Australian Government
Climate Change Authority

AUSTRALIA'S CLIMATE CHANGE POLICIES AT THE AUSTRALIAN AND STATE AND TERRITORY GOVERNMENT LEVELS: A STOCKTAKE

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1. INTRODUCTION

This paper provides an overview of climate change policies at the Australian and state and territory government levels. It considers both cross-cutting and sector specific policies and targets and outlines Australia's emissions by source and by state and territory. The paper also discusses climate change adaptation policies and Australia's contributions to international climate change mitigation and adaptation efforts.

This document is one of a series of stocktakes the Climate Change Authority is releasing in early 2019. The others examine the:

- strategies other countries are using to achieve their emissions reduction goals
- actions being taken by industry to position for a carbon constrained future.

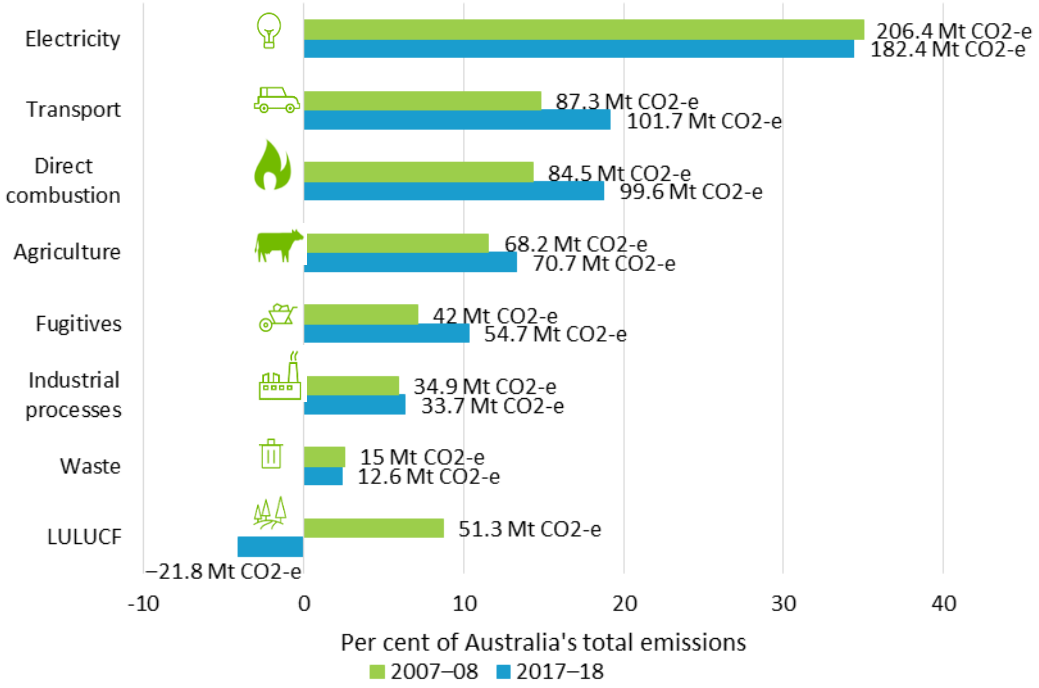
The Authority welcomes your input on the accuracy and reliability of the information contained in the stocktakes. The Authority is also interested in receiving any relevant additional information.

The stocktakes, along with other research and analysis, will assist the Authority to update its advice to the Australian Government on policies to meet Australia's emissions reduction commitments under the Paris Agreement. The Authority has not analysed the effectiveness of the policies identified in this document and will consult later in the year as it develops its approach to updating its advice.

2. AUSTRALIA'S EMISSIONS BY SOURCE

Australia's greenhouse gas emissions were 534 million tonnes of carbon dioxide-equivalent (Mt CO_2-e) in 2017−2018. The three source categories with the highest emissions are electricity (34 per cent), transport (19 per cent) and other direct combustion of fossil fuels to generate steam, heat or pressure (19 per cent), for example in liquefying natural gas. The land sector both generates and stores emissions — in 2017–18 it had a net effect of removing carbon dioxide from the atmosphere, sequestering four per cent of Australia's total emissions (Figure 1).

FIGURE 1 BREAKDOWN OF AUSTRALIA'S EMISSIONS BY SOURCE, 2007–08 AND 2017–18



Notes: Agriculture includes emissions from livestock, fertilisers and crop residue; fugitive emissions are released during extraction of fossil fuels; industrial processes are non-energy related processes including emissions from hydrofluorocarbons. LULUCF: land use, land use change and forestry. The bars show per cent of Australia's total emissions, whereas the data labels indicate absolute emissions.
Source: Commonwealth of Australia 2018b.

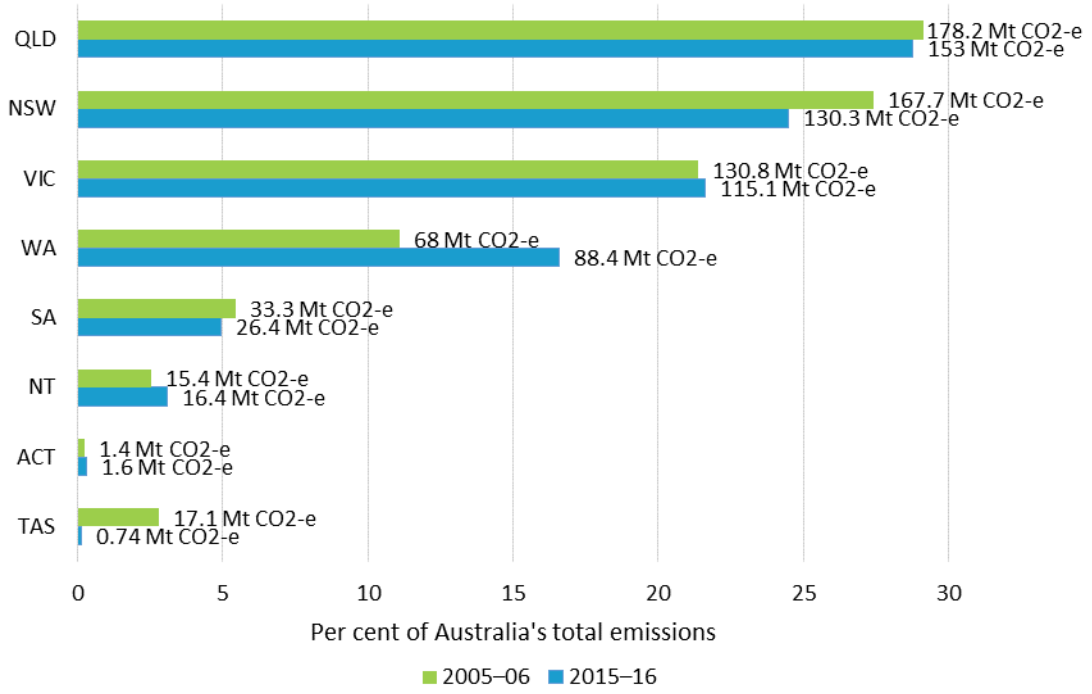
This breakdown has been fairly constant over time. Over the last ten years, the most notable shift has been a decreasing share of emissions from the land as it went from being a source of emissions to a net sink, which was offset by increasing shares of emissions in transport, direct combustion, agriculture and fugitives (Commonwealth of Australia 2018b).

