



Australian Government

Department of the Environment and Energy

2017 Review of Climate Change Policies

December 2017



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List of Abbreviations

ACCUs	Australian Carbon Credit Units
ARENA	Australian Renewable Energy Agency
CEFC	Clean Energy Finance Corporation
COAG	Council of Australian Governments
CSIRO	Commonwealth Scientific and Industrial Research Organisation
GWh	Gigawatt hours
HFCs	Hydrofluorocarbons
Kt CO₂-e	Thousand tonnes of carbon dioxide equivalent
Mt CO₂-e	Million tonnes of carbon dioxide equivalent
NEM	National Electricity Market
NEPP	National Energy Productivity Plan
R&D	Research and development
The Finkel Review	The Independent Review into the Future Security of the National Electricity Market
UNFCCC	United Nations Framework Convention on Climate Change

Executive Summary

The Australian Government is committed to addressing climate change while at the same time ensuring we maintain energy security and affordability and the competitiveness of our industries. The Government recognises that in reducing emissions and meeting our international commitments there are economic impacts to be balanced. Through effective policies, ambitious and responsible targets, and careful management, Australia is playing its role in global efforts to reduce emissions, while maintaining a strong economy and realising the benefits of the transition to a lower-emissions future.

Climate change is a global issue that requires international action. Australia is a relatively small contributor to global emissions, accounting for 1.3 per cent of the total. This compares to China (with 23.7 per cent), the United States (12.9 per cent) and India (6.6 per cent).¹ Emissions per person and the emissions intensity² of the economy are at their lowest levels in 28 years.³ These falls are a result of the Government's policies, as well as changes in the economy.

Australia has a track record of participating in global emissions reduction agreements and meeting and beating emissions reduction targets while maintaining economic and population growth.

Australia's target in the first commitment period of the Kyoto Protocol was to limit emissions to 108 per cent of 1990 levels over the period 2008–2012. This target was beaten by 128 million tonnes of carbon dioxide equivalent (Mt CO₂-e).

Australia is currently on track to over achieve the 2020 target of reducing emissions by 5 per cent below 2000 levels by 294 Mt CO₂-e, including Australia's over achievement against the Kyoto Protocol first commitment period.

The Government has ratified the Paris Agreement. Our target is to reduce emissions by 26 to 28 per cent below 2005 levels by 2030. The target is considered responsible and among the strongest of the major economies on a per capita and GDP intensity basis.⁴ We have a record of meeting and beating our emissions reduction targets and are on track to meet our 2030 target.

We are playing our part on the world stage

In addition to our own emissions reductions we are helping others through bilateral and multilateral initiatives. The Government established the Asia Pacific Rainforest Partnership and we are a founding member of the International Coral Reef Initiative, and the International Partnership for Blue Carbon. Australia has committed to spending at least \$1 billion through our aid program, including a contribution to the United Nations Framework Convention on Climate Change (UNFCCC) Green Climate Fund, to support developing countries to limit or reduce greenhouse gas emissions.

Australia is a founding member of Mission Innovation—a global initiative to increase public investment in clean energy research and development (R&D)—and has pledged to double public expenditure on clean energy R&D by 2020. Australia is also a founding member of the Clean Energy Ministerial Forum and a founding member of the International Solar Alliance. Australia took a leading role in securing the Kigali Amendment to the Montreal Protocol, a major international agreement to reduce global production and use of hydrofluorocarbons (HFCs), which are highly potent synthetic greenhouse gases. The emissions reductions that will be achieved through this agreement are estimated to be equivalent to one and a third years of total global emissions.

¹ World Resources Institute 2017 CAIT global emissions data (2014 country emissions).

² Emissions per unit of product.

³ Emissions per capita in the year to March 2017 have fallen 34.2 per cent since 1990, while the emissions intensity of the economy has fallen 58.4 per cent since 1990.

⁴ [Australian Government \(2015\) Setting Australia's Post-2020 Target for Reducing Greenhouse Gas Emissions.](#)

Australia's world-leading climate research capabilities continue to make globally recognised contributions to climate science. A new CSIRO Climate Science Centre in Hobart has been established to increase our long-term climate science monitoring capability. We are investing \$23.9 million in a climate change hub as part of the National Environmental Science Program and have made a \$255 million investment to enhance Australia's Antarctic logistics and science capabilities, with a focus on Antarctic climate science. These investments help the world to better understand the way the climate is changing and the impacts we need to manage.

Our domestic policies position us to meet the 2030 target

Australia needs climate policies that are stable, predictable and scalable. We met and beat our first Kyoto target and are on track to meet and beat the second. We will meet our 2030 target and we will do so without compromising economic growth or jobs. Our current policy suite can deliver this outcome.

We have a comprehensive set of policies covering every sector of the economy and a sector by sector approach remains the best way to meet our 2030 target. No country in the world is relying on a single policy.

Our policies are designed to reflect the opportunities and challenges of reducing emissions in each sector. They are designed to keep downward pressure on power prices and manage the transition to a lower-emissions future such that Australian businesses remain internationally competitive. We will meet our 2030 target in a balanced way that supports investment and supports employment, particularly in regional Australia.

The Emissions Reduction Fund has been the successful centrepiece of the Government's policies since 2014. The Fund is one of the world's largest domestic carbon offset markets and has been internationally recognised. It has supported the growth of a market for activities that reduce and avoid emissions. It has been particularly successful for reducing emissions in regional areas, with more than 80 per cent of the emission reductions contracted through the Fund occurring in the agricultural and land sectors. Activities supported through the Fund have improved biodiversity and agricultural productivity and created employment opportunities for Indigenous Australians.

The Safeguard Mechanism complements the Emissions Reduction Fund through providing a framework for Australia's largest emitters to measure, report and manage their emissions.

The National Energy Productivity Plan (NEPP) will ensure energy productivity improves by 40 per cent over the period 2015 to 2030. This provides low-cost emissions reductions alongside other benefits for households and businesses such as reduced energy bills, job creation and improved health. For example, minimum energy performance standards for products such as fridges have saved households between \$90 and \$190 a year, while reducing emissions.⁵

The Government has policies in place in the transport sector. The Green Vehicle Guide provides information to car purchasers about the performance of their vehicle and the Government provides exemptions from some vehicle taxes for efficient vehicles. New and existing technologies have the potential to transform the transport sector over time, delivering emissions reductions and cost savings. Through the Clean Energy Finance Corporation (CEFC) the Government provides finance for businesses to upgrade their fleets with low-emissions vehicles and supports new innovations like lightweight carbon-fibre wheels. The Ministerial Forum on Vehicle Emissions is looking at further opportunities, including consideration of a fuel efficiency standard for light vehicles and opportunities to encourage the development of Australia's alternative fuels industry.

In the electricity sector, the National Energy Guarantee (the Guarantee), as recommended by the

⁵ Greenhouse and Energy Minimum Standards have reduced emissions by between 23 and 35 Mt CO₂-e over the period 2000 to 2014.

independent Energy Security Board, represents a significant breakthrough. It combines reliability and emissions reduction in a single mechanism.

The Guarantee is a credible, workable, pro-market policy that does not involve subsidies, taxes, or trading schemes. It will lower electricity prices, make the system more reliable, encourage the right investment and reduce emissions. Importantly it is technology-neutral, offering a future for investment in whatever technology the market needs—solar, wind, hydro, coal, gas, batteries or pumped hydro storage.

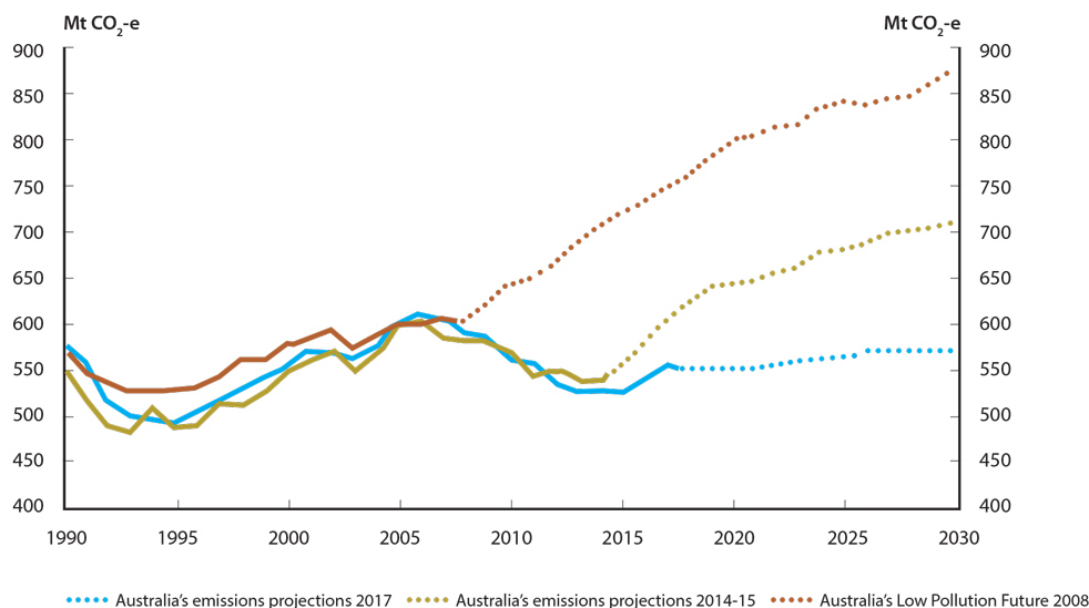
The Government is also making major investments to support the energy sector to transition through the CEFC and the Australian Renewable Energy Agency (ARENA). It has introduced legislation to Parliament to make the CEFC's investments technology neutral by removing the CEFC's prohibition on Carbon Capture and Storage.

Next steps

With the rapid pace of technology change it is hard to predict what the Australian and global economy will precisely look like in 2030. This means it is also difficult to predict Australia's future emissions and the reductions that will be required to meet the 2030 target. Emissions projections have been revised substantially downwards over the past due to factors like lower than expected demand for electricity and faster than expected technology change (Figure 1). Since the last projections in December 2016, the task has reduced by more than 120 Mt CO₂-e ⁶. Technology is changing rapidly and future advances have the potential to reduce the cost of moving to a lower-emissions economy.

⁶ The emissions reductions required to meet the 2030 target were revised from 990 Mt CO₂-e in 2015-16 to 868 Mt CO₂-e in 2016-17.

Figure 1: Downwards revisions to Australia's emissions projections⁷



Our policies need to anticipate technology change and stay in step with other countries. If we move ahead too fast, industries could face costs not borne by their overseas competitors, or we could lock in technologies that may soon be superseded. This would impact on jobs. Our climate change policies must retain a degree of flexibility, so they can be adjusted in response to changes in technology, the economy and the action of international competitors.

Our current policy suite, with some adjustments, provides the right approach.

The Government will continue to improve the operation of the Emissions Reduction Fund by improving the transparency of method prioritisation and development, and by exploring new opportunities to partner with industry, business and the community.

The Government will make the Safeguard Mechanism fairer and simpler, with future reviews in line with the review cycles under the Paris Agreement.

The Government supports, in principle, the use of international units. A final decision on the timing of use and appropriate quantity and quality limits (equivalent standard to Australian Carbon Credit Units (ACCUs)) will be taken by 2020.

Flexibility and predictability will be achieved by building in regular 'review and refine' cycles. These cycles will line up with the five-yearly submission of emissions reduction targets required under the Paris Agreement.⁸ This establishes a pathway to the 2030 target. Our climate change policies will be adjusted over time, if needed, in response to national and international circumstances.

The Council of Australian Governments (COAG) has endorsed recommendation 3.1 of the Independent Review into the Future Security of the National Electricity Market (the Finkel Review) to develop a long term emissions reduction strategy by 2020. This is consistent with the approach adopted by most G20

⁷ The results have been scaled to a common start point. The underlying assumptions, accounting systems and policy measures may differ between each publication.

⁸ The Paris Agreement requires countries to put forward successive Nationally Determined Contributions (targets) every 5 years. Australia is due to submit its next target in 2025, however reviews of some domestic policy elements would commence by 2020 as set out in Chapter 3.

countries. The Government will develop a strategy in consultation with businesses, the community and state and territory governments.

The Government will continue to work with business and the community on implementation of these policies.

About this review

The Terms of Reference for the review are at Appendix A.

The Department consulted widely with businesses across all sectors of the economy and with the community. This included the release of a discussion paper which generated over 350 public submissions; 105 submissions from individuals and 252 from organisations. The majority of submissions have been published on the department's website at <http://www.environment.gov.au/climate-change/review-climate-change-policies/discussion-paper-2017>

The Department met with more than 270 stakeholders and the Minister for the Environment and Energy hosted two roundtables attended by 42 business, community, environmental and Indigenous stakeholders.

1. Australia's International Activities

The Australian Government is committed to addressing climate change while at the same time ensuring we maintain energy security and affordability and the competitiveness of our industries. The Government recognises that in reducing emissions and meeting our international commitments there are economic impacts to be balanced. Through effective policies, ambitious and responsible targets, and careful management, Australia is playing its role in global efforts to reduce emissions, while maintaining a strong economy and realising the benefits of the transition to a lower-emissions future.

Climate change is a global issue that requires global action. Australia is a small contributor to global emissions. We are one of 178 countries whose emissions are less than two per cent, but together account for around 40 per cent of global emissions. Australia is playing its part through ratifying the Paris Agreement, participating and taking leading roles in a range of other international agreements and the provision of financial and technical support to developing and regional neighbours.

1.1 International emissions reduction agreements

Australia has a track record of participating in global emissions reduction agreements and meeting and beating our emissions reduction targets while maintaining economic and population growth.

Australia is one of 191 countries that ratified the first commitment period of the Kyoto Protocol. We over achieved on our target to limit emissions to 108 per cent of 1990 levels over the period 2008–2012 by 128 Mt CO₂-e.

Australia is one of 96 countries, as at 1 December 2017, that have ratified the second commitment period of the Kyoto Protocol. We are currently on track to over achieve the 2020 target of reducing emissions by 5 per cent below 2000 levels by 294 Mt CO₂-e, including Australia's over achievement against the Kyoto Protocol first commitment period.

Australia ratified the Paris Agreement at the earliest opportunity in the 45th Parliament in November 2016. Australia's 2030 target to reduce emissions by 26–28 per cent below 2005 levels amounts to a halving of per person emissions and almost a two thirds reduction in emissions intensity of economic activity. On that basis, it is among the strongest targets of major economies.

Our track record is strong and projections of our emissions continue to fall

Progress against Australia's emissions targets is measured on a cumulative emissions basis over a defined period of time. This reflects that cumulative emissions released into the atmosphere over time, and not the emissions in any one single year, are what determine climate impacts.

For example, in 2012 the official emissions projections showed the emissions reductions required to meet Australia's 2020 emissions target was 755 Mt CO₂-e. Over the past five years this gap has been progressively closed. *Australia's emissions projections 2017* now show Australia is on track to overachieve the 2020 target by 294 Mt CO₂-e—an improvement of more than 1000 Mt CO₂-e. This has occurred at the same time as ongoing growth in Australia's economy and population over the same five-year period.

