CLIMATE CHANGE AUTHORITY

2035 TARGETS ADVICE

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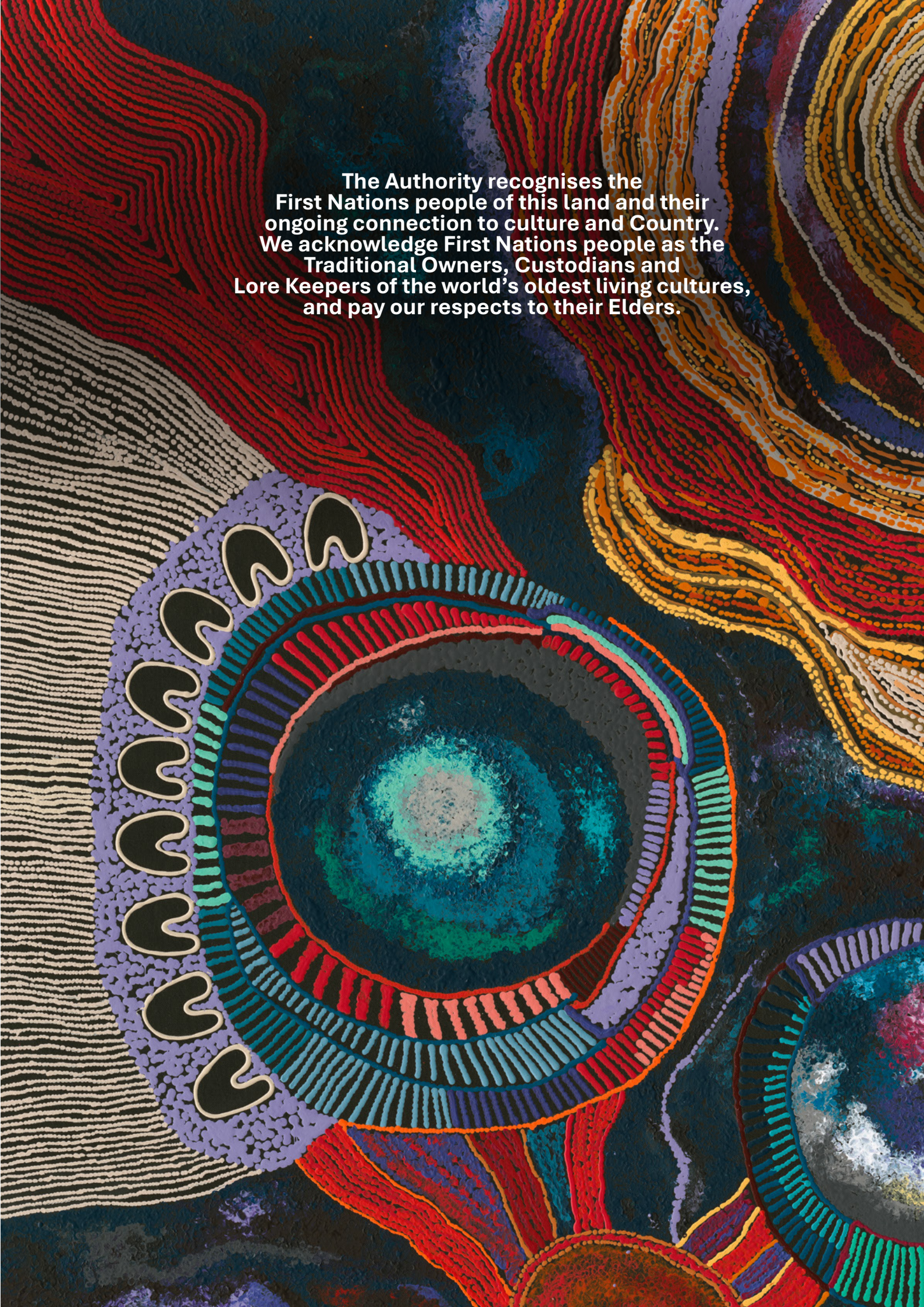
The Authority recognises the
First Nations people of this land and their
ongoing connection to culture and Country.
We acknowledge First Nations people as the
Traditional Owners, Custodians and
Lore Keepers of the world's oldest living cultures,
and pay our respects to their Elders.

CLIMATE CHANGE AUTHORITY

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The Hon Chris Bowen MP
Minister for Climate Change and Energy
Parliament House
CANBERRA ACT 2600

Dear Minister

In response to your request of 21 July 2023, and in accordance with section 15 of the *Climate Change Act 2022*, we are pleased to submit to you the Climate Change Authority's advice to inform Australia's greenhouse gas emissions reduction target 2035, entitled *2035 Targets Advice*.

In accordance with section 15(6) of the Act, the Authority will publish a copy of the report on its website.

Yours sincerely

Matt Kean
Chair

Brad Archer
Chief Executive Officer

12 September 2025

Acknowledgements

The Climate Change Authority would like to thank the many individuals and organisations who contributed their time and expertise to the development of this report.

The Authority published 3 public consultation papers in 2023 and 2024 and received 565 formal submissions in response. The Authority also held more than 500 direct engagements with a wide range of stakeholders. These contributions have provided valuable evidence to help inform the Authority's analysis and recommendation.

Public submissions received by the Authority in response to the 3 consultation papers are published and can be viewed via the consultation page on the Authority's website.

A range of government agencies also provided technical expertise to the Authority in the preparation of this report.

The views expressed in the report are the Authority's own. They should not be taken as the views or positions of the entities mentioned above.

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Acronyms and abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABCB	Australian Building Codes Board
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ACCU	Australian Carbon Credit Unit
ACT	Australian Capital Territory
AEMO	Australian Energy Market Operator
AI	Artificial intelligence
AIMS	Australian Institute of Marine Science
ANU	Australian National University
ARENA	Australian Renewable Energy Agency
ASIC	Australian Securities and Investment Commission
ASX	Australian Securities Exchange
BOM	Bureau of Meteorology
CBAM	Carbon border adjustment mechanism
CCA	Climate Change Authority (the Authority)
CCS	Carbon capture and storage
CCU	Carbon capture and utilisation
CER	Clean Energy Regulator
CIS	Capacity Investment Scheme
COP	Conference of the Parties
COP31	Conference of the Parties: UN Climate Change Conference 2026
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEWR	Department of Employment and Workplace Relations
DFAT	Department of Foreign Affairs and Trade
DISR	Department of Industry, Science and Resources
DITRDCA	Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts
DRI	Direct reduced iron
ESG	Environmental, social and governance
EU	European Union
EV	Electric vehicle
GDP	Gross domestic product
GFC	Global Financial Crisis
GNI	Gross national income
GW	Gigawatt
GX	Green Transformation (Japan's national decarbonisation strategy)
ICJ	International Court of Justice
IPCC	Intergovernmental Panel on Climate Change
IPEF	Indo-Pacific Economic Framework
IRA	*Inflation Reduction Act 2022* (US)
ITMO	Internationally Transferred Mitigation Outcome

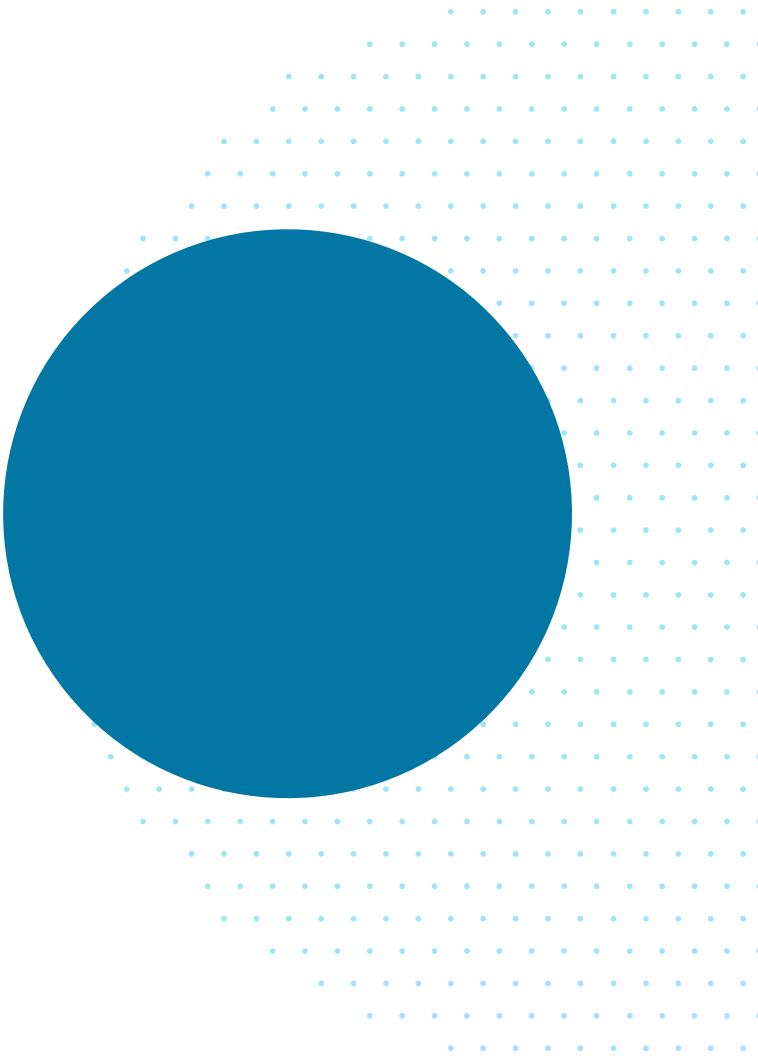
LNG	Liquefied natural gas
Mt CO_2-e	Million tonnes carbon dioxide equivalent
MW	Megawatt
NABERS	National Australian Built Environment Rating System
NDC	Nationally Determined Contribution
NEM	National Electricity Market
NGER	National Greenhouse and Energy Reporting
NOAA	National Oceanic and Atmospheric Administration
NSW	New South Wales
NZEA	Net Zero Economy Authority
ODA	Official Development Assistance
PRC	People's Republic of China
PV	Photovoltaic
REZ	Renewable Energy Zone
SAF	Sustainable aviation fuel
TWh	Terawatt hour
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNSW	University of New South Wales
US	United States
WMO	World Meteorological Organization
WTO	World Trade Organization

Legislation

All legislation cited in this report is Commonwealth legislation unless otherwise indicated. Commonwealth legislation can be found on the Federal Register of Legislation: www.legislation.gov.au. The following Commonwealth Acts are cited in this report:

Climate Change Act 2022

Climate Change Authority Act 2011



Chair's foreword

This report makes a compelling case that Australians can take ambitious and decisive action to cut our greenhouse gas emissions by capitalising on our existing strengths to reposition our economy.

Australia's clean energy transition is an economic growth opportunity not a drag. Ambitious action will enrich our economic fortunes as few nations have Australia's advantages in a low-carbon economy. We enjoy an abundance of wind and solar resources above ground and a periodic table's worth of critical minerals below.

Navigating such a path over the next decade and beyond will need a whole-of-society effort. Governments at all levels must provide policy consistency and coordination to serve Australians' best interests and implement the necessary changes at least-cost to drive down costs and ensure the maximum economic benefits are realised.

Our advice recognises geopolitical uncertainties, implementation barriers and the potential for technological advances. That's why we recommend a target range.

The modelling, provided by CSIRO, shows the recommended emissions reductions can be delivered against a backdrop of continued economic growth and rising incomes. Output expands across all major sectors, including mining and resources.

The sooner the world reaches net zero emissions, the sooner we can look forward to a safer climate. While costly disruptions are unavoidable in coming decades as temperatures rise, the damage can be minimised if we take decisive action and encourage other nations to do likewise to slash carbon pollution.

Our analysis plots a course that is credible and marks one of the most ambitious tracks of any nation, especially in per-capita terms. While the electricity sector will continue to lead the decarbonisation push, other sectors will need to step up to play their important roles, setting themselves up to be more future-ready in the process.

Just as the survival prospects of our glorious Great Barrier Reef and other coral reefs improve with every fraction of a degree of warming avoided, so must we seize every advance that innovation presents to meet or beat the higher end of our recommended target range.

In doing this, we will also be serving our long-term interests by laying the foundations of Australia's future prosperity and making the post-2035 race to net zero emissions by 2050 easier. Australia's legislated 2030 target and now our proposed 2035 goal are waypoints on our decarbonisation journey. In summary, this report represents our moment to be bold, to do what's right for the environment and the economy for generations to come, and to demonstrate what's possible when we act together.

This work is the culmination of hundreds of submissions and engagements with the public and experts in their fields.

It also represents many work years by dedicated and tireless staff at the Climate Change Authority, and extensive deliberations by Authority members. It is on their behalf that I have the honour and pleasure to present this advice to the Government.

Matt Kean
Chair

Executive summary

Key points

The Climate Change Authority is required by law to give independent, expert advice to the Government on the targets Australia should include in its next Nationally Determined Contribution (NDC) under the Paris Agreement on climate change.

The Authority's advice is built on a rigorous methodology that starts with climate science and extends through whole-of-economy modelling, sector-by-sector analysis, deep engagement with stakeholders, insights from geoeconomics, and structured expert deliberation, ensuring its recommendations are robust and practical.

The Authority finds that an emissions reduction target of 62–70% from 2005 levels represents Australia's highest possible ambition taking account of the matters set out under the relevant legislation, is achievable, and is in Australia's national and economic interest.

As an emissions-intensive, advanced economy that is extremely vulnerable to climate change, Australia has a clear national interest and responsibility to signal that we are willing and able to support the greatest possible emissions reductions.

Technologies now exist to meet an economy-wide 62–70% 2035 goal, mainly by:

- transitioning to a renewables-based electricity system
- electrifying and improving the efficiency of transport and buildings
- improving the efficiency and emissions intensity of industry, mining and agriculture
- increasing land-sector carbon removals.

However, meeting even the lower end of the target range won't be easy. It requires:

- halving Australia's current emissions levels
- more than doubling Australia's decarbonisation rate
- scaling up capacity in the National Electricity Market (NEM), including six-fold growth in utility storage, quadrupling wind capacity, tripling utility solar capacity and doubling rooftop and distributed solar capacity by 2035, consistent with the Australian Energy Market Operator's (AEMO's) Step Change scenario
- extending the Safeguard Mechanism's decline rate out to 2035 to reduce emissions from industry and resources by almost a third
- half of the light vehicles sold between now and 2035 being electric vehicles (EVs)
- producing more sustainable aviation fuel and renewable diesel
- electrifying low temperature process heat in the industry sector
- increasing organics recycling rates from around 50% to more than 80%
- ceasing logging of old growth forests and halving re-clearing rates.

