise large commercial buildings owners to increase the building's NABERS score, and fund NABERS ratings for existing commercial buildings.[112]
- States and territories have also implemented a range of grant programs to incentivise energy efficiency in existing commercial buildings.[113,114,115,116,117,118]

Building electrification is another area where states and territories are beginning to take action. New initiatives in the last year include:

- Victoria's Gas Substitution Roadmap removes the requirement for new housing to be connected to gas.[119]
- Western Australia is providing financial support for Esperance households and businesses to switch from gas to electricity, as the private gas network operator ceases operations in the area.[120]

The uptake of on-site renewables for residential and commercial buildings remains strong, with 2.3 GW of installations expected in 2022 (Australian Government 2022d). States and territories support the uptake of on-site renewables through a variety of policies including feed-in-tariffs, rebates, no-interest loans and grant programs.

Federal action

The federal government has an important regulatory role in reducing building emissions by setting mandatory standards and disclosure requirements across all states and territories. For example:

- The federal government played an important intergovernmental role in updating the National Construction Code (see Box 3).
- In its October 2022–23 Budget, the federal government committed $4.5 million to expand and modernise the Equipment Energy Efficiency Program and the Nationwide House Energy Rating Scheme.[121]
- The Commercial Building Disclosure Program requires that energy efficiency information be provided for large commercial office spaces for sale or lease through NABERS.[122]

The federal government can also support building energy efficiency and electrification by providing funding for deployment and research. For example:

- As part of its Powering Australia policy, the federal government is investing $102.2 million to deliver 85 solar banks around Australia. This will give renters, apartment dwellers or people who can't afford to install their own solar panels access to solar energy. [123,124]
- The federal government is providing $224.3 million to deploy 400 community batteries across Australia and $62.6 million to help small and medium-sized enterprises make energy efficiency upgrades.[125]

+ The Australian Renewable Energy Agency (ARENA) is now able to support innovation in energy efficiency and electrification technologies following the federal government's new regulations which expand ARENA's remit. [126]
+ Through the Clean Energy Finance Corporation, the federal government supports green home loan programs[127] and the development of more energy-efficient community housing.[128]

More to be done

In 2019, federal, state and territory Energy Ministers all agreed to The Trajectory for Low Energy Buildings and its Addendum (The Trajectory).[129] Greater collaboration across all levels of government would help achieve the commitments made under The Trajectory. This could produce more coordinated action across the sector to enable zero energy and zero-carbon-ready buildings by 2030.[i]

BOX 2:

National Construction Code

The National Construction Code sets out minimum performance requirements for building design and construction, and as such is Australia's primary set of technical provisions for buildings. The performance requirements include health, amenity, accessibility and sustainability.

In August, federal, state and territory Building Ministers agreed to upgrade the Code for energy performance of residential buildings. New homes (and homes undergoing major renovations) will be required to improve minimum performance from six to seven stars under the National Home Energy Rating Scheme. The rating is based on a whole-of-home energy 'budget' that will allow homes to meet the new standard in different ways (Armstrong G et al 2022).

Modelling of this update suggests the higher standards could save households up to $576 a year on their energy bills, cut emissions by up to 15 $MtCO_2e$ by 2030 and reduce the cost of grid upgrades by up to $12.6 billion to 2050 (Climateworks Centre 2022a).

There is still work to be done in future iterations of the National Construction Code. The International Energy Agency recommends advanced economies such as Australia have a 'zero-carbon-ready building code' in place by the end of the 2020s. This would ensure all new buildings and buildings undergoing major renovations are zero or near-zero carbon in the 2030s.

The 2025 update to the Code is expected to include provisions for increasing commercial building energy efficiency and moving towards zero energy and zero-carbon-ready buildings.[130] Aligning with the International Energy Agency's recommendation, further updates to the Code should include the goal that all new buildings in the 2030s be zero or near-zero carbon.

i According to the International Energy Agency, a zero-carbon-ready building is highly energy-efficient and either uses renewable energy directly, or uses an energy supply (e.g. electricity or district heating) that will be fully decarbonised by 2050.

