ClimateWorks AUSTRALIA

State and territory climate action:

LEADING POLICIES AND PROGRAMS IN AUSTRALIA

OCTOBER 2021

ACKNOWLEDGMENT OF COUNTRY

We acknowledge and pay respect to the Traditional Owners and Elders – past and present – of the lands and waters of the people of the Kulin nation on which the ClimateWorks Australia office is located, and all of the Elders of lands across which ClimateWorks operates nationally. We acknowledge that sovereignty was never ceded. More information.

ABOUT US

ClimateWorks Australia 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.

This report is an early outcome of ongoing ClimateWorks analysis of state and territory policies and actions geared toward achieving net zero emissions. This work is benchmarked against extensive ClimateWorks research into possible net zero pathways for Australia that are aligned to the goals of the Paris Agreement.

ACKNOWLEDGMENT OF SUPPORT

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

ClimateWorks Australia, 2021, *State and territory climate action: leading policies and programs in Australia*.

ISBN: 978 0 9924232 0 9

Executive summary

All Australian state and territory governments are now committed to net zero emissions by 2050 or earlier. These commitments cover all emissions produced within Australia's borders. The majority of states and territories have also set interim emissions targets. Current state and territory interim targets combined translate to an estimated 37-42 per cent reduction on 2005 emissions Australia-wide by 2030. While this is short of what is needed, it is higher than Australia's Paris commitment for 2030 of 26-28 per cent below 2005 levels.

As part of Decarbonisation Futures (ClimateWorks Australia 2020), ClimateWorks modelled pathways for Australia to reach net zero emissions that are aligned to the goals of the Paris Agreement. These goals include limiting global temperature rise this century to well below 2 degrees Celsius above pre-industrial levels, and pursuing efforts to limit temperature rise to 1.5 degrees Celsius. The modelling shows that this decade needs to be one of transformational action if these goals are to be achieved. Emissions need to be reduced rapidly, and net zero emissions achieved well before 2050.

ClimateWorks has analysed the targets, policies and programs that have been announced by Australian states and territories since the start of 2020 - the decade of action. States and territories have allocated billions of dollars of funding to emissions reduction measures, and have also made significant and inventive regulatory and legislative changes. Some examples of targets and policies that directly target emissions reductions are included below.

+ In **ELECTRICITY**, state and territory targets translate to a 55 per cent renewable energy target Australia-wide by 2030 and governments are taking substantial action to ensure their implementation. As of July 2021, renewable electricity projects in the pipeline equate to over 10,000 MW of new generation and 1,400 MW of new storage

+ In **TRANSPORT**, the two most populous states have targeted 50 per cent of new car sales being electric by 2030, which translates to an estimated 30 per cent of new car sales Australia-wide. Multiple jurisdictions are also addressing public transport emissions, powering rail with renewable electricity and transitioning bus fleets to electric vehicles

+ In **BUILDINGS**, Australia is leading the world on solar uptake, with increased action in energy efficiency and electrification

+ In **INDUSTRY**, and **AGRICULTURE AND LAND** – the harder-to-abate sectors – governments are beginning to address emissions and institute policies that will drive the changes needed this decade

These actions have occurred across all key sectors of the economy. Taking action on climate change has become much less of a partisan issue in Australia at the state and territory level – governments from across the political spectrum are starting to move on climate policy.

The most noteworthy initiatives that have been implemented by states and territories are presented in this report by sector – Electricity, Transport, Buildings, Industry, and Agriculture and Land. The report shows that different state and territory actions are stronger in different policy areas. 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 accelerated momentum in state and territory climate policy. They also show how much more can and needs to be achieved in Australia. The window for keeping global temperature rise to below 1.5 degrees Celsius is narrowing, but the goal is still possible if ambitious benchmarks of progress are met this decade (Intergovernmental Panel on Climate Change [IPCC] 2021). For example, in ClimateWorks' scenarios aligned to the goals of the Paris Agreement, by 2030 in Australia:

- Total annual emissions are 48-74 per cent lower than 2005 levels
- Renewables generate 70-79 per cent of electricity
- Electric vehicles represent 50-76 per cent of new car sales.

Currently, there is at least one state or territory in Australia that has set a target and introduced an implementation strategy aligned to each of these benchmarks. But there is significant work to do to achieve these, and other key transitions, across the Australian economy. This report focuses specifically on what state and territory governments have done and can do to drive emissions reductions. But states and territories cannot do it alone. Achieving the Paris Agreement will require all levels of government – along with businesses and individuals – to go 'all in' on climate action this decade (ClimateWorks Australia 2020).

2020s

This needs to be the decade of transformational action if the goals of the Paris Agreement are to be achieved

37–42%

State and territory 2030 interim targets translate to an estimated 37-42 per cent reduction on 2005 levels Australia-wide

2050

All Australian states and territory are committed to net zero emissions by 2050 or earlier

$ bn

State and territory governments have allocated billions of dollars of funding to emissions reduction measures and enacted important regulatory and legislative changes

55%

State and territory renewable energy targets translate to an estimated 55 per cent renewable energy target Australia-wide by 2030

↑ EVs

The two most populous states have targeted 50 per cent of new car sales being electric by 2030

↑ solar

Australia is leading the world in solar uptake, alongside increased action in building energy efficiency and electrification

Governments have begun to address emissions sources in harder-to-abate sectors like Industry and Agriculture

All Australian states and territories are committed to net zero emissions by 2050

As of July 2020, all Australian state and territory governments have set a target of net zero emissions by 2050 or earlier. While these net zero emissions targets are not yet aligned to the requirements for keeping temperature rise to below 1.5 degrees, they represent a significant, unified step forward in Australian climate policy. These targets cover all emissions produced within jurisdictional borders.[1] The majority of states and territories have also set interim emissions targets.

> Australia's national 2030 emissions target is a reduction of 26-28 per cent below 2005 levels. However, current state and territory 2030 emissions targets give the country a de-facto emissions target of 37-42 per cent below 2005 levels.[2]

Figure 1 details all state and territory emissions targets. The graphic outlines what share of Australia's emissions are covered by each jurisdiction's target; when each target was set and by what government; which targets are legislated; and what interim targets and whole-of-economy climate change strategies are in place to support the achievement of net zero emissions.

FIGURE 1: Australian emissions and emissions targets by state and territory

WESTERN AUSTRALIA

Target:	Net zero emissions by 2050
Target set:	2017 by Labor government
Legislated:	No
Interim target(s):	No, Western Australia 'supports' Federal Government target of reducing emissions by 26-28% by 2030
Emissions:	91.9 Mt (2019), 17.4% of Aus total

1 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 to Australia.

2 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 is expected to set interim targets by the end of 2022.

NORTHERN TERRITORY

Target:	Net zero emissions by 2050
Target set:	2020 by Labor government
Legislated:	No
Interim target(s):	Will set interim targets by mid-2022
Emissions:	20.6 Mt (2019), 3.9% 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:	164.5 Mt (2019), 31.3% 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:	136.6 Mt (2019), 25.8% of Aus total

VICTORIA

Target:	Net zero emissions by 2050
Target set:	2016 by Labor government
Legislated:	Yes (Victoria's Climate Change Act 2017), including: + 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
Emissions:	91.3 Mt (2019), 17.3% 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):	50-60% reduction on 1990 levels by 2025, 65-75% reduction by 2030, and 90-95% reduction by 2040 (legislated)
Emissions:	1.3 Mt (2019), 0.2% of Aus total

TASMANIA

Target:	Net zero emissions by 2030 (achieved in 2015)
Target set:	2017 by Liberal government
Legislated:	To come, draft bill currently open for consultation
Interim target(s):	See net zero target
Emissions:	-1.7 Mt (2019)

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
Interim target(s):	At least 50% reduction on 2005 levels by 2030
Emissions:	23.9 Mt (2019), 4.5% of Aus total

This is the transformational decade for climate

This decade must be one of transformational action in Australia and around the world if the goals of the Paris Agreement are to be achieved. The Paris Agreement aims to limit global warming to well below 2, and preferably to 1.5 degrees Celsius. The difference in the physical impacts of 1.5 and 2 degrees of warming are substantial (Intergovernmental Panel on Climate Change [IPCC] 2021). From an Australian perspective, keeping temperature rise to below 1.5 degrees means rapidly reducing emissions this decade and achieving net zero emission well before 2050. Doing this involves:

- Rapidly deploying mature emissions reduction solutions – such as energy efficiency improvements in buildings, and renewable electricity generation assets – at an accelerated scale
- Undertaking extensive research, deployment and demonstration of emissions reduction solutions for harder-to-abate sectors like industry, agriculture, and freight transport
- Ensuring new assets that will still be in operation in 2050 – such as large energy and transport infrastructure assets – are built with a net zero emissions future in mind (Infrastructure Sustainability Council of Australia [ISCA], ClimateWorks Australia and the Australian Sustainable Built Environment Council [ASBEC] 2020). This includes no new additional fossil fuel generation capacity.