In terms of Australia's 2030 target, *Australia's emissions projections 2017* show that Australia has made progress since the previous emissions projections. The estimated emissions reduction task over 2021 to 2030 has reduced by more than 120 Mt CO₂-e since the 2016 projections and by more than

1200 Mt CO₂-e since the 2014-15 emissions projections to 868 Mt CO₂-e for the 26 per cent below 2005 target. This is an improvement of nearly 60 per cent since 2014-15.

The emissions reduction task does not include abatement from measures currently under development including vehicle efficiency standards or the National Energy Guarantee.

Emissions projections make informed assumptions about the future economic growth of Australia and the world, policies and measures, technological innovation and human behaviour, but are inherently uncertain. This uncertainty increases the further into the future we project. Emissions projections have been substantially revised downwards over the past, due to factors like lower than expected demand for electricity, the Global Financial Crisis and faster than expected technology change.

The 2016 projections included sensitivities to show how emissions may change according to different assumptions. These sensitivities show that a future with high deployment of low emission technologies results in a smaller cumulative emissions reduction task.⁹ A scenario with high demand for energy exports results in a higher cumulative emissions reduction task over time.

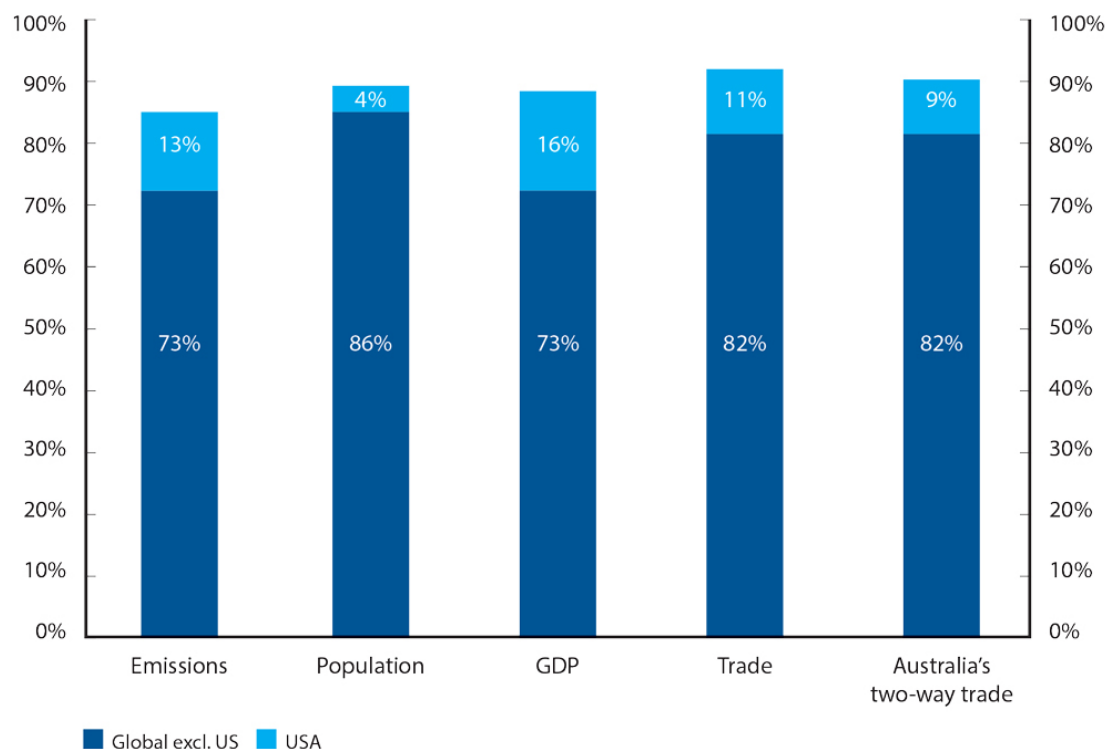
As the world moves on and data is updated, the future outlook for Australia's emissions will change. In order to respond to these changes, the Government has designed policies that are flexible, scalable and promote economic growth. The Government will continue to closely monitor emissions and ensure Australia continues its international record of meeting and beating its targets.

The Paris Agreement is a landmark collective global response to the threat of climate change, which for the first time involves domestic mitigation actions by developed and developing nations. As of December 2017, it has been ratified by 170 Parties to the UNFCCC, accounting for 86 per cent of global emissions, 90 per cent of the world's population, 93 per cent of global trade and 89 per cent of global GDP (Figure 2).¹⁰

⁹ Department of the Environment and Energy (2016) [Australia's Emissions Projections 2016](#).

¹⁰ The USA has ratified the Paris Agreement but announced its intention to withdraw.

Figure 2: Coverage of the Paris Agreement



The Paris Agreement sets overarching global goals to limit temperature increase to well below 2 degrees Celsius and pursue efforts to limit increase to 1.5 degrees Celsius above pre industrial levels, and peak emissions as soon as possible.

In order to meet their Paris pledges all countries are adopting a mix of policies suited to their national circumstances. For example, in China and South Korea, concerns over air pollution and environmental degradation are driving large investments in renewables.

European countries continue to be committed to climate action. In the United Kingdom and Germany, support for climate targets has attracted substantial private sector investment in renewables and energy efficient technologies.

While the United States announced it would withdraw from the Paris Agreement, it is continuing to support different policies that reduce emissions at the national, sub-national and local levels. In the July 2017 G20 Leaders Communiqué, the United States affirmed its commitment to an approach that lowers emissions while supporting economic growth and improving energy security needs.¹¹

The Paris Agreement sent a clear global signal that the transition to a lower-emissions economy is underway. Around the world businesses are seeking to factor this into planning. The Australian Prudential Regulation Authority has said the Paris Agreement ‘provides an unmistakable signal about the future direction of policy and the adjustments that companies, markets and economies will need to make’.¹²

Businesses are becoming increasingly aware of the risks posed by climate change. This includes both the risk of physical damage to assets and transition risks, which arise from shifts in policy, technology and consumer behaviour in response to climate change mitigation. Managing these risks will be important for Australia’s future prosperity.

¹¹ G20 Leaders Communiqué, 7–8 July 2017, p. 10 <https://www.g20.org/eipfeldokumente/G20-leaders-declaration.pdf>

¹² Geoff Summerhayes 2017, *Australia’s New Horizon: Climate Change Challenges and Prudential Risk*, Sydney, NSW.

1.2 Australia's technical and scientific engagement

Australia is collaborating with global partners to find new technological solutions to climate change. This includes building technical capacity to track emissions and supporting the international scientific assessments that underpin climate action.

We are a founding member of the Clean Energy Ministerial Forum, established in 2000. This is a global forum that promotes policies and programs that advance clean energy technology, shares information and best practices, and encourages the transition to a global clean energy economy. We are also a founding member of Mission Innovation, an initiative formed at the Paris Climate Conference which aims to double investment in clean energy innovation over five years (discussed further in Chapter 2.6).

Australia's national greenhouse gas inventory is world-leading. It has stood the test of ongoing, intensive international scrutiny under the UNFCCC for over 20 years. We share our expertise in measuring and monitoring emissions by supporting countries as they design and build their own systems to measure and report their greenhouse gas emissions. For example, we have collaborated with China over many years to share our experience with greenhouse gas emissions measurement and reporting. We are also working with Thailand to develop a national emissions inventory IT system. Through the Global Forest Observations Initiative, Australia is partnering with Norway, the United States, the Food and Agriculture Organization of the United Nations, and the satellite community to build forest monitoring capacity in developing countries in South America, Africa and Asia.

Drawing on our technical skills in greenhouse gas measurement and reporting, we work directly with Indonesia, South Africa, and Kenya to build systems to measure and report on the carbon stored in land, vegetation and soils.

Most recently, Australia announced in November 2017 a project to share world-leading fire management expertise developed by Indigenous Australians to reduce greenhouse gas emissions and improve land management outcomes in Botswana.

Intergovernmental Panel on Climate Change

Australia is an active member of the Intergovernmental Panel on Climate Change (IPCC). The IPCC is the leading international body for the climate change assessment and source of scientific information and technical guidance to the UNFCCC. Australian experts are contributing to IPCC assessments of the latest information on climate science, impacts and mitigation options, and the refinement of emission estimation technical guidance. This work will build confidence in collective climate action under the Paris Agreement and the 2023 stocktake of progress against the Paris Agreement goals.

1.3 Bilateral and regional partnerships

Governments, businesses, communities and non-government organisations all have a role to play in reducing emissions and preparing for a changing climate. Australia often plays a facilitation role, helping bring these sectors together and providing a platform for collaboration.

Australia established the Asia-Pacific Rainforest Partnership and held the first meeting in Sydney in 2014 to promote action and provide a platform to progress actions to reduce emissions from deforestation and forest degradation in the Asia-Pacific region. Through the Partnership, Australia works with governments, the private sector, and civil society to help countries achieve their Paris Agreement commitments. Two

summits have been held to assist with implementing commitments made by countries and facilitate private sector efforts on climate change and forests. At the UNFCCC 23rd Conference of the Parties in Bonn the Indonesian Government announced they will be hosting the third Asia-Pacific Rainforest Summit in Yogyakarta in April 2018.

International Coral Reef Initiative

Coral reefs around the world are being impacted by climate change much more quickly than anticipated, with three quarters of World Heritage reefs affected by bleaching. Achieving the long-term temperature goal set out in the Paris Agreement will be essential to the future of coral reefs. International partnerships and collaborations can inform actions to build resilience to climate change. Australia is a founding member of the International Coral Reef Initiative and has made a \$2 million commitment to improve sharing of knowledge, experience and innovation between countries through this Initiative. A further commitment of \$5 million has been made for the establishment of a Coral Reef Innovation Facility to help incubate and accelerate solutions to coral reef management challenges common to developing countries. It will harness Australian expertise on coral reefs.

International Partnership for Blue Carbon

The International Partnership for Blue Carbon was announced by Australia at the UNFCCC Conference in Paris in 2015. The Partnership brings together governments, non-government organisations and research institutions to enhance the protection and restoration of coastal blue carbon ecosystems—mangroves, tidal marshes and seagrasses. When degraded or lost, blue carbon ecosystems can become significant emission sources. Protection and restoration of these ecosystems can contribute to climate change mitigation, increase coastal resilience and protection from storm surges, and deliver a range of co-benefits for food security, fisheries and sustainable livelihoods. Australia accounts for 10 per cent of the world's blue carbon. In November 2017, the Australian Government announced a \$6 million initiative to support efforts to protect and manage coastal blue carbon ecosystems in the Pacific. This initiative will strengthen blue carbon expertise and data in the Pacific, support its integration into national greenhouse gas accounting and climate policy, and encourage public and private sector investment.



Kimberly Region Pneumatophore Mangrove (credit Mat Vanderklift CSIRO)

At the UNFCCC Conference in Marrakech in November 2016, Australia announced a \$16 million Indo-Pacific Land Action Partnership focused on mobilising private sector funds for agricultural and forestry projects to help countries deliver on their Paris targets.

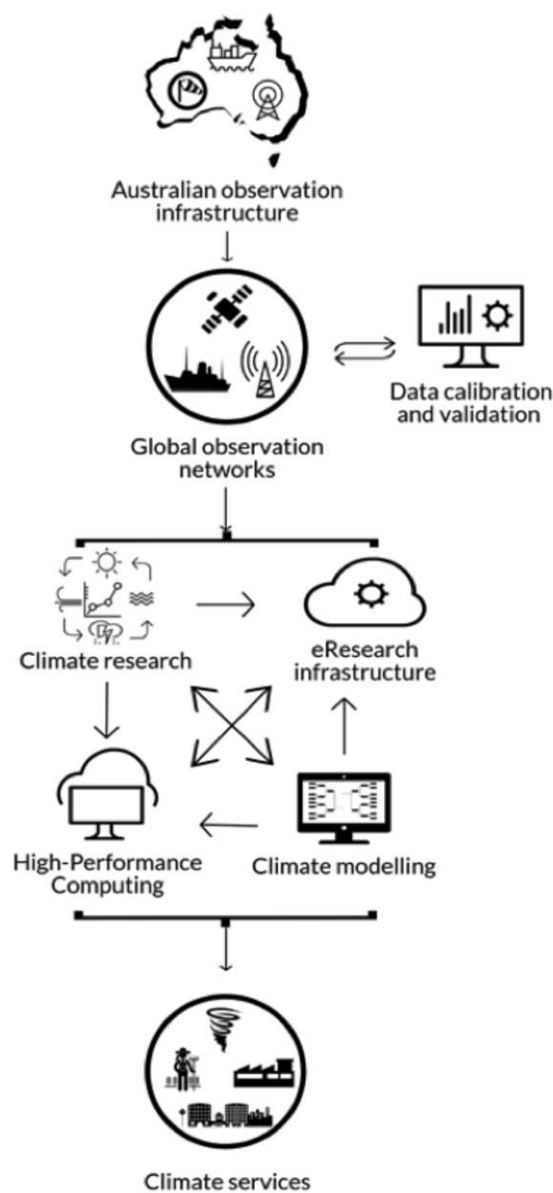
Australia is working in partnership to assist countries transition their energy systems to lower-emissions generation. For example, in 2016 we announced \$32 million to support infrastructure projects such as hydropower in Vietnam. Australia is working with India and China on a number of research and development initiatives to advance CO₂ carbon capture and storage technologies. We have also joined the International Solar Alliance, an initiative led by India and France, to increase the deployment of solar technology across countries in the tropics.

1.4 Australia's contribution to climate science

Australia makes an important contribution to global climate science. This investment is crucial to our ability to better understand and manage weather and climate impacts in our region and globally, including future risks and opportunities. This investment underpins global climate science efforts and global agreements, such as the Paris Agreement.

CSIRO is investing \$37 million over 10 years to create a decadal climate forecasting capability within the new CSIRO Climate Science Centre. This centre focuses on observing and understanding the large-scale patterns and drivers of weather and climate in our region. Australia's observation and modelling efforts are an important contribution to the collective scientific understanding of global climate and weather (Figure 3).

Figure 3: The climate science pipeline. This process represents the interdependency of activities needed for climate science.



The Government is investing \$23.9 million in the Earth System Climate Change hub as part of the National Environmental Science Program. The Hub aims to ensure Australia's policies and management decisions are informed by the latest science, now and into the future. Research to date includes projects on improving and preparing Australia's climate model (ACCESS) for the next IPCC report, climate change projections for extreme weather events and sea-level rise, and improving understanding of heat uptake by oceans. The ACCESS climate model provides Australia with a global climate modelling capability that is uniquely targeted to the weather and climate of the Australasian region and more broadly the Southern Hemisphere. Development and refinement of this model will allow for multi-year to multi-decadal projections, as well as enabling better forecasting on daily through to seasonal time scales.

The Australian Government has made a \$255 million commitment as part of the Australian Antarctic Strategy to enhance Australia's Antarctic logistics and science capabilities, with a focus on Antarctic and

Southern Ocean climate science. This science is a key component of our understanding of Antarctic ice-sheets, ocean heat content and ocean carbon update. This scientific effort helps to resolve key uncertainties in anticipating future climate impacts.