Industry

Industry produces almost half of Australia's emissions when electricity use is considered, as of 2020 (Australian Government 2022c). More than 40 per cent of industrial emissions in Australia are from non-energy sources, such as fugitive emissions from coal and gas mining, and emissions from manufacturing of metals and other products.

Aiming for 1.5°C

Climateworks' *Decarbonisation Futures* 1.5°C scenario shows Australia's industry emissions could be reduced by 49 per cent this decade. More recent industry-focused modelling shows that faster decarbnosation of the industry sector could be possible, with a greater decline in industry emissions by 2030.

This can be achieved through electrification, renewable energy use, energy efficiency improvements and fuel switching in industrial processes. Australia also has an opportunity to become a low-carbon industry superpower this decade by developing new industries such as renewable hydrogen, green iron and steel, green ammonia and critical minerals.

Recent studies have examined the role of hydrogen in industry decarbonisation. Multi-sector modelling conducted by CSIRO and Climateworks Centre for AEMO in 2021 found that in AEMO's 1.5°C Hydrogen Superpower scenario, Australia produced around 35 PJ of mostly green hydrogen for domestic use in the NEM-connected states in 2030.

Australia's industrial regions play an essential role in the nation's economy, and also contribute a significant proportion of Australia's greenhouse gas emissions and energy use. Place-based industrial decarbonisation provides a practical opportunity to both decarbonise existing industry and develop new low-emissions industries.

This chapter summarises policy action for industry from state, territory and federal governments. The examples included are primarily new policies introduced since the last version of this report, or in some cases, policies that are particularly important for the sector.

Highlighted text below represents new policies and programs announced since last year's report, published October 2021.

State and territory action

Emissions from industry can be decreased by reducing energy emissions, reducing fugitive emissions and reducing industrial process emissions. Overall, state and territory action in the industry sector is not yet aligned to limiting warming to 1.5°C; however, positive examples are emerging:

NEW POLICIES

+ The New South Wales Environment Protection Authority (EPA) recently published a draft Climate Change Policy and Action Plan, which would treat greenhouse gases as pollutants and eventually require companies to develop emissions reduction plans.[131] See Box 4.
+ Under its Resources Industry Development Plan, the Queensland Government will work with the resources industry to develop a decarbonisation plan.[132]

- The Victorian Government's Low Carbon Manufacturing Grant Program provides grants to help small and medium-sized manufacturers pivot towards low-carbon and renewable energy supply chains.[133]
- The Queensland Energy and Jobs Plan includes a $7.1 million grant program for small and medium-sized manufacturing enterprises to reduce energy costs and operational emissions.[134]
- The Northern Territory's Large Emitters Policy[135] and Western Australia's Greenhouse Gas Emissions Policy for Major Projects[136] require large industrial project proponents to develop emissions targets and emissions reduction plans.
- New South Wales and Queensland provide support for businesses undertaking energy management assessments,[137,138] with New South Wales also assisting businesses with decarbonisation strategies.
- New South Wales, Victoria and South Australia's retailer energy efficiency schemes support improvements to industrial energy efficiency.

Another important area for industrial decarbonisation is growing new low-carbon industries. The hydrogen industry has been a particular focus for state and territory governments over the last year:

- Four states have developed hydrogen strategies.[139,140,141,142]
- Western Australia and Queensland have committed to investigations into renewable hydrogen targets.[143,144]
- State governments have announced funding for hydrogen hubs. A number of these hydrogen hubs have also received funding from the federal government, including hubs located at Pilbara in Western Australia,[145] Bell Bay in Tasmania,[146] Port Bonython in South Australia[147] and the Hunter Valley in New South Wales[148 149] (CSIRO 2022).
- South Australia is investing $593 million over four years to establish a new large-scale green hydrogen production facility and a hydrogen power station in the Whyalla region.[150]
- Through its Energy and Jobs Plan, Queensland has committed up to $15 million for further planning for renewable hydrogen hubs.[151] This builds on the Queensland Government's existing hydrogen strategy[152] and support for hydrogen hubs.
- Through the Renewable Hydrogen Pathways Fund, the Victorian Government is funding projects that aim to produce and use hydrogen in real-world applications.[153]