As part of Decarbonisation Futures (2020), ClimateWorks modelled two scenarios of the Australian economy that are aligned to net zero emissions by 2050 (compatible with a 2 degree Celsius global temperature limit), and one scenario aligned to net zero emissions by 2035 (compatible with a 1.5 degree Celsius global temperature limit, the primary goal of the Paris Agreement). These scenarios show an Australian economy in 2030 that is substantially different to the economy in 2020. Figure 2 provides some examples of what Australia looks like in 2030 (compared to 2020) in scenarios aligned to net zero by 2050 and 2035.

State and territory governments have a central role to play in enabling the changes required this decade. They have constitutional power and responsibility over many key enablers – such as transport infrastructure – and have the important levers available to incentivise change – such as registration and stamp duty for electric vehicles. State and territory governments can also drive change in the private sector, addressing key barriers to development and deployment through grant programs and regulatory and legislative changes. States and territories can develop sector-wide emissions reduction plans, such as Victoria's transport emissions pledge. They can also enable collaboration between sectors, such as New South Wales' Electricity Infrastructure Roadmap, which connects renewable energy zones to low carbon industry development.

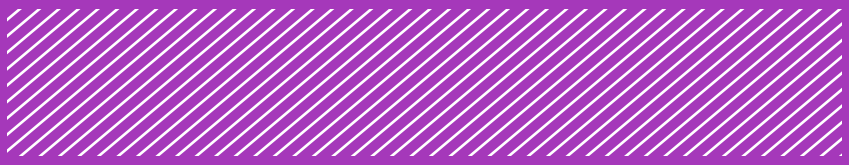
States and territories can achieve substantial emissions reductions on their own, but achieving the goals of the Paris Agreement will require ambitious action at all levels of government. Key policy levers require coordination across all states and territories, such as the minimum energy requirements in the National Construction Code. In the absence of strong national-level policy, there is an opportunity for states and territories to work together to create ambitious and consistent national approaches to key policy areas.

The task ahead is large, but emissions reducing solutions are increasingly available – technologies exist now to bring emissions to zero or near zero in all sectors (ClimateWorks 2020). There are pathways to net zero by 2050 worldwide that are technically feasible, cost-effective and socially acceptable (International Energy Agency [IEA] 2021).

The increase in state and territory ambition and action since the start of 2020 has put Australia on the path towards meeting its commitments under the Paris Agreement. The emissions targets outlined in Figure 1 have begun to be implemented at scale. Multiple economy-wide and sector-specific emissions reduction strategies have been released. Additionally, state and territory governments have used the opportunity of COVID-19 economy recovery spending to further set foundations for a net zero emissions future. This upscaling of action is happening across the political spectrum. The momentum also exhibits how much more can and needs to be done in the rest of the decade.

ClimateWorks has analysed the targets, policies and programs that have been announced and implemented by Australian states and territories since the start of 2020 – the beginning of the decade of action. The leading policies and programs are presented in the following sections of this report. They are organised by sector – Electricity, Transport, Buildings, Industry and Agriculture and Land.

FIGURE 2: Benchmarks of progress in 2030 for Australia in scenarios aligned to net zero by 2050



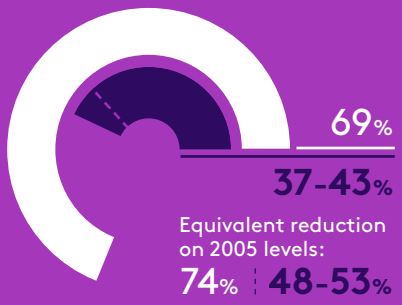
Australia in 2030 in *Decarbonisation Futures* scenarios aligned to...

KEY:

2°C OF WARMING

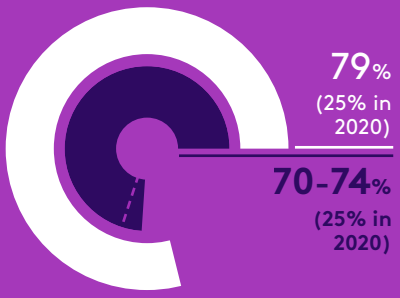
1.5°C OF WARMING

The reduction in annual emissions from 2020 levels is...

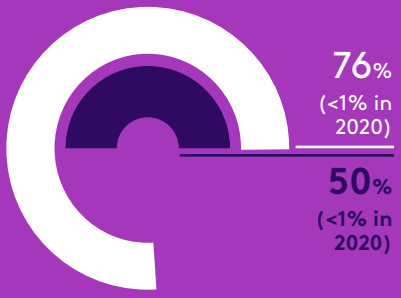


Equivalent reduction on 2005 levels:
74% | 48-53%

The renewable share of electricity generation is...

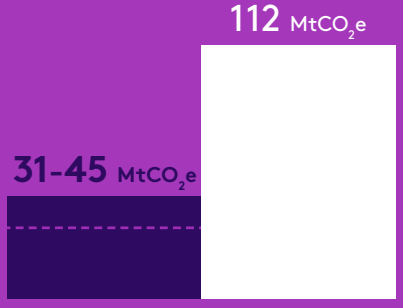


The electric vehicle share of new car sales is...

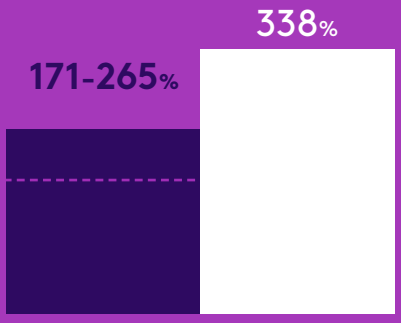


The improvement in residential energy performance compared to 2020 is...

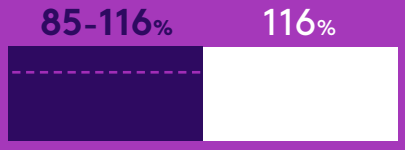
The emissions sequestered through nature-based solutions are...



The increase in the use of zero emissions fuels like hydrogen and biofuels between 2020 and 2030 is...



The increase in rooftop solar generation compared to 2020 is...



Electricity

Electricity generation continues to be Australia's largest source of emissions, even though electricity emissions have been decreasing since 2016 (Australian Government 2021a). State and territory governments have been investing in renewable electricity for many years, but the ambition and scale has increased considerably since the beginning of 2020. This has been especially notable in the three large east coast states – New South Wales, Queensland, and Victoria – which account for 82 per cent of Australia's electricity emissions (Australian Government 2021a).

THE AIM

In ClimateWorks' scenarios that are aligned to 1.5 and 2 degrees of warming (see Figure 2), 70-79 per cent of electricity is renewable-generated by 2030 and electricity emissions reach zero or near zero by 2040. Additional generation capacity is also needed – an estimated 54-84 per cent increase in capacity by 2050 – to meet the demand of a growing population and increased electrification (ClimateWorks 2020). Substantial investment in firming up the electricity grid – through battery deployment and demand response measures – is necessary to provide affordable and reliable supply. Improvement in the efficiency of electricity use is also required across all sectors (energy efficiency is discussed in further detail in the proceeding sector sections of the report).

PROGRESS SO FAR

In aggregate, current state and territory 2030 renewable energy targets represent an implicit Australian renewable energy target of approximately 55 per cent.[3] As of July 2021, renewable electricity projects in the pipeline equate to over 10,000 MW of new generation and 1,400 MW of new storage (Clean Energy Council 2021). Key state and territory actions this decade include:

Tasmania achieving 100 per cent net renewables and has set a legislated target of 200 per cent renewables by 2040

South Australia setting a target of 100 per cent net renewables by 2030 and has noted that 500 per cent renewables is possible by 2050

New South Wales generating an estimated 67 per cent of its electricity from renewables by 2030 through its Electricity Infrastructure Roadmap

New South Wales, Queensland and Victoria announcing more than $1.1 billion of funding to facilitate the establishment of renewable energy zones that will serve as modern-day power plants

Other key actions by states and territories, announced before 2020, include:

The Australian Capital Territory procuring 100 per cent renewable energy

Victoria, Queensland and Northern Territory setting targets for 50 per cent renewables by 2030

Northern Territory targeting 70 per cent renewables in remote communities

3 This has been calculated by combining current state and territory shares of Australia's electricity generation and their 2030 renewable generation targets. New South Wales does not have a renewable target but an estimate of 67 per cent renewables by 2030 is based on current generation assets, retirement schedules, and new generation announced as part of the Electricity Infrastructure Roadmap.