3. AUSTRALIA'S EMISSIONS BY STATE AND TERRITORY

In 2015–16, the bulk of Australia's emissions (92 per cent) was generated in the four most populous states, where Australia's emissions-intensive economic activity is also concentrated: Queensland, New South Wales, Victoria and Western Australia.[1] Between 17 and 29 per cent of Australia's total emissions occurred in each of those states.

This breakdown has been fairly constant over time. Over the last ten years, the most notable shifts have been an increasing share of emissions occurring in Western Australia due to growth in the electricity generation, manufacturing and transport sectors and a decreasing share of emissions occurring in Tasmania and New South Wales, mainly due to a decline in their forestry industries (Figure 2).

FIGURE 2 BREAKDOWN OF AUSTRALIA'S EMISSIONS BY STATE AND TERRITORY, 2005–06 AND 2015–16



Notes: Percentages do not sum due to rounding. The bars show per cent of Australia's total emissions, whereas the data labels indicate absolute emissions.
Source: Commonwealth of Australia 2018c.

[1] At the time of publication, 2015–16 data was the latest available for a state and territory breakdown.

4. AUSTRALIA'S EMISSIONS REDUCTION TARGETS

In 2010, the Australian Government committed to reduce Australia's emissions by 5 per cent below 2000 levels by 2020 under the United Nations Framework Convention on Climate Change (UNFCCC) (the Cancun Agreement). This is consistent with Australia's target under the second commitment period of the Kyoto Protocol. In 2015, it made a commitment to reduce Australia's emissions by 26 to 28 per cent below 2005 levels by 2030 under the Paris Agreement (Australian Government 2015). The Paris Agreement brings all nations into a common framework to combat climate change and adapt to its effects. This agreement sets a global goal of limiting global warming to well below 2ºC and achieving net zero emissions in the second half of this century (UNFCCC Dec. 1/CP. 21 2015). The Australian Government has committed to reviewing its emissions reduction targets in line with the five yearly review process of the Paris Agreement, which requires Australia to submit its next emissions reduction target in 2025, and developing a long term emissions reduction strategy by 2020 (Commonwealth of Australia 2017b).

As at 7 March 2019, the Queensland, New South Wales, Victorian, South Australian, Tasmanian and Australian Capital Territory governments have emissions reduction targets.

In addition, the Australian Government and the Queensland, New South Wales, Victorian, South Australian and Australian Capital Territory governments have each established independent bodies that provide advice on setting or meeting their emissions reduction targets.

A selection of Australia's emissions reduction targets are outlined in Table 1.

TABLE 1 AUSTRALIA'S EMISSIONS REDUCTION TARGETS (CONVERTED TO A 2005 BASE YEAR)

	2020	2030	2050
Australia	14 per cent below 2005 levels Announced in 2010[b]	26-28 per cent below 2005 levels Announced in 2015	
States and territories			
Queensland		30 per cent below 2005 levels Announced in 2017	Net zero Announced in 2017
New South Wales			Net zero Announced in 2016
Victoria	15-20 per cent below 2005 levels Announced in 2017		*Net zero* Committed in 2017
South Australia			*60 per cent below 2005 levels*[c] Committed in 2007 Net zero Announced in 2015
Australian Capital Territory [a]	*40 per cent below 2005 levels* Committed in 2010[d]	*65-75 per cent below 2005 levels*[e] Committed in 2018	*Net zero by 2045* Committed in 2018
Tasmania			*64 per cent below 2005 levels*[f] Committed in 2008 Net zero Announced in 2017
Capital city local governments			
Brisbane		Reduce the average emissions per household to 6 tonnes by 2031[g] Announced in 2017	
Sydney		70 per cent below 2006 levels Announced in 2008	Net zero Announced in 2008
Melbourne	Net zero Announced in 2002		
Adelaide	Net zero by 2025 Announced in 2015		
Perth		32 per cent below a business-as-usual projection by 2031 Announced in 2014	

Notes: Legislated targets are italicised. Western Australia and the Northern Territory do not have emissions reduction targets.
[a] The Australian Capital Territory also has a 2025 target of 50-60 per cent below 2005 levels and a 2040 target of 90-95 per cent below 2005 levels (Climate Change and Greenhouse Gas Reduction (Interim Targets) Determination 2018 (ACT)).
[b] The Australian Government's 2020 target is expressed as 5 per cent below 2000 levels.
[c] The South Australian Government's legislated 2050 target is expressed as 60 per cent below 1990 levels.
[d] The Australian Capital Territory's 2020 target is expressed as 40 per cent below 1990 levels.
[e] The Australian Capital Territory's 2030 target is expressed as 65 to 75 per cent below 1990 levels.
[f] Tasmania's legislated 2050 target is expressed as 60 per cent below 1990 levels.
[g] In 2013, the average Brisbane household produced 10.5 tonnes of greenhouse gas emissions (Brisbane City Council 2018b).
Sources: Australian Government 2015, Brisbane City Council 2018a, City of Adelaide 2015, City of Melbourne 2002, City of Perth 2014, City of Sydney 2018, *Climate Change and Greenhouse Emissions Reduction Act 2007* (SA), *Climate Change And Greenhouse Gas Reduction Act 2010* (ACT), *Climate Change and Greenhouse Gas Reduction (Interim Targets) Determination 2018* (ACT), Government of South Australia Department for Environment and Water 2017, NSW Government Office of Environment and Heritage n.d., Queensland Government 2017b, Tasmanian Climate Change Office Department of Premier and Cabinet 2017, Victoria State Government Department of Environment, Land, Water and Planning 2018c.

5. AUSTRALIA'S EMISSIONS OVER TIME

At 534 Mt CO_2-e, Australia's emissions in 2017–18 were 2 per cent below 2000 levels and 12 per cent below 2005 levels (Commonwealth of Australia 2018b).

Australia's emissions are projected to be:

- 543 Mt CO_2-e in 2020 (2 per cent below 2000 levels)
- 563 Mt CO_2-e in 2030 (7 per cent below 2005 levels) (Commonwealth of Australia 2018a).