State and territory governments are also providing support for the development of other low-carbon industries:

- New South Wales has established the Critical Minerals Activation Fund to attract mining and processing investment to the state.[154]
- Queensland is providing additional funding for its Collaborative Exploration Initiative for new economy mineral exploration.[155]
- Western Australia's Collie Industrial Transition Fund provides funding to support a range of new and emerging industries, including potential opportunities in battery manufacturing, wind turbine manufacturing, hydrogen, green cement and minerals processing.[156]

Place-based decarbonisation is an emerging area of focus for state and territory governments. In particular, New South Wales is developing Clean Manufacturing Precincts in the Hunter Valley and Illawarra,[157] and the Western Australian Climate Policy includes plans to develop Net Zero Industrial Estates.[158] Federal and state governments are also collaborating on the development of a number of regional hydrogen hubs as noted above.

Federal action

The federal government has implemented or committed to a range of initiatives in the industry sector, including regulating large emitters, coordinating action across federal, state and territory governments and funding to decarbonise existing industry and grow new low-carbon industries.

The Safeguard Mechanism limits the amount of greenhouse gases Australia's largest industrial facilities can emit and requires offsets if a facility exceeds its limit. It was introduced in 2016 and applies to all facilities that emit more than 100,000 tCO_2 per year.[159] As part of its Powering Australia policy, the federal government has committed to gradually and predictably lower emissions limits for facilities under the Safeguard Mechanism, in line with its target of net zero emissions by 2050.[160] The federal government has since completed a consultation process on an initial discussion paper on the Safeguard Mechanism, and has opened consultation on draft legislation for creating a crediting mechanism under the Safeguard Mechanism.[161]

In 2019, the Council of Australian Governments Energy Council released Australia's National Hydrogen Strategy. This strategy outlined a national approach for growing Australia's hydrogen production, including creating hydrogen hubs, clear regulatory frameworks and international engagement on clean hydrogen certification.[162]

The federal government has committed to a number of industry initiatives:

- The $15 billion National Reconstruction Fund, modelled on the Clean Energy Finance Corporation, includes up to $3 billion for the development of a renewables manufacturing industry and deployment of low-emissions technologies.[163,164]
- The $1.9 billion Powering the Regions Fund will provide grant funding to assist existing industries to decarbonise and develop new industries in regional Australia.[165]
- A new Net Zero Economy Taskforce will advise the Government on ensuring regional Australians benefit from Australia's transformation to a renewable energy superpower.[166]
- The Australian Made Battery plan includes partnering with the Queensland Government to create an Australian Made Battery Precinct and establishing a Powering Australia Industry Growth Centre to upskill businesses looking to manufacture renewable energy technologies.[167]
- The Strategic Critical Minerals Development program will support Australian critical minerals producers to overcome technical and market access barriers ($99.8 million), and an Australian Critical Minerals Research and Development Hub ($50.5 million).[168]
- $71.9 million in funding has been allocated for the delivery of a new hydrogen hub in Townsville in Queensland.[169]
- The federal government signed the Global Methane Pledge, a voluntary international commitment to reduce global methane emissions across all sectors to at least 30 per cent below 2020 levels by 2030.[170]

More to be done

Further action from federal, state and territory governments will be needed to align Australia's industry emissions with a 1.5°C trajectory. For new low-carbon industries, governments can provide support by funding research, development and deployment and by providing appropriate regulatory settings and coordinating demand in emerging markets. For existing industries, governments can implement regulations or incentives for emissions reductions.