MORE TO BE DONE

In coming years, governments can build on current commitments. There is an opportunity to increase 2030 renewable energy targets and to create renewable energy zones, or equivalent actions, in jurisdictions that don't yet have them. The share of renewables in the mix needs to increase as well as the overall capacity to be prepared for increases in demand. There is also scope for improved whole-of-economy energy efficiency targets to counteract increases in demand from electrification, as well the deployment of new grid solutions like the integration of electric vehicles as battery assets.

> Current state and territory 2030 renewable energy targets represent an implicit Australian renewable energy target of approximately 55 per cent

CASE STUDY:

Tasmania's legislated target of 200 per cent renewables by 2040

In November 2020, Tasmania reached 100 per cent net renewables (Tasmanian Government 2020). This is largely a result of the state's abundant hydroelectric resources, but recent years have also seen a build-out of wind generation assets (OpenNEM 2021). The island state is now looking beyond 100 per cent renewables: it has legislated a target of 200 per cent renewables by 2040 – double the state's renewable generation from current demand levels. This is planned to be achieved through further wind and pumped hydro assets, as well as renewable hydrogen initiatives.

The Tasmanian Government is implementing a $50 million renewable hydrogen industry development support package, and is exploring the potential for renewable energy zones (Australian Energy Market Operator [AEMO] 2020). The state has also signed a memorandum of understanding with the Federal Government to progress two projects (Prime Minister of Australia 2020). Project Marinus includes interconnector and transmission developments that will allow Tasmania to export additional electricity generation to the mainland. This will improve reliability in the National Electricity Market and is expected to reduce wholesale electricity prices (TasNetworks 2021). The Battery of the Nation initiative is exploring the potential for hydro pumped storage in Tasmania that will support grid reliability and stability across the National Electricity Market (Hydro Tasmania 2021).

CASE STUDY:

South Australia on track to 100 per cent renewables by 2030

In the year to July 2021, 62 per cent of South Australia's electricity was generated by renewable assets (OpenNEM 2021). The state has been able to attract significant private sector investment in wind and solar through a combination of the Federal Government's Renewable Energy Target scheme, developing a wind farm planning policy (Government of South Australia 2012), and underwriting renewable generation with supply contracts (AGL 2009). The government also supported employment alternatives when the state's largest coal generator closed, including a $6 million investment in a solar-powered greenhouse that employed 220 people (Government of South Australia 2016).

The South Australian Government is targeting 100 per cent net renewables by 2030 (Government of South Australia 2021), and the Australian Energy Market Operator forecast South Australia reaching over 80 per cent renewables by mid-decade (AEMO 2021). The government has highlighted the potential for South Australia to generate 500 per cent of current local grid demand by 2050, exporting the additional generation (Government of South Australia 2021). In addition, one in three homes in South Australia have rooftop solar, and the state has the world's largest per capita rollout of home battery storage (Government of South Australia 2021).

Transport

Transport is Australia's fastest growing source of emissions (Australian Government 2021a), but solutions are available to counteract this trend. This decade has shown a marked change in the ambition of states and territories in reducing transport emissions. This includes the two most populated Australian states – New South Wales and Victoria – developing ambitious light electric vehicle (EV) strategies that have targets aligned to net zero by 2050 pathways.

THE AIM

In ClimateWorks' scenarios aligned to 1.5 and 2 degrees of warming, electric vehicles reach 50-76 per cent of new car sales by 2030 in Australia and account for 15-28 per cent of the total vehicle fleet. There is also considerable uptake of zero emissions trucks and buses. Passengers and freight are shifted to lower emissions modes like rail, where possible, through improved infrastructure and services, and there is a doubling or more in the use of zero emissions fuels, largely in the freight sector. Infrastructure, planning and behaviour change is also needed to reduce overall per capita demand for transport modes to assist in offsetting demand from increases in population.

PROGRESS SO FAR

Australia's two largest states – New South Wales and Victoria – have targeted more than 50 per cent of new car sales to be electric by 2030. These targets alone equate to an estimated 30 per cent of new car sales Australia-wide being electric by 2030.[4] Other leading state and territory actions this decade include:

South Australia targeting EVs being the default choice for private passenger vehicles by 2035

New South Wales, Victoria and South Australia offering direct $3000 subsidies on new electric vehicle purchases

Australian Capital Territory, Tasmania, Northern Territory and New South Wales waiving stamp duty for electric vehicles

Australian Capital Territory, Tasmania, New South Wales and South Australia targeting 100 per cent electric government fleets (where fit-for-purpose) by 2030

New South Wales transitioning its 8,000 public buses to electric by 2030; Victoria targeting all public bus purchases to be zero emissions[5] from 2025; Australian Capital Territory targeting full transition of bus fleet by 2040; Victoria and New South Wales powering all metro rail with renewables this decade

Early trials being undertaken for hydrogen refuelling for freight vehicles in Western Australia and South Australia, and the Queensland Government introducing five hydrogen fuel cell sport utility vehicles (SUVs) into its government fleet

Substantial investments being made in public and active transport infrastructure, such as Western Australia expansion of their METRONET network (72 kilometres of new passenger rail and up to 18 new stations)

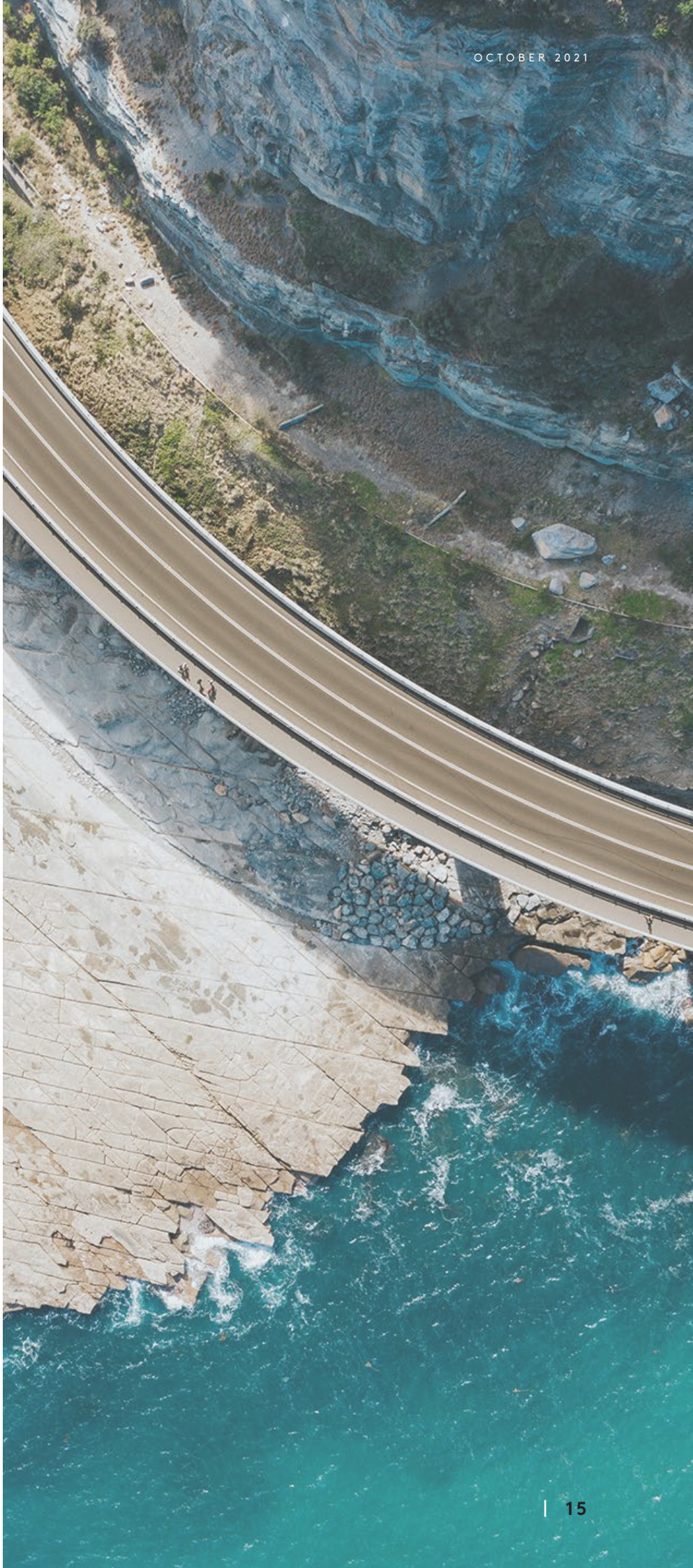
Victoria investing in mode shifts for both passenger and freight transport, targeting 25 per cent active travel mode share by 2030 and providing ongoing funding for a freight Mode Shift Incentive Scheme