1.5 The Montreal Protocol on Substances that Deplete the Ozone Layer

Australia had a lead role in securing the global agreement to the 85 per cent phase-down of HFC production and imports under the Montreal Protocol on Substances that Deplete the Ozone Layer. The former Minister for the Environment, the Hon Greg Hunt MP, was an instigator of the Dubai Pathway agreement in 2015 that led to agreement of the Kigali Amendment in October 2016. Australia co-chaired negotiations throughout 2015 and 2016, and was an influential delegation in brokering the final agreement. Australia ratified the Kigali Amendment in October 2017.

It is estimated the Montreal Protocol's HFC phase-down will reduce global greenhouse gas emissions by up to 72 billion tonnes in the period 2019 to 2050. This is equivalent to one and a third years of total global greenhouse gas emissions.

1.6 Australia's climate aid

The impacts of climate change will intensify existing challenges such as food security and access to clean water, particularly in developing countries. To address these challenges and build the resilience of the global economy, climate change needs to be considered in development priorities. That is why Australia is committed to integrating climate action through our overseas aid program. This means accounting for expected impacts such as sea-level rise when building infrastructure overseas, or anticipating what future jobs might look like in a low emissions global economy when supporting education and livelihood programs.

Australia has committed to spend at least \$1 billion in climate finance from 2015 to 2020 through our aid program. This includes a \$200 million contribution over four years to the Green Climate Fund (GCF) to support developing countries to limit or reduce greenhouse gas emissions and help adapt to climate change. The GCF supports partner organisations, known as Accredited Entities, to implement projects. As co-chair of the GCF Board for three of the last five years, Australia has worked to engage and leverage the private sector, expedite disbursements to Accredited Entities for approved projects and ensure the effectiveness and impact of GCF funding. To date, the GCF has committed a total of US\$2.65 billion to 54 projects in 73 countries.

In another example of how we are meeting our aid program commitment, Australia has committed \$300 million over four years (2016–2020) to address the challenges of climate change in Pacific Island countries. This program will help Pacific countries adapt to the changing climate and to prepare for more frequent, intense weather events. We are also contributing \$1.5 million to the World Bank Energy Sector Management Assistance Program for renewables in Pacific Island countries.

Overviews of a range of Australia's international climate activities can be found in Appendix C.

2. Australia's Domestic Climate Change Policies

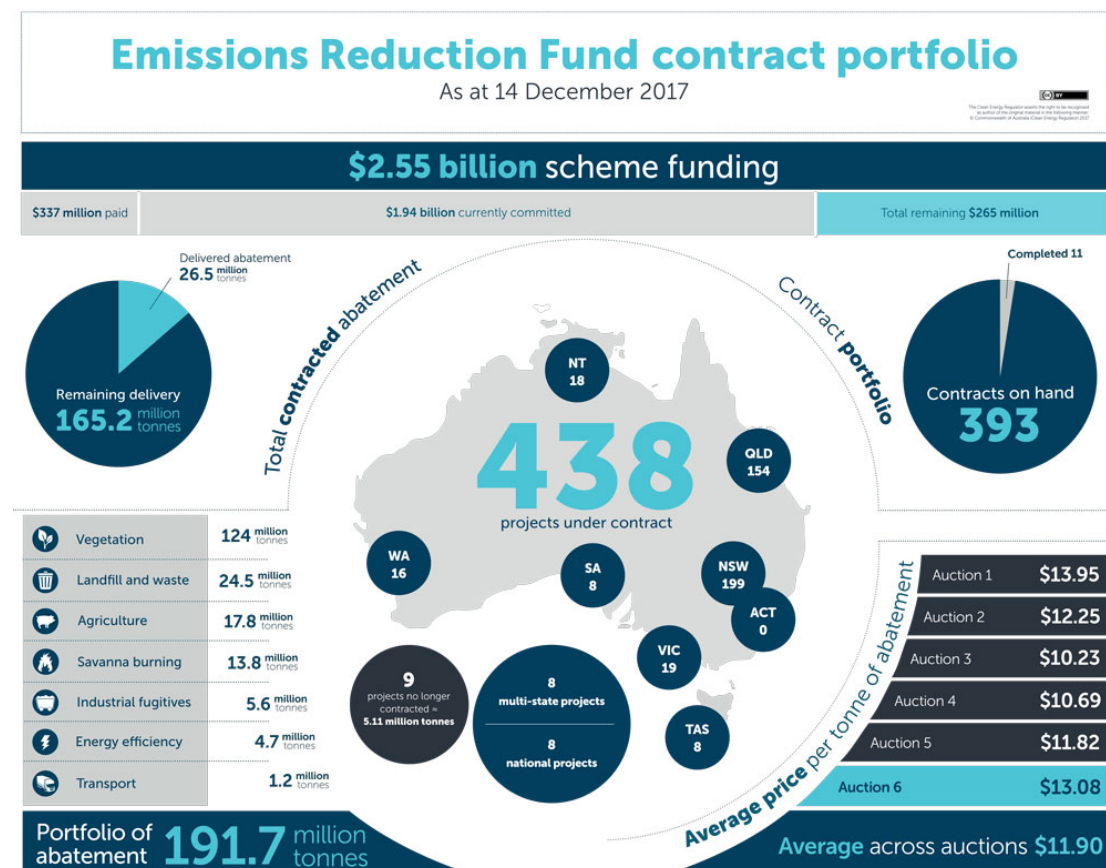
2.1 The Emissions Reduction Fund

The Australian Government's Emissions Reduction Fund has been the successful centrepiece of Australia's climate change policies since its legislation in 2014. As a model presented on the world stage, the Fund has supported the growth of a carbon market for Australian businesses, communities, landholders and others to generate carbon offsets from activities that reduce and avoid greenhouse gas emissions. Activities supported through the Fund provide important environmental, economic, social and cultural benefits for farmers, businesses, landholders, Indigenous Australians and others.

The Fund was established on the principles of reducing emissions at lowest cost, purchasing genuine emissions reductions and streamlining administration, making it easy for businesses to participate.

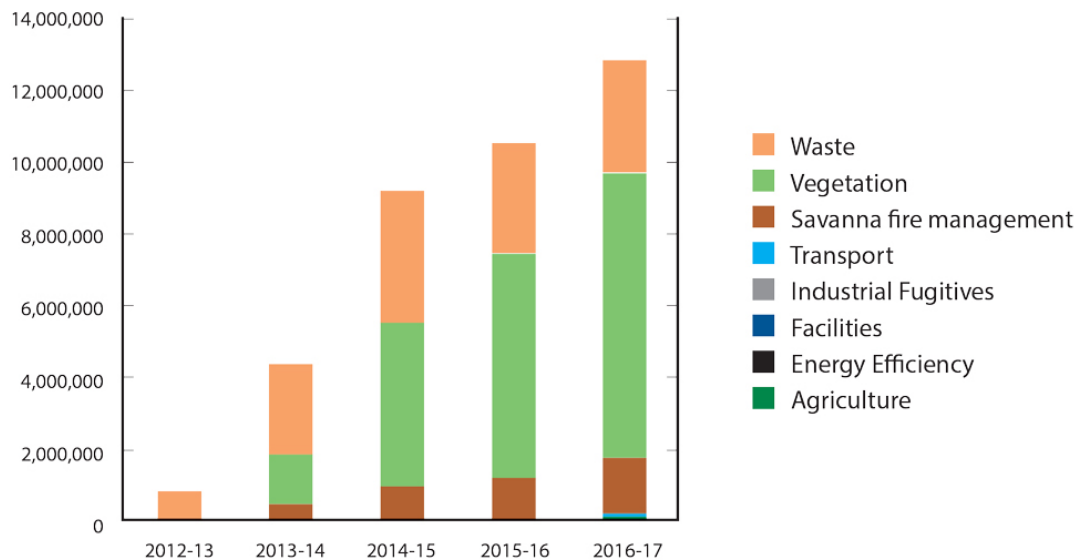
Results to date demonstrate these objectives have been achieved. Over 400 projects have been contracted across all states and territories representing more than 191 Mt CO₂-e.

Figure 4: Combined Results for Emissions Reduction Fund auctions



The Fund has secured high volumes of low-cost abatement. The six reverse auctions held to date have contracted emissions reductions at an average price of \$11.90 per tonne CO₂-e, lower than many predicted. Figure 5 illustrates a doubling of Australia's domestic carbon offsets supply following the introduction of the Fund in late 2014, and incremental growth in supply each year since. With more than 12 million ACCUs generated in the 2016–17 financial year, the Fund is one of the world's largest domestic carbon offset markets.

Figure 5: Australian carbon credit unit generation under the Emissions Reduction Fund



The Fund includes a stringent method development process that sets out the rules for participating and estimating emissions reductions for eligible activities. The Government has worked closely with stakeholders to develop 34 methods covering all sectors of the economy. As outlined in the Emissions Reduction Fund White Paper, a program of ongoing method reviews is an important aspect of the scheme's governance and as the Fund continues to mature, the program of method reviews will expand.

The Emissions Reduction Assurance Committee, an independent expert advisory group, helps ensure eligible activities meet the strict criteria established in legislation. The Minister decides the priority activities to be considered for inclusion into the Fund, making sure that more people have an opportunity to participate and that resources are dedicated to activities most likely to deliver large amounts of emission reductions.

The method development process has been complemented by extensive and comprehensive consultation. Since 2014, the Department of the Environment and Energy has held more than 100 technical working group meetings and workshops with more than 2000 representatives from businesses, governments, Indigenous organisations and technical experts.

The Government will continue to lead development and review of methods under the Fund, and in response to views presented in review submissions, will broaden consultation with stakeholders to ensure a full range of perspectives are considered. To assist this, the Department of the Environment and Energy will further increase the transparency of prioritising eligible activities in the Emissions Reduction Fund.

To ensure the Government pays for genuine emissions reductions, the Fund provides a pay on-delivery approach (i.e. payments occur when the emissions reductions have been demonstrated). This framework ensures that public money is only spent once verified abatement is achieved. If projects and/or contracts do not proceed, no funding is expended and contracted amounts are released back into the Fund for other projects.

In 2016, the Fund was subject to an independent performance audit by the Australian National Audit Office (ANAO).¹³ ANAO's findings determined the program has sound crediting and purchasing arrangements.

¹³ Abatement Crediting and Purchasing under the Emissions Reduction Fund - Report No.14 2016–17, Australian National Audit Office

More than 80 per cent of the emissions reductions contracted through the Fund are occurring in the land sector. Practical land sector projects include revegetation, soil carbon and savanna fire management activities.

Submissions to the review pointed to further potential for increasing carbon stored in land or soil including through new proposed activities such as savanna fire management, sequestration projects and plantation forestry projects. On 10 August 2017, the Minister for the Environment and Energy decided, following advice from the Emissions Reduction Assurance Committee, to allow a new type of activity for plantation forests into the Fund. The Government expects this to deliver additional emissions reductions on top of the more than 191 Mt CO₂-e already contracted.

Case study: North East Arnhem Land Fire Abatement Project

The North East Arnhem Land Fire Abatement project in the Northern Territory is a recently registered Emissions Reduction Fund project. Operated by the Yirralka Rangers in north east Arnhem Land, the project is undertaking early dry season fire management to avoid high intensity wildfires later in the season, reducing greenhouse gas emissions and protecting the natural and cultural assets of the Laynhapuy Indigenous Protected Area.

In 2016, Yirralka Rangers traversed 10,000 km of remote country by vehicle and 4200 km by helicopter to undertake ground and aerial burning. Their hard work resulted in a very productive year, earning more than 110,000 ACCUs through the Fund, where one Australian carbon credit unit represents one tonne of emissions reductions.

The project successfully bid into the Clean Energy Regulator's fourth reverse auction in November 2016, where they contracted 100,000 tonnes of abatement, allowing the project to sell their ACCUs to the Australian Government over coming years.

In addition to carbon credits, the project has additional benefits, including increasing Indigenous employment, supporting Aboriginal people to return and remain on their country, biodiversity protection, transfer of knowledge to younger generations, maintaining Aboriginal languages, and higher standards of mental and physical health.

The Yirralka Rangers and the Laynhapuy Indigenous Protected Area are supported by the Australian Government's Indigenous Protected Area and Working on Country—Indigenous Ranger programs. These programs maintain and enhance the biodiversity of the land and sea, protect cultural sites, develop alternative sources of income and build the Yolngu people's skills and capacity to undertake activities like those covered by the Fund. The role of the Yirralka Rangers goes beyond the physical to the nurturing of spiritual components—essential to the Yolngu people's relationship with their land.



Yirralka Rangers Fuel Reduction Burning, Laynhapuy Indigenous Protected Area (credit Yirralka Rangers/Laynhapuy Homelands Aboriginal Corporation)

‘Caring for country is not just about plants and animals, it is also about songlines and sacred sites within the country. Under Yolngu law we must protect these places. Ranger djama (work) is good because it gives us more ways to fulfill our obligation to look after country while continuing to live on our ancestral lands. Living on the homelands is the vision of our old people.’

—Mungurrapin Maymuru, Yirralka Rangers Cultural Manager

Projects on the land deliver a range of other benefits, including increased biodiversity, increased productivity in agriculture and expanding traditional land management for Indigenous Australians. A common theme in submissions to the review was for greater recognition and valuation of non-carbon benefits.

In general, because an offsets market values only carbon abatement it does not support other critical priorities such as biodiversity or landscape restoration. These values should also be recognized and valued. In addition, many Indigenous carbon projects provide a host of additional social, cultural and remote employment benefits. These also should be valued.¹⁴

— Australian Conservation Foundation, 2017

The Department of the Environment and Energy will continue to work with stakeholders on ways to deliver other benefits. This includes natural resource management groups, state and territory governments, peak bodies, Indigenous organisations and partner agencies involved in biodiversity and improved environmental outcomes.

¹⁴ Australian Conservation Foundation submission to the 2017 climate change review Discussion Paper.

The Climate Change Authority is working on a research report on ways to better coordinate action to reduce carbon emissions on the land, while enhancing our natural environment and helping farmers improve their bottom line. The Government will consider the findings of the Climate Change Authority's research report.

Of the \$2.55 billion allocated to the Fund, more than \$265 million remains. Most of the ACCUs generated by projects have been purchased by the Australian Government, and submissions to the review suggested Government funding is required, at least in the near term, to ensure effective continuation of the market. There is growing activity in the secondary market, including those purchasing ACCUs voluntarily, and many participants in the Fund anticipate an increasing transition from Government purchasing of emissions reductions to private sector purchasing over coming years. With more than \$265 million remaining in the Fund, the Government will consider further funding through future budgets.

Some stakeholders support the export of ACCUs to international carbon markets in order to channel more investment into domestic abatement projects and open up market opportunities. This is covered in Section 3.4 on International Units.

During 2017 the Climate Change Authority reviewed the operation of the enabling legislation for the Emissions Reduction Fund, the *Carbon Credits (Carbon Farming Initiative) Act 2011*. The final report of this review was released on 11 December 2017.¹⁵ The Government will consider the findings of the Climate Change Authority's review and respond to the recommendations. This is a further opportunity to make improvements to the effectiveness and integrity of the Emissions Reduction Fund.