Achieving the top of the range will become easier as technologies evolve, we 'learn by doing' and prices come down, as we have seen with the rollout of solar photovoltaics (PVs). However, some technologies may face challenges that delay deployment, as we have seen with green hydrogen.

A transformation of this scale requires the committed and coordinated efforts of governments, companies and households to overcome challenges that stand in the way. The Australian Government has already put in place foundational climate change policies that can be strengthened and supported to remove barriers, lower costs, and ease implementation.

Climate and energy policies touch the lives and operations of every Australian household and business. While this can create near-term challenges and complexities, it also provides opportunities to deliver long-run benefits through lower energy costs, cleaner air, more attractive products and services, and enhanced resilience to extreme events such as heatwaves, drought, floods and storms.

The recommended reductions in net emissions are achievable against a projected background of economic growth and rising national income. Output volumes and values are projected to increase across all major sectors, including mining and resources, although the output of fossil fuel extraction within mining is projected to decline as a result of the global energy transition.

Adopting a 2035 target that is, and is seen to be, ambitious is crucial for unlocking national economic benefits, for creating good jobs in regions that have underpinned Australia's economy for generations, and for delivering new opportunities for Australian farmers and First Nations communities.

While the recommended target range is focused on domestic emissions, Australia can also play an important role in helping other countries, especially its trading partners, achieve significant emissions reductions. For example, decarbonisation deals between nations and businesses could be a key achievement at COP31 in 2026—under a potential Australian presidency in partnership with the Pacific—putting a focus on implementing targets, reducing emissions in international supply chains, and creating demand for Australia's green exports.

The Authority recommends that the Australian Government adopt the 62-70% target, and in doing so present it as Australia's minimum commitment, aim for the top of the range, prepare for both breakthroughs and setbacks, and not rule out 'overachievement', should greater emissions reductions prove possible.

The Authority will continue working hard to advise the Government as to how to best achieve its 2030, 2035 and net zero targets, how even greater reductions might be achieved, and how it can step up its ongoing efforts to build proactive climate resilience and adaptation.

The Authority finds that an emissions reduction target of 62–70% from 2005 levels represents Australia's highest possible ambition taking account of the matters set out under the relevant legislation, is achievable, and is in Australia's national and economic interest.

The Climate Change Authority is required by law to give independent, expert advice to the Government on the targets Australia should include in its next NDC under the Paris Agreement on climate change. In doing so, it must consider the Paris Agreement, the requirements under the Climate Change Act, and principles of environmental effectiveness, economic efficiency, equity and other considerations set out in the Climate Change Authority Act (see Appendix A).

The Authority considers its recommended target to be ambitious, having taken into account all of the matters set out under the relevant legislation. While some will view the recommended target as too low from a scientific viewpoint, there will be others who are concerned about the social and economic impacts. These concerns reflect very real challenges, including in relation to technological readiness, costs, and the pace and scale of change required. We recognise the tension between these different considerations and acknowledge a diversity of views in the Australian community on the trade-offs between them. We have drawn on deep consultation and rigorous analysis, and taken account of legislated requirements, to arrive at the recommended target of 62–70%, as explained throughout this report.

The Authority's advice is built on a rigorous methodology:

- **Grounded in science** – We began with the best available climate science and projected impacts of climate change, the global goals to limit warming to well below 2 °C about pre-industrial levels and pursue efforts to limit this to1.5 °C, and the remaining global emissions budget, drawing on peer-reviewed scientific literature and expert reports from many organisations. These scientific benchmarks shape the parameters for the modelling and ultimately for Australia's pathway.
- **System-wide modelling** – We commissioned macroeconomic modelling from Australia's premier science agency, the CSIRO, to evaluate the economic, technological and emissions implications. The CSIRO modelled 6 scenarios, exploring 4 levels of Australian ambition with net zero years ranging from 2050 to 2035 and linear trajectories that, in 2035, achieved between 57% and 100% reductions below 2005 levels. These domestic scenarios were modelled in the context of a global pace of action consistent with limiting long-term global warming to 1.5 °C and/or below 2 °C. This first pass modelling exercise identified what is technically and economically achievable, using least cost pathways as a benchmark.
- **Sectoral deep-dives** – We then undertook detailed analysis of each sector to understand the role each can play in reducing emissions, including consideration of opportunities and constraints. Our findings can be seen in Part 2 of this report and in our 2024 *Sector Pathways Review*.
- **Stakeholder engagement** – We consulted widely with business, communities, governments and civil society to test assumptions, identify barriers and ground the analysis in real-world perspectives.
- **Geoeconomic analysis** – We examined how Australia's choices fit into the global picture: trade relationships, demand for green exports, supply chain security, and the impacts of international policy shifts, including those of the current US Administration.

- **Expert deliberation** – Members of the Authority—appointed for their diverse fields of expertise—met regularly over 2.5 years to bring together the evidence from these 5 streams for expert consideration, having regard to the full range of legislative considerations.

Our comprehensive analysis has led us to conclude that 62–70% is **an ambitious target** for Australia to achieve by 2035. It involves cutting Australia's emissions by roughly half from the current level, requiring emissions to decline by around 19–24 Mt CO_2-e per year on average from 2024 through to 2035. This compares with the average reduction of 9 Mt CO_2-e per year achieved from 2005–2024, and the 16 Mt CO_2-e per year required to reach the national 2030 target. This national target represents a per capita decline of 76–81% on 2005 levels, bringing Australia's per-person emissions down from the current level of 16.5 t CO_2-e per person per year to around 7.5–5.9 t CO_2-e by 2035. It aligns with what the science demands: strong and urgent action.

A target of 62–70% is also **an achievable target**. It is technically feasible, harnessing contributions across every sector and jurisdiction and enabled by practical policy measures. Careful analysis finds that delivering a reduction at the top of that range—70%—would be more challenging than 62% but is feasible by 2035. Achieving the top of the range will become easier as technologies evolve and prices come down, as we have seen with the rollout of solar PVs. However, some technologies may face challenges that delay deployment, as we have seen with green hydrogen. While some analysis suggests it would be technically possible for Australia to achieve even more, our analysis finds that doing so would involve higher delivery risks and may require policies with considerably higher near-term social, environmental or economic impacts.

Furthermore, a target of 62–70% is **in Australia's national and economic interest**. Committing to an ambitious target is necessary to maximise the chances of Australia capturing the full potential benefits of the global clean energy transition. There are already strong incentives to replace ageing fossil fuel-based electricity infrastructure with the lowest cost alternative: firmed renewable energy. The global transition is inevitable, already occurring, and accelerating—driven by rising global incomes and energy demand, falling clean energy costs and expanding low-emissions technology options, and rising concerns about the risks and impacts of climate change.

As an emissions-intensive advanced economy that is extremely vulnerable to climate change, Australia has a clear national interest and responsibility to signal that we are willing and able to support the most ambitious possible emissions reductions.

While the world is already bending the curve of global emissions, far more needs to be done to avoid the worst impacts and risks of climate change. Around the world, people are already living with climate change and the impacts it has on societies, ecosystems and livelihoods. How much those impacts worsen in coming decades depends on how fast Australia and the rest of the world cut greenhouse gas emissions. The true burden of climate change will lie in the cost of inaction: rising costs to adapt and respond to more frequent and extreme disasters, worsening inequality, and futures undermined for coming generations.

The world needs to lift its ambition, and Australia needs to play its part. Australia is required to be as ambitious as possible under its Paris Agreement obligations. And its high per-capita emissions, its high per-capita draw on the global emissions budget to date, and its unusually rich endowment of renewable and carbon removal resources all makes it imperative that it should. A target of 62–70% is both in Australia's national interest and a significant contribution to the goals of the Paris Agreement, particularly when complemented with efforts to establish low-emissions export industries and support other countries' efforts to decarbonise.

The Australian Government can and should be among the leaders of a new era of global climate mitigation and adaptation. With the Paris Agreement rules and countries' new targets in place, next year's United Nations climate conference (COP31) is the time to focus on clean trade and implementation partnerships between governments and business, to drive innovation and investment and keep the goals of the Agreement within reach.

The technologies exist to meet the recommended target, but it won't be easy.

Continuing the **transition to a renewables-based electricity system** can deliver around half the emissions reductions required to achieve the recommended 2035 target. As set out in AEMO's Step Change scenario, for the NEM this requires **accelerating the rate of transmission line installation** and scaling up renewable generation and storage capacity, including **six-fold growth in utility storage** from around 3.5 to 22 GW, **quadrupling wind capacity** from around 13 to 56 GW, **tripling utility solar capacity** from around 9.5 to 26 GW and **doubling rooftop and distributed solar capacity** from around 23 to 48 GW by 2035.

Expert analysis by the Australian Energy Market Commission projects residential electricity prices will fall by 13% (about 5c/kWh) and average household energy costs will fall by about 20% (around $1,000/year) over the next decade under a coordinated renewables rollout. Households that fully electrify (by transitioning to electric transportation, appliances, heating, and integrating solar and battery storage) could potentially cut energy costs by as much as 70% (AEMC, 2024). As well as saving money, the decarbonisation and growth of electricity production is a necessary pre-condition for the decarbonisation of other sectors.

Electrification and improved efficiency of transport and buildings can account for a further 11–14% of required emissions reductions, contributing to the energy cost savings. However, realising the cost savings in the transport sector available on a 62–70% pathway requires putting more than 20 times the number of battery electric passenger vehicles on the road than there are today. This means over 5 million EVs that would otherwise have been petrol and diesel vehicles. Around half of all light vehicles sold between now and 2035 would need to be EVs.

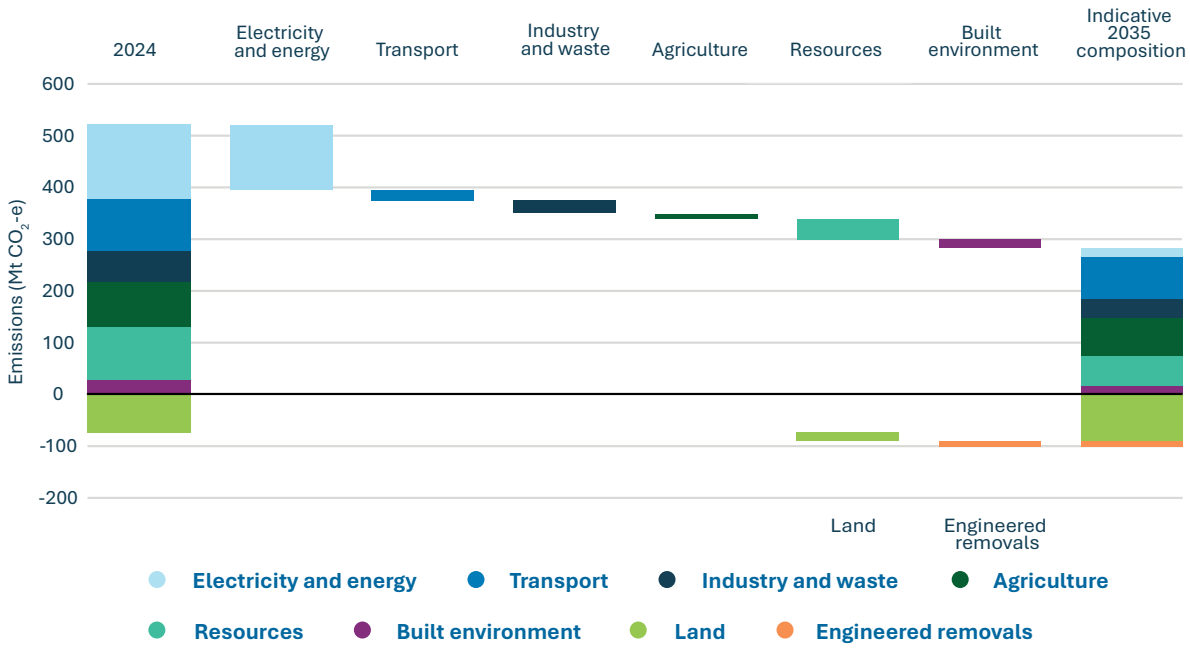
Scaling up land-sector carbon removals by locking in carbon already stored—stopping old-growth clearing and reducing native forest harvesting—and by planting new forests where it makes sense could provide around 6% of the required emissions reductions, while lifting and diversifying farm sector incomes and protecting nature at the same time.

Most of the remaining reductions come from ongoing **efficiency and emissions intensity improvements across industry, mining and agriculture,** including new methods for producing steel and alumina, the adoption of hydrogen and other alternative fuels, and addressing fugitive emissions from mining. These sectors account for around 56% of current emissions. Our analysis identifies emissions reductions of around 23–29% in these sectors. These are some of the factors informing that conclusion:

- **Extending the Safeguard Mechanism's decline rate out to 2035 could reduce emissions from industry and resources by almost a third.** Importantly, the decline rate is additive—requiring facilities to reduce or offset more of their emissions each year
- Cost-effective abatement options are more limited in these sectors and some technologies will not be affordable to deploy by 2035, even with government support. However, **concerted efforts to overcome regulatory barriers would allow some cost-effective technologies to be deployed now.** For example, CSIRO analysis indicates that ventilation air methane abatement technologies could be cost effective in Australian coal mines (Regan et al, 2024). Once regulatory and safety barriers are overcome, the technology could reduce methane emissions from underground coal mines by 3 Mt CO_2-e per year.
- There are uncertainties around the timing of the deployment of known and ready technologies, because that deployment is generally linked to the timing of the turnover of existing assets. However, multiple lines of evidence find that Australia is well placed to make significant emissions reductions cost-effectively as the economy's stock of capital assets is expanded and replaced.

Each sector will contribute to the 2035 goal in different ways (Figure 1). The analysis suggests that real-world shortfalls in abatement from specific sectors, relative to the projections, can be balanced by additional abatement from other sectors.

Figure 1: Estimated sector contributions to the top of the 62–70% target range, 2024–2035



Source: Authority analysis.

Notes:

1. Abatement and indicative 2035 composition are based on the Authority's analysis of sector pathways.
2. For simplicity, the indicative 2035 composition and abatement pathways represents one possible pathway.