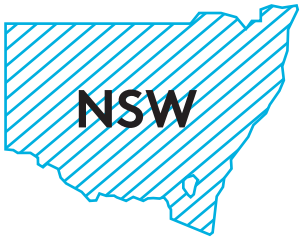
4 This calculation combines New South Wales and Victoria's shares of new vehicle sales in ClimateWorks' Decarbonisation Futures (2020) scenario modelling and their electric vehicle uptake targets for 2030.

5 Zero emissions vehicles include battery electric vehicles, as well as other vehicles technologies that do not use fossil fuels, such as hydrogen fuel cell vehicles.

MORE TO BE DONE

In the coming years, governments have the opportunity to do more to reduce rising transport emissions. This includes reducing overall transport demand and encouraging shifts to lower emissions modes, such as through better land use planning and improving access to public transport and active transport options. Governments can also drive the transition to zero emissions vehicles through setting electric vehicle uptake targets and developing implementation strategies aligned to the emissions reductions required to meet the goals of the Paris Agreement. Of particular importance in Australia is raising zero emissions vehicle model availability and uptake across the country through coordinated action (Posner 2021). Governments can also adopt lessons from action overseas to improve public transport use and address freight emissions. Sixteen US jurisdictions, for example, have signed a joint MOU to achieve a target of 30 per cent of medium and heavy duty vehicles being zero emissions by 2030 (California Air Resources Board 2020).





CASE STUDY:

New South Wales' Electric Vehicle Strategy

In July 2021, New South Wales released its Electric Vehicle Strategy (NSW Government 2021a), which is underpinned by a target to increase light electric vehicles sales to 52 per cent by 2030–31. This uptake target is supported by a number of policies that include:

- Rebates of $3000 for the first 25,000 electric vehicles sold for under $68,750
- A stamp duty waiver from electric vehicles purchased for under $78,000 and from all other EVs and plug-in hybrids from 2027 (or when EVs make up at least 30 per cent of new car sales)
- A $171 million package for charging infrastructure that aims to ensure households with limited off-street parking would be no more than 5km from a charger, and chargers would be installed at 100km intervals along major highways and at 5km intervals on major roads in Sydney
- Access to T2 and T3 transit lanes for electric vehicles
- A target to electrify the NSW Government's passenger vehicle fleet by 2030.

This policy suite is supported by Transport New South Wales' Future Energy Strategy (NSW Government 2021b). This strategy includes actions such as transitioning the state's public transport fleet to zero emissions vehicles, and powering all metro rail and light rail with net zero emissions electricity.

CASE STUDY:

Australian Capital Territory's transport commitments in the 2020 governing agreement

In the 2020 Australian Capital Territory election, the Labor party was re-elected in a coalition with the Greens party. As part of this coalition, a Parliamentary and Governing Agreement (2020a) was signed between the two parties, in which climate change was highlighted as a key priority area of action. The Australian Capital Territory now procures 100 per cent renewable electricity and climate action in the territory has shifted to decarbonising other sectors including transport, which accounts for approximately 60 per cent of the territory's emissions (ACT Government 2021). Expanding the number of zero emissions vehicles (ZEVs) in the territory was a central part of this climate change focus, and a list of actions that were agreed to be undertaken in the four-year electoral term include:

- Engaging with the vehicle industry and adopting an ambitious target for new ACT vehicle sales to be zero emission by 2030[6]
- Providing financial incentives for ZEVs, including free registration
- Developing additional financial incentives to support zero emissions vehicle uptake by businesses and the community sector
- Implementing a pathway for ACT to use only zero emissions public transport, garbage trucks, taxis and rideshare vehicles by the mid 2030s
- Enacting regulation to require charging infrastructure for new multi-unit residential and commercial buildings, and investigate measures to support retrofitting of charging infrastructure in existing buildings.

The agreement also included other transport-related actions such as the provision of a pathway to achieve net zero emissions in the territory planning system, and an extension of light rail infrastructure, a central public transport mode in the city of Canberra.

6 Note: This action is not an explicit zero emissions vehicle target of 100 per cent by 2030.

Buildings

Residential and commercial buildings comprise around one-fifth of Australia's emissions (Australian Government 2021a). Australian states and territories have had policies and programs in place to drive energy efficiency improvements and renewable energy uptake for years. Since the start of the decade, states and territories have built on these foundations to drive deeper change, and there is now the opportunity to do even more. 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.

THE AIM

In ClimateWorks' scenarios aligned to 1.5 and 2 degrees of warming, energy performance improves this decade by 44-49 per cent in residential buildings, and by 16-28 per cent in commercial buildings. We also see a doubling of rooftop solar generation and a transition away from gas use in these scenarios, especially in residential, with full electrification occurring in all buildings by 2040. These changes reduce emissions, and have co-benefits in terms of health, energy costs and comfort.

PROGRESS SO FAR

Four jurisdictions,[7] representing 66 per cent of the Australian population (Australian Bureau of Statistics [ABS] 2020), have retailer energy efficiency schemes. These schemes set energy efficiency targets that are required to be met by electricity and gas retailers through the provision of energy saving initiatives for households and businesses. Since the start of the decade, these four schemes have been extended until the end of the decade, or later. Additional recent actions to drive energy efficiency improvements include:

The Australian Capital Territory planning to implement minimum energy efficiency standards for rentals by 2022-2023

Victoria adopting minimum heating efficiency standards for rental properties from 2023

Victoria's Residential Efficiency Scorecard Program, a voluntary thermal performance and energy efficiency assessment for existing homes, is to become available nationally, creating a nationally consistent approach to assessing the energy performance of existing homes

Other specific energy efficiency investments include: New South Wales' $157.8 million in LED lights for schools, South Australia and Victoria's $60 million in government buildings energy efficiency, and Tasmania's $15 million in public housing heating and energy efficiencies

Australia also leads the world on a per person basis for rooftop solar PV. More than 29 per cent of households in Australia have rooftop solar[8] (Australian Government 2021b), and states and territories continue to drive further uptake, such as through Victoria's Solar Homes program. In terms of electrification, the Australian Capital Territory (2020) has targeted no gas use in buildings by 2045 (the first jurisdiction to do so).

7 New South Wales, Victoria, South Australia and the Australian Capital Territory.

8 Rooftop solar doesn't necessarily include solar water heating.

MORE TO BE DONE

The Australian Capital Territory has a 2045 target to phase out gas use in buildings - other governments have the opportunity to build on this ambition to target 2040, in line with ClimateWorks' scenarios aligned with 1.5 and 2 degrees of warming. There is also much greater deployment of energy efficiency measures that is possible, cost-effective and will assist with both emissions reductions and energy bill savings for households and businesses. Jurisdictions without retailer energy efficiency schemes can introduce them, and those that already have such schemes can lift the targets to the level required for Paris-aligned pathways. Incentives are needed not just for the uptake of energy efficient appliances, but also building-envelope retrofits and the construction of highly efficient, all-electric new buildings.

Another key part of improving energy performance is greater stringency in minimum requirements. States and territories can strengthen these requirements for residential buildings through the National Construction Code (Australian Sustainable Built Environment Council [ASBEC] and ClimateWorks Australia 2018). Under the Trajectory for Low Energy Buildings policy, there are opportunities to review these requirements in 2022 and 2025 – there is a need to set forward targets beyond 2025 to provide long-term certainty for industry, building owners, and tenants.