Place-based decarbonisation is an important area for future focus and can provide a practical solution for scaling up and accelerating industrial decarbonisation. Renewable Energy Industrial Precincts (REIPs) – clusters of industrial businesses (for example, steel and aluminium producers, along with supporting industries) powered by 100 per cent renewable energy – are a potential mechanism for place-based decarbonisation. This requires initiatives to develop shared infrastructure and draw in large-scale renewable energy from renewable energy zones or their equivalent. Federal, state and territory governments could collaborate on further action to establish REIPs, including developing co-designed roadmaps with key stakeholders such as industry and local communities, identifying skills gaps and establishing training programs, and undertaking strategic infrastructure planning and analysis.

Investment in skills and workforce development will be essential to ensure there are sufficient workers with the skills required for a net zero future. The federal government, through the new Jobs and Skills Australia body, could play a valuable role in bringing together governments and other stakeholders for knowledge sharing and to ensure that adequate planning takes place to develop this skilled workforce.

BOX 3:

New South Wales Environment Protection Authority Climate Change Policy and Action Plan

In September, the New South Wales Environment Protection Authority released its Climate Change Policy and Action Plan.[171] This plan would treat greenhouse gases as pollutants and eventually require companies to develop emissions reduction plans. The EPA is currently completing a consultation process on the Climate Change Policy and Action Plan, which are expected to be formalised by the end of 2022. The plan features a staged process to introduce new requirements for regulated entities. This involves:

- Listening to industry leaders to understand where proactive emissions reduction is already taking place
- Taking into account feedback from industry and experts, setting emissions reduction targets for key industry sectors and providing climate change mitigation and adaptation guidance
- Enabling and requiring licensees to prepare climate mitigation and adaptation plans
- Phasing in the introduction of greenhouse gas emissions limits on environment protection licences for key industry sectors.

The Climate Change Policy and Action Plan will provide regulation to help achieve the New South Wales Government's net zero goal and interim emissions target, a 50 per cent reduction on 2005 levels by 2030.

Agriculture and Land

Agriculture accounts for approximately 16 per cent of Australia's emissions, with methane from livestock accounting for the majority of all agriculture emissions (Australian Government 2022c). Agriculture also remains a key driver of land clearing and associated emissions. Land use, land use change and forestry, on the other hand, is a net emissions sink for Australia and further sequestration is essential for the sector in contributing to net zero emissions.

Aiming for 1.5°C

Solutions are available to reduce carbon and other greenhouse gas emissions from agriculture, but will need to be scaled. These include less emissions-intensive farming and regenerative practices that can support sequestration as well as off-farm solutions such as alternative proteins, coupled with significant changes in diet.

Although energy use only accounts for a small proportion of agricultural emissions, energy efficiency and electrification within the agriculture sector can be improved. In Climateworks' *Decarbonisation Futures* 1.5°C scenario, the energy intensity of agriculture improves by 22 per cent this decade and agricultural machinery and processes are electrified. The share of electricity in total energy use for agriculture triples from eight to 24 per cent.

Climateworks' modelling also shows much greater deployment of nature-based sequestration this decade. The most important action is protecting and expanding the carbon sinks currently present in our natural ecosystems. This could include policies for biodiversity conservation, but it also requires changing land use to enhance sequestration through landscapes. This includes scaling up of biodiverse carbon forestry and other sequestration options, such as blue carbon. Climateworks' *Decarbonisation Futures* 1.5°C scenario shows 112 Mt per year of nature-based, carbon sequestration this decade. Our more recent industry-focused modelling shows that with greater opportunities available for industry to decarbonise, including through large scale zero-carbon electricity and hydrogen, this reliance on land-based sequestration could be reduced.

This chapter summarises policy action for agriculture and land from the state, territory and federal governments. The examples included are primarily new policies introduced since the last version of this report, or in some cases, policies that are particularly important for the sector.

Highlighted text below represents new policies and programs announced since last year's report, published October 2021.