A transformation of this scale requires the committed and coordinated efforts of governments, companies and households to overcome challenges that stand in the way. The Australian Government has put foundational climate change policies in place that can be strengthened and supported to remove barriers, lower costs, and ease implementation.

The Authority's 2024 *Sector Pathways Review* outlines the main barriers we identified that could affect sector pathways to net zero by 2050:

- Lack of willingness to pay the 'green premium'—the higher cost of low and zero emissions technologies relative to the high emissions technologies they must replace, which often face no penalty for the harm caused by the greenhouse gas emissions they generate.
- Slow and complicated development approval processes for renewable energy and enabling infrastructure projects.
- A lack of community support (referred to as 'social licence') for changes such as deployment of key clean energy infrastructure like wind farms and transmission lines.
- Constraints in supply chains for important low emissions technologies including renewable energy generation, electric mining and haulage equipment and low emissions liquid fuels.
- Workforce shortages, particularly in regional areas and highly skilled new industries.

- Information and data gaps that impede planning for decarbonisation, the workforce it will require, and the investment decisions that could finance it.

The Authority's *2024 Sector Pathways Review* also suggests 6 strategies and 27 actions to address these barriers, including:

- Establishing policy settings and market design arrangements that will continue to drive the clean energy transition beyond 2030 *(underway –National Energy Market Review, Productivity Commission's interim report on the net zero transformation)*.
- Simplifying, coordinating and expediting approval processes for priority projects within and between jurisdictions *(underway – EPBC Act reforms)*.
- Implementing a carbon border adjustment measure to maintain the competitiveness of Australian businesses as decarbonisation accelerates (*being investigated – Carbon Leakage Review)*.
- Harmonising signalling on the cost of carbon (value of emissions reductions) to further promote efficient decision-making and resource allocation *(also proposed in the Productivity Commission's interim report on the net zero transformation)*.

Our analysis and results are consistent with the continuation and enhancement of current national climate and energy policy settings and intentions, including the Capacity Investment Scheme (CIS), support for distributed energy and storage, the New Vehicle Efficiency Standard (NVES), the Safeguard Mechanism and settings for Australian Carbon Credit Units (ACCUs).

The first 3 of these policies support the rollout of cost-competitive reliable renewable energy, improved household access to the benefits of distributed energy, and more efficient vehicles for household and business use.

The Safeguard Mechanism and carbon credit arrangements provide a flexible, market-based approach to reducing the emissions intensity of Australia's largest industrial facilities, including manufacturing, mining, oil and gas production, and waste, with some coverage of domestic transport. These policies are designed to recognise the particular challenges faced by Australia's emissions-intensive trade-exposed industries, and to help strengthen their competitiveness as the world moves towards net zero emissions.

Enhanced policy settings are needed to support greater innovation and more timely deployment of technology. Governments should simplify and accelerate project approvals for clean energy generation and electricity network infrastructure, vehicle charging and distributed energy resources. Capturing the full potential benefits of the global energy transition will also require support for innovation and the development of new-to-world and new-to-Australia technologies and industrial processes.

Advancements in technology will be important for reaching future targets, including net zero by 2050. Right now, the priorities are to rapidly deploy and scale known technologies, and to build the foundations and mobilise capital for the technologies needed after 2035. Policies that provide incentives to quicken the take-up of that know-how and overcome barriers to deployment will pave a smoother and cheaper path to net zero.

Climate and energy policies touch the lives and operations of every Australian household and business. While this can create near-term challenges and complexities, it also provides opportunities to deliver long-run benefits through lower energy costs, cleaner air, more attractive products and services, and enhanced resilience to extreme events such as heatwaves, drought, floods and storms.

The impacts of climate change are likely to be felt most by vulnerable people, especially in suburbs and regional areas. These places are also where households are adopting solar, batteries and electric vehicles—demonstrating that emissions reduction measures can ease cost-of-living pressures while contributing to environmental goals.

Decarbonisation poses structural adjustment challenges for some regions and households, particularly where economies or livelihoods depend on emissions-intensive industries and energy sources. The costs and impacts are not felt evenly, and tailored support will be needed to ensure the transition is fair and inclusive.

Smarter climate policies can help address inequities, social licence constraints, and unlock a range of wider benefits, including improved health, new well-paid jobs, more resilient communities, and nature repair. Governments and businesses should give careful attention to the distribution of benefits and impacts of policies and emissions reductions activities, with particular attention to communities in Renewable Energy Zone (REZ) regions and First Nations people managing the Indigenous Estate. For example, policy and regulatory frameworks (including for taxation and private and public investment) should seek to ensure that the lower whole-of-system costs associated with the uptake of distributed energy—particularly batteries—benefit all energy users, not only owners. This is also relevant to pricing decisions by energy suppliers. Another business example is that project proponents can ease concerns and enhance community support by ensuring host regions receive—and can see—an enduring, fair share of the different benefits generated by their projects, including jobs and skills, as well as designing and implementing projects in ways that minimise undesired impacts. First Nations and Torres Strait Islander peoples face unique circumstances, challenges and opportunities. For that reason, it is appropriate to develop First Nations and Torres Strait Islander transition pathways in genuine collaboration with their communities, and aligned with Closing the Gap goals, to ensure approaches reflect their priorities, knowledge and aspirations. States and territories are also in a position to enable and accelerate the transition through investments in non-energy infrastructure and services, requiring a rethink of their spending priorities.

We therefore urge the National Cabinet to prioritise climate change mitigation and adaptation, including at annual summits of the premiers of the states and chief ministers of the territories, and rebalance spending priorities towards the programs and infrastructure that will support achievement of the upper end of the target range—70%—by 2035.

Australia's clean energy transition is an economic growth opportunity, not an economic burden. The CSIRO's modelling and Authority's analysis show any actual cost to the economy is negligible, while the benefits from investment in new green industries and avoided damages from climate change are enormous.

The proposed reductions in net emissions are all achieved against a projected background of economic growth and rising national income. Much of the so called 'cost' of achieving a target is actually investment to replace ageing assets like old coal plants, vehicles, appliances and industrial gear with cheaper to run technology—it's investment that has to happen regardless of the emissions reduction imperative. It's investment in solar, wind, batteries, EVs, heat pumps, and efficient tech that generate jobs,

savings, and long-term value for Australians. It grows the economy, rather than being a drain on it or a 'bill' to taxpayers.

Modelling by the CSIRO shows the Australian economy can be expected to keep growing by an average of 2.7% each year while achieving an emissions reduction target of 62–70% by 2035. The costs of achieving this target represent a small share of national economic output, offset by the increased resilience of our exports to trends in international demand. Output volumes and values increase across all major sectors, including mining and resources, although the value of fossil fuel extraction within mining is projected to decline as a result of the global energy transition.

In fact, the benefits from investment in new green industries could add more than $300 billion[1] to the economy annually by 2035–2050, more than a 10% boost compared to Australia's current GDP.

By contrast, climate damages if countries maintain their current climate change policies could reduce GDP by 14% and income per person by over $7,000 by 2050 from extreme weather, lost productivity and damage to infrastructure and ecosystems (NGFS, 2024).

The Network for Greening the Financial System (a group of central banks and others) finds ambitious global action could save the Australian economy over $230 billion a year by 2050.

Adopting a 2035 target that is, and is seen to be, ambitious is crucial for unlocking national economic benefits, and for creating good jobs in regions that have underpinned Australia's economy for generations and new opportunities for Australian farmers, and First Nations communities.

Global decarbonisation is underway, presenting clean energy opportunities that could power the Australian economy for decades to come. An ambitious target is crucial for unlocking these national economic benefits. These are the main reasons why:

An ambitious target provides momentum and confidence around policy intent and commitment.
This will be important as efforts broaden from the current focus on renewal and expansion of electricity supply to action across other sectors that is needed to achieve net zero national emissions beyond 2035. Committing to an ambitious target will help drive the policy enhancements, enabling environment, and business investments required to drive lower energy costs and improved competitiveness while also reducing emissions.

- **An ambitious target is crucial for attracting the international capital, talent and innovation partners required for Australia to capture the benefits of the global clean energy transition**.
  It will signal that Australia is committed to supporting innovation and emerging low-carbon industries, as well as the roll-out of cost-competitive low-emissions energy these industries require. Partnerships with key trading partners will be vital for decarbonising transnational supply chains, in particular iron and steel production. Australia's Northeast Asian trading partners are an obvious focus for these endeavours.
- **An ambitious target can position Australia as a major exporter of low-emissions products.**
  The Authority's analysis suggests that the economic benefits to Australia of the global energy transition could be 5 to 8 times larger than the impacts of achieving ambitious emissions reductions by 2035 (on the way to net zero emissions). Adopting an ambitious target increases the likelihood and likely size of these benefits, without significantly increasing the costs and actions needed to deliver the emissions reductions required by 2035.

1 Beyond Zero Emissions 2021 modelling: $333 billion by 2050; Accenture 2023 modelling for the Sunshot Alliance: $314 billion by 2040, Fortescue 2023 consultation submission: $670 billion and $1.8 trillion by 2035.

Presented as part of an investable partnership proposal, alongside measures such as the Government's Future Made in Australia agenda, an ambitious target should position Australia for prosperity, realising opportunities to navigate the transition from an emissions-intensive economy to a prosperous future as a major exporter of low-emissions products.

While the recommended target range is focused on domestic emissions, Australia can also play an important role in helping other countries, especially its trading partners, achieve significant emissions reductions. Decarbonisation deals between nations and businesses could be a key achievement at COP31 in 2026—under a potential Australian presidency in partnership with the Pacific—putting a focus on implementing targets, reducing emissions in international supply chains, and creating demand for Australia's green exports.

Australia is well-positioned to usher in a new era of international climate deals and partnerships that catalyse implementation actions for the new NDCs that countries are announcing this year. Decarbonisation deals are a way to coordinate emissions reductions across international supply chains and address supply chain barriers to implementation. They do not require any new rules under the Paris Agreement.

Countries and businesses could signal their openness to such deals by making voluntary political declarations or joining non-binding, coalition-based or regional initiatives at COP31, like the existing Australia-Japan Partnership on Decarbonisation through Technology (DCCEEW, 2025b) and the Indo-Pacific Economic Framework (IPEF) Clean Economy Agreement, with 14 members including Australia, Japan, Korea, India, Southeast Asian nations and the US (DFAT, 2025d).

Australia can boost its contribution to the global goals of the Paris Agreement—over and above meeting a strong domestic emissions reduction target—by partnering with trading partners to decarbonise their energy systems and supply chains. Further, experts estimate Australia's green commodity exports could scale up over the next 3 decades to displace around 6.7– 9.6% of global emissions (approximately 3,000 Mt) under a very ambitious scenario with commensurate levels of investment (The Superpower Institute, 2024). There is much to gain from harnessing Australia's unique advantages in abundant clean energy resources, land, and strong capacity for innovation to meet rising global demand for low- and zero-emissions goods and services.

The Authority recommends that the Australian Government adopt the 62-70% target, and in doing so present it as Australia's minimum commitment, aim for the top of the range, prepare for both breakthroughs and setbacks, and not rule out 'overachievement' through greater reductions in net national emissions should that prove possible.

The Authority considers there are good reasons for the Australian Government to adopt a target range, rather than a single point target, and to aim for the top of the Authority's recommended range—70%. National emissions reduction targets provide a crucial lynchpin in national and global efforts to limit the costs and risks of climate change. They provide a tangible signal of national ambition and intent, driving the design and implementation of locally appropriate climate policies. These signals are crucial for providing the confidence required for ambitious global action on climate to emerge from bottom-up national commitments.

Emissions reduction targets also provide tangible guidance to business and investors—reducing investment risk, signalling opportunities, shaping and calibrating implementation, and supporting coordination across sectors and supply chains.

A target range signals intent, while recognising a variety of uncertainties and delivery risks. For example, the rapid growth of artificial intelligence and data centres is driving significant increases in electricity demand, which in turn is contributing to higher emissions than anticipated, making a more ambitious target harder to meet. On the other hand, some clean energy technologies—including solar PVs —have rolled out much faster than anyone anticipated. A target range also acknowledges that there will be a range of views on feasibility, as well as a range of views on the risks and opportunities associated with different emissions trajectories. The future is always going to be uncertain but that is no cause to pause—the stakes are too high and stalling creates other risks and costs.

Aiming for the top of an ambitious range drives the strongest possible action. At the same time, a target range provides an opportunity to establish a broader coalition of actors who are willing and able to drive the changes required to actually achieve the target. Once engaged, many of these actors will discover the costs and barriers are lower than they feared, and the rewards and opportunities are greater than they hoped. The Authority considers these reasons support a target range commencing outside the range originally identified for investigation, from a still very ambitious lower bound of a 62% reduction up to a 70% reduction from 2005 levels. In addition, Australia should commit to keeping within a corresponding emissions budget of 1,248–1,395 Mt CO_2e from 2031 to 2035.

In summary, a target of 62–70% is ambitious, achievable, in Australia's national interest, and is based on robust analysis of the best available evidence. It anchors Australia's commitment to the global goal of pursuing efforts to limit warming to 1.5 °C, the threshold beyond which multiple climate systems risk irreversible breakdown. Australia should aim for the top of the recommended range and keep moving towards its 100% emissions reduction target—net zero emissions—by 2050 at the latest.

The Authority will continue working hard to advise the Government as to how to best achieve its 2030, 2035 and net zero targets, how even greater reductions might be achieved, and how it can step up its ongoing efforts to build proactive climate resilience and adaptation.

This report presents the Authority's advice on Australia's 2035 emissions reduction targets in 4 parts

In Part 1, we lay out the context and analytical framework underpinning our advice. In Part 2, we then explore what potential sectoral pathways may look like. In Part 3 we discuss how the Australian economy can continue to grow while navigating the socio-economic impacts and opportunities of decarbonisation. Finally, in Part 4, we outline how Australia could grasp international opportunities, contribute to reducing emissions beyond its borders, and accelerate the global transition through mutually beneficial decarbonisation trade. The report structure is detailed in Figure 2.

Figure 2: Report structure

Structure of the report

Executive summary

Part 1
Context, framework and findings

- Temperatures are rising and the impacts are worsening.
- Geopolitical conflicts, trade tensions, supply chain constraints and social unrest are creating a volatile backdrop.
- The Authority's comprehensive target-setting framework is founded on science and economics.
- The Authority recommends Australia's 2035 emissions reduction target be 62–70% below 2005 levels.