> More than 29 per cent of households in Australia have rooftop solar

CASE STUDY:

Victoria's Household Energy Savings Package

Victoria's COVID-19 economic recovery-led Budget for 2020-21 included record spending on renewable energy and energy efficiency. This spending included:

- $335.5 million to replace wood, electric or gas fired heaters with new energy-efficient systems
- $112 million for social housing energy efficiency upgrades
- $191 million to expand the Solar Homes program, which provides rebates for solar rooftop panels and batteries
- $5.9 million to introduce a new 7-Star energy efficiency standard for new homes (previous standard was 6-Star)
- $14 million to expand Victoria's retailer energy efficiency scheme, the Victorian Energy Upgrades program.

This substantial funding for improving residential energy efficiency was paired with a $5.3 billion investment in 12,000 new 7-Star social housing homes. It was also accompanied by spending to drive emissions reductions in commercial buildings, including:

- $38 million for solar rebates for small businesses under the Solar Homes program (for the first time)
- $3.72 million to enable the development of a Gas Roadmap to support more efficient use of gas and support opportunities for electrification and alternative fuels
- $59.9 million to the Greener Government Buildings (GGB) Program and creating a revolving fund that will see energy savings reinvested in further buildings upgrades.

CASE STUDY:

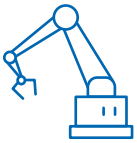
The Australian Capital Territory is phasing out fossil fuel gas

The Australian Capital Territory is the first Australian jurisdiction to set a target for the full phase out of fossil fuel gas: by 2045, at the latest. In 2020, the Labor and Greens coalition's Parliamentary and Governing Agreement announced this target. Initial policies and programs to support this that were part of the agreement include:

+ Legislating to prevent new gas mains network connections to future greenfield residential development in 2021-22
+ Commencing a transition project to advance all-electric infill developments, with a goal of no new gas mains network connections to future infill developments from 2023
+ Ensuring all new ACT Government buildings and facilities are fossil-fuel-gas free, including new leases, and retrofitting existing buildings and facilities with a goal of net zero emissions post retrofit by 2040
+ Developing a flagship all-electric commercial centre, and use lessons from this project to assist the phase out of fossil-fuel gas
+ Adopting an ACT Appendix to the Building Code of Australia that sets out improved sustainability standards all new buildings must meet, including the phasing out of gas.

The Australian Capital Territory also announced in 2020 the first all-electric hospital in Australia. The Canberra Hospital Expansion – a 40,000sqm emergency, surgical and critical healthcare facility – will be entirely powered by renewable electricity and will save 1886 tonnes of CO2 each year (ACT Government 2020b).

Industry



Industry produces more than 40 per cent of Australia's emissions (Australian Government 2021a). Almost half of industry 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. Since the start of the decade, states and territories have begun to address the harder-to-abate emissions sources in industry. Governments have built on efforts to improve material and energy efficiency. They have also established new low carbon industries which can drive economic growth and employment, and capitalise on Australia's competitive and comparative advantages.

THE AIM

In ClimateWorks' scenarios aligned to 1.5 and 2 degrees of warming, industry emissions are reduced by 40-49 per cent in Australia this decade. This can be achieved through improvements in electrification, renewable energy use, energy efficiency, industrial process changes, and shifts to lower emissions products and services. Australia also has the opportunity to become a low-carbon industry superpower this decade by developing new industries such as renewable hydrogen and critical minerals.

PROGRESS SO FAR

This decade, states and territories have introduced programs employing a variety of emissions-reducing mechanisms that range from grant programs to loan schemes and regulatory changes:

New South Wales announcing its $750 million Net Zero Industry and Innovation program

Tasmania introducing an Emissions Reduction Loan Scheme for large emitters to trial clean technologies and innovative production processes

Northern Territory releasing its Large Emitters Policy, which requires large industrial project proponents to develop emissions targets and emissions reduction plans. Western Australia's similar policy, the Greenhouse Gas Emissions Policy for Major Projects, was applied to its first three projects

Queensland's Large Customer Adjustment program, which delivers free audits and grants of up to $250,000 to help improve energy management, is being provided further funding

Victoria establishing a Business Recovery Energy Efficiency Fund that provides grant funding to businesses for energy efficient capital works and energy demand management technologies

Governments are also investing heavily in industries like renewable hydrogen, green manufacturing and critical mineral mining. Recent low carbon industry policy highlights include:

All states and territories developing renewable hydrogen strategies or allocated significant funding to renewable hydrogen development in recent years, such as Queensland's $2 billion Renewable Energy and Hydrogen Jobs Fund

Western Australia leading the nation in exploring a variety of new low carbon industries - their 2021-22 Budget included funding for a range of emerging sectors, including green steel, battery manufacturing, and renewable hydrogen

States and territories are also supporting the transition of skills and employment in regions that have historically been economically dependent on high emitting industries:

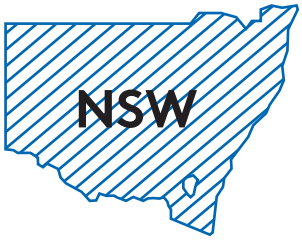
New South Wales is supporting coal communities transition to new sustainable jobs through the Royalties for Rejuvenation Fund

Victoria's Latrobe Valley Authority and Economic Development Fund are assisting with economic diversification in the Latrobe Valley region as coal-fired power stations are closed

Western Australia's Collie Futures Fund is providing grants and up to $2 million in matched funding for project proposals that will drive jobs and economic development and diversification in the historically coal-focused Collie region

MORE TO BE DONE

There is room to substantially increase the scale of low carbon industries (Garnaut 2020). New low carbon industries will support the transition away from existing high-emitting export industries such as coal and natural gas. Governments can draw from early examples, like New South Wales' Industry and Innovation program, to develop large scale programs that drive innovation, employment and emissions reductions in heavy industries. Governments can also ensure new industrial developments are built with a net zero emissions future in mind through regulatory change that requires project proponents to show how new developments are aligned to emissions goals.



CASE STUDY:

New South Wales' Net Zero Industry and Innovation Program

In March 2021, the New South Wales Government announced the allocation of $750 million in funding for a new Net Zero Industry and Innovation Program. This is the largest allocation of funding to date by an Australian state or territory government to reduce industry emissions and capture the economic benefits of clean industries.

The program will co-invest with the private sector to drive innovation and new technologies. Funding is allocated to three focus areas:

- $380 million to support high-emitting existing industries deploy low emissions technologies and infrastructure (almost 30 per cent of New South Wales' emissions come from 55 large industrial facilities)
- $175 million to set up low carbon industries, including new Clean Manufacturing Precincts, and at least $70 million for the establishment of hydrogen hubs in the Hunter and Illawarra regions
- $195 million for research and development of new clean technologies including for industrial energy use and electrification, and solutions for primary industries.

Many of the initiatives in the program will benefit from the changes to New South Wales' electricity system announced as part of the Electricity Infrastructure Roadmap. The Roadmap includes the development of renewable energy zones in regional New South Wales that can provide industry with cheap, renewable electricity.

Australian states and territories have the opportunity to become low-carbon industry superpowers this decade by developing new industries such as renewable hydrogen and critical minerals.

Agriculture and Land

Agriculture and land-use sectors account for approximately 15 per cent of Australia's emissions, or around 12 per cent when accounting for land use, land use change, and forestry (LULUCF) (Australian Government 2020a). LULUCF emissions are negative in Australia, and further sequestration is essential for the sector in contributing to net zero emissions. The majority of positive emissions in agriculture come from non-energy sources, particularly methane from livestock. The solutions for agriculture emissions are still emerging. States and territories have begun to take action to trial and develop these solutions, as well as to incentivise higher rates of carbon farming.

THE AIM

Extensive research, development and deployment of solutions for non-energy agricultural emissions sources – such as algae feeds for cattle and novel alternative proteins – are needed this decade. In addition, improvements can be made in agricultural energy efficiency and electrification. In ClimateWorks' scenarios aligned to 1.5 and 2 degrees of warming, the energy intensity of agriculture improves by 21-22 per cent this decade, and agricultural machinery and processes are electrified – the electricity share of total energy use triples from eight to 24 per cent.

Also, ClimateWorks' modelling shows a need for much greater nature-based sequestration this decade. In scenarios aligned to 1.5 and 2 degrees of warming, there is 31-112 Mt of sequestration, which can be achieved through methods like carbon forestry and blue carbon.