State and territory action

States and territories have begun to enact policies that address agricultural emissions and introduce initiatives that encourage farmers and landowners to develop carbon forestry. The Queensland Government's $500 million Land Restoration Fund remains the largest state and territory initiative in this sector.[172] New announcements from state and territory governments since the last report include:

NEW POLICIES

+ The New South Wales Government's Primary Industries Productivity and Abatement Program received new funding: $52 million to develop market and industry foundations including frameworks for

assessing carbon and biodiversity outcomes, $72 million in incentives for land managers to reduce emissions at scale, and $1 million to work with the finance sector to increase investments in natural capital and low-carbon farming.[173]

+ New South Wales announced the $206 million Sustainable Farming Program, which will certify farms that improve biodiversity and reduce emissions, while enhancing productivity.[174]
+ Western Australia is providing Katanning Research Station with an additional $4.2 million for research and development in carbon sequestration and reducing livestock emissions.[175]
+ New South Wales' Biodiversity Conservation Trust is partnering with Telstra to accelerate conservation on private land and create carbon credits.[176]
+ As part of its 2022–23 Budget, Queensland announced $262.5 million for Queensland's Protected Area Strategy 2020–2030 to expand protected areas and provide carbon positive outcomes.[177]
+ The West Australian Government is providing support packages for forestry workers transitioning to a new industry before native logging ends in the state in 2024.[178]
+ Victoria opened expressions of interest for its BushBank program, which restores natural habitat on private land.[179]

Federal action

At the federal level, a number of policies have been implemented or announced to reduce emissions in the land and agriculture sectors:

+ Introduced in 2015, the Emissions Reduction Fund gives landholders, communities and businesses the opportunity to earn Australian Carbon Credit Units (ACCU) for every tonne of CO_2e stored or avoided by a project. In 2022, the federal government appointed an independent panel to review the integrity of ACCUs issued under the Emissions Reduction Fund to ensure the carbon crediting framework maintains a strong and credible reputation.[180]
+ The federal government signed the Global Methane Pledge, a voluntary international commitment to reduce global methane emissions across all sectors to at least 30 per cent below 2020 levels by 2030.[181]
+ The federal government announced plans for a biodiversity certificates scheme, which will recognise landholders who restore or manage habitat and grant them saleable biodiversity certificates.[182]
+ The federal government's National Reconstruction Fund includes grants for commercial opportunities from new livestock feeds that reduce methane emissions as well as grants for commercial opportunities for bioenergy and biomass.[183]
+ The Powering Australia plan includes $8 million in funding for the Australian Seaweed Alliance to research ways to incorporate seaweed into cattle feed to reduce methane emissions.[184]
+ The Carbon Farming Outreach Program aims to empower Australian farmers and land managers, including First Nations peoples, to participate in carbon markets and integrate low-emission technologies and practices ($20.3 million).[185]
+ The National Soil Strategy was released in 2021 and sets out how Australia will value, manage and improve its soil for the next 20 years. The strategy was developed in collaboration with state and territory governments. The overall National Soils Package also provides funding for soil research and development, including improving carbon sequestration in soil.[186]

+ The federal government has a range of initiatives in place on financing solutions for nature, including supporting the Task Force on Nature-related Financial Disclosures, supporting the development of biodiversity markets, improving the measurement of natural capital, demonstrating the productivity benefits of natural capital and helping to embed natural capital in commercial and financial decision-making.[187]