Australia's international emissions reduction targets, including for the Kyoto Protocol, are measured against an emissions budget. The emissions budget identifies the total amount of emissions allowable over a period of time consistent with a linear decline in emissions to meet the nominated point target in a particular year. Using this approach, the Australian Government Department of the Environment and Energy projects Australia is on track to overachieve on its 2020 target of 5 per cent below 2000 levels by 240 Mt CO_2- e between 2013 and 2020, excluding overachievement from the first commitment period of the Kyoto Protocol. Although the emissions budget to 2020 is projected to be achieved, Australia's emissions at 2020 are projected to be only 2 per cent below 2000 levels (Commonwealth of Australia 2018a). The emissions budget can still be achieved as Australia's emissions are below the linear trajectory defining the emissions budget[2] in the first part of the period to 2020 (more so than they are projected to be above the trajectory in the latter part of the period) (Figure 3).

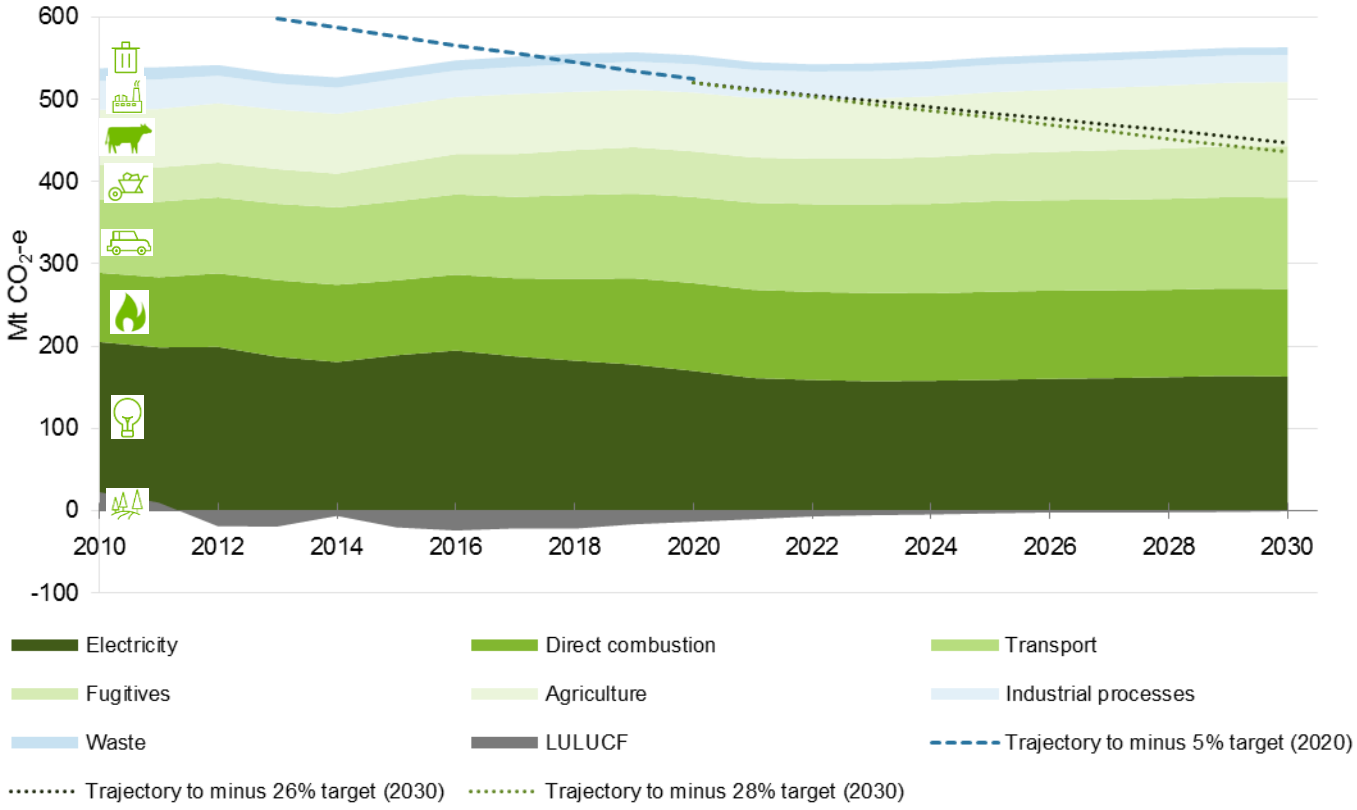
Under the Paris Agreement, the Australian Government has indicated its intention to account against the point target of 26 to 28 per cent below 2005 levels by 2030 using an emissions budget over the period 2020–21 to 2029–30 (Commonwealth of Australia 2015). The Australian Government Department of the Environment and Energy's projections adopt a straight line reduction from Australia's 2020 target of 5 per cent below 2000 levels to the 2030 point target, consistent with the approach used by Australia under the second commitment period of the Kyoto Protocol and the Cancun Agreement.

The Australian Government Department of the Environment and Energy's emissions projections estimated emissions reductions of around 695 Mt CO_2-e would be required relative to projected emissions between 2021 and 2030 to meet the 2030 target of 26 per cent below 2005 levels, or 762 Mt CO_2-e to meet the 28 per cent target (Figure 3). These projections are indicative only and are subject to change over time. They assume current trends and existing policies continue. They do not account for the introduction of new emissions reductions policies and measures, such as the Climate Solutions Package announced in February 2019, the use of international units or surplus units from the Kyoto Protocol first and second commitment periods (Commonwealth of Australia 2018a).[3] The Australian Government (2019) has estimated the Climate Solutions Package could reduce Australia's emissions by around an additional 200 Mt CO_2-e to 2030.

[2] The straight-line trajectory used to determine Australia's emissions budget is drawn from 2010 at 108 per cent of Australia's emissions at 1990 (Australia's target under the first commitment period of the Kyoto Protocol). Australia's actual emissions in 2010 were well below this level.

[3] If surplus units from the Kyoto Protocol first and second commitment periods are used to meet the Paris Agreement target, emissions reductions of 328 Mt CO_2-e will be required relative to projected emissions between 2021 and 2030 to meet the 2030 target of 26 per cent below 2005 levels, or 395 Mt CO_2-e to meet the 28 per cent target (Commonwealth of Australia 2018a).

FIGURE 3 AUSTRALIA'S EMISSIONS AND PROJECTIONS



Notes: Australia's 2020 and 2030 trajectories start at the point target of the previous period's commitment. That is, the 2020 trajectory starts at 108 per cent above 1990 levels and the 2030 trajectory starts at 5 per cent below 2000 levels.
Source: Commonwealth of Australia 2018a.