PROGRESS SO FAR

This decade, states and territories have begun to enact policies to address agricultural emissions, and to introduce initiatives to encourage farmers and landowners to develop carbon forestry. Recent policy highlights include:

Western Australia developing a carbon neutral agriculture scheme and a carbon neutral farm showcase

South Australia supporting the development of anti-methane seaweed production

Victoria undertaking a $10 million pilot program to deliver up to 250 on-farm emissions reduction action plans

New South Wales announcing a Primary Industries Productivity and Abatement Program that will support commercialisation of technological solutions to agriculture emissions, and develop land-based carbon markets

Victoria and Western Australia announcing carbon farming programs

Queensland providing further support for its Land Restoration Fund, which seeks to expand carbon farming by supporting projects that deliver emissions reductions and additional environmental, socio-economic and First Nations co-benefits

MORE TO BE DONE

The task for the rest of the decade is for governments to undertake emissions reductions at scale, and at the level of ambition held by the industry: Meat & Livestock Australia (2020), for example, has targeted carbon neutrality by 2030. There is also substantial room to increase nature-based carbon sequestration efforts, with support needed to drive greater action than is currently being demanded by the Federal Government's Emissions Reduction Fund (ERF).

Sequestration efforts like carbon forestry will need to be balanced against other land-use needs and its vulnerability to extreme weather such as bushfires and drought. A deeper understanding of the impacts of pursuing solutions across the food and land use system is needed to support the achievement of multiple outcomes across the system, not just emissions reductions. Government-supported research and development will assist in developing sustainable carbon sequestration efforts and solutions for agricultural emissions that have co-benefits for other land use outcomes.

CASE STUDY:

Queensland's Land Restoration Fund

The Queensland Government's $500 million Land Restoration Fund builds on Australia's voluntary Emissions Reduction Fund (ERF), which encourages land-based emissions reductions. Through the ERF, landowners can earn income by generating Australian Carbon Credit Units (ACCUs) from carbon farming projects. To further incentivise such projects, the Land Restoration Fund provides income for emissions reductions (as the ERF does) but also pays for quantified co-benefits such as environmental, socio-economic and First Nations outcomes.

The fund has a commercial arm, the Land Restoration Fund Trust, which purchases carbon credits and co-benefits, as well as an arm focused on research, innovation and market development. This part of the fund seeks to develop new carbon farming methods, improve measurement and assessment tools, and increase the capacity of Queensland landowners, farmers, and First Nations people to access credits. Initiatives supported by the fund include:

- Working with the CSIRO on the LOOC-C tool (2021), which allows users to quickly assess the options available on their land for carbon projects
- Supporting the Aboriginal Carbon Foundation (2021) in developing and implementing an Indigenous-owned verification framework for environmental, social and cultural values associated with carbon framing
- The Blue Heart initiative (2021), a partnership between the Queensland Government, the Sunshine Coast Council, and sewerage service provider Unitywater, that is trialling a blue carbon project.

In Queensland's 2021/22 State Budget, a $500 million Carbon Reduction Investment Fund was established. The principal amount is to remain invested, but returns will be used to fund subsequent rounds of the Land Restoration Fund.

Integrating climate action for maximum impact

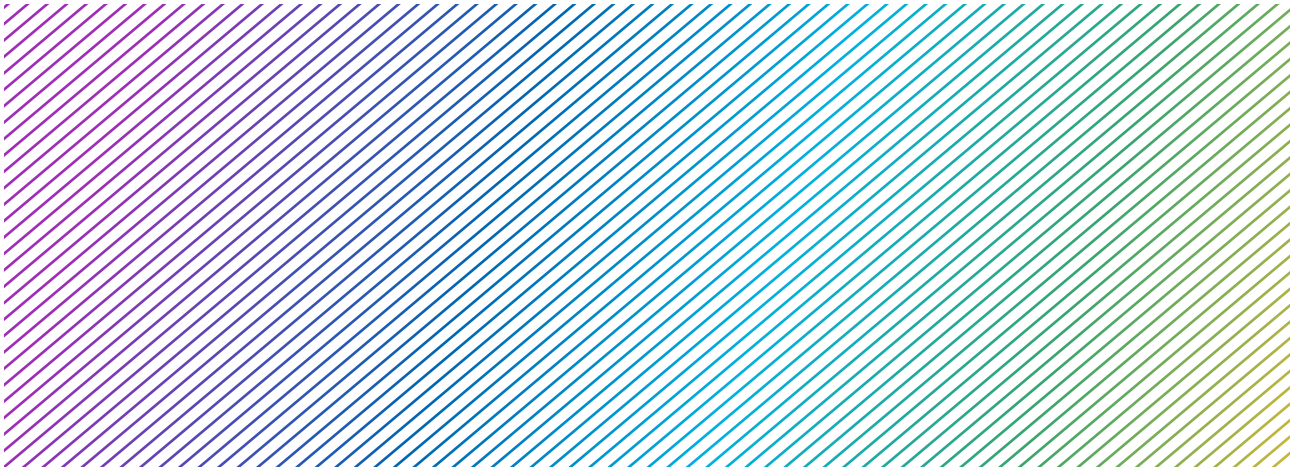
This report has outlined some of the key sectoral policies that are driving emissions reductions in states and territories across Australia. A sectoral focus allows governments to target specific sources of emissions in their policies, and to work with the stakeholders that these policies will impact. But the acceleration of climate action that is needed to achieve the goals of the Paris Agreement requires action on all fronts. This decade, governments will need to integrate climate goals into foundational policies that have impacts across the economy. This includes those that relate to infrastructure, land-use and spatial planning, procurement and finance.

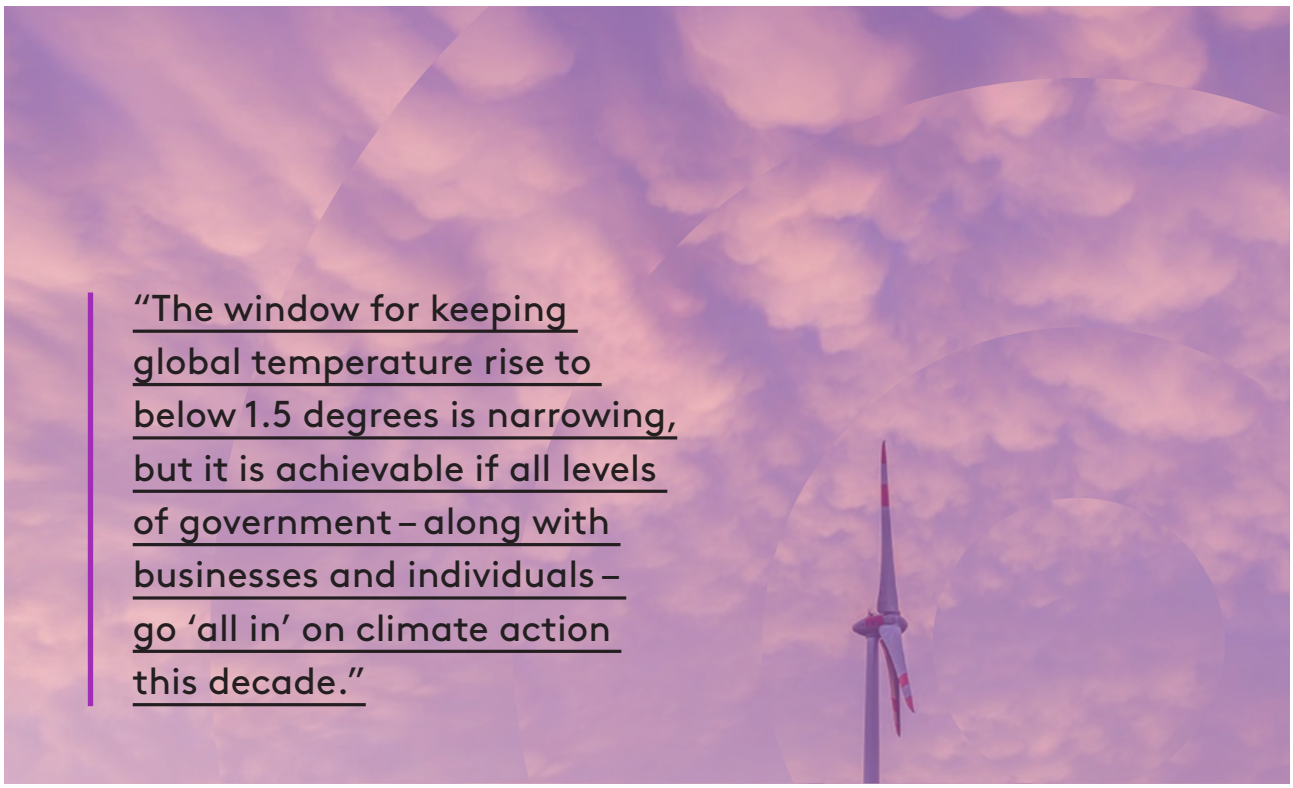
Policies implemented by central agencies like Treasury departments have a guiding influence over the way the economy develops. Not integrating emissions goals in these policies may stop those goals from being achieved if the policies continue to allow and support high emissions activities. At the very least, the mismatch between policies will lead to an inefficient allocation of resources – for example, infrastructure guidelines that make no considerations for net zero emissions will likely lead to infrastructure being built that could become stranded assets or require costly retrofits in the future (ISCA, ClimateWorks Australia and ASBEC 2020). On the other hand, if different policy frameworks work in concert with each other, efficient and cost-effective emissions reductions can be achieved.