More to be done

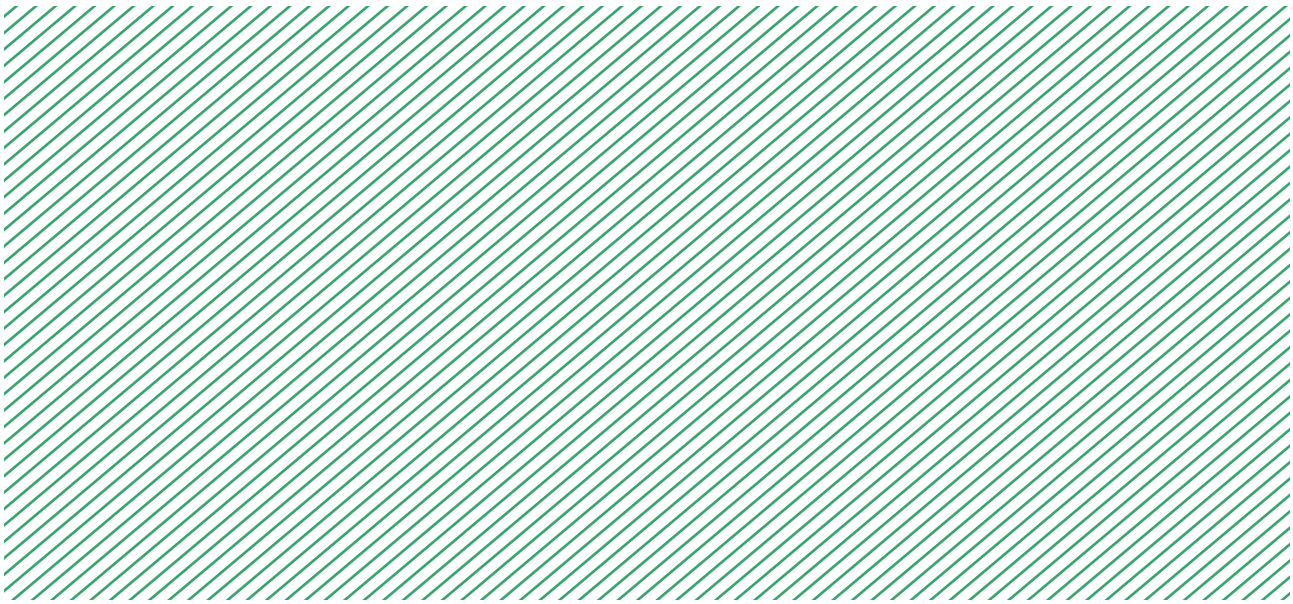
The changes in land use and management required to enable sequestration and meet emissions reduction targets should not be underestimated. Achieving this change will take balancing multiple, competing demands for land, which increasingly include use of the land to support renewable energy infrastructure. It also involves aligning biodiversity and climate goals in the face of the critical challenges outlined in the State of the Environment report, while ensuring agricultural productivity.

Government support for carbon and biodiversity markets is important for promoting change in land use and management. However, further action, leadership and coordination at the national level will be essential to achieve change at the scale and pace needed to align with a 1.5°C pathway. Australia's overall policy response to climate change could include strategies for land use at a national scale, incorporating actions to both promote biodiversity and sequester carbon.

Plans to phase out native forest logging and enhance ecosystem protection are also promising, and accelerating these efforts can help to avoid some of the long-term impacts on carbon stocks, sequestration capacity and ecosystem loss.

Over the next decade, the agriculture sector needs to be supported to reduce emissions. These efforts need to be considered in the context of broader land use and food systems including implications of waste reduction and dietary shifts, and how to balance multiple needs and interests across the land sector.

Government-supported research and development can assist in developing sustainable carbon sequestration efforts and solutions for agricultural emissions that have co-benefits for other land use outcomes.



Integrating climate action

The sectoral emissions reduction policies outlined in this report are essential for addressing climate change. However, aligning action with 1.5°C requires transformational change across the economy. Governments will need to integrate climate goals into foundational policies that have economy-wide impacts, including those that relate to infrastructure, land use and spatial planning, procurement and finance.