6. POLICIES TO REDUCE EMISSIONS

6.1. Across sectors

6.1.1. Emissions Reduction Fund

The Australian Government's Emissions Reduction Fund allows organisations and individuals to register projects to reduce their emissions. Participants can undertake specified activities for which they can earn one Australian Carbon Credit Unit per tonne of greenhouse gas stored or avoided by a project. Units can then be sold to either the Government, generally via auction, or a third party. Some state and territory governments provide additional support for carbon farming activities (refer to the section on the land sector). Projects have been registered in all states and territories and in the agriculture, land, energy, transport, industrial and waste sectors. The Fund was originally allocated a budget of $2.55 billion for government purchases of Australian Carbon Credit Units (of which $226 million remains uncommitted) (CER 2018a) and projected to generate 240 Mt CO_2-e of emissions reductions between 2021 and 2030 (Commonwealth of Australia 2018a). In February 2019, the Government announced an extra $2 billion in funding over the next 10 years, which is projected to contribute an additional 103 Mt CO_2-e of emissions reductions by 2030 (Australian Government 2019).

6.1.2. The safeguard and other emissions limits

The Australian Government places limits (or baselines) on greenhouse gas emissions from large facilities under the safeguard mechanism, which provides a framework for Australia's companies to measure, report and manage their emissions. The safeguard mechanism aims to ensure emissions reductions generated under the Emissions Reduction Fund are not offset by significant increases in emissions above business-as-usual levels elsewhere in the economy. In 2016–17, it applied to 203 facilities in the mining, oil and gas, manufacturing, transport and off-grid electricity sectors and 284 grid-connected electricity generators (CER 2018d).

Some state and territory governments, such as the Western Australian Government, also incorporate emissions limits into development approvals for new projects.

6.1.3. Phasedown of hydrofluorocarbons

Hydrofluorocarbons are a synthetic greenhouse gas imported for use in refrigeration and air-conditioning equipment. In 2017, the Australian Government passed amendments to the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (Cth) to start a gradual phase down of hydrofluorocarbon imports from 1 January 2018. This contributes to Australia's commitment under the Montreal Protocol to reduce the production and imports of hydrofluorocarbons by 85 per cent compared to current levels by 2036 (from 8.0 Mt CO_2-e in 2018 to 1.6 Mt CO_2-e in 2036) (DoEE n.d.).

As part of the ozone protection and synthetic greenhouse gas program, the Australian Government is also developing information products to assist equipment owners to reduce emissions from refrigerant leaks.

6.1.4. National Carbon Offset Standard

The Australian Government Department of the Environment and Energy administers the National Carbon Offset Standard — a voluntary standard used by organisations to manage and offset their emissions. Businesses that wish to be certified against the Standard must measure, reduce and offset their emissions and publicly report on their performance. In 2017, businesses certified as carbon neutral against the Standard voluntarily offset over 2.5 million tonnes of emissions (including the voluntary retirement of over 110,000 t CO_2-e of Australian Carbon Credit Units). Total emissions reductions achieved by these business are likely to be greater than this amount as they are also required to reduce their own emissions where possible before offsetting the remainder.

6.1.5. Measuring and reporting emissions

Policies that require the measurement and reporting of emissions can support a better understanding of emissions trends and opportunities for emissions reductions.

The Australian Government publishes a national emissions inventory each year to fulfil its reporting obligations under the UNFCCC and the Kyoto Protocol. It also prepares state and territory inventories to provide a breakdown of national emissions. The state and territory governments provide data on agriculture, waste and fugitive emissions to inform the inventory. In addition, the Australian Capital Territory, Victorian and Tasmanian governments publish their own state or territory inventories, reports or accounts each year. These provide a more detailed breakdown of their emissions and help monitor progress towards their emissions reduction targets.

The national inventory's principal data source is the National Greenhouse and Energy Reporting scheme. The scheme requires companies that meet certain thresholds to report their greenhouse gas emissions, and energy production and consumption to the Australian Government. The scheme streamlines state and territory reporting requirements into a national system; however some specific state and territory reporting requirements still exist, such as reporting to state-based energy efficiency schemes.

6.2. Energy

6.2.1. Renewable energy targets

The production of electricity accounts for 34 per cent of Australia's emissions (Commonwealth of Australia 2018b). To reduce emissions and encourage the uptake of low emissions generation, the Australian Government and most states and territories have implemented renewable energy targets (Table 2). The Australian Government's renewable energy target is supported by a scheme (the large-scale renewable energy target) that allows generators to create tradeable renewable energy certificates and places an obligation on electricity retailers to surrender a certain number of certificates each year. The Queensland, Victorian and Australian Capital Territory targets are supported by reverse auctions that fund renewable energy projects by awarding a contract for difference to supply electricity.[4]

[4] In a reverse auction, electricity generators compete to win the auction and prices will typically decrease as the sellers underbid each other. Contracts for difference are a long-term contract in which the government guarantees the renewable generator a fixed price for its electricity generation for the duration of the contract.

6.2.2. Support for small-scale renewables and storage

The Australian and state and territory governments provide support for small-scale renewables, such as to households to purchase solar photovoltaic systems and batteries. The Australian Government's small-scale renewable energy scheme allows individuals and small businesses to create tradeable certificates by installing small-scale renewable energy systems, and places an obligation on electricity retailers to surrender a certain number of certificates each year. Other than Tasmania, all state and territories also provide financial incentives for the installation of small-scale renewables. The Queensland, New South Wales, Victorian, South Australian and Australian Capital Territory governments also provide, or have committed to provide, support for small-scale batteries through interest free loans, rebates and subsidies.

TABLE 2 AUSTRALIA'S RENEWABLE ENERGY TARGETS

	Renewable Energy Target	Mechanisms to deliver the Renewable Energy Target
Australia	*33,000 GWh by 2020* Committed in 2015 (target stays the same from 2020 until 2030 when the scheme ends)	Creation of tradeable renewable energy certificates by generators and an obligation on electricity retailers to surrender a certain number of certificates each year.
Queensland (large-scale)	50% by 2030 Announced in 2015	Reverse auction to fund renewable energy generation projects (550 MW), and successful bidders enter into contracts for difference to supply electricity.
Queensland (small-scale)	3,000 MW by 2020 Announced in 2015	Supports rooftop solar photovoltaic systems.
Victoria	*25% by 2020, 40% by 2025* Committed in 2016	Reverse auction to fund renewable energy generation projects (>900 MW in total), and successful bidders enter into contracts for difference to supply electricity.
South Australia	33% by 2020 Announced in 2009 50% by 2025 Announced in 2014	No market mechanism. A range of complementary measures including government funding for renewables and storage.
Northern Territory	50% by 2030 Announced in 2017	In January 2019, the Northern Territory government entered into power purchase agreements to buy electricity from two new solar farms.
Australian Capital Territory	*100% by 2020* Committed in 2016	Reverse auction to fund renewable energy generation projects (650 MW in total), and successful bidders enter into contracts for difference to supply electricity.
Tasmania	100% by 2022 Announced in 2017	No market mechanism. A range of complementary measures including government investment in existing hydro-power assets.