2.2. Resources, manufacturing and waste

The Emissions Reduction Fund Safeguard Mechanism covers around 140 businesses¹⁶, including in the mining, oil and gas, manufacturing and transport sectors. Together these businesses are responsible for about half of Australia's emissions.

The Safeguard Mechanism is part of the *National Greenhouse and Energy Reporting Act 2007*. Together with the reporting obligations under the Act, the Safeguard Mechanism provides a framework for Australia's largest emitters to measure, report and manage their emissions.

Australian industry action to reduce emissions

Australia's industrial facilities are taking measures to reduce emissions. Australian Paper invested over \$1 billion to replace, develop and expand its renewable energy generation and manufacturing operations.¹⁷ Adelaide Brighton has registered an Emissions Reduction Fund project, and broader action by Australia's cement industry has led to emissions reductions of more than 20 per cent since 2005.¹⁸ Australia's aluminium sector has reduced emissions per tonne of production by more than 15 per cent for indirect emissions in smelting, more than 25 per cent for alumina refining, and more than 90 per cent for potent perfluorocarbons since 1990.¹⁹ Where on-site emissions reduction opportunities are limited there is growing interest in the potential of offsets.

¹⁵ Climate Change Authority (2017) [Review of the Emissions Reduction Fund](#).

¹⁶ Estimate based on validated data reported under the National Greenhouse and Energy Reporting Act 2007. This number will be revised once 2016-17 data has been validated.

¹⁷ Australian Paper submission to the 2017 climate change review Discussion Paper.

¹⁸ Cement Industry Federation submission to the 2017 climate change review Discussion Paper.

¹⁹ Australian Aluminium Council submission to the 2017 climate change review Discussion Paper.

The Government has partnered with industry on a range of low-emission fossil fuel initiatives such as carbon capture and storage technologies. For example, the Gorgon CO₂ Injection Project, operated by Chevron Australia, received \$60m from the Government towards a commercial-scale demonstration of the capture and storage of CO₂ at Barrow Island off northwest Western Australia. The project plans to inject between 3.4 and 4 million tonnes of carbon dioxide each year once fully operating. This will reduce greenhouse gas emissions from the Gorgon Liquefied Natural Gas Project by approximately 40 per cent. When operational, the Gorgon project will be the world's largest commercial scale carbon dioxide injection facility.

The Safeguard Mechanism was developed through extensive consultation with a broad cross section of industry. Its operation was outlined in the Emissions Reduction Fund White Paper released in April 2014 and refined through a consultation paper released in March 2015. It was legislated in November 2014, with detailed rules and regulations released in September 2015.

The Safeguard Mechanism came into effect on 1 July 2016. It was designed to suit the unique circumstances of Australia's economy, in particular the need to protect the competitiveness of Australian industry and support jobs. These remain priority considerations of the Government.

Through the review, businesses told us the Safeguard Mechanism framework is working, but there are opportunities to improve it. The next steps for improving the Safeguard Mechanism are set out in Section 3.3.

For the waste sector, the Emissions Reduction Fund has driven emissions reductions at landfills across Australia. It has helped fund 104 landfill gas capture and alternative waste projects, which are expected to reduce emissions by more than 24 Mt CO₂-e. The waste industry supports the continuation of the Fund.

The Safeguard Mechanism places limits on the emissions of waste deposited at large landfills after scheme commencement (1 July 2016). Landfill operators raised concerns about the operation of the Safeguard Mechanism for the sector. These include that historical emissions are not an appropriate basis for setting Safeguard Mechanism baselines and that the current participation threshold (landfills that emit more than 100,000 tonnes of CO₂-e each year) will only cover a small proportion of landfills which may lead to competitive distortions in the industry.

The Government will consult with the waste sector on options for better aligning Safeguard Mechanism baselines with actual emissions in a given year. For example, baselines could reflect a benchmark gas capture rate instead of historical emissions levels.

Two of the four waste sector methods are currently being reviewed by the Emissions Reduction Assurance Committee. These reviews are scheduled for completion in 2017 and the outcomes will determine how far into the future projects will generate credits under the Emissions Reduction Fund.

2.3 Electricity

On 17 October 2017, the Prime Minister with the Minister for the Environment and Energy announced the Australian Government would introduce a National Energy Guarantee. The Guarantee will ensure Australians have affordable electricity and a reliable 21st century energy system, while helping to meet Australia's international commitment to reduce emissions. The National Energy Guarantee was proposed by the independent Energy Security Board (ESB), which includes the sector's foremost energy market experts, and builds on the work done in the Independent Review into the Future Security of the National Electricity Market (Finkel Review).

The electricity industry has expressed their views through consultation processes for the Finkel Review and the 2017 climate change review, and further consultation will be undertaken on the National Energy Guarantee. The Guarantee will work with other actions the Government is taking to reduce electricity prices and improve security, including abolishing the Limited Merits Review so networks cannot appeal decisions of the Australian Energy Regulator (AER), and ensuring there is sufficient gas for the domestic market.

Australia's energy market is undergoing the largest transition since the creation of the National Electricity Market (NEM). The same transition is happening across the world, driven by retirement of ageing thermal generation, flattening demand for electricity and rapid growth in renewable energy resources. The costs of intermittent generation from wind and solar, once prohibitively expensive, have plummeted in the past decade. At the same time, electricity prices for households, business and industry have increased, and investment has dried up for the kind of dispatchable generation needed to stabilise the grid, such as ready-to-use sources like coal, gas, pumped hydro and batteries. The Government's priority is to deliver a more affordable, more reliable and cleaner electricity supply for all Australians.

Many of the problems can be traced to a failure to properly integrate climate and energy policy over the past decade. Recognising that the electricity sector is transitioning, Council of Australian Governments (COAG) Energy Ministers agreed on 7 October 2016 to an independent review of the future security of the NEM. The review was led by Australia's Chief Scientist, Dr Alan Finkel and was tasked with taking stock of its current security and reliability and to provide advice to governments on a coordinated, national reform blueprint.

The overwhelming view from stakeholders was that a credible and durable mechanism is required to provide industry with the confidence needed to invest in new generation assets.

The Government agreed to 49 of the 50 Finkel Review recommendations, and along with state and territory energy ministers, agreed to a timeline to implement these recommendations. A key recommendation of the Review was the creation of a new independent body, the ESB, to oversee the implementation of the blueprint and coordinate whole-of-system oversight for security and reliability.

Building on the Finkel Review and advice from AEMO on dispatchable capacity in the NEM, the Government asked the ESB to provide advice on the lowest cost way to ensure reliability and cleaner energy is delivered in the NEM. The ESB recommended a National Energy Guarantee as a mechanism to ensure reliability, restore investor confidence and address affordability while lowering emissions in the electricity sector. The Government has accepted the ESBs advice to establish a National Energy Guarantee.

For years now, the Business Council has been calling for an energy policy that can endure the vagaries of politics while ensuring reliability, improving affordability and meeting the government's emissions target. This approach, well implemented, can deliver those outcomes.

— Business Council of Australia, 2017²⁰

The Guarantee will work with other actions the Government is taking to reduce electricity prices and improve security, including abolishing the Limited Merits Review so networks cannot appeal decisions of the AER, and ensuring there is sufficient gas for the domestic market.

2.3.1 The National Energy Guarantee

The Guarantee has been designed to bring together energy and climate policy while maintaining system reliability. The Guarantee will:

- incentivise the right investment in the right place at the right time

²⁰ Business Council of Australia media release, 17 October 2017

- lower wholesale prices and reduce spot price volatility
- improve reliability
- reduce emissions at lowest cost.

The National Energy Guarantee levels the playing field and is technology neutral. It will provide an incentive for every single technology to perform within the two constraints of meeting international commitments and maintaining reliability.

The Guarantee will provide the industry with policy certainty, allowing them to manage their emissions intensity while providing reliability of supply to their portfolio of customers.

Figure 6: The key benefits of the Guarantee



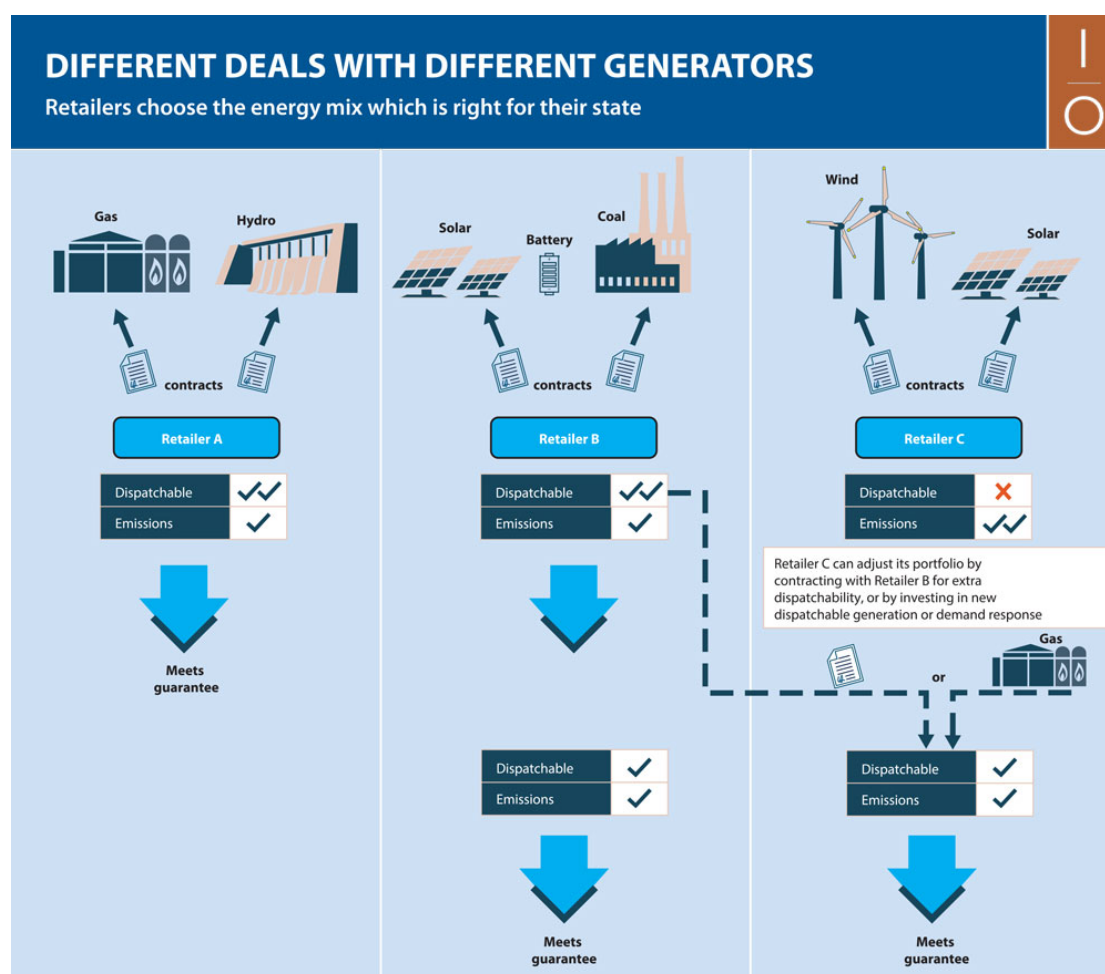
The National Energy Guarantee will consist of dual obligations that will require energy retailers and some large users across the NEM to deliver reliable and lower-emissions energy generation each year. The dual guarantees are:

- **A reliability guarantee** to deliver the right level of dispatchable energy to meet customer and system reliability needs—from ready-to-use sources such as coal, gas, pumped hydro and batteries—in each state. It will be set by the AEMC Reliability Panel and AEMO.
- **An emissions guarantee** which will require all electricity that retailers contract or purchase through the wholesale market to achieve an average emissions level over a compliance period. The level of the Guarantee will be determined by the Commonwealth and enforced by the Australian Energy Regulator.

Retailers will be responsible for meeting these dual obligations and it will be up to retailers to determine how. Retailers could achieve the right mix of generation to meet the guarantee by:

- investing directly in new generation assets that are dispatchable and/or lower emissions.
- entering into contracts with a range of generators.

Figure 7 How the Guarantee works



As retailers will need to contract with low-emissions and dispatchable generators, the Guarantee will encourage more supply into the market, putting downward pressure on wholesale prices. It will also encourage existing generators to invest in their existing plants improving their efficiency.

Modelling conducted for the ESB estimates that the Guarantee will result in wholesale electricity prices being an average of 23 per cent lower than without the Guarantee over the period 2020 to 2030. The lower wholesale prices drive a reduction in retail prices, with the average household expected to save around \$120 compared to business as usual on its electricity bill each year from 2020 to 2030.

The Commonwealth is responsible for ensuring that Australia meets its emissions reduction commitment under the Paris Agreement. Accordingly, the Commonwealth is best placed to set the emissions target and carbon budget for the NEM under the Guarantee. The target will be translated into the annual level of the emissions guarantee for individual retailers.

Stakeholder consultation conducted by the ESB in early 2018 will help to inform the detailed design and implementation of the Guarantee. The Guarantee is intended to commence from 2019 for the reliability component and 2020 for the emissions component.

2.3.2 Integrating renewable energy into the electricity grid

As well as introducing the National Energy Guarantee, the Government is taking a number of other steps to ensure renewable energy is properly integrated into the grid to help deliver reliable and affordable energy. This includes investing in a range of technologies such as battery storage, concentrated solar

thermal, bioenergy and pumped hydro that together with other non-renewable technologies such as coal and gas, play important roles in stabilising the grid and can help meet demand at peak times. The Government has already spent or committed around \$220 million in funding for a suite of energy storage projects across the country.

Pumped hydro, a form of energy storage, is a critical piece of energy infrastructure that can ensure the secure, reliable and affordable supply of energy. The Government, through ARENA and the CEFC, is helping to maximise renewable energy potential by investing in pumped hydro.



The Government is investing up to \$8 million towards Snowy Hydro’s feasibility study on expanding pumped hydro storage in the Snowy Mountains (total cost of \$29 million). Snowy Hydro 2.0 involves an extra 2000 megawatts of generation capacity—a 50 per cent increase in the capacity of the Snowy Scheme—which would help make renewables more reliable, and help stabilise electricity supply into the future.

The Australian and Tasmanian Governments, through ARENA, are working with Hydro Tasmania on feasibility studies to assess several new pumped hydro energy storage schemes that could deliver up to 2500 megawatts of additional capacity for the NEM. The proposed expansion builds on the Government’s feasibility study for Snowy 2.0 and supports the Government’s technology neutral approach to affordable, reliable electricity.

EnergyAustralia and its partners, through ARENA, have undertaken a feasibility study of a new pumped hydro storage project using sea water. The potential site is located near Port Augusta in South Australia.

The Government has committed to invest up to \$110 million to secure the delivery of a concentrated solar thermal plant at Port Augusta. Solar thermal plants operate in a similar way to traditional fossil fuel power plants with steam spinning a conventional turbine, which allows them to contribute to network stability and reliability.