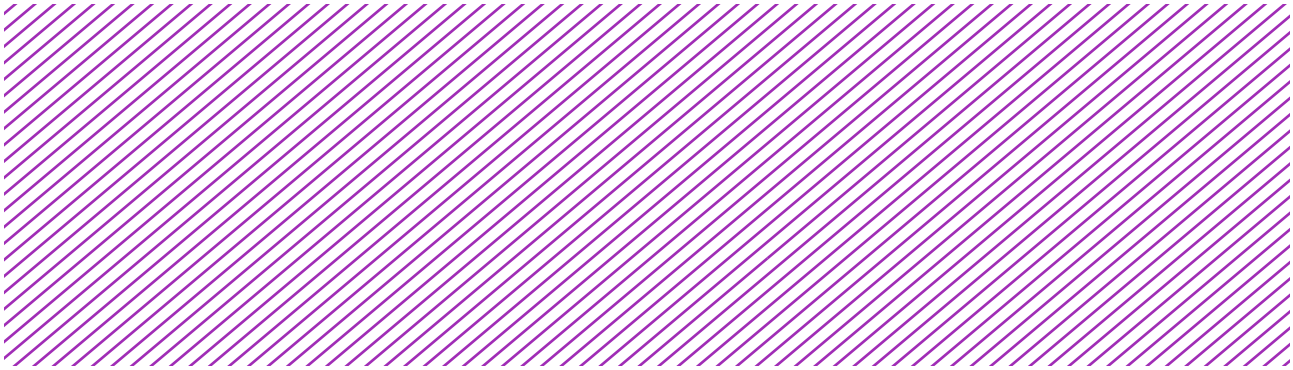
Policies implemented by central agencies such as treasury departments have a guiding influence over the way the economy develops. If emissions goals aren't integrated into high-level policies, they may not be achieved as policies continue to allow and support high-emissions activities.

This year has seen a number of developments in incorporating emissions considerations into central policy areas. Highlights include:

+ The Australian Parliament passed the Climate Change Act (2022), legislating Australia's emissions reduction target of 43 per cent on 2005 levels by 2030 and net zero by 2050. The Act also included a number of Consequential Amendments that will improve the integration of climate change into whole-of-government decision-making. This includes legislated requirements for a number of entities and schemes to consider Australia's emissions reduction targets in their operations, including Infrastructure Australia, the Northern Australia Infrastructure Facility and CSIRO.[188]
+ The federal government's October 2022–23 Budget included an analysis of the fiscal risks associated with climate change, outlined spending associated with climate change and incorporated climate change indicators into the budget statement on 'Measuring What Matters'.[189]
+ The federal government's October 2022–23 Budget also committed funding to improve the Australian Public Service's climate expertise. This includes funding for the Treasury and the Australian Accounting Standards Board to develop and introduce climate reporting standards for large businesses and financial institutions, in line with international reporting standards.[190]
+ The Australian Capital Territory has become the first jurisdiction in Australia to calculate its scope 3 emissions – which it found make up 94 per cent of its total emissions.[191]
+ Queensland,[192] New South Wales,[193] the Northern Territory[194] and Western Australia[195] all developed infrastructure strategies that included climate change mitigation as a key focus. Victoria[196] and the Australian Capital Territory[197] released infrastructure plans in previous years which included a similar focus.
+ The South Australian Government has declared a climate emergency, with the motion passing both houses of Parliament.[198]

While some jurisdictions have taken the lead in aligning certain policy areas with climate objectives, there are other policy areas that have not yet been addressed at scale. These include finance, in particular, investment and superannuation portfolios, and export trade policies that need to consider the international shift towards net zero emissions.

Another area for further action is assessing all policies for their emissions reduction impacts. In these areas, Australian governments could benefit from collaborative work, both with each other and by learning from leading governments around the world.