Notes: Legislated targets are italicised. The Australian Government target has undergone changes since originally implemented in 2001. Certificates created under the small-scale renewable energy scheme cannot be used to meet the 33,000 GWh target. Power purchase agreements are long-term contracts under which an entity agrees to purchase electricity directly from an energy generator. New South Wales and Western Australia do not have renewable energy targets.
Sources: ACT Government Environment, Planning and Sustainable Development Directorate – Environment 2018c, CER 2018b, Gramenz 2017, Northern Territory Government 2017, Queensland Government DNRME 2018a, Queensland Government DNRME 2018b, Victoria State Government DELWP 2018e.

6.2.3. Investments in clean energy

The Australian Government established the Clean Energy Finance Corporation (CEFC) to fund renewable energy, energy efficiency and low emissions projects (Department of Finance 2017), and the Australian Renewable Energy Agency (ARENA) to support the development of renewable energy and related technologies (ARENA n.d.b).[5] As at 30 June 2018, the CEFC has invested $6.7 billion of its $10 billion investment mandate (CEFC 2018a) and ARENA distributed $1.2 billion of its $2 billion funding (ARENA 2018a). In 2017–18, the focus of investments included large-scale solar, wind and storage projects; energy efficiency improvements in property, infrastructure and agriculture; and reducing emissions from waste and landfill. The estimated lifetime abatement across the CEFC's investment portfolio, once all committed funds are deployed and projects are fully operational, is 190 Mt CO_2-e (CEFC 2018a).[6] State and territory governments have partnered with the CEFC and ARENA on numerous projects and also fund renewable energy innovation independently. For example, the Australian Capital Territory Government has established a $12 million Renewable Energy Innovation Fund.

The CEFC and ARENA have also committed funding to accelerate the development of new low emissions technologies such as hydrogen. The Hydrogen Strategy Group, chaired by the Chief Scientist, is developing a national hydrogen strategy to position Australia as a leading hydrogen exporter and reduce energy sector emissions domestically and internationally. The South Australian, Queensland and Victorian Governments are also taking action to support the development of a hydrogen industry in their states.

Integrating a large proportion of renewable energy in the electricity grid achieves emissions reductions but can have implications for the reliability of the grid. The Australian Energy Market Commission and Australian Energy Market Operator both play important roles in supporting the security and reliability of the National Electricity Market.

The Australian Government is working with the state and territory governments to progress the implementation of the retailer reliability obligation, which will require companies to hold contracts for, or invest directly in reliable generation. In February 2019, it committed funding to expand the Snowy Mountains Scheme (hydro-electric power) to provide additional generation and storage capacity and further support for the development of a second electricity transmission interconnector between Tasmania and the mainland (Australian Government 2019).

State and territory governments are also taking action to improve the reliability of the networks in their regions. For example, the South Australian Government commissioned a 100 megawatt battery in 2017 (Hornsdale Power Reserve 2017).

The Australian, Victorian, New South Wales and Western Australian governments have also implemented policies to support the coal industry through the transition to a lower emissions economy. They include economic diversification programs, research and development into low emissions coal technologies and carbon capture and storage research, development and demonstration activities.

[5] In 2018, the Government issued a new investment mandate to increase the focus of the CEFC's investments on projects that support the reliability and security of electricity supply (*Clean Energy Finance Corporation Investment Mandate Direction 2018* (Cth)).
[6] The estimated abatement of ARENA's investment is not available as its focus is primarily on research and development rather than deployment of new technologies.

6.2.4. Energy efficiency policies

The Council of Australian Governments' Energy Council, which includes the Australian and state and territory governments, has implemented a number of energy efficiency measures through its National Energy Productivity Plan, which aims to improve Australia's energy productivity by 40 per cent between 2015 and 2030 (DoEE 2018). Measures include developing and rolling out mandatory energy efficiency standards for equipment and appliances, which is projected to contribute over 6 Mt CO_2-e of abatement in 2020 (Commonwealth of Australia 2017b).

The focus of other measures is improving the energy efficiency of buildings. The National Construction Code, implemented through state and territory legislation, sets minimum energy efficiency requirements for commercial and residential buildings across Australia. The code is currently being reviewed, with a revised code for commercial buildings due later in 2019. The Commercial Building Disclosure program requires sellers and lessors of large commercial office spaces to disclose the energy efficiency ratings of their buildings. This is projected to contribute 3.8 Mt CO_2-e of emissions reductions between 2015 and 2019 (ACIL Allen 2015). The Council of Australian Governments is considering expanding the program to other buildings. Some states and territories, such as the Australian Capital Territory, also require owners of residential properties to disclose the property's energy efficiency rating when it is advertised for sale or lease.

The Australian Capital Territory, New South Wales, South Australian and Victorian governments have also introduced market-based mechanisms to drive energy efficiency improvements (Table 3). These schemes are commonly referred to as white certificate schemes and place an obligation on energy retailers to surrender tradeable energy efficiency certificates representing emissions reductions from energy efficiency activities.

TABLE 3 POLICIES AND PROGRAMS TO REDUCE ELECTRICITY EMISSIONS

	AUS	QLD	NSW	VIC	WA	SA	NT	ACT	TAS
Energy efficiency certificate scheme			✓	✓		✓		✓	
Energy efficiency funding	✓	✓	✓	✓		✓	✓	✓	✓
Energy savings standards for new buildings	✓	✓	✓	✓	✓	✓	✓	✓	✓
Energy efficiency requirements for government operations	✓	✓	✓	✓		✓		✓	
Regulated feed in tariff/ certificates for small-scale renewables	✓	✓		✓	✓	✓		✓	✓
Small-scale storage funding	✓	✓	✓	✓		✓		✓	
Large-scale storage funding	✓		✓	✓	✓	✓		✓	
Small to medium-scale renewables funding	✓	✓	✓	✓	✓	✓	✓	✓	
Renewables innovation funding	✓	✓	✓	✓	✓	✓		✓	

Notes: Regulated feed in tariffs mandate a minimum price paid for electricity generated by small-scale solar and exported into the electricity grid.
Sources: ACT Government 2015, ACT Government Environment, Planning and Sustainable Development Directorate – Environment 2018a, b, ARENA 2018a, n.d.b, Aurora Energy n.d., CER 2018, CEFC 2018a, DoEE n.d. a, c, Essential Services Commission 2018, Government of South Australia 2018a, b, Government of Western Australia Department of Treasury 2017, IPART New South Wales n.d., NT Government 2018, NSW Government Office of Environment and Heritage 2018a, b, NSW Government 2018, n.d., Queensland Government 2018a, b, c, Victoria State Government Department of Environment, Land, Water and Planning 2018a, b, d, University of Western Australia 2017, Victoria State Government Treasury and Finance 2018, Western Power 2018

6.3. Industry

In 2017–18, industry generated 35 per cent of Australia's emissions through direct combustion, fugitives and industrial processes (Commonwealth of Australia 2018b).