Part 2
Implementation pathways

- The national target represents the total collective effort required across the economy; it is not the target for any individual sector, business, jurisdiction or household.
- Technologies exist to reach the recommended target by 2035.
- Foundational climate change policies must be refined, extended and expanded.
- Governments, companies and households have roles to play.

Part 3
Navigating impacts and opportunities

- Australia's economy is projected to continue growing while it decarbonises.
- Australia's regions face both opportunity and disruption from decarbonisation.
- Ensuring this transition is fair and inclusive is essential for securing the social licence needed to unlock Australia's full decarbonisation potential.

Part 4
International context and insights

- Australia must transition progressively from a net exporter of emissions to a net exporter of abatement.
- Despite global headwinds, most of Australia's trade partners are continuing to decarbonise.
- On balance, recent actions of the US Government are unlikely to delay Australia's decarbonisation.
- Australia can contribute beyond its borders and prosper.
- Australia is well placed to attract investment and enter win-win decarbonisation trade deals with trade partners.

Appendices

A. Advice requirements
B. Mixed methods approach

Part 1

Context, framework and findings

Key points

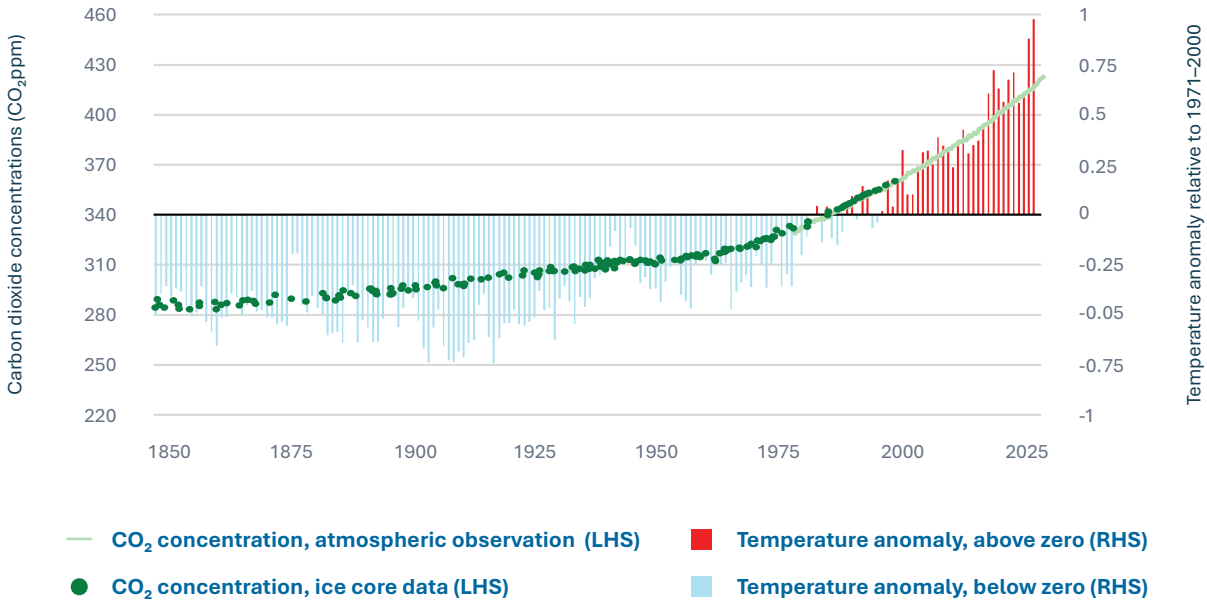
- The Authority's expert, independent advice on Australia's next emissions reduction target is delivered in accordance with the *Climate Change Act 2022 and Climate Change Authority Act 2011,* and takes account of the requirements of the Paris Agreement.
- Temperatures are rising and impacts are worsening. New national targets – due this year – can be the catalyst for shared global action to address the escalating threats.
- Geopolitical conflicts, trade tensions, supply chain constraints and social unrest are creating a volatile backdrop for countries setting their new NDCs. However, history shows that such disruption, while uncomfortable and dangerous, also creates opportunities and can be a powerful catalyst for technological advancement.
- The Authority arrived at the recommended target using a combination of analytical methods to pair maximum ambition with achievability. By weaving together quantitative data, qualitative inputs and broader systemic insights, we assessed the social, economic and environmental implications, risks and opportunities associated with different potential 2035 emissions targets and pathways.
- The appropriate target for Australia is to reduce emissions to 62–70% below 2005 levels by 2035 and stay within a budget of 1,248–1,395 Mt CO_2-e between 2031 and 2035.
- The 62–70% target acknowledges the future is inherently uncertain and hence there is the prospect of both breakthroughs and setbacks.

1.1 Climate change impacts: Scientific trends and projections

The Government's decision on Australia's third NDC comes at a critical time. The broader global environment is undergoing profound economic, technological and social shifts, while also experiencing the worsening impacts of climate change.

Last year was the world's hottest on record, with the global average temperature reaching more than 1.5 °C above pre-industrial levels for the first time (Copernicus, 2025a). The world has warmed by about 0.24 °C per decade since the late 1970s (Copernicus, 2025b), as the concentration of greenhouse gases in the atmosphere continues to rise at a record rate (Earth System Science Data, 2025). The annual increase in carbon dioxide from 1 January 2023 to 1 January 2024 was 2.83 ± 0.08 ppm (NOAA, 2025b). The increase in warming and growing concentration of carbon dioxide are closely linked (Figure 3).

Figure 3: Carbon dioxide concentrations and temperature anomalies over time, 1850–2025



Sources: Authority analysis using carbon dioxide concentrations from CSIRO data (Rubino et al., 2018; CSIRO, 2025d) and temperature anomaly data from the National Oceanic and Atmospheric Administration (NOAA, 2025a).

Notes:

Temperature anomalies (NOAA, 2025a) have been calculated relative to the period 1971–2000, which already includes some warming relative to pre-industrial levels. Access the original data sources for additional guidance on interpretation. Recent carbon dioxide concentrations (displayed as a line) are from CSIRO's Kennaook / Cape Grim Baseline Air Pollution Station (CSIRO, 2025d), while older carbon dioxide concentrations (displayed as points) are from Law Dome ice core records (Rubino et al., 2018).

Australia is on the front line of climate change, and communities around the country are bearing the brunt of its impacts. The *2024 State of the Climate Report* prepared by the Bureau of Meteorology and the CSIRO emphasises that Australia is experiencing increasing disruptions to weather and natural systems as average temperatures rise. Australia's land temperatures have warmed by an average of 1.51 °C since 1910, leading to extreme weather events like heatwaves, fires and wild storms becoming more severe and happening more often, and the consequences are escalating (Figure 4). At the same time, rainfall that nourishes agricultural land and natural environments is becoming less frequent and even less predictable in large parts of the country. Sea levels are rising, putting homes and infrastructure at risk. Ocean heatwaves are impacting marine ecosystems and risking the livelihoods of coastal communities that rely on industries like fishing and tourism (BOM, 2024). Acidification is also harming ecosystems that play an integral role in the lives, livelihoods and cultures of Aboriginal and Torres Strait Islander communities (ASPI, 2022).

The physical impacts of climate change are disruptive, far-reaching, and can be extremely difficult and expensive to adapt to. Local insured losses from extreme weather disasters totalled $22.5 billion over the past 5 years, up two-thirds on the 5 years before that (Insurance Council of Australia, 2025b). Financial figures alone cannot capture the destruction and disruption of events like Cyclone Alfred, outback Queensland's record floods, severe drought conditions affecting parts of Western Australia, South Australia, Victoria and Tasmania, and South Australia's unprecedented algal bloom. Lives and livelihoods are being affected across the nation.

A decade ago, Parties to the Paris Agreement – including Australia – set the goals of limiting the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit this to 1.5 °C above pre-industrial levels (UNFCCC, 2015). Continuing to strive for 1.5 °C matters because the difference in risks and impacts between a 1.5 °C and 2 °C outcome is stark. For example, sustained warming of 1.5 °C is projected to see irreversible damage to 70–90% of global coral reefs, including the Great Barrier Reef. At 2 °C, tropical coral ecosystems may no longer exist as the world currently knows them (Lachs et al., 2024). This would drive significant biodiversity loss, disrupt food systems, severely impact tourism and fisheries sectors, and expose millions to increased coastal vulnerability (Eddy et al., 2021; Great Barrier Reef Marine Park Authority, 2024; Hicks et al., 2021; NOAA, 2024; UNSW, 2021).

There is a strong scientific consensus that without a concerted and sustained global effort to cut emissions, temperatures are likely to keep rising well beyond the 1.5 °C threshold (IPCC, 2021b). Destructive climate impacts are projected to keep rising with them (IPCC, 2022b).

Figure 4: Physical impacts of escalating climate change in Australia

One in every 25 homes could be uninsurable by 2030 due to climate change and extreme weather events like bushfires, extreme wind and flooding.

The changing frequency and severity of disasters are raising insurance costs and putting pressure on Australians struggling with the cost of living. Data from the Insurance Council of Australia shows ex-Tropical Cyclone Alfred generated 95,000 insurance claims totalling almost $1 billion in early 2025. Between 2004 and 2022 the average cost of insurance premiums quadrupled, with steeper rises in high-risk, flood prone areas.

Sources: ANU ICEDS (2024), Climate Council (2022), Insurance Council of Australia (2022, 2024, 2025a), Settle (2025).

NSW could experience more than double the annual number of days above 35 °C by the end of this century.

Extreme heat accounts for 70–84% of weather-related hospitalisations nationally. The incidence of health problems like heat exhaustion and heatstroke rises significantly during heatwaves. Extreme heat can also compound conditions like diabetes, asthma and cardiovascular disease. People who work outdoors and vulnerable groups, including the elderly, children and people with chronic illnesses, are most affected by extreme heat.

Sources: AdaptNSW (2025), AIHW (2023), NSW Health (2024), WHO (2024).

A hotter and drier climate is projected to impact agricultural production, reducing yields for some crops by as much as 30% in southwestern Australia and as much as 15% in South Australia.

In Australia, shifting rainfall patterns are contributing to drier conditions in some regions and seasons. These regional and seasonal changes are projected to impact staple crops like wheat – reducing yields and incomes. During the 2017–2019 Tinderbox Drought in south-eastern Australia, regional production of wheat and barley fell between 43% and 73% in 2018 and 2019. Summer rice production decreased by more than 90% in the 2018–19 and 2019–20 financial years. Regional reductions in rainfall related to climate change have already reduced profits by an average of around 22% for Australian broadacre farmers since 2000.

Sources: Bailey et al. (2024), CSIRO & BOM (2024), Devanand et al. (2024), Hughes et al. (2019), IPCC (2022a).

More than 2,000 threatened species and ecological communities face greater risks in a changing climate.

Climate change is altering conditions in many ecosystems. Australia is one of 17 megadiverse countries but has one of the highest rates of species decline amongst OECD nations. The impacts of climate change put species and ecosystems already being impacted by other threats such as invasive species and habitat loss under more pressure. Addressing these threats is critical to building resilience to climate change impacts.

Sources: DCCEEW (2021, 2025j), UN (2024).

If warming rises above 2 °C, 99% of reefs in the Great Barrier Reef are expected to experience regular coral bleaching.

In early 2025, the Great Barrier Reef suffered its sixth widespread coral bleaching event in the last 10 years, the second time parts of the reef have been impacted by mass bleaching in consecutive summers. This threatens the economic security of surrounding communities including nationally important tourism and fishing industries. The Great Barrier Reef is just one Australian reef being harmed by bleaching, with the World Heritage-listed Ningaloo Reef in Western Australia also experiencing a widespread coral bleaching event during early 2025 – making it the first time tropical corals had suffered simultaneously off Australia's north-east and north-west.

Sources: Great Barrier Reef Marine Park Authority et al. (2025), Kalmus et al. (2022), Richards (2025).

Long-term sea level rise risks inundating low-lying inhabited islands in the Torres Strait region, posing an existential threat to local culture and communities.

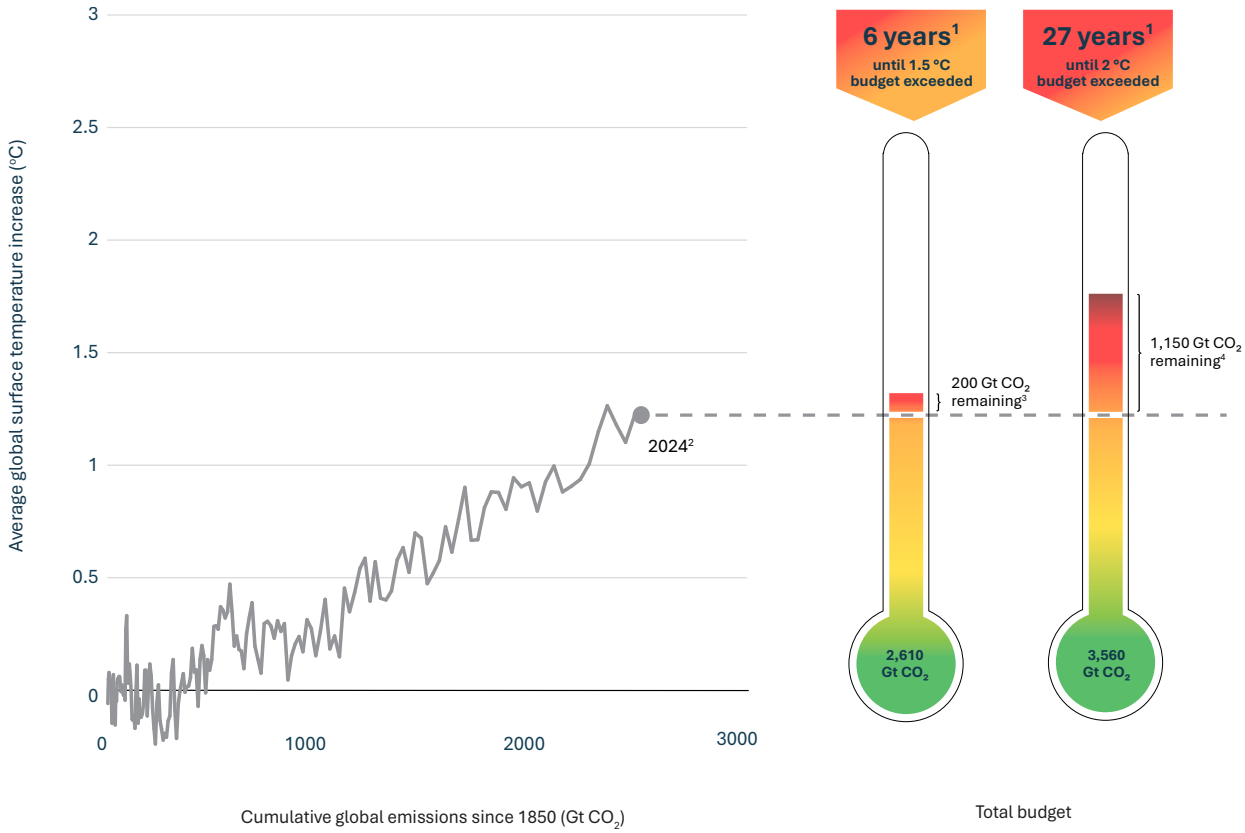
Torres Strait Islanders are facing a combination of sea level rise, weather extremes, rising atmospheric and ocean temperatures and changing ocean chemistry. These physical impacts pose an existential threat to every aspect of local society, cultural practice, livelihoods, and health and wellbeing. Torres Strait culture is strongly connected to the health and wellbeing of land and sea Country. As sea level rise threatens communities, they will lose not only their land and homes, but the cultural stories and burial sites of their ancestors which is an irreplaceable part of their culture.