The Government has confirmed its commitment to energy security by providing \$54 million from the CEFC to support a large-scale solar development with the potential for pumped hydro storage. The solar development will take place at Genex Power's Kidston Renewable Energy Hub, northwest of Townsville. ARENA has provided \$9 million for a study into the next phase, a 250 megawatt pumped hydro-storage project. Co-locating a large-scale solar farm with a large-scale pumped hydro storage project will be an Australian first.

ARENA: Building the grids of the future

The Kennedy Energy Park 20 km south east of Hughenden in Queensland is receiving \$18 million in funding through ARENA. This will be the first renewable energy project in Australia to combine wind and solar with battery storage and feed power into the national electricity grid. This approach opens the door to more reliable renewable energy that can be dispatched when the sun is not shining and the wind is not blowing.

ARENA is currently supporting a trial at South Australia's Hornsdale Stage 2 Wind Farm to provide Frequency Control Ancillary Services (FCAS) to the grid to maintain a balance of supply and demand during a range of power system conditions.

Traditionally, power demand and supply is continuously balanced by procuring FCAS services from thermal generation. When frequency is too low, it is increased by FCAS services to either increase generation or decrease demand. When frequency is too high, it is reduced by FCAS services which lowers generation or increases demand. This trial is an important step towards the integration of wind and solar technologies into the NEM as we transition to a lower-emissions future.

2.4 Households, small to medium enterprises and the built environment

Measures that improve energy productivity for households and small businesses can provide a large volume of low cost emissions reductions alongside other benefits such as reduced energy bills, job creation, improved health, and regional benefits. Stakeholders are supportive of action to improve energy efficiency.

More efficient and productive use of energy has great potential as a source of low cost abatement. Consumption efficiency is also necessary to moderate the overall cost of our energy system, and to help energy users endure the extreme increase underway in the prices of electricity and gas. Nationally coordinated action on energy efficiency has never been more necessary.²¹

— Australian Industry Group, 2017

²¹ Australian Industry Group submission to the 2017 climate change review Discussion Paper.

The NEPP aims to improve Australia's energy productivity by 40 per cent over the period 2015 to 2030. This is being done through a package of 34 measures to support:

- smarter energy choices (by providing more efficient incentives, empowering consumers and promoting business action).
- better energy services (by driving greater innovation, more competitive and modern markets and updating consumer protections and standards).

The NEPP has delivered tighter energy standards for equipment through the Equipment Energy Efficiency (E3) program, including both energy efficiency standards and energy labelling for equipment and appliances.

Greenhouse and Energy Minimum Standards (GEMS) set minimum energy performance standards for products such as air conditioners, dishwashers, fridges, lighting, televisions and washing machines. Products cannot be sold in Australia if they do not meet these minimum standards. This means people can buy energy efficient products off the shelf without having to do their own research. This program is saving households on average between \$90 and \$190 a year, while also reducing greenhouse gas emissions by between 23 and 35 Mt CO₂-e between 2000 and 2014.²² Standards applying to products such as lighting, electric motors and refrigeration display cabinets have also saved energy in the commercial sector.

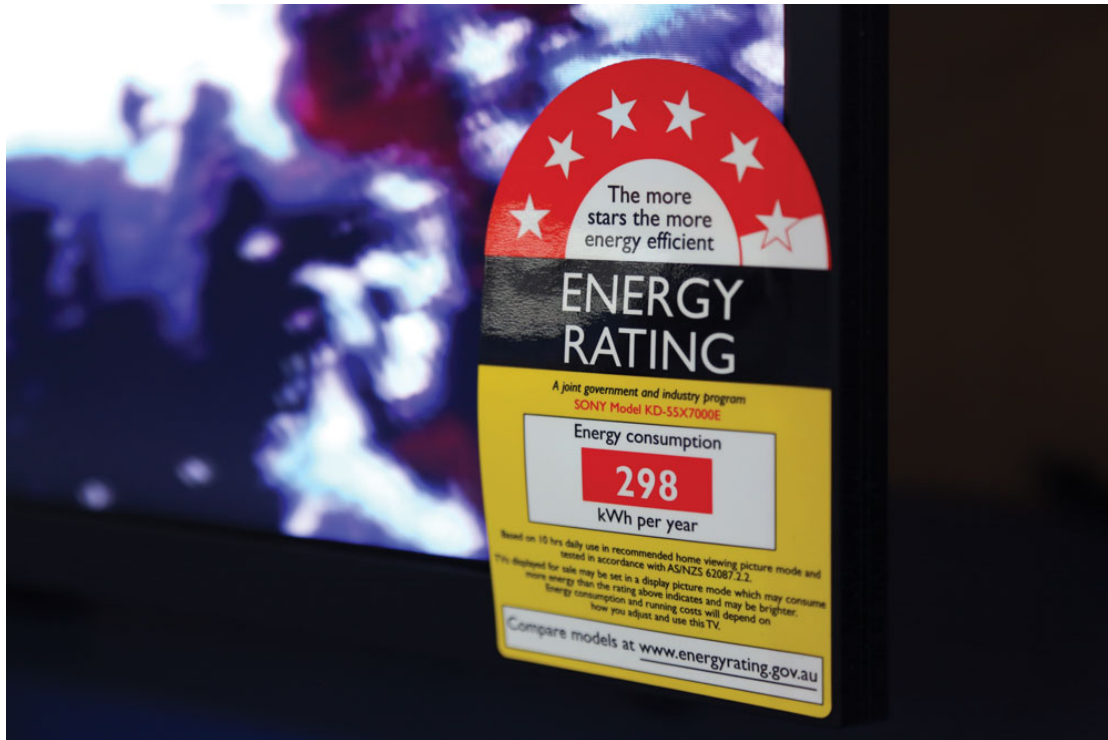
*GEMS is one of the biggest drivers of energy efficiency in Australia, annually delivering around \$1 billion in avoided energy costs and cutting emissions by over 1.5 per cent.*²³

— Energy Efficiency Council, 2017

To accelerate the impact of the E3 program, new proposed standards have been consulted on for air conditioners, commercial refrigerated display cabinets, industrial fans, swimming pool pumps, lighting, refrigerators and freezers. These measures will deliver an estimated \$7 billion in economic benefits and reduce emissions by 45 Mt CO₂-e (cumulative to 2030).

²² DataBuild, Greenhouse and Energy Minimum Standards Review 2015 Report, July 2015. The benefits and emissions are calculated using a range of inputs which contain statistical uncertainty in the analysis. An exact historical figure would only be possible if the department metered each appliance within a home.

²³ Energy Efficiency Council submission to the 2017 climate change review Discussion Paper.



Energy rating labelling

Improving the energy productivity of buildings offers opportunities for low-cost emissions reductions as well as providing owners, buyers and tenants with more affordable, comfortable buildings and lower energy bills.

Minimum energy performance standards are set out in the National Construction Code for new buildings and major renovations. Commonwealth, state and territory governments agreed standards should be raised for commercial buildings in 2019. In partnership with the Australian Building Codes Board, proposed provisions are under review and initial industry consultation and development of case studies is underway. Public consultation on the proposed changes is scheduled for February 2018.

Disclosure of energy performance at the point of sale, lease or rent is mandatory for large commercial office buildings under the Commercial Buildings Disclosure (CBD) Program. The CBD Program has been highly successful. In the first five years of operation, it is estimated to have reduced emissions by two Mt CO₂-e and delivered \$44 million in net benefits to the commercial building sector.²⁴

In 2016 the mandatory disclosure threshold for commercial buildings was lowered from 2000 square metres to 1000 square metres. This will lead to an estimated \$50 million in new energy savings, and a reduction of around 3.5 MtCO₂-e between 2015 and 2019. The CBD Program is scheduled for review in 2018–19. The review will consider the effectiveness of the current program which applies to offices and will also examine the case for extending it to other high energy using classes of building.

²⁴ ACIL Allen Consulting 2015, [Commercial Building Disclosure Program Review](#).



Global Change Institute, UQ (6 Star Green Star building) © Green Building Council Australia

To improve the energy efficiency of residential buildings, Commonwealth, state and territory governments are working collaboratively to deliver targeted industry training, tools and information to improve compliance with the energy performance requirements of the Australian National Construction Code. Other work areas include developing rating and disclosure schemes to improve existing buildings, and investigating trajectory and whole of house approaches to ensure residential buildings are built and improved to need less energy for heating and cooling.

For example, Kingspan Insulation Australia opened Australia's first five star Greenstar manufacturing facility in Somerton, Victoria, in 2017. The new factory has several innovative features, including a 750 kilowatt solar system designed into the roof structure (currently under construction in partnership between Kingspan Energy and Origin Energy), an industrial low energy lighting system and a low energy heating system. Kingspan is on track to achieve its commitment of net zero energy use at its facilities by 2020, with renewable energy use across more than 90 manufacturing sites estimated to account for 57 per cent of its consumption in 2016.

To ensure we can plan the best energy system for this more efficient future, the Government has committed \$19.4 million funding to work with the CSIRO and industry to develop the Energy Use Data Model. This is a 'big data' project that will reduce future costs for consumers by investing in cutting-edge techniques to better understand and forecast changing energy use. Rapid change in how consumers are using new technologies like solar power, more efficient modern appliances, storage and electric vehicles means that we need to do much more to understand consumer needs and choices.

The Australian Government's Smart Cities Plan will contribute to the NEPP through measures to address climate change at the local level, such as the \$100 million a year Sustainable Cities Investment Fund. There are also opportunities to drive the deployment of clean energy, renewable energy and energy efficiency technology in cities through City Deals.

The Townsville City Deal, Australia's first, was signed on 9 December 2016. The CEFC has a Townsville presence and has financed two major investments in renewable energy in the region—the Kidston Renewable Energy Hub and the Ross River Solar Farm near Townsville. The Launceston City Deal was signed on 20 April 2017. Through this City Deal, the Australian Government is supporting the University

of Tasmania to establish a new campus in the centre of the city that sets a high benchmark, with world class water sensitive and energy efficient design. The Australian Government is also working with the New South Wales Government and local governments across Sydney's Western City District toward a landmark Western Sydney City Deal—the first in New South Wales. Future City Deals are expected to be announced in the coming months.

The National Carbon Offset Standard and carbon neutral certification

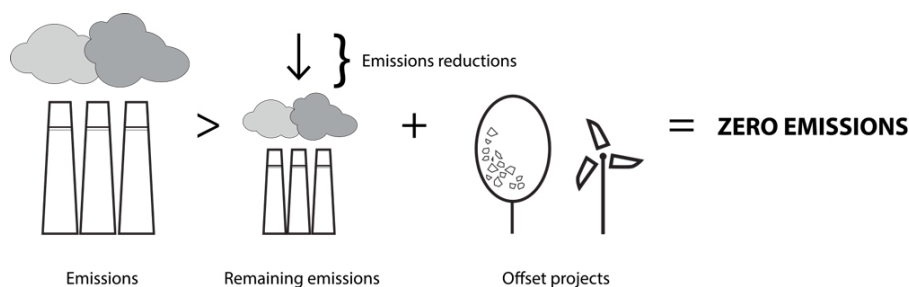
Businesses and other organisations are increasingly managing their greenhouse gas emissions to position themselves for growth and competitiveness in a lower-emissions future. Businesses are also choosing to go one step further and demonstrate their leadership and corporate responsibility by becoming certified as carbon neutral.

The Australian Government's National Carbon Offset Standard helps these businesses and organisations by outlining how to measure, reduce, offset and report emissions. It also provides a framework to credibly claim or be certified as carbon neutral. The Standard is available across a range of categories including organisations, products/services, buildings, precincts and events.

Some of Australia's best known businesses are part of a proactive and environmentally responsible network of leading enterprises that are carbon neutral. Membership is diverse and includes banks, airlines, legal firms, councils, property groups and small to medium enterprises (SMEs).

There are many benefits to being certified carbon neutral, including increased customer recognition, a new competitive edge, improved employee engagement, enhanced corporate social responsibility, internal expertise in carbon management, and measurable environmental outcomes.

By offsetting residual emissions that cannot be avoided, carbon neutral entities are investing in carbon offset projects that often deliver additional environmental or social outcomes such as improved water quality, increased biodiversity and increased Indigenous employment. Organisations are seeking offset projects that provide these benefits and align with their organisational or corporate values.



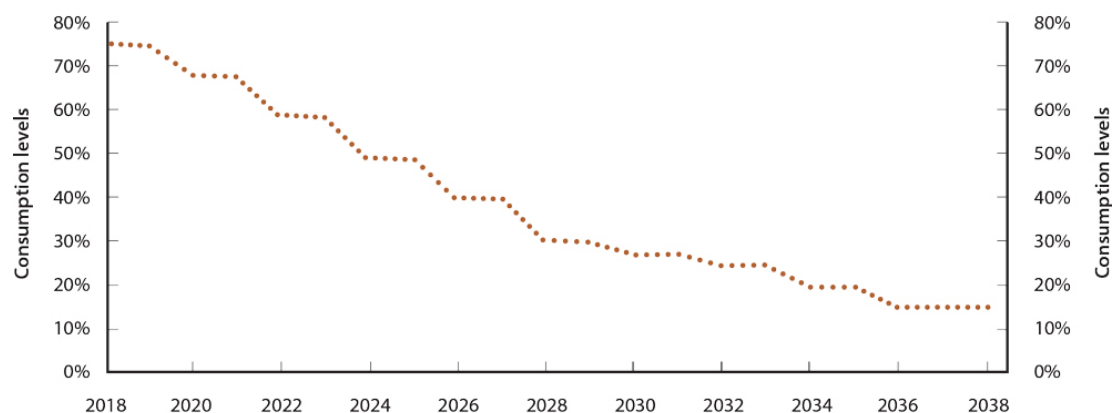
2.4.1 The phase-down of hydrofluorocarbons (HFCs)

HFCs are one of the seven greenhouse gases controlled under the Kyoto Protocol. HFCs are industrial chemicals used mainly as refrigerants in refrigeration and air conditioning equipment, and in fire protection systems. They generally have a high global warming potential compared to carbon dioxide. The most common, HFC134a, is 1430 times more potent than carbon dioxide. HFC emissions make up around 2 per cent of Australia's total greenhouse gas emissions but are projected to increase without policy intervention.

Legislation was passed by Parliament on 19 June 2017 which will enable Australia to commence a phase-down of HFC imports from 1 January 2018. The phase-down will reduce the total quantity of HFCs

permitted to be imported every two years until an 85 per cent reduction from 2011–2013 levels is achieved from 2036 (Figure 8).

Figure 8: Australia’s HFC phase-down



Australia’s HFC phase-down is ahead of the global phase-down agreed under the Montreal Protocol on Substances that Deplete the Ozone Layer in Kigali in October 2016. It commences one year earlier, HFC limits start 25 per cent below the Montreal Protocol’s limits and Australia has more frequent reduction steps. Australia will use 25 per cent less HFCs than permitted under the Montreal Protocol over the period from 2018 to 2036.

2.5 Transport

Existing and emerging technologies have the potential to reduce emissions in the transport sector. Electric and hybrid vehicles are already providing low-emissions transport options for individuals and fleet owners. Innovations like connected vehicles, that can communicate with other vehicles and traffic infrastructure, automated vehicles and smart infrastructure will transform the way people travel and live in cities, towns and rural areas. New technology allows the creation of low-carbon fuels from waste products like plastics and timber off-cuts as well as sustainable biomass. Low-carbon fuels like these can reduce emissions from freight, aviation and shipping.