Industry activities are covered by the safeguard mechanism and the Emissions Reduction Fund (sections 6.1.1 and 6.1.2).

6.4. Transport

Transport activities accounted for 19 per cent of Australia's emissions in 2017–18 (Commonwealth of Australia 2018b).

Policies to reduce emissions from transport are largely aimed at incentivising lower emissions vehicles and fuels and include biofuel mandates, discounts on stamp duty and registration fees for low emissions vehicles, government procurement targets, support for electric vehicle charging stations and consumer education (Table 4).

The CEFC and ARENA also provide funding to reduce transport related emissions. For example, the CEFC provides financing for converting trucks and vans to electric vehicles and switching from road to rail transport. ARENA provides research and development funding to advance the use of biofuels and is currently contributing funding to a project to provide an electric vehicle charging network along Australia's east coast. To date, the CEFC has provided over $250 million in funding to reduce transport related emissions (CEFC 2018a, 2017, 2015). In February 2019, the Australian Government announced the development of a National Strategy for Electric Vehicles, which will build on existing CEFC and ARENA investments and coordinate action across governments, industry and communities (Australian Government 2019).

The state and territory governments also provide funding for low emissions transport. For example, the Victorian Government has provided funding to support a commercial electric vehicle manufacturing facility.

In 2016–17, the safeguard mechanism placed emissions limits on large facilities in the air, rail and road transport sectors (although only a small proportion of the emissions in the road transport sector are covered). Under the Emissions Reduction Fund, participants can earn Australian Carbon Credit Units for reducing the emissions intensity of air, land and sea transport. To date, the Government has contracted 1 Mt CO_2-e of emissions reductions in the transport sector through the Emissions Reduction Fund (CER 2018a).

The Australian Government supports the Carbon Offsetting and Reduction Scheme for International Aviation, which will require Australian aircraft operators to manage and offset their emissions from international flights from 2021. Australia is also a member of the United Nations' International Maritime Organisation, which has committed to reduce greenhouse gas emissions from the international shipping sector to 50 per cent below 2008 levels by 2050 (*IMO Resolution MEPC.304(72)*).

The Australian Government established the Ministerial Forum on Vehicle Emissions, which brings together the ministers from the Australian Government Infrastructure and Environment and Energy portfolios to coordinate a whole-of-government approach to addressing emissions from motor vehicles. It has considered implementing or making changes to fuel quality, noxious emissions and vehicle efficiency standards, including consulting on draft regulation impact statements. Although the Forum

found the benefits of emissions standards in Australia exceeded the costs (Commonwealth of Australia 2016), such standards have not been implemented in Australia. Nearly 80 per cent of new passenger vehicles sold globally are subject to fuel efficiency or carbon dioxide standards (ICCT 2017).

TABLE 4 AUSTRALIAN AND STATE AND TERRITORY POLICIES ON LOW EMISSIONS TRANSPORT

POLICIES	AUS	QLD	NSW	VIC	WA	SA	ACT	TAS
Regulatory incentives								
Fuel quality standards	✓							
Biofuel mandate		✓	✓					
Purchase incentives								
Tax discounts	✓	✓					✓	
Preferential loans	✓							
Government procurement		✓	✓	✓	✓	✓	✓	✓
Use incentives								
Registration incentive		✓	✓	✓			✓	
Preferential lane access							✓	
Support for electric vehicle recharging infrastructure								
Public chargers	✓	✓	✓	✓	✓	✓	✓	✓
Private chargers		✓					✓	✓
Information based								
Consumer education	✓	✓	✓	✓	✓	✓	✓	✓
Research & development funding	✓	✓	✓	✓	✓	✓	✓	✓

Notes: The Australian Government's fuel quality standards apply to all states and territories. At the Commonwealth level, the luxury car tax applies to the value of fuel-efficient vehicles above $75,526 instead of $66,331 for other vehicles (ATO 2018). In the ACT and Queensland, low emissions vehicles pay no or discounted rates of stamp duty (Access Canberra 2018, Queensland Government 2018f). In the ACT, gas and electric vehicles are subject to a 20 per cent discount on registration fees (ACT Government Environment, Planning and Sustainable Development Directorate 2018d). In NSW, hybrid and electric vehicles are subject to a discount on registration fees of up to $30 (*Motor Vehicles Taxation Act 1988 No 111* (NSW) (Sch. 1). In Victoria, hybrid and electric vehicles receive a $100 discount on registration fees (Vic roads 2014). In Queensland, electric vehicles receive a $68 discount on registration fees (Queensland Government 2018g). The Northern Territory has not implemented specific policies on low emissions transport.
Sources: Access Canberra 2018, Australian Government 2018a, ACT Government Environment, Planning and Sustainable Development Directorate 2018d, ATO 2018, CEFC 2018b, DoEE n.d.b, ARENA 2018b, c, n.d.a, Government of South Australia Department of Planning, Transport and Infrastructure n.d., NSW Government Premier & Cabinet 2014, NSW Government Fair Trading n.d., NSW Department of Planning and Environment 2018, *Motor Vehicles Taxation Act 1988 No 111* (NSW) (Sch. 1), Queensland Government 2018d, e, f, 2017c, Synergy 2018a, b, Tasmanian Climate Change Office DPAC 2018, The REV Project n.d., Transport for NSW 2018, Vic roads 2014, Victorian Premier 2018.

6.5. Agriculture

Agricultural emissions accounted for 13 per cent of Australia's total emissions in 2017–18 (Commonwealth of Australia 2018b).

Under the Emissions Reduction Fund, participants can earn Australia Carbon Credit Units for activities such as reducing methane emissions from cows and pigs and increasing carbon storage in soils.[7] To date, the Government has contracted 18 Mt CO_2-e of emissions reductions from agricultural activities (CER 2018a).

The CEFC provides funding to agricultural businesses to reduce their emissions by improving their energy efficiency and installing renewable energy. To date, the CEFC has provided over $260 million to agriculture projects (CEFC 2018a).