States and territories in Australia have begun incorporating emissions considerations into central policy areas, and building the capacity of government officials to factor emissions into their decision making. Highlights of recent government action in integrating climate change into central policy include:

- The Australian Capital Territory implementing a social cost of carbon that will be factored into a range of government decisions
- South Australia's infrastructure project guidelines including a specific requirement for projects to show how it supports net zero emissions by 2050
- Tasmania's Procurement Better Practice Guidelines providing clear guidance for aligning government procurement to climate change objectives
- The Environmentally Sustainable Development Roadmap for Victoria's Planning System making provisions for renewable energy and supporting low emissions vehicle uptake in line with emissions targets.

As states and territories break new ground in Australia – such as the Australian Capital Territory with its social cost of carbon – the social license to act will improve for other states and territories, and there is the potential for tipping points in the momentum of mainstreaming emissions goals. 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 state and territory investment and superannuation portfolios, and export trade policies that need to consider the international shift toward net zero emissions. In these areas, states and territories could benefit from collaborative work, both with each other and by learning from leading governments around the world.





"The window for keeping global temperature rise to below 1.5 degrees is narrowing, but it is achievable if all levels of government – along with businesses and individuals – go 'all in' on climate action this decade."

The decade of action has just begun

The leading policies, targets and programs highlighted throughout this report indicate a strong increase in momentum for climate action in states and territories across Australia, especially since the start of this decade. All states and territories have committed to net zero emissions by 2050 or earlier, and state and territory governments across the political spectrum have begun to implement the kinds of ambitious policies needed to reach this shared goal. Some are making great progress in areas of renewable electricity and electric vehicle uptake, while others are leading in cross-sectoral policy that will drive long-term change. The sheer number of policies, programs and targets since the start of 2020 shows positive movement.

But the decade of transformational action has just begun, and action needs to accelerate across all states and territories and across sectors of the economy. There is much more work to be done in accelerating the deployment of mature emissions reduction solutions, undertaking research and development for emerging solutions, and ensuring only assets that will support the net zero transition are built.

Subnational governments can not do all this work alone – all levels of government in Australia and across the world need to increase their ambition. To meet the goals of the Paris Agreement, stronger interim emissions targets for 2030 are required, and net zero emissions needs to be achieved well before 2050 (ClimateWorks 2020). The window for keeping global temperature rise to below 1.5 degrees is narrowing, but it is achievable if all levels of government – along with businesses and individuals – go 'all in' on climate action this decade. The good news is that most emissions reduction technologies continue to outperform expectations, and the costs are dropping and will continue to drop as their uptake increases.

So far this decade, Australia's state and territory governments have gained important experience in developing climate action policies and programs. This report finds evidence of different policy strengths across states and territories, and across economic sectors. There is substantial opportunity for governments to learn from their counterparts, in Australia and internationally, to deliver the coordinated, ambitious action that is needed in the transformational decade for climate. Australian states and territories have built the momentum and the experience – the country can now capitalise on it.

State and territory government actions referenced in this report

The following table lists the state and territory actions that have been referenced in this report. This is not an exhaustive repository of all state and territory climate actions that have been taken. In some instances, initiatives discussed in the report are elements of state and territory economy-wide climate change strategies. The links to these strategies will provide further information on those initiatives.

STATE OR TERRITORY (IN ALPHABETICAL ORDER)	LEGISLATION, POLICY, PROGRAM, INITIATIVE OR ANNOUNCEMENT
CLIMATE CHANGE LEGISLATION	
Australian Capital Territory	Climate Change and Greenhouse Gas Reduction Act 2010
South Australia	Climate Change and Greenhouse Emissions Reduction Act 2007
Tasmania	Climate Change (State Action) Act 2008 (currently under review)
Victoria	Climate Change Act 2017
CURRENT CLIMATE CHANGE STRATEGIES	
Australian Capital Territory	Climate Change Strategy 2019-2025
New South Wales	Net Zero Plan Stage 1: 2020-2030
Northern Territory	Climate Change Response: Towards 2050
Queensland	Climate Action Plan 2020 – 2030
South Australia	Climate Change Action Plan 2021 – 2025
Tasmania	Climate Change Action Plan 2017-2021 (new plan in development)
Victoria	Climate Change Strategy
Western Australia	Climate Change Policy

ELECTRICITY

Australian Capital Territory	100 per cent renewable electricity procurement
New South Wales	Electricity Infrastructure Roadmap
	Renewable Energy Zones
Northern Territory	50 per cent renewables by 2030 target (Roadmap to Renewables)
	70 per cent renewables by 2030 in remote communities
Queensland	50 per cent renewables by 2030 target
	Renewable Energy Zones
South Australia	100 per cent renewables by 2030 target, and potential for 500 per cent by 2050
Tasmania	Tasmanian Renewable Energy Action Plan
Tasmania (and Cth Government)	Energy and Emissions Reduction Deal
Victoria	50 per cent renewables by 2030 target
	Renewable Energy Zones

TRANSPORT

Australian Capital Territory	The ACT's transition to zero emissions vehicles action plan 2018-21
	Zero-emissions Transition Plan for Transport Canberra
New South Wales	Electric Vehicle Strategy
	Transport NSW's Future Energy Strategy
Northern Territory	Electric vehicle strategy and implementation plan
Queensland	Hydrogen fuel cell vehicles in government fleet
South Australia	Electric Vehicle Action Plan
Tasmania	Stamp duty waiver for electric vehicles
	100 per cent electric government vehicle fleet by 2030
Victoria	Zero Emissions Vehicle Roadmap
	Mode Shift Incentive Scheme
	Transport Sector Emissions Reduction Pledge
Western Australia	Expansion of METRONET public transport network
	Hydrogen refuelling initiatives for freight vehicles

BUILDINGS

Australian Capital Territory	Energy Efficiency Improvement Scheme
	Minimum Energy Efficiency Standards for Rental Homes
	All-electric public hospital
New South Wales	Energy Savings Scheme
	LED Lighting Upgrade Program
South Australia	Retailer Energy Productivity Scheme
	Energy Efficient Government Buildings commitment
Tasmania	Public housing heating and energy efficiency initiatives
Victoria	Victorian Energy Upgrades program
	Minimum Rental Standards for Heating
	Victorian Home Energy Scorecard Rating goes national
	Greener Government Buildings Program
	Solar Homes Program
	Household Energy Savings Package
	Gas Substitution Roadmap (in development)

INDUSTRY

New South Wales	Net Zero Industry and Innovation Program
	Royalties for Rejuvenation Fund
Northern Territory	Large Emitters Policy
Queensland	Large Customer Adjustment Program
	Renewable Energy and Hydrogen Jobs Fund
Tasmania	Emissions Reduction Loan Scheme
Victoria	Business Recovery Energy Efficiency Fund
	Latrobe Valley Authority and Economic Development Fund
Western Australia	Greenhouse Gas Emissions Policy for Major Projects
	Collie Futures Fund

AGRICULTURE AND LAND

Queensland	The Land Restoration Fund
South Australia	Support for anti-methane seaweed production
Victoria	Carbon Farming Program
Western Australia	Carbon Farming and Land Restoration Program