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2022 – the year of renewables

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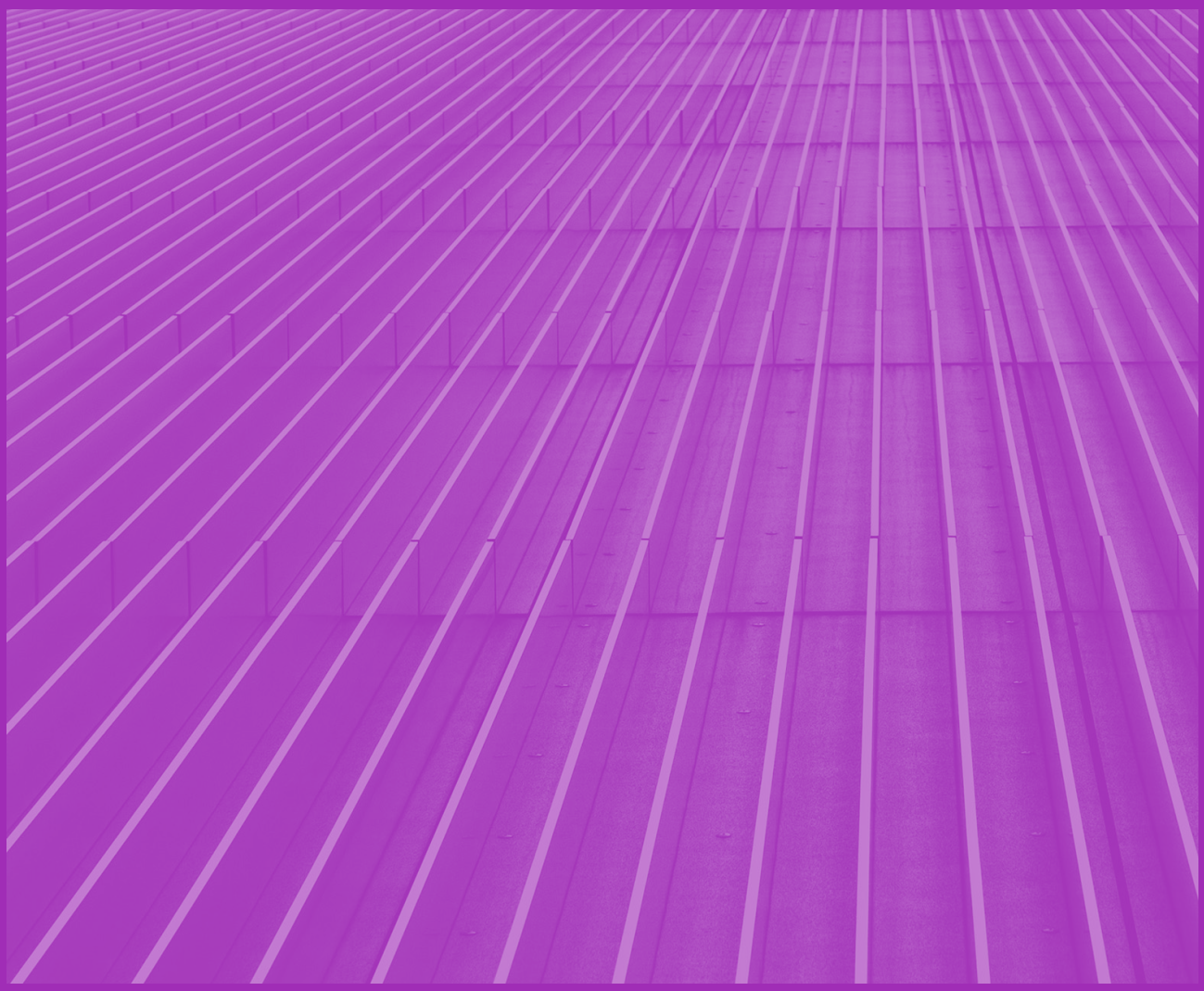

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Climateworks Centre, 2022,
Government climate action: Leading policies and programs in Australia

Published by Climateworks Centre
Melbourne, Victoria,
December 2022

This publication can be downloaded at:
www.climateworkscentre.org

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Climateworks Centre is an expert, independent adviser, committed to helping Australia and our region transition to net zero emissions. It was co-founded through a partnership between Monash University and The Myer Foundation and works within the Monash Sustainable Development Institute.