The Australian and state and territory governments also fund research and development in the agriculture sector. Some of this research is aimed at reducing emissions from agricultural production and adapting to climate change. The Australian Government also provides grants to agricultural businesses to adopt tools and practices that have multiple benefits including reducing emissions. For example, ARENA has provided funding for projects involving biofuel production and waste to energy conversion using agricultural by-products.

6.6. Land

The land sector plays an important role in storing carbon dioxide from the atmosphere and in 2017–18 had a net effect of sequestering 4 per cent of Australia's emissions (Commonwealth of Australia 2018b). Australia's agricultural activities occur in the context of land use and so there is a strong link between the land and agriculture sectors.

6.6.1. Carbon farming

To date, most of the emissions reductions contracted under the Emissions Reduction Fund are to land based projects with 126 Mt CO_2-e (or almost two thirds) of all emissions reductions contracted to projects to regrow vegetation or prevent land clearing (CER 2018a). Participants can also earn Australian Carbon Credit Units for reducing the frequency and extent of late dry season fires in savannas, which results in fewer emissions and more carbon being stored in dead organic matter.

The Queensland Government established the $500 million Land Restoration Fund in 2018 and $8.4 million Aboriginal CarbonPlus Fund in 2017 (Queensland Government 2017a).[8] These programs support carbon farming through land management activities, such as managing bush fires and reducing land clearing. In October 2018, the Northern Territory Government released its Aboriginal Carbon Industry Strategy to support the establishment of emissions reduction projects on Aboriginal land by developing new methods and identifying existing and creating new market opportunities for emissions reduction credits. The South Australian Government aims to support carbon farming through a number of measures including innovative financing models for projects, linking carbon offsets with other environmental drivers and markets, and addressing legislative or policy barriers.

[7] Activities that increase carbon stored in soils and vegetation are reflected in land use and land use change and forestry emissions rather than agriculture emissions in Australia's national emissions inventory.
[8] The Queensland Government has contributed $30 million and the remaining $470 million is to be raised through the issuance of a State Government Green Bond (Queensland Labor 2017).

6.6.2. Land management and biodiversity conservation laws

The Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (Cth) protects land defined as being of national environmental significance from significant impacts by proposed developments. State and territory governments also manage or prevent clearing of vegetation and conserve biodiversity through specific legislation, such as Western Australia's *Environmental Protection Act 1986* and *Biodiversity Conservation Act 2016*, or through planning and development legislation. The New South Wales Government has established the Biodiversity Conservation Trust, which manages and delivers private land conservation across New South Wales.

The Australian Government invests in programs to plant or protect native vegetation. These programs have emissions reduction benefits as well as other environmental and agricultural benefits, such as stabilising soils against erosion and providing shelter and windbreaks for livestock. For example, the Australian Government is investing $1 billion between 2018–19 and 2022–23 in Phase Two of the National Landcare Program (Australian Government n.d.). State and territory governments are also taking action to increase the number of trees, for example the New South Wales Government has set a target of planting 5 million trees in Greater Sydney by 2030.

The Australian Government is supporting sustainable forestry industries and carbon storage through the National Forest Industries Plan, *Growing a Better Australia — A Billion Trees for Jobs and Growth.* The plan will support new plantations through research and development, education, infrastructure investment and removing regulatory barriers.

Box 1 provides an overview of emissions reductions policies and programs which have been implemented by local councils in Australia.

BOX 1 Role of local governments in climate change mitigation

Australian local governments are implementing policies and programs to reduce emissions — the extent of action and range of activities undertaken varies significantly. This box describes a number of these actions.

Many individual councils have climate change strategies or action plans, which outline their plans to achieve emissions reductions. For example, the City of Joondalup in Western Australia has published a climate change strategy for 2014 to 2019.

In general, local governments' actions to reduce emissions are aligned with the emissions sources under their control. They include purchasing renewable electricity, installing energy efficient lamps, planting trees, reducing waste, increasing flaring at landfills and improving water efficiency.

Some local governments also support the organisations and residents within their area to take action to reduce their emissions, for example by encouraging the uptake of public transport, walking and cycling; and providing grants for organisations to reduce their energy consumption or switch to renewables.

Brisbane City, City of Melbourne, City of Sydney, City of Yarra and Moreland City Council have been certified carbon neutral for their operations under the National Carbon Offset Standard.

The City of Melbourne, City of Sydney, City of Adelaide, City of Perth, North Sydney Council, City of Port Phillip and the City of Unley are also partners in CitySwitch, which assists businesses to reduce emissions from offices.

7. ADAPTATION STRATEGIES, LEGISLATION AND POLICIES

Climate change adaptation in Australia is underpinned by a series of agreements made between the Australian and state and territory governments through the Council of Australian Governments including their Statement on Roles and Responsibilities for Adaptation, which was adopted in 2012. These agreements set priority areas for adaptation action and clarify roles and responsibilities.

In 2015, the Australian Government released the *National Climate Resilience and Adaptation Strategy*, which sets out how Australian governments are managing the risks of climate change (for example through changing land use, upgrading infrastructure and emergency planning). It also outlines principles of effective resilience and adaptation and the Australian Government's vision for a climate-resilient future.

Australian Government agencies work together to integrate disaster and climate resilience into their decision-making, for example through the Australian Government Disaster and Climate Resilience Reference Group. In 2019, this group published a framework for Australian public servants to manage climate risks to policies, programs and asset management.

The Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation also play important roles in providing climate science, data and information to inform adaptation strategies, legislation and policies. These agencies participate in collaborative research initiatives, including the Integrated Marine Observing System, which monitors changes in Australia's oceans, and the National Environmental Science Program's Earth System and Climate Change Hub. The Department of the Environment and Energy's Australian Antarctic Division also conducts climate research.

Some state governments sponsor climate modelling and science, for example the New South Wales and Australian Capital Territory Governments are involved in the NSW and ACT Regional Climate Modelling Project.

The Australian and state and territory governments have each created strategies for adapting to climate change or are addressing risks through broader planning and resource management legislation and policy. The Australian Capital Territory, Queensland, South Australian, Tasmanian and Victorian governments have also implemented specific policies to address climate change adaptation, support the development of adaptation responses and manage risks. These include the *ACT Climate Change Adaptation Strategy* and the Victorian *Climate Change Act 2017*. The Victorian *Climate Change Act 2017* requires the development of five-yearly sector-based Adaptation Action Plans to drive adaptation action in core systems across the economy such as health and human services, primary production, water, transport and the natural environment. New South Wales and Western Australia address the risks of climate change and adaptation measures through broader planning and resource management legislation and policy. The Northern Territory is currently developing a Climate Change Strategy, which will be finalised in early 2019. Planning principles for flooding and storm surges are included in the Northern Territory's existing planning scheme.