WHOLE-OF-ECONOMY

South Australia	Department of Infrastructure and Transport Sustainability Manual
Tasmania	Procurement Better Practice Guidelines
Victoria	ESD Roadmap for Victoria's Planning System

References

ACT Government 2020a, *Parliamentary and Governing Agreement*, https://www.cmtedd.act.gov.au/__data/assets/pdf_file/0003/1654077/Parliamentary-Agreement-for-the-10th-Legislative-Assembly.pdf

ACT Government 2020b, *ACT Government announces first all electric public hospital in Australia if not the world*, https://www.cmtedd.act.gov.au/open_government/inform/act_government_media_releases/rattenbury/2020/act-government-announces-first-all-electric-public-hospital-in-australia-if-not-the-world

ACT Government 2021, *Measuring ACT Emissions*, https://www.environment.act.gov.au/cc/measuring-act-emissions

AGL 2009, *South Australian desalination renewable energy contract underlines strength of AGL's renewable energy position*, https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2009/september/south-australian-desalination-renewable-energy-contract-underlines-strength-of-agls-position

Australian Bureau of Statistics (ABS) 2020, *National, state and territory population*, https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/latest-release#states-and-territories

Australian Energy Market Operator (AEMO) 2020, 2020 *Integrated Systems Plan*, https://aemo.com.au/-/media/files/major-publications/isp/2020/final-2020-integrated-system-plan.pdf

Australian Energy Market Operator (AEMO) 2021, *South Australia Generation Forecasts*, https://www.aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/sa_advisory/2021/2021-south-australian-generation-forecasts.pdf?la=en

Australian Government 2021a, *National Greenhouse Gas Inventory*, https://ageis.climatechange.gov.au/nggi.aspx

Australian Government 2021b, *Postcode data for small-scale installations*, http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations

Australian Sustainable Built Environment Council and ClimateWorks Australia 2018, *Built to Perform: An industry led pathway to a zero carbon ready building code*, https://www.asbec.asn.au/research-items/built-perform/

Brinsmead, T, Rendall, A, Baynes, T, Butler, C, Kelly, R, Adams, P, Hayward, J, Reedman, L, Nolan, M, Lennox, J, Hennessy, K, Ahmad, M, Marcos-Martinez, R, Collins, L, Lu, Y, Che, N, Qiu, J & Kanudia, A 2019, *Australian National Outlook 2019: Technical report*, CSIRO

California Air Resources Board 2020, *15 states and the District of Columbia join forces to accelerate bus and truck electrification*, https://ww2.arb.ca.gov/news/15-states-and-district-columbia-join-forces-accelerate-bus-and-truck-electrification

Clean Energy Council 2021, *Project Tracker*, https://www.cleanenergycouncil.org.au/resources/project-tracker

ClimateWorks Australia 2020a, *Decarbonisation Futures*, https://www.climateworksaustralia.org/wp-content/uploads/2020/04/Decarbonisation-Futures-March-2020-full-report-.pdf

Garnaut, R 2020, *Superpower: Australia's Low-Carbon Opportunity*, La Trobe University Press, Melbourne

Government of South Australia 2012, *Wind Farm Planning Policy*, http://www.renewablessa.sa.gov.au/topic/large-scale-generation-storage/wind-farm-planning-policy

Government of South Australia 2016, *Sundrop Farms*, https://newsouthaustralia.com/news/sundrop-farms/

Government of South Australia 2021, *Climate Change Action Plan 2021-2025*, https://www.environment.sa.gov.au/topics/climate-change/climate-change-action-plan-2021-2025

Hydro Tasmania 2021, *Battery of the Nation FAQ*, https://www.hydro.com.au/clean-energy/battery-of-the-nation/battery-of-the-nation-FAQs

Infrastructure Sustainability Council of Australia (ISCA), ClimateWorks Australia and the Australian Sustainable Built Environment Council (ASBEC) 2020, *Issues paper: Reshaping Infrastructure for a net zero emissions future*, https://www.climateworksaustralia.org/resource/issues-paper-reshaping-infrastructure-for-a-net-zero-emissions-future/

Intergovernmental Panel on Climate Change 2021, *AR6 Climate Change 2021: The Physical Science Basis*, https://www.ipcc.ch/report/ar6/wg1/

International Energy Agency (IEA) 2021, https://www.iea.org/reports/net-zero-by-2050

Meat & Livestock Australia 2020, *The Australian Red Meat Industry's Carbon Neutral by 2030 Roadmap*, https://updates.mla.com.au/globalassets/mla-corporate/research-and-development/program-areas/environment-and-sustainability/2689-mla-cn30-roadmap_d3.pdf

NSW Government 2021a, *Electric Vehicle Strategy*, https://www.environment.nsw.gov.au/topics/climate-change/net-zero-plan/electric-vehicle-strategy

NSW Government 2021b, *Future Energy Strategy*, https://future.transport.nsw.gov.au/plans/future-energy-strategy

OpenNEM 2021, https://opennem.org.au/energy/nem/

Posner, R 2021, 'On the road again: here's how the states can accelerate Australia's sputtering electric vehicle transition', *The Conversation*, https://theconversation.com/on-the-road-again-heres-how-the-states-can-accelerate-australias-sputtering-electric-vehicle-transition-158218

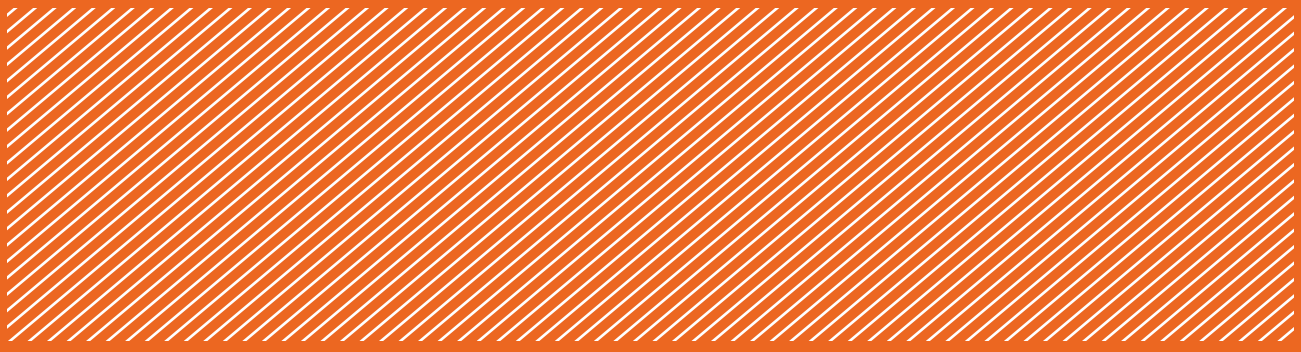
Prime Minister of Australia 2020, *Energy and Emissions Reduction Deal With Tasmania*, https://www.pm.gov.au/media/energy-and-emissions-reduction-deal-tasmania

Tasmanian Government 2020, *Tasmanian Renewable Energy Action Plan*, https://renewablestasmania.tas.gov.au/__data/assets/pdf_file/0008/275876/Tasmanian_Renewable_Energy_Action_Plan_December_2020.pdf

TasNetworks 2021, *How do customers benefit from Project Marinus? Summary Report*, https://www.tasnetworks.com.au/config/getattachment/6a564026-bf45-4b4e-91e5-70b754a3c070/Wholesale-Pricing-Report-How-do-customers-benefit-from-Project-Marinus.pdf

United Nations Framework Convention on Climate Change (UNFCCC) 2015, *The Paris Agreement*, https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

Victoria State Government 2020, *Victoria's Household Energy Savings Package*, https://www.victorianenergysaver.vic.gov.au/victorias-household-energy-savings-package



For further information please contact:

ALISON CLEARY
SENIOR PROJECT MANAGER
alison.cleary
@climateworksaustralia.org

SIMON GRAHAM
SENIOR ANALYST
simon.graham
@climateworksaustralia.org

ClimateWorks Australia
Level 27, 35 Collins Street
Melbourne Victoria 3000

ClimateWorks Australia, 2021, *State and Territory Climate Action: Leading Policies and Programs in Australia.*

ISBN: 978 0 9924232 0 9

Published by ClimateWorks Australia
Melbourne, Victoria, October 2021

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

MONASH University | MONASH SUSTAINABLE DEVELOPMENT INSTITUTE | THE MYER FOUNDATION

ClimateWorks Australia 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.