The CEFC provides financing for businesses to upgrade their fleets with low-emissions vehicles through several industry partnerships. Over 1000 lower-emissions vehicles have been financed through these partnerships to date. The CEFC also supports new innovations like lightweight carbon-fibre wheels. The Government provides exemptions from some vehicle taxes for highly efficient vehicles.

Under the Emissions Reduction Fund, vehicle fleet owners can earn ACCUs by improving vehicle efficiency. Six projects have been registered under the method focused on improvements to heavy vehicles and ships.

Information programs are in place to help individuals and businesses choose more efficient vehicles, including light vehicle labelling and the online Green Vehicle Guide that provides information to car purchasers about the performance of their vehicle choice.

The Government established a Ministerial Forum to coordinate a whole of government approach to addressing emissions from motor vehicles. The Ministerial Forum is chaired by the Minister for Urban Infrastructure, the Hon Paul Fletcher MP, and includes the Minister for the Environment and Energy, the Hon Josh Frydenberg MP.

Australia was a founding member of the International Civil Aviation Organization and is working with other member states to achieve a medium-term aspirational goal of keeping global net emissions from

international aviation at the same level from 2020. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) will encourage the use of sustainable alternative aviation fuels to reduce emissions and involve offsetting any growth in emissions.

International developments are driving emissions reductions from the shipping sector. The International Maritime Organization (IMO) has adopted binding energy efficiency measures across the global shipping industry and is working towards a greenhouse gas emissions reduction strategy. The IMO estimates that by 2025, all new ships will be 30 per cent more energy efficient than those built in 2014.

Electric vehicles in Australia

Annual sales of electric vehicles in Australia have been around 500 to 1000 since 2010. There are around 4000 electric and plug-in hybrid vehicles registered in Australia. Of these, around 1100 are Tesla pure electric vehicles.

The current uptake rate of electric vehicles in Australia is around 0.1 per cent of new vehicle sales. This is projected to increase to 0.3 by 2020 and 15 per cent by 2030 as electric vehicles become more competitive. This would result in more than 12,000 electric vehicles in Australia by 2020, and around 1 million by 2030.²⁵

There are a range of electric vehicle recharging options in Australia. A number of motoring groups and businesses are developing charging network schemes, including the NRMA in NSW and the RAC in WA. Tesla has established a network of direct and current fast charging stations from SA to northern NSW, and is working on extending this network further.



Shifting freight and passenger transport from road to rail or ship has the potential to reduce emissions by transporting passengers and freight more efficiently. The 2017–18 Budget includes a \$10 billion National Rail Program to invest in major passenger rail projects to help people move around our growing cities. It also includes \$20 million to support faster rail connections between capital cities and regional centres. In

²⁵ Department of the Environment and Energy projections.

addition, the Government is providing \$500 million to upgrade regional rail in Victoria which is intended to provide better transport connections and reduce travel times, making it easier for people to move between regional and metropolitan centres for business, education and recreation.

The CEFC has invested \$150 million in a new freight hub in south-west Sydney. This hub will divert freight from trucks to trains and is expected to reduce truck emissions by 100,000 tonnes of emissions each year.

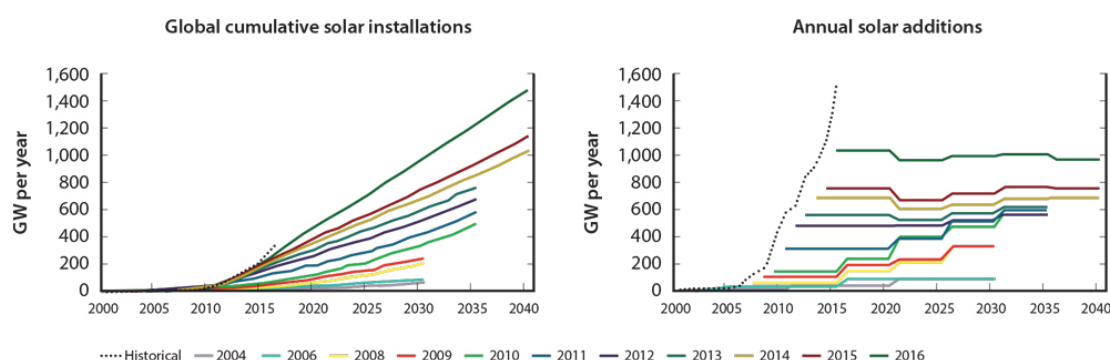
2.6 Research, development and innovation

Innovation in clean energy technology is essential for Australia and other countries to maintain a growing economy while meeting the ambition of the Paris Agreement. An unprecedented transformation of the energy sector will be required world-wide, and technology will be the swing factor that achieves this. Low-emissions technologies like renewable energy with storage, energy efficiency, electric vehicles, solar fuels, carbon capture and storage, and the latest High Efficiency Low Emissions thermal technology will all play a role.

The clean energy technologies being used today, from advanced solar cells to energy storage, are the result of decades of investment in R&D. For example, in the last 10 years, the efficiency of average commercially-available solar panels has increased by almost 50 per cent.²⁶ The price of lithium-ion batteries fell by 73 per cent²⁷ between 2010 and 2016 while battery performance continues to improve at between 5 and 8 per cent every year, thanks to new breakthroughs.

Technology has the potential to rapidly change the way that we live, but the timing and pace of these changes can be difficult to predict. An example of this is the rapid increase in the uptake of solar PV systems. Installations of small-scale solar PV systems increased from a total of around 22,000 in 2008 to a total of over 1.7 million in mid 2017.²⁸ These systems use solar panel technology largely developed in the 1970s. However, from the mid-2000s, consumers began seeking greater control over their energy supply in response to higher electricity prices and environmental concerns, and it was this, combined with falling costs and government policy, that drove widespread uptake. Figure 9 shows how forecasts of solar capacity have increased over time and how actual installations have outstripped forecasts.

Figure 9: International Energy Agency solar capacity forecast evolution²⁹



The CSIRO Low Emissions Technology Roadmap, released on 2 June 2017, provides insights into technologies that are likely to be important for Australia in the medium to long term. The Roadmap found that clean energy innovation could be a major source of competitive advantage for Australia. Regardless of

²⁶ Fraunhofer Institute for Solar Energy Systems, ISE, 2016 photovoltaics report.

²⁷ Bloomberg New Energy Finance.

²⁸ Clean Energy Regulator.

²⁹ Source: IEA World Energy Outlook. Note: 2004-05 Reference, 2010-2016 New Policies Scenario.

the pathway Australia takes to achieve its climate commitments, we can play an important role in the global uptake of low-emissions technologies. We can contribute to technology development, help regional neighbours deploy technologies, and demonstrate possibilities to other countries. Australia can also export low-emissions products and commodities, from hydrogen for fuel, to minerals like lithium, magnesium, cobalt, nickel, lead, zinc and graphite used in batteries and other technology.³⁰

The Roadmap recommends that Australia prioritise its research, development and deployment efforts on areas that can make the greatest impact. This includes:

- building on areas of comparative advantage (e.g. solar PV, grid integration)
- capitalising on global market opportunities (e.g. hydrogen export, energy services)
- supporting global decarbonisation efforts (e.g. carbon capture and storage) and
- driving down technology costs for deployment in Australia (e.g. concentrated solar thermal).

The Government will use the Roadmap, together with the broader National Innovation and Science Agenda, to guide the direction of future research, development and deployment.

Australia was a founding member of Mission Innovation—a global initiative to increase public investment in clean energy R&D as part of global efforts to accelerate breakthroughs in clean energy technologies. Along with 22 other member countries plus the EU, the Government has pledged to double public expenditure on clean energy R&D from 2015 levels by 2020.

The aim of Australia's participation in Mission Innovation goes beyond meeting our commitment to doubling R&D expenditure. Building on the areas of strategic advantage identified in the Low Emission Technology Roadmap, Mission Innovation is a great opportunity for Australian researchers to forge international links and access global investors. It will help attract talent and investment to Australia, helping to grow our economy and create jobs. For example, involvement in Mission Innovation allows R&D projects from participant countries to attract venture capital from the Breakthrough Energy Coalition—a group of billionaires who have agreed to invest personal funds in energy innovation. Already the Breakthrough Energy Coalition has announced its first venture capital fund of US\$1 billion.

ARENA will play an important role in delivering Australia's renewable-energy related Mission Innovation commitment. The Department will also work with the Australian Research Council and the CSIRO to encourage more funding proposals from the clean energy R&D community.

Innovation at Sundrop Farm

Sundrop Farm in Port Augusta, South Australia uses renewable energy and seawater to produce high value crops in an area with no fresh water, degraded pasture land and an unforgiving climate. The 100 per cent renewable farm uses concentrated solar thermal energy to generate power to cool and heat greenhouses, and desalinate seawater for irrigation. Ongoing operational costs are lower than traditional greenhouses.

Sundrop grows tomatoes, a high value crop, all year round, reaping more than 15,000 tonnes every year without needing fresh water or prime agricultural land. This provides a major boost to the Port Augusta economy as well as wider benefits for businesses and sustainable agriculture research in Australia.

This project demonstrates the potential for meeting the global food production challenge sustainably and profitably using renewable technologies. It is the only farm of its kind in the world and presents world-class sustainable agriculture.

³⁰ Low Emission Technology Roadmap p6

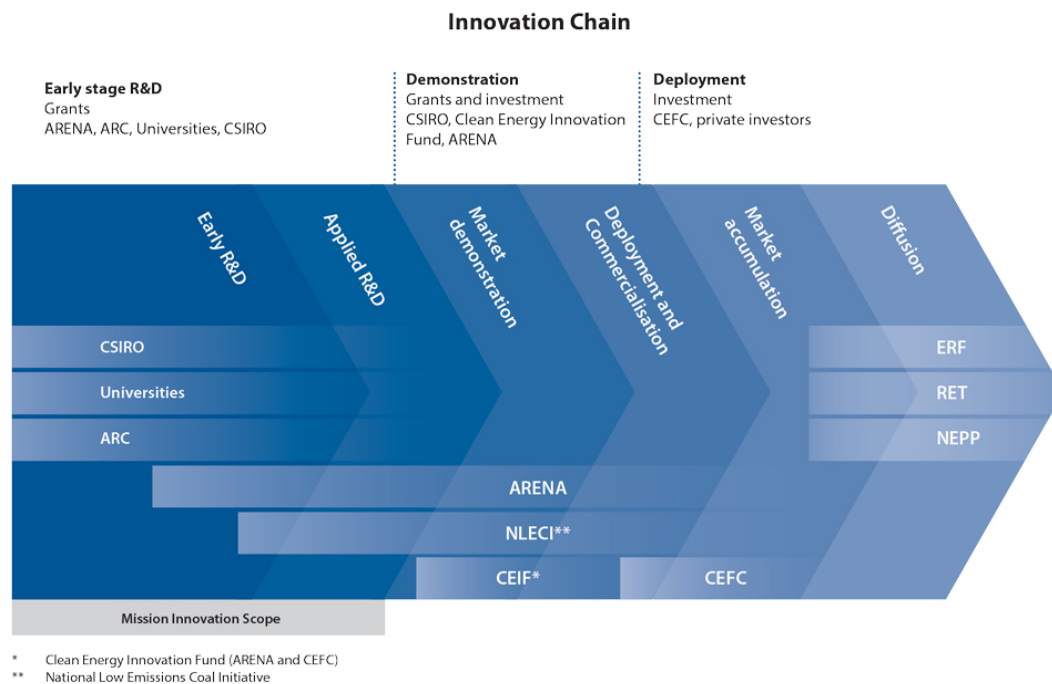
The CEFC initially underwrote \$40 million, approximately 25 per cent of the \$200 million project cost. This commitment assisted Sundrop to secure private sector finance for the entire project, demonstrating the value proposition Australia's exceptional renewable energy endowment enables.



Australia is also building bilateral collaborations in clean energy. The jointly funded Australia Germany Energy Transition Research Hub will bring together Australian and German research institutions to work on challenges of developing sustainable clean energy for the future. The Hub will generate collaborative and world-leading research to help the technical, economic and social transition to new energy systems and a low-emissions economy. Australian researchers have also joined the international ITER consortium attempting to build the world's biggest fusion reactor.

The Government is supporting investment in clean energy innovation through ARENA and the CEFC, which work to drive the development and uptake of clean energy technologies in Australia. ARENA provides research, development and deployment grant funding to improve the affordability and supply of renewable energy in Australia. The CEFC focuses on investing commercially to increase the adoption of clean energy technologies and facilitate the flow of funds into the clean energy sector.

Figure 10: Clean Energy Innovation Chain

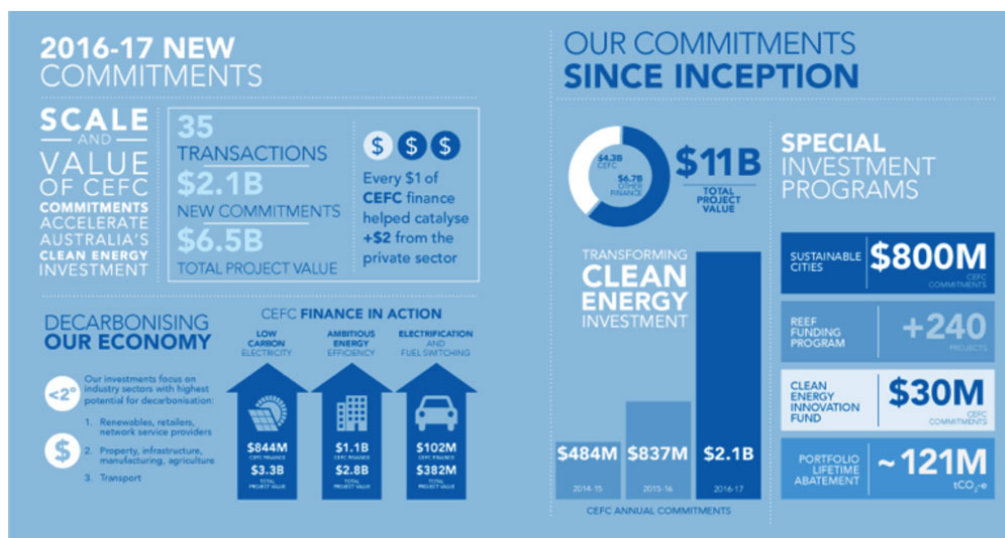


As at 30 June 2017, ARENA had committed approximately \$1 billion to over 320 renewable energy projects. This has been matched by \$2.5 billion in co-funding, making the total \$3.5 billion. These funds support projects that span the commercialisation pathway, from R&D to demonstration and near-commercial deployment projects.

In 2016 the Government provided \$800 million in funding to ARENA to 2022. The Government's priorities for ARENA include:

- at least double the funding allocated to R&D, consistent with Australia's Mission Innovation target
- fund R&D of technologies that support electricity system security and reliability (such as storage)
- make funding decisions informed by independent expert advice (such as the Finkel Review and CSIRO Low Emissions Technology Roadmap)
- work collaboratively with other agencies supporting clean energy innovation, including delivering joint activities or work programs with agencies like the Australian Research Council and CSIRO.