Box 2 provides an overview of adaptation action by local councils.

BOX 2 Role of local governments in climate change adaptation

Local governments play a significant role in climate change adaptation. Many local governments across Australia have undertaken climate change risk assessments or developed adaptation plans. The Australian, state and territory and local governments collaborate to implement climate change adaptation initiatives at the local level. This box outlines a number of these initiatives.

For example, the New South Wales Government provides grant funding to local governments to complete projects to build resilience to climate change through adaptation. These projects include adapting roads, safeguarding infrastructure against extreme weather conditions, expanding public shade and assessing current local government activities to prepare for climate change through land use planning.

The Victorian state and local governments have partnered to deliver a range of climate change projects, including making investments to lessen the impacts of climate change on infrastructure and assets, for example to reduce the effects of drought on sporting facilities and stormwater harvesting projects.

Similarly, the Tasmanian local governments collaborate with the state government, and also implement a number of initiatives independently. These include an educational project aimed at increasing awareness of the effects of sea level rise and storms on coastlines, and a coastal adaptation project. The City of Hobart is reviewing its climate change strategy, which sets out the actions it would undertake in response to climate change between 2008 and 2013.

The City of Darwin published a Climate Change Action Plan, which outlines adaptation policies and their intended outcomes. This includes strategies to prevent coastal erosion.

In South Australia, local governments, natural resources management boards, local government associations and Regional Development Australia have partnered with the state government to develop 12 regional adaptation plans. Regions are now looking to progress and implement priority actions from their adaptation plans.

In 2018, the Local Government Association of Western Australia released their policy statement on climate change, which represents the collective position of their local governments. Local governments in Western Australia also undertake several projects to mitigate the risks of climate change, including preventing coastal erosion.

The Queensland Government collaborates with local governments through programs such as Queensland Climate Resilient Councils and QCoast2100, which aim to strengthen local government frameworks for climate resilient decision-making.

8. CONTRIBUTING TO INTERNATIONAL CLIMATE CHANGE MITIGATION AND ADAPTATION EFFORTS

The Authority's stocktake of international action on climate change provides an overview of international initiatives and fora on climate change action. A short overview of Australia's participation in those initiatives and fora is provided here.

As part of Australia's commitment to the Paris Agreement, the Australian Government pledged $1 billion over five years to 2020 to strengthen climate resilience and reduce emissions in developing countries. This includes $300 million to address climate change and disaster resilience in Pacific island countries (DFAT n.d.). Other programs supported by the Australian Government also contribute in part to the $1 billion pledge. Some of these include:

- the Australian Government's contribution of $200 million between 2015 and 2018 to the Green Climate Fund, a global fund established under the United Nations Framework Convention on Climate Change to help developing countries reduce their emissions and adapt to climate change.
- Australia's contributions to the Asian Development Bank, World Bank, Global Green Growth Institute and United Nations Agencies, which provide climate change assistance to developing countries through their programs (DFAT 2017).
- contributions totalling nearly $77 million to the Global Environment Facility between 2018 and 2022 to support the reduction of emissions and building resilience in the Pacific region (DFAT 2018a).

The Australian Government has collaborated with other countries to build technical capacity to track emissions. For example, Australia is working directly with Indonesia and Kenya to build systems to measure and report on the carbon stored in land, vegetation and soils and with Thailand to develop its national emissions inventory. The Government is also exploring with Indonesia and some Pacific Island countries similar measurement and reporting systems for coastal blue carbon ecosystems (mangroves, tidal marshes and seagrasses).

Through the Global Forest Observations Initiative, Australia is partnering with governments (Norway, US, UK and Germany) and multilateral organisations (FAO and World Bank Group) to build forest monitoring capacity in developing countries in South America, Africa and Asia.

9. REVIEWS OF AUSTRALIAN CLIMATE CHANGE MITIGATION POLICIES

Australian climate change policies are subject to reviews of their adequacy in meeting emissions reduction targets and the efficiency of their operation.

In 2016, the Climate Change Authority recommended a toolkit of policies Australia should implement to meet its obligations under the Paris Agreement (CCA 2016).

In 2017, the Australian Government reviewed the effectiveness of Australia's emissions reduction policies in meeting Australia's 2030 target and Paris Agreement commitments. The review found Australia has a comprehensive set of policies covering every sector of the economy that can be used to meet Australia's 2030 target but committed to continue to review and refine their operation (Commonwealth of Australia 2017a). This is in line with the Paris Agreement's "ratchet mechanism", which is designed to increase countries' levels of ambition over time to limit global warming to well below 2ºC through a five yearly review and refine cycle. This will commence with the first global stocktake on climate mitigation, adaptation and finance in 2023 and the submission of countries' new emissions reductions targets by 2025.

In 2018, the International Energy Agency reviewed Australia's energy policies. It found the extent of renewables deployment was testing the resilience of the electricity system and that Commonwealth government leadership is needed to set a stable, long-term national, integrated energy and climate policy framework (IEA 2018).

In January 2019, the Organisation for Economic Co-operation and Development (OECD) published its review of Australia's environmental performance, including the energy efficiency and carbon intensity of its economy. It found Australia is one of the most carbon-intensive OECD countries, has adopted a piecemeal approach to achieving emissions reductions and should strengthen its climate change policy (OECD 2019).

The individual emissions reduction policies in operation in Australia are also subject to periodic reviews. For example, the Climate Change Authority reviewed the Australian Government's Emissions Reduction Fund in 2017 and the National Greenhouse and Energy Reporting legislation in 2018. The reviews found that both the Emissions Reduction Fund and the National Greenhouse and Energy Reporting legislation are working well and meeting their objectives. The reviews also identified a number of areas for incremental improvements.

In December 2018, Deloitte conducted a statutory review of the CEFC, which found the CEFC has been effective in facilitating increased flows of finance into the clean energy sector (Deloitte 2018).

In the Australian Capital Territory, South Australia, Tasmania and Victoria, specific legislation is used to set emissions reduction and renewable energy targets and implement the approach for monitoring and reporting on progress towards targets and revising them over time. These acts are subject to periodic reviews. For example, the *Climate Change and Greenhouse Gas Reduction Act 2010* (ACT) was reviewed in 2015.

10. NEXT STEPS

The Authority is updating its advice to the Australian Government on policies to meet Australia's commitments under the Paris Agreement. This stocktake, as well as other stocktakes on international and industry action on climate change, will provide an input to that work along with other research and analysis.

The Authority welcomes your input on the accuracy and reliability of the information contained in this stocktake and any relevant additional information. To do so, please contact the Climate Change Authority on freecall 1800 475 869 or via email at enquiries@climatechangeauthority.gov.au.

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