Sources: CoastAdapt (2017), CSIRO (2023b), TSRA (2021, 2025).

Last year's temperature record is a stark warning, as crossing 1.5 °C even temporarily may increase the risk of triggering tipping points in the Earth's delicately balanced biosphere. It does not necessarily signal a point of no return for the climate or the demise of the Paris Agreement's goals. Scientific assessments by the Intergovernmental Panel on Climate Change (IPCC), the World Meteorological Organisation (WMO) and others generally consider average global temperatures over multiyear periods, rather than a single year outcome, to assess whether specific global warming levels have been breached (Earth System Science Data, 2025; IPCC, 2021a; WMO, 2025). Nonetheless, the upward trajectory in global average temperatures over the past 150 years is clear and alarming.

The remaining global carbon budget for a 50% chance of limiting warming to 1.5 °C is about 200 Gt CO_2 – equivalent to just 6 years of emissions at the current global rate (Earth System Science Data, 2025). It looks certain that the world will overshoot this warming level (Figure 5). However, every fraction of a degree matters. Cutting greenhouse gas emissions as far and as fast as possible and keeping warming as close as possible to 1.5 °C and below 2 °C, which looks achievable, needs to be an urgent priority worldwide, because the amount of carbon in the atmosphere today locks in a certain level of future warming (Buis, 2019; IPCC, 2021b; WMO, 2024).

Figure 5: Global surface temperatures and carbon budgets



Sources: Global Carbon Project (2024), Forster et al. (2023).

Notes:

The probabilities used for the budgets in this figure align with the IPCC AR6 WGI report, which uses a 50% and 67% likelihood for limiting global warming to 1.5 °C and 2 °C respectively.

1. Calculated using the remaining carbon budget from the Global Carbon Project.
2. 1.3 °C is the Forster et al. estimate of 'current' global warming.
3. This budget is for a 50% likelihood to limiting global warming to 1.5 °C.
4. This budget is for a 67% likelihood to limiting global warming to 2 °C.

Global progress to date confirms that concerted efforts can bend the emissions curve and temperature trajectory. Before the Paris Agreement, temperatures were projected to rise by more than 5 °C. In 2023, the first global stocktake of steps taken under the pact revised this projection to between 2.1–2.8 °C if all current country commitments are delivered (UNFCCC, 2023). Countries are currently developing and submitting their third NDCs which, because they must be more ambitious than the last, can be expected to bring temperature projections down further.

The first 10 years of the Paris Agreement have established a solid foundation for collective action. They have also begun reshaping global economic, trade, and diplomatic partnerships to enable this transition. The challenge now is to significantly accelerate implementation to deliver on the agreement's urgent, shared objectives.

Box 1: International Court of Justice – advisory opinion – obligation of States in respect of climate change – 23 July 2025

The International Court of Justice (ICJ) has issued an advisory opinion on the legal obligations of states regarding climate change (ICJ, 2025). The opinion responded to questions asked by the United Nations (UN) General Assembly to the court, following a request from a group led by the Pacific Island state of Vanuatu.

The ICJ's opinion was delivered while the Authority's 2035 Targets advice was under development. It is a significant decision and its implications will take some time to analyse.

The court's unanimous opinion included the following key points:

- Climate change treaties, human rights treaties and customary international law impose binding obligations on countries to ensure the protection of the climate system and other parts of the environment from anthropogenic greenhouse gas emissions.
- A breach of these obligations is an internationally wrongful act, and countries harmed by climate change may seek restitution or compensation from states that breach these obligations.

The opinion referred to both the 2 °C and 1.5 °C goals in the Paris Agreement and noted that it considers the 1.5 °C threshold to be the treaty parties' primary temperature goal for limiting the global average temperature increase in accordance with the best available science. The court also observed that it is scientifically possible to determine a country's total contribution to global emissions, taking into account both historical and current emissions.

Although non-binding, the opinion carries significant weight and can be expected to influence future climate litigation, international negotiations, and national climate policies.

1.2 A strong target provides a clear direction amid uncertainty

Geopolitical conflicts, trade tensions, supply chain constraints, and social unrest are creating a volatile backdrop for countries setting their new NDCs. These pledges will outline nations' targets and policies for reducing greenhouse gas emissions. The Paris Agreement calls for NDCs to not only advance on previous commitments, but to reflect each nation's highest possible ambition. At the time of writing this advice, 28 countries had submitted their third NDCs and 2035 targets (UNFCCC, 2025b) with many more, including Australia, due to submit ahead of the United Nations climate change conference in Brazil in November this year, COP31.

Geopolitical shifts can alter what is possible and today's competitive advantage may not be tomorrow's. Disruptions can be short-lived, with markets and systems often finding a new equilibrium over time. The US withdrawal from the Paris Agreement and its winding back of many climate policies signal a significant reversal of federal American climate action. The US has previously disengaged with climate agreements – it did not ratify the Kyoto Protocol following its agreement in 1997 and withdrew from the Paris Agreement in 2017. Yet some US states and businesses maintained their climate policies in line with other jurisdictions, and the US rejoined the Paris Agreement in 2021 after a change of administration.

History shows that disruption can also serve as a powerful catalyst. The COVID-19 pandemic devastated communities and economies around the world, but it also brought rapid breakthroughs in vaccine development, digital health and remote work. The space race drove advances in satellites, computing and materials science. Energy shocks have also spurred major leaps. The 1970s oil crisis led to higher fuel efficiency standards and investment in alternative energy. And more recently, Russia's war on Ukraine triggered a global shift away from fossil fuels and a surge in clean energy deployment.

Australia has consistently demonstrated an ability to ride through global disruptions better than many other nations, with the Global Financial Crisis (GFC) and the COVID-19 pandemic being clear examples:

- During the GFC, Australia avoided an economic recession altogether – being one of the few developed economies to do so. This success was due to a combination of prudent financial regulation, Asia's strong demand for Australia's exports, and a swift, targeted fiscal stimulus (Treasury, 2012).
- During the COVID-19 pandemic, Australia's early and decisive public health measures, alongside sustained government support for businesses and workers, helped cushion the economic impact and enabled a faster recovery once restrictions eased (Reserve Bank of Australia, 2023).

These responses were marked by adaptability, coordinated policymaking – including the creation of a National Cabinet – and a willingness to act decisively on scientific and medical advice in the national interest. The longer-term benefits have included a reputation for economic resilience, sustained investor confidence, and a strengthened capacity to respond to future shocks. The Prime Minister, premiers of the states and chief ministers of the territories should demonstrate the same kind of national leadership on the response to climate change by meeting annually to review progress and plan the path to net zero and climate resilience. Regular high-level engagement would elevate accountability, align priorities across governments, and ensure Australia stays ahead of accelerating climate risks and global shifts.

Australia's strengths and the broader international context have informed the Authority's advice on Australia's emissions reduction target for 2035. The recommended target provides a clear direction through uncertainty and incorporates flexibility to account for variation across years and sectors. It is ambitious yet grounded in evidence and designed to weather volatility while remaining responsive to future shifts. It also includes an emissions budget target, which provides for variable outcomes in a given year to be evened out over time. The recommended target is about building on what is working, holding the course through fluctuating times, and being clear-headed and ready to adapt as needed.

Periods of disruption can open doors to opportunity. Investors and partners are drawn to well-founded strategies that have the potential to shape the future. With the right positioning, this necessary transition could be a significant opportunity for Australia to lead and introduce innovations such as new battery technologies, seaweed that reduces livestock emissions, expanded First Nations savanna fire management and better functioning distributed energy markets.

1.3 Scope and methodology of this assessment

This report responds to the Minister for Climate Change and Energy's request for the Authority to provide advice on Australia's potential national greenhouse gas emissions reduction targets for 2035, in accordance with the *Climate Change Act 2022*, *the Climate Change Authority Act 2011* and the Paris Agreement. The Authority's advice is guided by the goal of the Paris Agreement of holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels (UNFCCC, 2025b). See Appendix A for further information about the scope of this work.

The advice presented in this report accounts for an evolving geopolitical landscape. International changes of government and shifting trade dynamics have important ramifications for both domestic and global decarbonisation efforts. International carbon markets are stalling and the global climate policy architecture is being redesigned with the establishment of new partnerships (e.g. IPEF Clean Economy Agreement), more countries exploring carbon border adjustment measures (including Canada, the UK and Australia) and the repeal of clean energy incentives (e.g. US *Inflation Reduction Act)* reverberating along supply chains.

Since the Authority last provided advice on targets, the Paris Agreement established a new, nationally determined approach to setting them. The Paris Agreement does not prescribe how countries should set their national emissions reduction targets. Instead, it calls on countries to determine targets that reflect their highest possible ambition taking account of their responsibilities, capabilities and national circumstances (UNFCCC, 2015; *Pabai v Commonwealth of Australia* (No 2) (2025) FCA 796). Accordingly, the Authority's approach to advising on 2035 targets is based

on these tenets of the Paris Agreement: pursuing efforts toward the 1.5 °C goal; as ambitious as possible; in accordance with the best available science; and considering Australia's responsibilities, capabilities and national circumstances.

The Authority's response to the scientific imperative

Figure 6 presents the Authority's approach to taking account of the scientific imperative in developing its advice. The science is clear that reducing global emissions as much as possible, as soon as possible, is essential to avoid escalating climate warming and its impacts on economies, environments and communities (IPCC, 2023). The Authority's approach sets out a pathway for Australia to deliver on this imperative within its borders and partner with other nations to help drive emissions down globally.

Importantly – and in contrast with the Authority's previous approach to determining targets[2] (CCA, 2014) – this advice on Australia's 2035 targets does not assume the use of international offsets. It assumes Australia will continue to make offshore contributions to the goals of the Paris Agreement by supporting other nations to reduce their emissions, without necessarily counting the resultant mitigation outcomes towards its own target. Australia could set national targets in the future embodying higher levels of ambition by proactively engaging with international carbon markets, as set out in Part 4.

2 The Modified Contraction and Convergence Method of sharing the global emissions budget was developed by Professor Ross Garnaut. It aims to determine what would represent an equitable share of emissions for each country (CCA, 2024b). In 2014, the Authority adopted this approach when providing advice on the national 2030 emissions reduction target (CCA, 2014). This method enabled the Authority to identify Australia's share of the global emissions budget consistent with a temperature rise of 2 °C or less (CCA, 2014). It has not been widely adopted by nations in developing their NDCs under the Paris Agreement.

Figure 6: The scientific imperative for Australia's 2035 emissions reduction target

Temperature alignment: The 1.5 °C imperative

The Paris Agreement (Article 2) sets out the goal of 'holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels'.

The Authority has been guided by the latest scientific evidence which reveals that 1.5 °C of global warming represents the threshold beyond which multiple climate systems risk irreversible breakdown.

A limit of 1.5 °C corresponds to a finite global carbon budget – the total amount humans can emit while having a chance of staying below that limit.

Highest possible ambition

The Paris Agreement (Article 4) calls on each nation to contribute its 'highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances'.

The Authority's sector pathway analysis—one of 5 methodological components—reviews not only what is possible now, but also what could be possible with dedicated policy action, coordination and cooperation. This approach considers the levers that can be pulled to overcome barriers and push the boundaries of what is achievable, including:

- funding research
- setting strategic priorities
- creating policies and regulations that shape markets and reduce risk for emerging technologies
- tools like grants, tax incentives, and public procurement.

Global contributions: Efforts to support offshore emissions reductions

The scientific imperative recognises that emissions don't respect borders.

National efforts can enable and drive global decarbonisation beyond Australia.