Figure 11: CEFC commitments since inception



Since 2013, the CEFC has made commitments of more than \$4.3 billion to projects with a total value of \$11 billion. The CEFC's investments have leveraged around \$1.94 for every \$1 of CEFC investment. In 2016 the Government agreed to create three new funds within the CEFC:

- The Clean Energy Innovation Fund (\$200 million, administered jointly with ARENA).
- The Sustainable Cities Investment Program (up to \$1 billion over 10 years).
- The Reef Funding Program (up to \$1 billion over 10 years).

The Government has introduced legislation to Parliament to make the CEFC's investments technology neutral by removing CEFC's prohibition on Carbon Capture and Storage. The Bill seeks to align the CEFC's Act with the Government's technology neutral approach to reducing emissions.

The Clean Energy Innovation Fund – helping emerging technologies make the leap to commercialisation

The Clean Energy Innovation Fund is a \$200 million fund, jointly administered by ARENA and the CEFC. It provides debt and equity funding for innovative clean energy projects. Projects funded so far since the Fund's establishment in March 2016 include:

- \$5 million to GreenSync to expand their smart technology business to help create the smart electricity grid of the future.
- \$10 million in equity to help Carbon Revolution expand production of carbon fibre wheels (an alternative to aluminium wheels) from under 6000 to over 100,000 a year.
- \$10 million to Artesian Venture Partners as a cornerstone investment to the Clean Energy Seed Fund. The seed fund targets scalable, high growth potential startups fuelling innovation and creating opportunities in the development of clean technology.

Developing Australia's resources and energy commodities in a sustainable manner is critical to the sector given its significant contribution to the Australian economy. The sector employed 225,000 people in 2016 and exports were valued at \$176 billion, accounting for around half of Australia's goods and services exports in the same year. The global demand and consumption of fossil fuels is likely to continue for the foreseeable future; many of these energy commodities, especially in Asian markets, will come from Australia.

Given the economic importance of the resources sector, the Australian Government has invested nearly \$590 million in research and development on low emission technologies for fossil fuels, such as Carbon Capture and Storage and coal mine methane abatement. This investment joins significant support provided by industry and research partners for low emission fossil fuel technologies.

3. Next Steps

The Government is committed to meeting its international obligations. With three years still remaining in the second Kyoto commitment period (2013–2020), Australia is on track to beat its 2020 target by 294 Mt CO₂-e. Consistent with Australia’s Nationally Determined Contribution, our Paris Agreement target applies over the period 2021 to 2030 i.e. after the Kyoto target ends.

With three years to go until the measurement period for the Paris 2030 target commences, Australia is well positioned. The required abatement task has been progressively reduced—down around 60 per cent since 2015 and around 75 per cent since 2008—and as set out through this review, we have in place a comprehensive policy suite covering every sector of the economy. This set of policies, with some adjustments set out below, is the right approach to meet our targets and support jobs and strong economic growth.

Our policies need to anticipate technology change and stay in step with those of other countries.

The Emissions Reduction Fund remains at the core of our suite of policies. We can learn from the successes of the last few years to capitalise on the range of economic, environmental and social benefits. The Government will continue to look at ways of improving the operation of the Fund, including considering recommendations from the Climate Change Authority’s review of the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

3.1 Review and refine cycles

To collectively achieve the goals of the Paris Agreement, countries are required to put forward progressively more ambitious commitments every five years. Australia’s 2035 emissions reduction target is due in 2025 (with its 2040 target due in 2030, and so forth).

The five yearly review process provides the opportunity for Australia to take stock of global climate action and the actions of its trading partners. It also provides a logical forward schedule to take stock of the domestic policy framework.

The Government will introduce domestic policy ‘review and refine’ cycles with the five-yearly review process under the Paris Agreement (while noting that from time to time policies will need to be adjusted outside this cycle as circumstances arise). This approach will provide for integrated consideration of domestic policy and international targets, and provide guidance for industry about future policy review processes.

3.2 Electricity Generation

Consultation on the detailed design elements of the National Energy Guarantee will occur in early 2018 and the COAG Energy Council will consider the outcomes of stakeholder feedback in the first half of 2018. The Guarantee is intended to commence from 2019 for the reliability component and 2020 for the emissions component.

3.3 Simplifying the Safeguard Mechanism

Safeguard Mechanism baselines are set and published by the Clean Energy Regulator. They are initially set with reference to historical emissions—specifically, the high point of emissions between 2009–10 and 2013–14 reported under the *National Greenhouse and Energy Reporting Act 2007*.

Historical data provides a sound initial basis to establish baselines, but it reflects past activity, so it is not

necessarily a good indicator of current and future circumstances. A risk identified by businesses during the review is that baselines based on data from up to eight years ago could be out of step with current operations.

AIGN urges the Government to consider the cases of entities whose requirements to remain competitive and meet demand may include incremental increases in production that will result in commensurate increases in emissions growth.

— Australian Industry Greenhouse Network, 2017

The current rules allow baselines to be increased under certain circumstances. For example, a facility can increase its baseline if it expands production capacity by more than 20 per cent, its emissions grow while its emissions-intensity³¹ is continuously improving, or there is natural variability in resource grades at mining, oil and gas facilities.

These circumstances apply to many, but not all, facilities. In addition, sectors and businesses have evolved differently over the past eight years reflecting different economic, technological and other factors. Businesses noted that historical baselines could have impacts across firms that are unexpected and uneven.

*Historical baselines will eventually see more and more growing businesses face a penalty, somewhat randomly and arbitrarily.*³²

— Australian Industry Group, 2017

The Government will consult with businesses and work with the Clean Energy Regulator on ways to bring baselines up-to-date with current circumstances, and make the Safeguard Mechanism fairer and simpler. This will address the risk of potential constraints on business growth raised by a number of stakeholders through the review.

One option would be to broaden access to baseline increases, so all facilities have an up-to date baseline that reflects their individual circumstances.

In addition, baselines could be regularly updated to reflect actual production. This would see baselines increase with production, supporting business growth. Conversely, if production falls, the baseline would automatically fall in proportion. This would stop baselines becoming out of date in the future. Together with broadening access to baseline increases, historical baselines could be progressively phased-out and replaced by calculated baselines which use more up-to-date data (as by then many will be more than a decade out of date).

To reduce the administrative and auditing costs of applying for a baseline increase, the Government could introduce an option for businesses to use default values reflecting median or average emissions outcomes. This is similar to the availability of lower order methods under the *National Greenhouse and Energy Reporting Act 2007*.

For example, default values could be calculated and published by the Government, based on independent advice. Avoiding audited, site-specific emissions and production forecasts would simplify applications for baseline increases and lower administrative costs for facilities that elect to use them.

Together, these changes would simplify the operation and administration of the scheme. Businesses would need to report production each year (around 60 per cent already do this under existing legislative obligations), but the overall framework would be simpler.

Other mechanisms for increasing baselines—such as the emissions-intensity test—may become redundant as baselines would automatically accommodate business growth. The Government will consult closely with industry on this. Current flexibility provisions set out in the rules to address the inherent variability of

³¹ Emissions per unit of product.

³² Australian Industry Group submission to the 2017 climate change review Discussion Paper.

emissions from natural resources would remain unchanged.

The Government will consult with businesses on all these options in the coming months, with the view to have any changes take effect for the 2018–19 compliance year. Through this consultation the Government will consider how new entrant baselines fit with the updated approach for existing facilities.

The Government recognises the importance of providing industry with clear and predictable policy review processes and sufficient lead times for policy adjustments. Beyond 2018, the next Safeguard Mechanism review will be by 2020 (to align with the long-term strategy discussed below) and then as part of the five-yearly review and refine cycle (outlined above). The review by 2020 will consider the role of the Safeguard Mechanism, including consideration of any updates to rules and regulations in the context of progress towards the 2030 Paris target, in particular, when and how international units can be used and under what conditions, and appropriate lead times.

3.4 International units

The Australian Government committed to reviewing the role of high quality international units in 2017, subject to rules to be agreed to implement the Paris Agreement and the credibility of the system for purchasing international units. International market rules for the post-2020 period are still being negotiated under the Paris Agreement, and there is a degree of uncertainty regarding the supply and price of high-quality units. At this stage, over 60 countries have signalled they intend to participate or will consider participating in the trade of international units as a buyer or seller.

Despite this uncertainty, access to high-quality international units will provide greater flexibility to business and government in meeting emissions reduction targets. A number of countries including Canada, New Zealand, Japan and South Korea have indicated they intend to use international units towards meeting their Paris commitments. Businesses in particular expressed support for the use of international units, in addition to domestic offsets, to provide greater flexibility.

*A competitive, credible, and liquid market is necessary to ensure the success, efficiency and effectiveness of an emissions reduction policy. This should include credible local units, as well as access to credible international markets/units.*³³

— Australian Industry Greenhouse Network, 2017

The Australian Government supports in-principle the use of international units. This in-principle commitment will better position Australia to influence post-2020 market design—including through negotiations under the UNFCCC—and secure access to affordable and high quality units.

Some submissions raised concerns over the use of international units. This includes the quality and integrity of international units (for example, ensuring they represent additional emissions reductions), concerns that competition between international units and domestic offsets may lower the price for domestic offset providers and that access to international units has the potential to delay domestic action on climate change.

*An Australian scheme should initially place limits on the types of international units allowed. Some CERs, for instance, might not be acceptable because the underlying projects raise social, environmental or strategic issues...Delaying domestic emissions reduction may also have longer-term negative economic impacts.*³⁴

— Grattan Institute, 2017

To ensure a balanced approach between domestic and international emissions reductions, by 2020 the Government will determine, in the context of the long-term strategy and in consultation with stakeholders, when and how international units can be used. Australia will only allow the use of units that are consistent

³³ AIGN submission to the 2017 climate change review Discussion Paper.

³⁴ Grattan Institute submission to the 2017 climate change review Discussion Paper.

with the rules implementing the Paris Agreement and where they are of an equivalent standard to ACCUs.

Australia will explore market access opportunities and continue its engagement in international negotiations and other fora to support access to affordable international units and promote environmental integrity. Australian engagement will help align international carbon markets with Australia's strengths and national interests, and support Australian businesses. The Australian Government will also continue to engage industry on UNFCCC negotiations and market access discussions.

Some Australian businesses and industry representatives support the export of ACCUs (selling units to overseas markets), noting this could channel more investment into domestic abatement projects and open up new market opportunities.

*A well-designed international market may also provide opportunities for Australian farmers and agribusinesses as it broadens the carbon market place to more purchasers of ACCUs.*³⁵

— National Farmers' Federation, 2017

Exporting ACCUs would impact on Australia's progress towards our targets. Adjustments will need to be made to Australia's reported progress to ensure each exported unit is only counted once, either towards Australia's target or towards the target of the country buying the units. By driving up the price of domestic offsets, allowing ACCU exports may also increase the cost of domestic abatement.

The rules for international unit transfers after 2020 are also still under development. It would be more appropriate to consider ACCU exports once market rules under the Paris Agreement are established.

3.5 Transport

The Ministerial Forum provides a platform for considering Government action to assist the transition to a low-carbon transport sector. Submissions to the 2017 review encouraged the Australian Government to consider policy options to remove commercial barriers and accelerate the production of high technology biofuels. As part of the next phase of the Ministerial Forum's consideration, it will request ARENA to look at the opportunities and implications of increasing Australia's production of conventional and advanced biofuels. This research will consider the impacts of policies on the community (including motorists), the environment and on agricultural commodities like food and feed stock biomass. This research could inform future policy recommendations by the Forum.

The Ministerial Forum is considering options to reduce carbon emissions from light vehicles through improving fuel efficiency and encouraging the uptake of low-emissions vehicles. One option is a light vehicle fuel efficiency standard, similar to standards in the United States, the European Union and Japan. Most submissions to the Ministerial Forum, consistent with submissions to the 2017 review, supported introducing fuel efficiency standards for light vehicles.

*The Business Council supports the introduction of stricter CO₂ emission standards for new light vehicles in Australia. Multiple studies have found that vehicle fuel efficiency represents some of the lowest cost abatement in Australia. Furthermore, three-quarters of the passenger vehicles that will be on Australia's roads in 2030 are yet to be purchased, so the opportunity exists to lower transport emissions and assist in delivering a lower emission future for Australia.*³⁶

— Business Council of Australia, 2017

The net benefits of a light vehicle fuel efficiency standard could range from \$5.8 to \$13.9 billion over 20 years, and could save motorists between \$237 and \$519 per year in fuel costs in 2025. Each tonne of carbon abatement from a fuel efficiency standard would provide around \$50 in savings to the economy,

³⁵ National Farmers' Federation submission to the 2017 climate change review Discussion Paper.

³⁶ Business Council of Australia submission to the Ministerial Forum on Vehicle Emissions consultation.

depending on the chosen improvement rate for the standard.³⁷ A fuel efficiency standard will also encourage vehicle manufacturers to increase the range of new, low or zero emissions vehicles available in Australia.

The Forum is considering other measures to encourage the uptake of low-emissions vehicles and new technology, including improvements to consumer information and other measures to support electric vehicles.

3.6 A long-term climate change strategy

Through the review, stakeholders emphasised the importance in understanding potential longer-term climate change policy settings to support investment decisions and minimise exposure to climate risk. Many submissions supported long-term targets or strategies.

*Providing long term indications, beyond the 2030 period, of how Australia will reach net zero emissions is central to allowing business to make long term decisions and optimise their position in the transition to a low carbon economy.*³⁸

— Carbon Market Institute, 2017

In releasing its Intended Nationally Determined Contribution in August 2015, Australia committed to considering a potential long-term emissions reduction goal, beyond 2030, taking into account international trends and technology developments.

The Paris Agreement sets a collective goal of reaching global net zero emissions in the second half of the century. The Paris Agreement does not involve individual country long-term emissions targets, however, it does invite countries to formulate and communicate ‘long-term low greenhouse gas emission development strategies’ by 2020.³⁹

The approach of many countries has shifted from ‘stand-alone’ long-term goals to the development of long-term strategies. In addition, the Finkel Review recommended that by 2020, the Australian Government should develop a whole-of-economy emissions reduction strategy for 2050 to increase investor confidence.

Consistent with the Government’s response to the Finkel Review, the Government will start developing in 2018 a long-term emissions reduction strategy by 2020. This is consistent with the approach adopted by most G20 countries.

The Government will continue to consult widely with businesses, the community and Commonwealth, state and territory agencies on the development of the strategy. The Government will work with other G20 countries to share expertise and build capacity throughout the development of the strategy.

The strategy will not be prescriptive. Instead it will explore the emissions reduction opportunities and implications across all major sectors of the economy. It will explore the transition towards a lower-emissions Australian economy in the context of the global goal established under the Paris Agreement, and predicated on the imperative of strong economic growth and an internationally competitive economy. It will build on the Government’s existing policy framework and will incorporate the recommendations and policies arising from the Finkel Review and the 2017 review of climate change policies.