The Authority's recommended target sits within the concept of an Australian NDC and approach that:

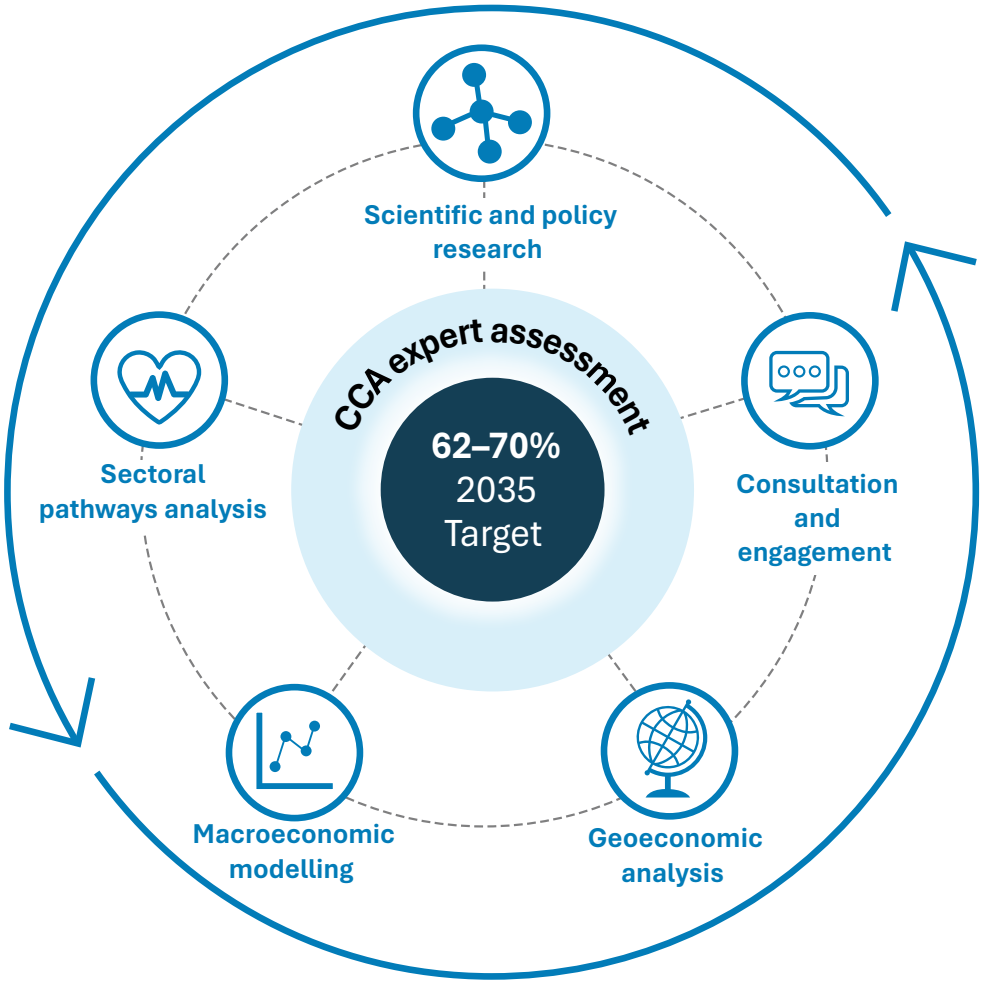
- increases clean exports
- reduces emissions-intensive exports
- supports Australia's neighbours to develop sustainably and adapt to climate risks.

Consistent with the *Climate Change Act 2022*, the *Climate Change Authority Act 2011* and the Paris Agreement, consideration of climate change science is an essential, but not exclusive, point of reference for the Authority's targets advice. The federal court recently acknowledged that while 'careful and earnest consideration and weight' is to be given by the Government to the best available science, the setting and implementation of a national emissions reduction target has broad social and economic implications that are reasonable to consider, alongside the overall feasibility of the implementation of the recommended target (*Pabai v Commonwealth of Australia* (No 2) (2025) FCA 796). The Authority's approach to incorporating all these considerations in the development of its advice is outlined below.

The Authority's mixed methods approach

To inform its advice on Australia's 2035 emissions reduction targets, and the pathways to achieving them, the Authority developed a 5-part mixed-methods approach (depicted in Figure 7 below). The approach integrates macroeconomic modelling – commissioned from Australia's premier science agency, the CSIRO – with science-based impact assessment, detailed sector-specific research, submissions from and direct engagement with stakeholders, and international policy and market research (geoeconomic analysis).

Figure 7: The Authority's 5-part mixed methods approach and expert assessment



A cornerstone of the Authority's mixed methods approach was a comprehensive consultation process designed to bring diverse expertise and lived experience to the heart of this advice. Over 2023–2024, the Authority released 3 discussion papers and received more than 560 written submissions in response, offering valuable perspectives, evidence and ideas. In response to the evidence it had considered at this early stage of the project, the Authority's 2024 consultation paper suggested a 65–75% target would be ambitious and achievable; in the feedback we received, some stakeholders called for a more ambitious goal, while others suggested a more cautious or incremental approach. The target we have recommended has taken account of the submissions and views received, as well as additional analysis conducted since. Without being exhaustive:

- Many submitters, including the Australian National University's Institute for Climate, Energy & Disaster Solutions and the Australian Academy of Technological Sciences & Engineering, argued that Australia's 2035 emissions reduction goal should align with limiting warming to 1.5 °C, and pointed out that a 65–75% reduction below 2005 levels is considered both ambitious and technically feasible.
- Voices representing industry – such as the Minerals Council of Australia, Australian Industry Greenhouse Network and Fortescue – emphasised the need for realistic transition support for carbon-intensive sectors and the importance of achieving targets without undermining competitiveness. Others – such as road freight transport association NatRoad – warned that focusing only on long-term technologies (e.g. hydrogen and EVs for freight) without near-term efficiency and renewable diesel pathways could increase costs and emissions in the short term. Other industry groups (e.g. National Farmers Federation, Science and Technology Australia) highlighted the need for supportive measures to ensure a just transition and to capture economic opportunities through green exports and innovation.
- Governance and regulation featured in several submissions. Business and investor groups (including Business Council of Australia (BCA), AiGroup, Clean Energy Investor Group, Investor Group on Climate Change) emphasised the need for streamlined environmental approvals and regulatory reform to accelerate renewable investment, uphold investor confidence and ensure competitiveness. The Australian Sustainable Finance Institute and other finance sector stakeholders emphasised aligning Australia's target with global climate-aligned capital flows. Several submissions (BCA, AiGroup, World Wide Fund for Nature (WWF), science bodies) called for improved monitoring, regular review mechanisms, and independent oversight to ensure targets stay on track and accountability is maintained across sectors and governments.
- Several groups highlighted the need for equitable climate policy and local roles – protecting low-income households, First Nations and regional populations – as part of transition planning. The Australian Council of Social Service, WWF, Australian Conservation Foundation (ACF) and various First Nations representatives emphasised fairness in distributing both the costs and benefits of the transition. Submissions from unions like the Mining and Energy Union and regional associations highlighted the need for retraining programs, support for energy-region workers, and just transition planning in heavily carbon-dependent communities. Several groups called for local governments roles to be clearly defined and adequately resourced (e.g. Council of Capital City Lord Mayors). Nature-based solutions and land use featured in several submissions as core to emissions reduction strategies – such as WWF, ACF and Wentworth Group of Concerned Scientists.

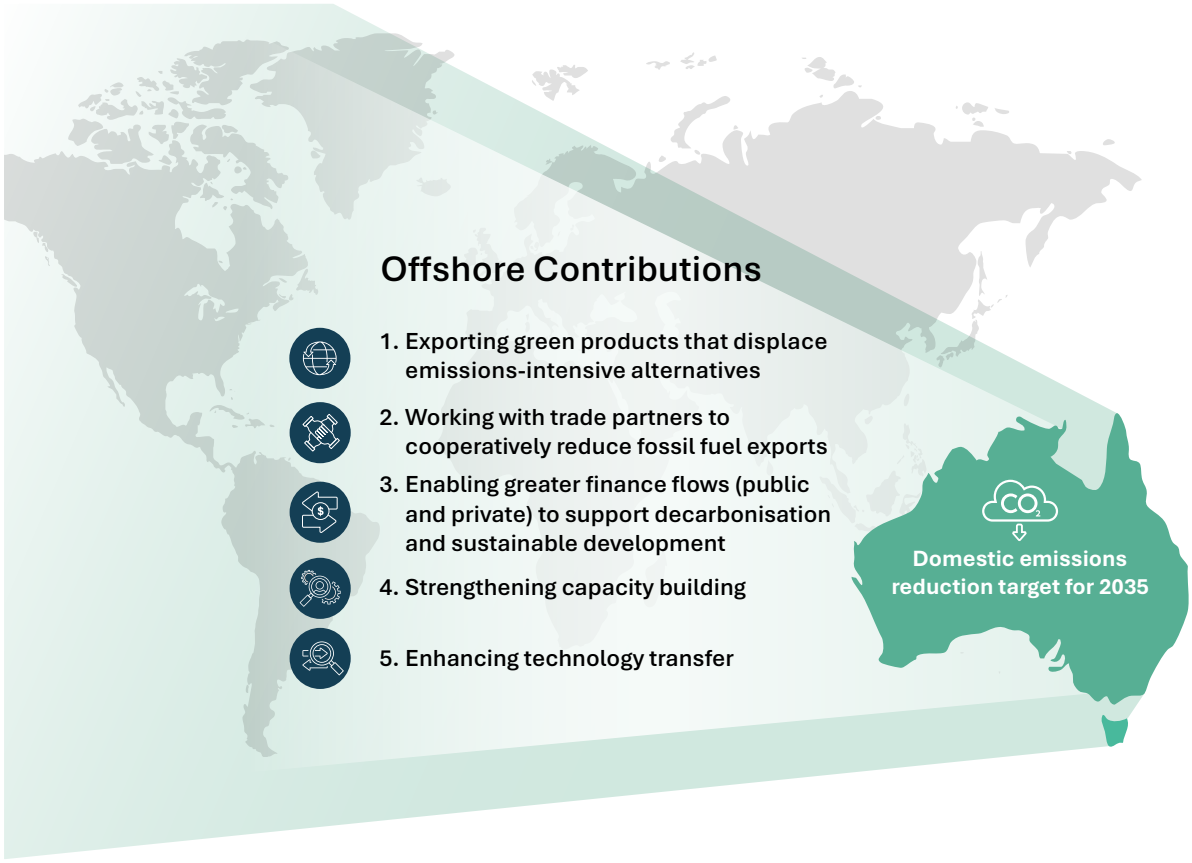
Public submissions are available here: https://www.climatechangeauthority.gov.au/consultation.

The Authority also engaged directly through more than 500 events and meetings, listening to and learning from business leaders, community advocates, First Nations people, young Australians, unions, regional representatives, academics, peak bodies and more. The generosity, candour, and depth of contributions the Authority received cannot be overstated. These insights have added immense value and are woven throughout the report, shaping both the analysis and recommendations.

The Authority's findings were then contextualised by in-depth analysis of scientific developments, international trends and geopolitical dynamics. The Authority has considered policy developments during the first several months of the new US Administration. The US Government's intent to withdraw from the Paris Agreement presents a major setback for multilateral cooperation on climate change. Its winding back of domestic measures to support the clean energy transition may slow reductions in US emissions and hinder breakthroughs in clean technology. However, the Authority found after careful consideration that new US policies as presently proposed are unlikely to have a material impact on Australia's own ability to decarbonise its industries to 2035. Indeed, it may enable Australia to attract displaced capital, capability and innovation to accelerate its own transition and secure a competitive edge in driving the energy transition.

As explored in Part 4 of this report, Australian contributions to emissions reductions beyond its borders can amplify its impact well beyond action on domestic emissions alone, while ushering in a new era of national prosperity. The Authority's advice on Australia's targets – as requested by the Minister – applies only to emissions that occur in Australia. However, this report also considers offshore contributions – beyond domestic targets – that Australia can make towards the goals of the Paris Agreement. These efforts – such as climate finance, capacity building and trade of goods that help other countries reduce their emissions – also contribute to meeting the goals of the Paris Agreement (Figure 8).

Figure 8: Australia's offshore contributions to the goals of the Paris Agreement



By bringing together quantitative economic data, qualitative expert insights and a sophisticated understanding of broader systemic contexts, the Authority created a multi-dimensional view of what emissions reductions between now and 2035 are possible, what barriers might stand in the way, and what can be done to overcome those barriers.

Setting national targets, while based on data and evidence, is ultimately a matter of judgement, priorities and trade-offs. The extensive analysis and consultation underpinning this advice has helped the Authority understand what is scientifically necessary and technologically and economically possible; where global momentum is trending at a time of high volatility; how diverse sectors and regions will be affected by action at different scales; and how communities, investors and businesses may respond. It is the Authority's expert assessment – drawing on members' knowledge and experience across diverse fields and disciplines, including business and finance, energy, industry, agriculture, science, academia, economics, law, civil society, and politics – that the 2035 targets it has recommended strike the right balance across all of these considerations (read more about the Authority's members online). Further information about the Authority's methodology can be found in Appendix B.

1.4 Recommended national emissions reduction targets

The Authority recommends Australia aim to reduce emissions by 62–70% below 2005 levels by the year 2035. This target should be described as Australia's minimum commitment, and the Government should aim for the top of that range and prepare for both breakthroughs and setbacks, while not ruling out 'overachievement' through greater reductions in net national emissions should that prove possible.

We have recommended a lower bound that makes allowance for the intrinsic uncertainty of our analysis and transition risks (e.g. strong data centre growth – see Box 3), and the potential to contribute to global abatement by growing clean mineral processing (e.g. direct reduced iron (DRI)) and chemical production (e.g. methanol).

The Authority recommends the Government adopt a target range in Australia's NDC to guide strategic planning, combined with a corresponding budget target. The budget target accommodates potential year-to-year volatility while signalling that emissions should decline progressively throughout the target period, in line with the need to limit cumulative emissions as much as possible. The Authority employed the same straight-line method used in Australia's previous NDCs to calculate the budget target that corresponds to the recommended target range.

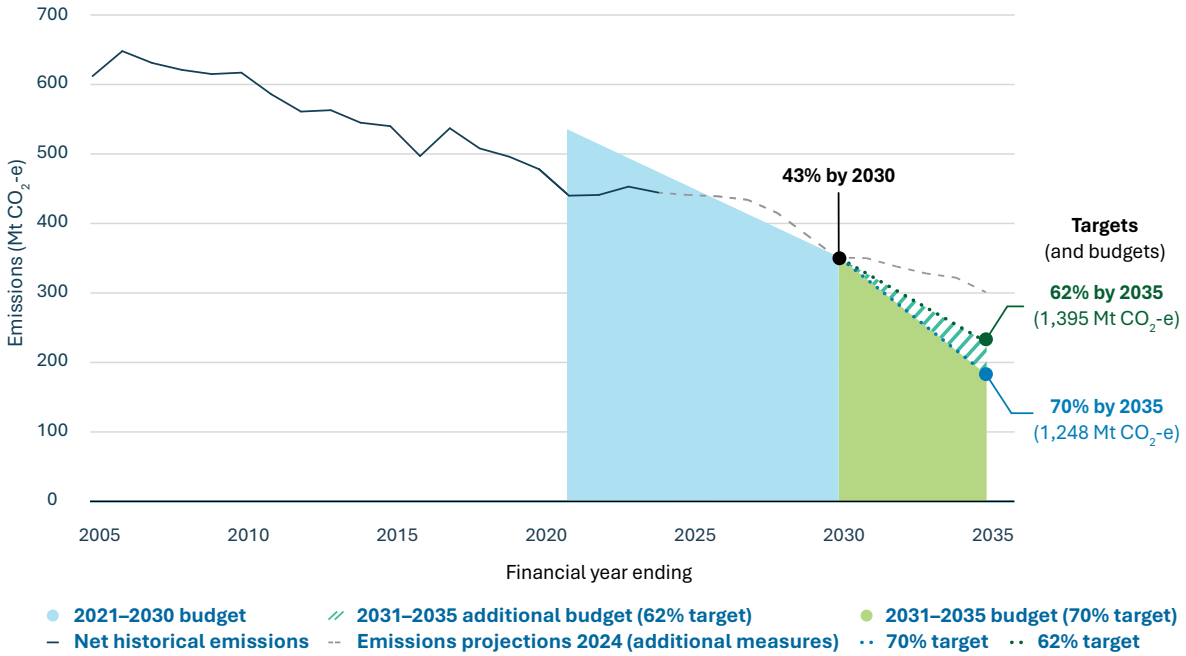
Table 1: The Authority's recommended emissions reduction targets

Target	62–70% below 2005 levels by 2035
Budget target	1,248–1,395 Mt CO_2-e for the period 2031 to 2035

The recommended targets represent a significant acceleration in Australia's progress. Australia's current target is 43% below 2005 levels by 2030, and, on current policies, Australia is projected to reduce emissions by 51% by 2035 (DCCEEW, 2024f).

The acceleration required to achieve a target of 62–70%, together with action to boost emissions reduction beyond Australia's borders, represents an ambitious and achievable contribution towards meeting the shared goals of the Paris Agreement.

Figure 9: Recommended 2035 emissions reduction targets



Note:

The historical emissions and projections do not align in 2024 as the projections are based on historical data that has been recalculated since their publication.

1.5 How the recommended targets have taken into account the matters set out in Article 2 of the Paris Agreement

Article 2 of the Paris Agreement sets out the purpose of the Agreement, including the overarching goals that Parties commit to pursue collectively. These goals include:

> *(a) Holding the increase in the global average temperature to well below 2 °C above preindustrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels*
>
> *(b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development*
>
> *(c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.*

The Authority has taken account of the matters set out in Article 2, including in the ways set out below.

1. *Aligning targets with a long-term goal to limit the temperature increase to 1.5 °C above preindustrial levels.*

The Authority used scientific assessments from the IPCC to understand the scale of greenhouse gas emissions reductions needed globally to limit warming to 1.5 °C.

The Authority investigated the share of that global abatement effort Australia should undertake based on historical responsibility, capability, developed country status and emissions profile.

Guided by principles of equity and common but differentiated responsibilities and respective capabilities, as enshrined in the Paris Agreement, we further determined Australia's national target should be as ambitious as possible domestically and complemented with additional contributions to offshore emissions reductions. These offshore contributions would support other nations to contribute more to the goals of the Paris Agreement, but would not be counted towards Australia's target and thus would not be 'double counted'. These contributions, such as clean energy exports (e.g. green iron), align strongly with Australia's national interest.

2. *Setting economy-wide, long-term decarbonisation pathways*

The Authority's recommended 2035 targets are interim targets and align with decarbonisation trajectories to achieve Australia's legislated goal of net zero emissions by 2050. These recommendations are developed together with detailed consideration of every sector of the economy, as set out in the Authority's *Sector Pathways Review* (CCA, 2024c).

3. *Considering broader climate-resilient development pathways*

Although emissions reduction is central to its advice, the Authority also emphasises the need for adaptation and resilience. It promotes just transition in emissions-intensive sectors, integrates emissions targets with green industrial policies, and seeks coherence with measures to enhance equity and wellbeing in the light of the challenges and opportunities of decarbonisation and the growing physical impacts of climate change.

4. *Assessing consistency with finance and investment flows*

In formulating its 2035 targets advice, the Authority reflected on how to redirect public and private finance in line with Article 2. This consideration influenced advice on climate finance, investable NDCs, trade partnerships, and the decision to exclude international offsets for now but remain open to their use in the future.

In summary, the Authority interprets Article 2 of the Paris Agreement as both a mandate for ambition and a framework for fairness. The recommended national emissions reduction targets for Australia, together with offshore contributions, contribute meaningfully to pursuing the goal of limiting warming to 1.5 °C, while taking account of Australia's national circumstances, capabilities and need for a just and orderly transition.

1.6 Target setting in an uncertain environment

The world is volatile and uncertain. Expressing the target as a range recognises this uncertainty, which arises from 5 particular sources.

First, some known new technologies could make a much larger contribution to Australia's 2035 target than currently predicted, while others may contribute less. Models have historically underestimated deployment rates and overestimated costs for some renewable energy technologies like solar PVs (Way et al., 2022). Some technologies show the opposite trend, for example green hydrogen which is now challenged by stronger 'headwinds' than originally anticipated (BNEF, 2025b). Assumptions about the cost and availability of proven technologies like batteries and electric vehicles (EVs) shaped the assessment of how quickly their use will scale up in the next 10 years. Faster reductions in costs leading to more deployment of these technologies could accelerate the decarbonisation of Australia's electricity grid and other sectors while slower cost reductions would have the opposite effect.

Second, if left unaddressed, barriers to deployment – such as supply chain and workforce constraints or a lack of social license, coordination and long-term market price signals – can delay decarbonisation efforts and outcomes. The Authority examined in detail potential barriers to the roll-out of decarbonisation technologies in its *Sector Pathways Review* (CCA, 2024c).

Third, the 10-year time horizon to 2035 limits the potential for 'gamechanger' technologies not currently tested and proven – but does not rule them out entirely. The first Apple iPhone reportedly sold 4 million units within just 6 months of its launch in 2007 (Reuters, 2008). This advance fundamentally re-shaped the media and communications landscape within a decade. Energy efficiency and artificial intelligence (AI) are areas where current research and development may trigger breakthroughs which reshape what is possible in the decade ahead. In the case of AI, this emerging technology cluster is also a source of downside risk if the industry's growing appetite for electricity hampers grid decarbonisation efforts (IEA, 2025a) (see Box 3).

Fourth, individual and community-level responses to new technologies and opportunities for behaviour change are a further source of uncertainty. The Authority's analysis has not incorporated significant assumptions about shifts in transport, housing or dietary choices in the years to 2035, yet these and other individual decisions could impact progress depending on the pace and direction of change. Widespread adoption of any new technology depends on social acceptance, which depends on how people perceive its benefits (Milani et al., 2024). Time will tell whether – and how quickly – a range of proposed solutions for reducing emissions will be taken up at population scale in Australia and around the world.

Finally, exogenous shocks – such as geopolitical developments, extreme weather disasters or chronic changes in local climates – have the potential to change what is possible, positively or negatively. The European Union (EU) introduced a suite of measures to assure energy security following Russia's 2022 invasion of Ukraine, prompting an acceleration in renewable deployment in Europe (European Commission, 2022). In 2024, a record 66 GW of solar was added in the EU, and solar overtook coal in the electricity generation mix for the first time (Ember Energy, 2025). A major global economic downturn sparked by a prolonged trade war between the US and

China could create emerging risks on the downside (Mazzocco, 2025). Carbon stored in land is at risk of being released due to seasonal or climatic conditions, such as drought. This risk is exacerbated by the impacts of climate change, with the potential for more frequent and severe extreme weather events likely to impact the agriculture and land sector's rate of carbon removal and storage (CCA, 2024c).

Together, these potential developments create a range of uncertainties around what is achievable for reducing emissions in Australia and globally by 2035. The Authority's recommended approach acknowledges today's volatility but is not held back by it. Importantly, even the upper end of the recommended target should not be viewed as a limit on Australia's ambition for reducing emissions should circumstances allow for faster progress. The remainder of this report outlines how Australia can position itself to prosper, thrive and reduce emissions in a complex and rapidly changing environment.

Box 2: Recent energy price increases were not driven by decarbonisation

Australia has experienced significant increases in energy prices over recent years, putting pressure on household budgets and the viability of some businesses. A combination of factors has caused the price rises, including:

- the Russian invasion of Ukraine (ACCC, 2022, IEA, 2023a)
- ageing coal-fired generators experiencing outages (Simshauser and Gilmore, 2025)
- supply chain constraints following the COVID-19 pandemic (CSIRO, 2024)
- interest rate rises increasing the costs of servicing debt on new generation (Simshauser and Gilmore, 2025).

These impacts would have occurred regardless of the net zero transition.

As Australia's fleet of ageing coal-fired power stations reach the end of their lives, they need to be replaced (CCA, 2024; AEMO, 2024b). Regardless of the need to decarbonise, the cheapest way to do this is with firmed renewable energy (CSIRO, 2024). Modelling of the Queensland electricity market found the recent price rises were inevitable and would have been even higher if renewables had not replaced fossil fuel-based electricity generation (Simshauser and Gilmore, 2025).

Similarly, electrifying transport can allow Australia to reduce its exposure to global oil prices. Passenger EVs now cost less over their lifetime than fossil fuel alternatives (IEA, 2025e). When charged with rooftop solar, the cost savings are even greater.

Despite the challenges that some of Australia's metal smelters are experiencing, Australia still has an opportunity to become a global supplier of clean metals. Producing green metals with renewable energy will reduce Australia's exposure to global fossil fuel prices. It will also allow Australia to take advantage of its comparative advantage in producing green metals.

Part 2

Implementation pathways

Key points

- The national target represents the total collective effort required across the economy; it is not the target for any individual sector, business, jurisdiction or household. Different parts of the economy face different opportunities and challenges, and so the pace of emissions reductions will vary among them.
- Building on the Authority's *Sector Pathways Review*, further analysis summarised here shows that Australia has access to proven and emerging technologies and capabilities to reduce emissions to 62–70% below 2005 levels by 2035. Many of these technologies are already being adopted; some will take more time to scale up.
- The foundational climate change policies for achieving this target are also now in place. These must be refined, extended and expanded to ensure the target is reached in a timely, efficient, and effective manner.
- State, territory and local governments will continue to play a key role in achieving national targets. State and territory targets – in aggregate – would have Australia aiming to achieve around 69% below 2005 levels by 2035, consistent with the Authority's recommended target.

2.1 Collective action: Roles of governments, businesses and consumers

Everyone has a role to play in reducing emissions, and the sum of those roles is greater than the parts. When governments, major corporations, investors, small businesses, community groups and households each commit to action, their efforts reinforce one another. Strong targets or action enables and encourages others to do the same, building momentum across the economy. Emissions reductions targets, where adopted by businesses or governments, don't need to be identical. Ambitious national targets become achievable when people and businesses adopt the strongest action possible, taking into account their respective capacities and constraints – and have the support of their governments to do so.

Governments hold the policy levers – including regulatory, financial, market-based and informational – that can guide businesses and households to choices that support Australia's climate change goals. However, the necessary changes go beyond the reach of governments acting alone.

Large corporations must lead – and many do – backed by mandatory reporting and regulatory obligations and growing shareholder expectations. To prosper in a decarbonising world, they will need to plan and invest for markets in which governments, investors and consumers demand low- and zero-emissions goods and services. Corporations' influence can flow through entire supply chains (Villena & Gioia, 2020). More than 130 of the ASX200 companies have net zero commitments, an 8% increase from 2023 to 2024 (ACSI, 2024). Investors increasingly insist that climate risks be disclosed, managed and priced in key financial markets globally (EY, 2022). Small and medium enterprises can also make meaningful shifts, such as switching to renewable electricity and electric vehicles (EVs) and making climate-conscious procurement decisions.

At the household level, people influence change through what they buy and support, how they travel, and where they invest. Community organisations amplify these actions locally, shaping culture. They play an important role in granting companies and governments the 'social licence' to make the changes required for decarbonisation to proceed, such as supporting new renewable electricity projects and the construction of transmission lines (AICD, 2025).

The path to 62–70% by 2035 is built on diverse contributions – distinct in nature but united in purpose.

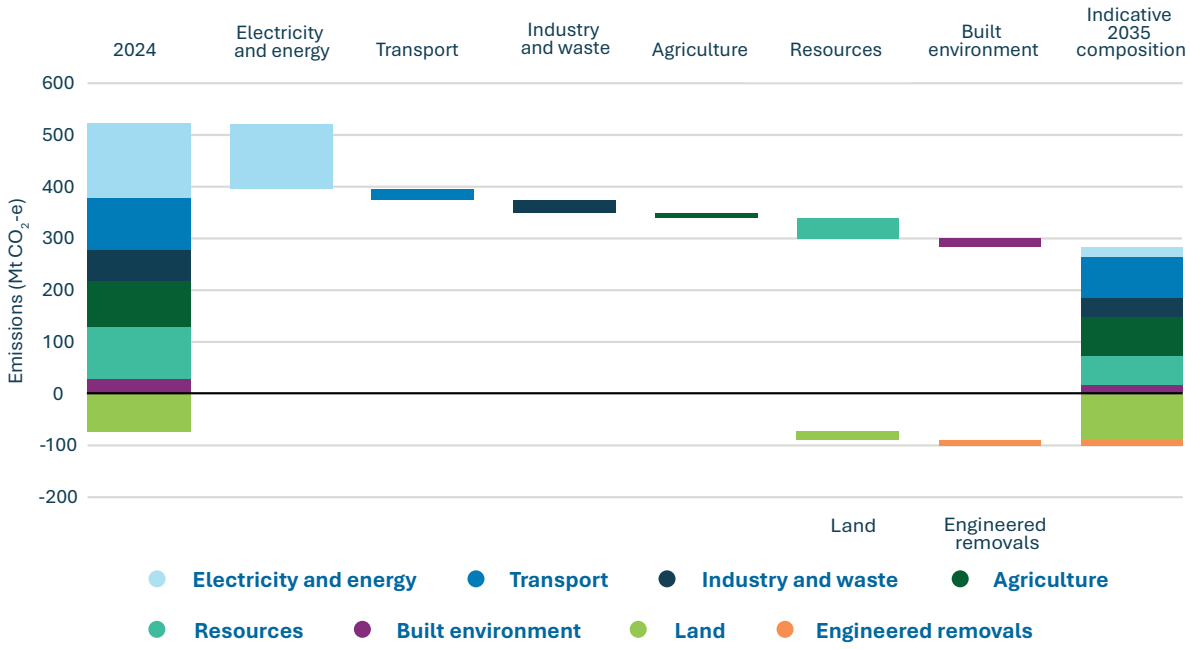
2.2 Sector-specific decarbonisation strategies

Sectors, industries and companies will decarbonise at different rates depending on the technologies and opportunities available. To explore the opportunities and hurdles that exist for each sector to decarbonise by 2035, the Authority consulted widely, commissioned modelling from the CSIRO, and conducted independent research and analysis. Importantly, both the CSIRO's and the Authority's independent analysis found that every sector can reduce emissions now with existing technologies, and opportunities will continue to grow in the coming decade as new and emerging technologies become available.