By exploring pathways for an orderly transition to a lower-emissions economy, the strategy can underpin investment and provide signals for research, development and innovation. It will support a more efficient transition and allow Australia to identify and take advantage of new opportunities. It can also provide a framework to inform the five-yearly review of Nationally Determined Contributions under the Paris

³⁷ Australian Government 2016, Improving the efficiency of new light vehicles: Draft Regulation Impact Statement.

³⁸ Carbon Market Institute submission to the 2017 climate change review Discussion Paper.

³⁹ Decision 36/CP.21, UNFCCC; Article 4.19, Paris Agreement.

Agreement.

Appendix A: Terms of Reference for the 2017 Review of Climate Change

The Government is committed to addressing climate change. Through effective policies, ambitious and responsible targets, and careful management, Australia is playing its role in global efforts to reduce emissions, while maintaining a strong economy and realising the benefits of the transition to a lower-emissions future.

The Government's policies are working to reduce Australia's emissions. They have Australia on track to surpass its 2020 emissions reduction target and provide a framework for the longer term.

In setting its 2030 target of reducing emissions to 26–28 per cent below 2005 levels, the Government committed to reviewing its policies during 2017. The review will ensure the Government's policies remain effective in achieving Australia's 2030 target and Paris Agreement commitments. The review will look at:

- the opportunities and challenges of reducing emissions on a sector-by-sector basis
- the impact of policies on jobs, investment, trade competitiveness, households and regional Australia
- the integration of climate change and energy policy, including the impact of state-based policies on achieving an effective national approach
- the role and operation of the Emissions Reduction Fund and its Safeguard Mechanism
- complementary policies, including the NEPP
- the role of research and development and innovation
- the potential role of credible international units in meeting Australia's emissions targets
- a potential long-term emissions reduction goal post-2030.

The review will involve close engagement with business and the community, beginning with consultation on a discussion paper.

The review will monitor and be informed by developments in international climate policy, and include a focus on electricity prices for end users. The review will build on parallel processes, including the Finkel review of the reliability and security of the NEM, and the work of the Ministerial Forum on Vehicle Emissions.

The review will commence in February 2017 and conclude by the end of 2017.

Appendix B: Australian Government Emissions Reduction Policies

The Government has a suite of policies in place to reduce emissions. These are summarised in the following table.

Emissions Reduction Fund	<p>The Emissions Reduction Fund provides incentives for emissions reduction activities across the Australian economy. Under the Fund, a range of activities are eligible to earn ACCUs. Projects must comply with an approved method that measures verifiable reductions in emissions and sets out the rules for activities which can earn carbon credits.</p> <p>The Government purchases credits through a reverse auction system. The first six Emission Reduction Fund auctions contracted more than 191 Mt CO₂-e of emissions reductions at an average price of \$11.90 per tonne.</p> <p>https://www.environment.gov.au/climate-change/emissions-reduction-fund</p>
Safeguard Mechanism	<p>The Safeguard Mechanism is part of the Emissions Reduction Fund. It puts limits (baselines) on the emissions of facilities that emit more than 100,000 tonnes of emissions a year. These baselines cover around half of Australia's emissions, including facilities in the manufacturing, electricity, mining, oil and gas, transport and waste sectors. A single sectoral baseline applies to grid connected electricity generators.</p> <p>https://www.environment.gov.au/climate-change/emissions-reduction-fund/about/safeguard-mechanism</p>
Renewable Energy Target (RET)	<p>The RET scheme aims to encourage additional generation of electricity from renewable sources and reduce emissions in the electricity sector. The scheme provides a financial incentive for investment in new renewable energy projects. It aims to grow the share of renewable energy to around 23 per cent of electricity supply by 2020.</p> <p>The RET has two components. The Large-scale Renewable Energy Target of 33,000 GWh by 2020 encourages investment in large scale projects. The Small-scale Renewable Energy Scheme helps home-owners and small businesses to install eligible small-scale renewable energy systems and solar hot water systems.</p> <p>https://www.environment.gov.au/climate-change/renewable-energy-target-scheme</p>
National Energy Productivity Plan (NEPP)	<p>The NEPP provides a framework and an initial economy-wide work plan designed to accelerate delivery of a 40 per cent improvement in Australia's energy productivity by 2030. The NEPP aims to boost competitiveness and growth, help families and businesses manage their energy costs and reduce emissions. The NEPP is driving change and accelerating energy productivity</p>

	<p>improvement through measures which support:</p> <ul style="list-style-type: none"> • smarter energy choices (by providing more efficient incentives, empowering consumers and promoting business action) • better energy services (by driving greater innovation, more competitive and modern markets and updating consumer protections and standards). <p>https://www.environment.gov.au/energy/national-energy-productivity-plan</p>
Clean energy innovation support	<p>The Government supports clean energy innovation across the spectrum of research and development, demonstration and deployment. Research and development grants are provided by ARENA, the Australian Research Council, CSIRO and others. Seed funding for emerging technology is provided by the Clean Energy Innovation Fund and ARENA. Projects near commercial deployment can access debt and equity from the Clean Energy Finance Corporation.</p> <p>https://arena.gov.au/about-arena/</p> <p>http://www.arc.gov.au/welcome-australian-research-council-website</p> <p>https://www.csiro.au/en/Research/Environment</p> <p>https://www.environment.gov.au/news/2016/03/23/clean-energy-innovation-fund</p> <p>http://www.cleanenergyfinancecorp.com.au/</p>
National Carbon Offset Standard	<p>The National Carbon Offset Standard provides benchmarks for organisations seeking to make their operations, products, services, buildings, precincts or events carbon neutral. The Carbon Neutral Program provides a framework for certifying carbon neutrality against the National Carbon Offset Standards.</p> <p>http://www.environment.gov.au/climate-change/carbon-neutral</p>
Solar Communities	<p>The Solar Communities program will support local responses to climate change and deliver lower electricity costs for community organisations. It will provide \$5 million in funding for community groups in selected regions to install rooftop solar panels, solar hot water and solar-connected battery systems for community-owned buildings.</p> <p>https://www.environment.gov.au/climate-change/renewable-energy/solar-communities</p>

Appendix C: Overview of Australia's International Climate Activities

Australia is playing its part internationally on climate change. This includes participating and taking leading roles in a range of international partnership and the provision of financial support and technical capacity building to developing and regional neighbours. This draws on our domestic expertise in greenhouse gas measurement and reporting. The table below provides an overview of a range of Australia's international activities, including our bilateral activities that focus on the Indo-Pacific region.

A snapshot of Australia's international climate activities	
	<i>Bilateral activities</i>
Botswana	Following the ongoing success of Australia's domestic savanna fire management methods, in November 2017, Australia announced a program for savanna fire management in Botswana to reduce land-based emissions.
China	Building on long standing technical collaboration on climate change, Australia and China are developing a bilateral cooperation project to share Australia's unique expertise and experience in the design and implementation of national greenhouse gas inventory systems. This project will enhance China's capacity for robust and transparent emission measurement, reporting and verification in support of its domestic climate action and commitments under the Paris Agreement.
Indonesia	<p>Australia has committed \$10 million from 2015 to 2019 to prevent smoke haze and emissions in the forestry and land use sectors in Indonesia through an environmental governance and climate change response program.</p> <p>Since 2009, Australia has supported Indonesia to develop a forest monitoring system which will allow Indonesia to develop policies to achieve their domestic and international forest commitments. The system has been used to generate estimates of national greenhouse gas emissions and removals across all of Indonesia's forests and peatlands.</p>
Kenya	<p>Since 2013, Australia has supported the Government of Kenya to implement the System for Land-based Emissions Estimation. This program enables Kenya to quantify and report its land sector emissions to the UNFCCC and evaluate different land use scenarios for sustainable development. This will inform policy decisions to improve forest, agriculture and water management.</p> <p>http://www.sleek.environment.go.ke/</p>
Malaysia	Australia will support Malaysia and the Philippines to manage their marine

	ecosystems and build their knowledge of marine ecosystem science through the Marine Biodiversity Conservation and Management Memoranda of Understanding, announced in November 2017.
Philippines	Australia has committed \$31.4 million to the Philippines Disaster and Climate Risks Management Initiative to strengthen the Philippines Government's capacity for disaster preparedness.
South Africa	Australia has assisted the Government of South Africa to develop and implement a strategic plan to enhance its emissions monitoring and reporting capacities in the Agriculture, Forestry and Land Use sectors. http://www.environment.gov.au/climate-change/international/land-emissions
Thailand	Australia is supporting the Government of Thailand in the development of a national greenhouse gas emissions inventory IT system. The system will support the design and implementation of effective domestic emission reduction measures and fulfilment of Thailand's current and future international emission reporting commitments, including those under the Paris Agreement. http://www.environment.gov.au/climate-change/international/land-emissions
Tuvalu	The Tuvalu Environment and Climate Change Initiative supports the implementation of Tuvalu's National Adaptation Plan of Action Project. Australia has committed \$2.5 million to the initiative from 2011 to 2017, focusing on improving agricultural food security and water management.
Vanuatu	The Vanuatu Roads for Development program aims to improve key roads at high risk of climate impacts (such as extreme rainfall and flooding). Australia has committed \$28.5 million to the program from 2012 to 2018.
Vietnam	Australia supports the Vietnam Government to strengthen planning, technical and financial capacities to foster climate-resilient development of the Mekong Delta through the Integrated Coastal Management Program.
	<i>Multilateral initiatives</i>
The Green Climate Fund	The Green Climate Fund (GCF) is the world's largest multilateral climate fund and aims to mobilise funding at scale for low-emissions and climate resilient development in developing countries. The GCF has attracted over US\$10.3 billion in pledges from 43 national and sub-national governments. Australia has committed \$200 million over four years (2015-2018) to the GCF, holds a seat on the Board and was elected co-chair in 2016 and 2017.

	http://unfccc.int
Global Environment Facility	<p>The Global Environment Facility (GEF) is a multi-stakeholder partnership working to address global environmental issues. Since its inception in 1991, the GEF has directly funded almost US\$16 billion (and leveraged US\$93 billion through external co-financing) for 4377 projects related to climate change, biodiversity, international waters, land degradation, the ozone layer, and persistent organic pollutants.</p> <p>Australia has been a contributing donor to the GEF since its inception. To date, Australia has contributed \$442 million to the GEF, including \$93 million to the GEF's sixth replenishment from 2014 to 2018. Australia holds a seat as member on the GEF Council in a donor constituency with New Zealand and the Republic of Korea.</p> <p>www.thegef.org</p>
The Clean Energy Ministerial	<p>The Clean Energy Ministerial (CEM) is a global forum to promote policies and share best practices to accelerate the global transition to clean energy. CEM initiatives and campaigns help reduce emissions, improve energy security, provide energy access and sustain economic growth. Participation in the CEM is action-oriented and flexible and clean energy initiatives and campaigns are based on areas of common interest. Countries lead or support initiatives and campaigns matching their national priorities.</p> <p>The CEM comprises ten initiatives and seven campaigns. Australia is a member of four: the Clean Energy Solutions Centre (CESC); the Super-efficient Equipment and Appliance Deployment initiative; the International Smart Grid Action Network; and the Clean Energy Education and Empowerment Women's Initiative. The CESC has been co-led and co-funded by Australia and the US since its inception in 2011. Australia has provided approximately \$3.2 million to support the CESC.</p> <p>http://cleanenergyministerial.org</p>
Global Forest Observations Initiative	<p>Through the Global Forest Observations Initiative (GFOI), Australia is partnering with Norway, United Kingdom, European Space Agency, USA, the Food and Agriculture Organization of the United Nations, and the satellite community to build forest monitoring capacity in developing countries in South America, Africa and Asia. The GFOI interactive online tool, REDDCompass, has been adopted by the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation (UNREDD) and other international organisations.</p> <p>http://www.gfoi.org/</p>
Asia-Pacific Rainforest Partnership	<p>Australia established the Asia-Pacific Rainforest Partnership to promote action and provide a platform to progress actions to reduce emissions from deforestation and forest degradation in the Asia-Pacific region.</p>

	<p>The third Asia-Pacific Rainforest Summit will be hosted by the Indonesian Government in Yogyakarta, from 23-25 April 2018.</p> <p>http://www.asiapacificrainforestpartnership.org/</p>
International Partnership for Blue Carbon	<p>Under the International Partnership for Blue Carbon, announced by Australia at the UN Climate Change Conference in Paris, governments, non-government organisations and research institutes are working to enhance the protection and restoration of coastal ecosystems for climate action.</p> <p>http://bluecarbonpartnership.org/</p>
International Coral Reef Initiative	<p>Australia is a founding member of the International Coral Reef Initiative focused on the impact of climate change on coral reefs.</p> <p>http://www.icriforum.org/</p>
International Solar Alliance	<p>Australia is a founding member of the International Solar Alliance (ISA), an initiative led by India and France, to increase the deployment of solar technology across countries in the tropics. The ISA aims to promote solar technologies and investment, create financing mechanisms and increase the use of solar energy.</p>
Montreal Protocol	<p>Australia co-chaired successful negotiations on phasing-down HFCs under the Montreal Protocol. The new agreement will see developed nations reduce HFCs by 85 per cent compared to current levels by 2036. The Australian Government is working with industry to fast-track work to reduce Australia's emissions of these potent greenhouse gases.</p> <p>http://www.environment.gov.au/protection/ozone/montreal-protocol</p>
International Civil Aviation Organisation's Carbon Offsetting Scheme for International Aviation	<p>Australia helped achieve an agreement to establish a carbon offsetting scheme under the International Civil Aviation Organisation. Under the scheme the sector agreed to halt emissions growth from international aviation.</p> <p>https://www.icao.int/environmental-protection/Pages/market-based-measures.aspx</p>
International Green Bank Network	<p>The Clean Energy Finance Corporation is sharing its expertise through the International Green Bank Network, which connects leaders in clean energy finance, shares best practices and supports investment in clean energy.</p> <p>http://greenbanknetwork.org/</p>
Forest Carbon Partnership Facility	<p>The Australian Government has invested \$44.6 million in the World Bank's Forest Carbon Partnership Facility. The Facility is a global partnership of government, business, civil society and indigenous people focused on piloting a market mechanism for REDD+.</p>

	https://www.forestcarbonpartnership.org/
Mission Innovation	<p>Australia joined the global Mission Innovation Initiative alongside the United States, China, the EU and 19 other countries, to accelerate research, development and demonstration of clean energy innovation. Australia has pledged to double government clean energy research and development expenditure between 2015 and 2020.</p> <p>http://mission-innovation.net/</p>
Responsible Asia Forestry and Trade	<p>In 2014, Australian committed to \$6 million to combat illegal logging and contribute to efforts to reduce deforestation through the Responsible Asia Forestry and Trade program.</p> <p>http://www.responsibleasia.org/</p>
Carbon Sequestration Leadership Forum (CSLF)	<p>Australian Government and research partners are active participants in the CSLF. The CSLF is high-level international climate change initiative that is focused on the development of improved cost-effective technologies for carbon capture and storage (CCS). It also promotes awareness and champions legal, regulatory, financial, and institutional environments conducive to such technologies. Five Australian projects are recognised by the CSLF as making significant contributions to global CCS research, development and deployment.</p>