Ultimately, there are multiple pathways that sectors could follow for Australia to achieve a 62–70% 2035 target. For that reason, the Authority analysed a range of possible emissions reduction outcomes in each sector and across the economy. Results are presented in this section as illustrative linear pathways in Figures 11–20 below for simplicity; actual progress will follow more variable paths.

The largest share of emissions reductions will continue to come from the electricity and energy sector, with the rapid rollout of utility-scale and distributed renewables supported by batteries and other dispatchable capacity. The decarbonisation of the electricity grid is a necessary pre-condition for the electrification of other sectors, such as transport (through battery EVs), industry, resources and the built environment. Further emissions reductions will need to be achieved through the take-up of other technologies, including new methods for producing steel and alumina, the adoption of hydrogen and other alternative fuels, addressing fugitive emissions from mining, and measures to reduce agricultural emissions. Removals will also play an important role in achieving the target, primarily through vegetation and soil-based carbon sequestration, but also through the gradual ramp-up of engineered removals such as biochar.

Figure 10: Estimated sector contributions to the top of the 62–70% target range, 2024–2035



Source: Authority analysis.

Notes:

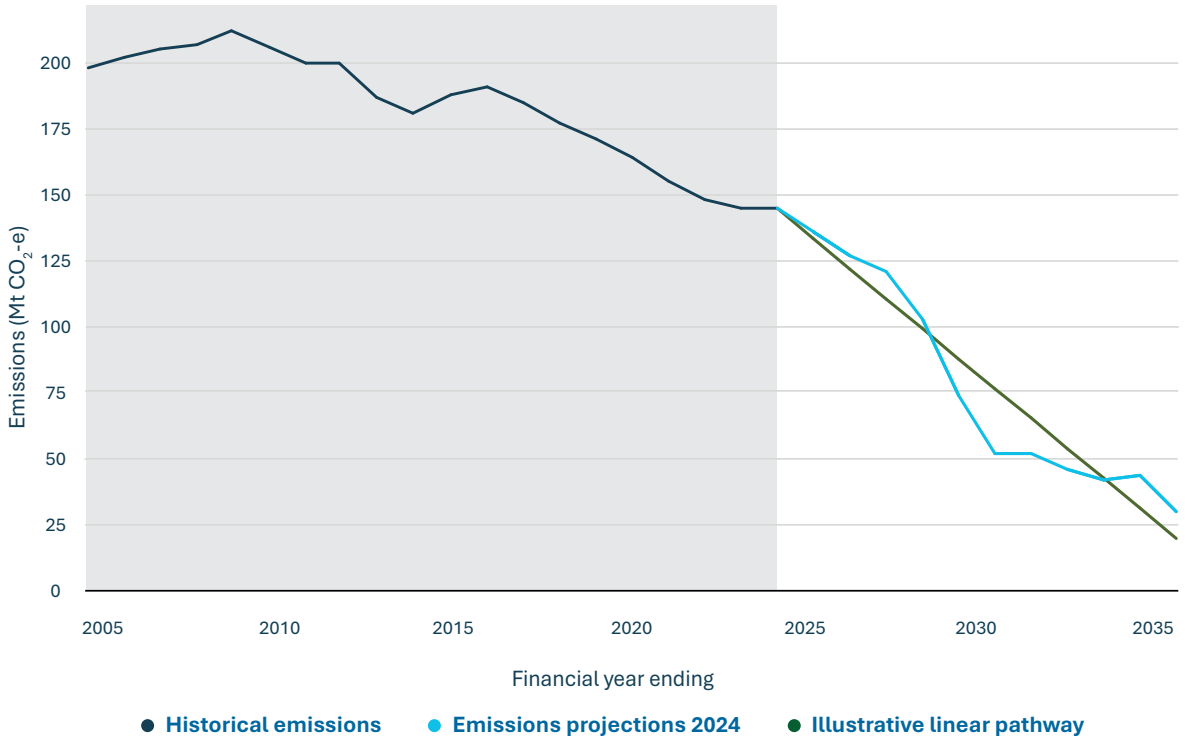
1. Abatement and indicative 2035 composition are based on the Authority's analysis of sector pathways.
2. For simplicity, the indicative 2035 composition and abatement pathways represents one possible pathway.

Electricity and energy

The electricity and energy sector generates power and undertakes other activities that provide energy sources, including petroleum refining and liquefying methane gas. The sector represents Australia's largest source of emissions. In 2024, this sector emitted 145 Mt CO_2-e, 32% of Australia's total emissions.

Priority areas for reducing emissions are accelerating the deployment of solar and wind generation, backed by investment in transmission and firmed with energy storage and gas generation. The grid will also be supported by technologies such as synchronous condensers and grid-forming inverters.

Figure 11: Electricity and energy emissions, 2005–2035



Sources: Authority analysis based on data from DCCEEW (2024j, 2024f) and modelling from CSIRO (2025c).

Notes:

1. For simplicity, illustrative pathways based on the Authority's sectoral assessment are presented linearly; actual progress will follow more variable paths, fluctuating above and below these lines with periods of acceleration and slower movement.
2. In this report, the Authority has allocated historical emissions and projected emissions to different sectors using the same methodology as in the *Sector Pathways Review* (CCA, 2024c).
3. The historical emissions and projections do not align in 2024 as the projections are based on historical data that has been recalculated since their publication.

The rapid decarbonisation and expansion of the electricity and energy sector are key to meeting an ambitious national emissions reduction target. There is a clear and viable decarbonisation pathway for the sector that relies on known technologies to deliver very large emissions reductions and facilitate reductions in other sectors (CCA, 2024c).

Our illustrative pathways see more abatement than current policies according to Australia's official emissions projections (see Figure 11). It is largely consistent with Australian Energy Market Operator's (AEMO) Step Change scenario in the 2024 Integrated System Plan (ISP). As AEMO's central case, the Step Change scenario is already informing federal and state government policy, action and investment (AEMO, 2024a; DCCEEW, 2024f).

An accelerated buildout of renewable electricity infrastructure and firming is already needed to replace exiting coal-fired generation. About 90% of the coal-fired generation capacity in the National Electricity Market (NEM) is forecast to close by 2035 under AEMO's Step Change scenario, with full retirement possible before 2040 (AEMO, 2024a). This timeline reflects that much of the coal fleet is nearing the end of its economic life. Replacing coal generators with clean energy is essential for domestic energy security and achieving Australia's emissions reduction goals. Substituting this capacity in an orderly way within the next 15 years using the most cost-effective mix of available technologies is necessary to maintain system security and reliability at the lowest cost to electricity customers.

Rapid deployment of renewable electricity infrastructure is also required to meet the growing demand for electricity. Population growth and the transition from gas to electricity in homes, businesses, and certain industries will drive an increase in demand. Expanding domestic production of green exports like iron, hydrogen, ammonia and critical minerals will also increase demand (Box 6). AEMO expects total generation in the NEM (including large and small scale) will need to grow to 316 terawatt hours (TWh) by 2035[3] in its Step Change scenario or to 492 TWh in its Green Energy Exports scenario, up from 209 TWh in 2023 (AEMO, 2024a).

3 This is as generated, excluding generation from storage and demand side participation.

Box 3: Managing artificial intelligence

The development of artificial intelligence (AI) represents another critical shift to navigate as part of Australia's net zero transition. AI offers potential energy and cost efficiencies from automating and optimising operations in a number of sectors, including transport, manufacturing, the built environment, and renewable energy integration. AI can accelerate climate decision making by processing data, forecasting change and creating models at greater speed and detail than traditional approaches (UNESCO, 2024). Governments are also using AI to make environmental and planning approvals processes more streamlined, transparent and efficient (cBrain, 2025; NSW Government, 2024a; PNNL, 2024).

However, with the benefits of AI comes the challenge that it can be highly energy intensive, requiring large amounts of electricity to run powerful computer hardware. Bloomberg modelling suggests that, with Australia being among the countries with a more advanced digital industry, data centres could account for over 10% of Australia's electricity consumption by 2035. Data centres will also be built at increasingly large scales and capacity, compounding pressure on regional power sources (BNEF, 2025b) and placing additional pressure on the renewables buildout.

Some AI infrastructure providers are planning to decarbonise. For example, Amazon Web Services, which in June announced an investment of AUD 20 billion into data centre infrastructure in Australia, plans to achieve net zero by 2040 and already matches 100% of its electricity consumption with renewable energy. However, meeting such decarbonisation targets will rely on the successful transition of the electricity system.

Australia could minimise the strain on energy systems from AI growth in the next decade by investing in research, planning and policy. For example, by co-locating data centres with storage to provide operators flexibility over when to draw from the grid, and investing in hardware and software upgrades to fast-track energy efficiency improvements (IEA, 2025a).

A mix of dispatchable technologies will be needed as coal plants close, with batteries suited to address short-term capacity needs and technologies like hydro that can shift energy across longer periods of time. Substantial flexible gas-fired generation capacity will also be needed, but will be used sparingly when other forms of storage have been exhausted (AEMO, 2024a). These assets should be able to run on liquid fuels, biomethane, hydrogen or other renewable fuels.

The technologies needed to decarbonise the electricity and energy sector are already available. Deploying them at the necessary speed and scale to meet Australia's electricity needs by 2035 will require sustained effort.

Achieving the Australian Government's current target of 82% renewable electricity by 2030 will not be easy. Doing so, or getting close, will create important momentum towards a near-fully renewable grid in the future. To meet the target, the rate and scale of renewable energy deployment, alongside transmission and storage, will have to increase (Wood Mackenzie, 2025). The Authority has made several recommendations in recent reports aimed at overcoming barriers and accelerating this deployment (CCA, 2023a, 2024c, 2024a, 2025), and will continue to assess progress and advise accordingly.

Box 4: Easing the load: Managing demand to support the grid

Decarbonising the electricity sector requires building significant amounts of new transmission and renewable electricity generation infrastructure. Managing electricity demand and reducing waste across all sectors of the economy can help make this infrastructure buildout more manageable. Strategies include:

- **improving energy efficiency** to lower demand by reducing energy intensity and cutting waste
- **expanding demand-side flexibility and consumer energy resources** (like grid-integrated appliances and rooftop solar with batteries) to shift or reduce loads at peak times
- **unlocking the potential of commercial and industrial sites** to generate, use, store, and shift energy locally
- **optimising use of distribution networks** to increase local use of generation.

These strategies can reduce costs, accelerate the transition, and build a more resilient, efficient energy system.

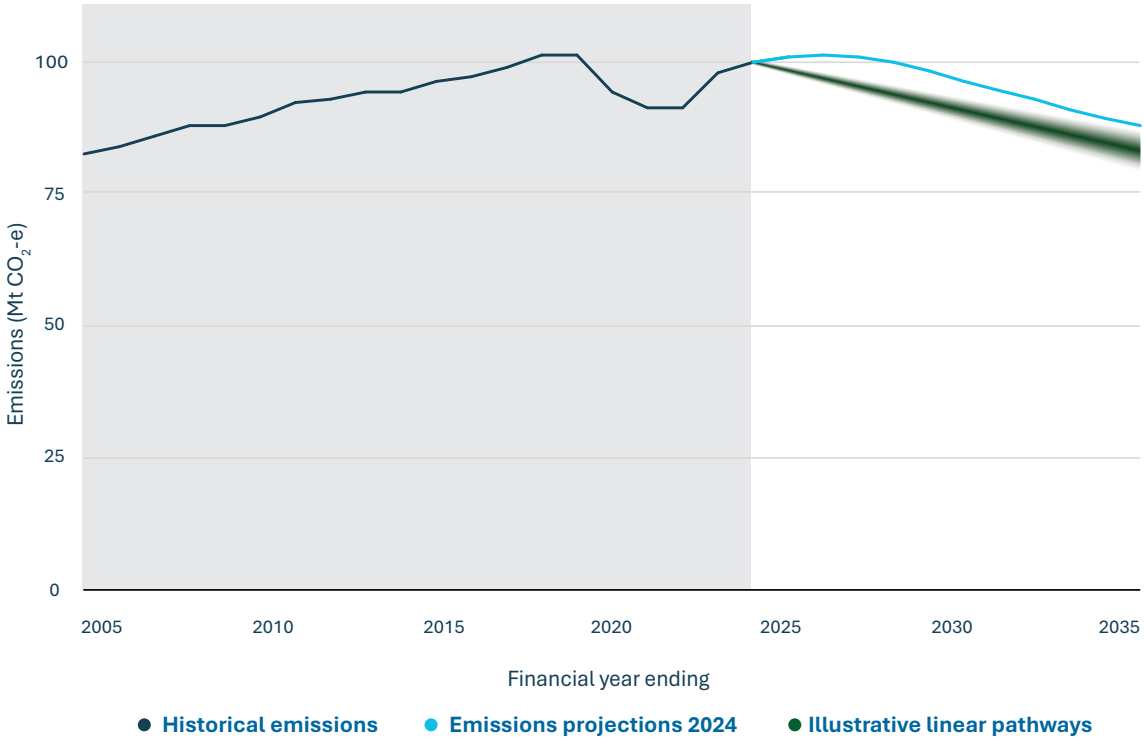
Transport

The transport sector provides services to move people and freight, including by road (cars, light commercial vehicles, heavy duty trucks, busses, motorcycles), domestic aviation, domestic shipping and rail[4]. In 2024, transport produced 100 Mt CO_2-e of emissions (22% of Australia's emissions). It is Australia's third-largest source of emissions after electricity and energy, and resources, and emissions in the sector are still rising.

According to Australia's official emissions projections, transport will be Australia's largest emitting sector by 2030, with only modest projected emissions reductions (CCA, 2024c).

Priority areas for reducing emissions in this sector are increasing electrification of vehicles and rail backed by renewables and energy storage, and increasing the uptake of low-emissions fuels such as sustainable aviation fuel (SAF), renewable diesel, methanol and ethanol blended fuels.

Figure 12: Transport emissions, 2005–2035



Sources: Authority analysis based on data from DCCEEW (2024j, 2024f).

Notes:

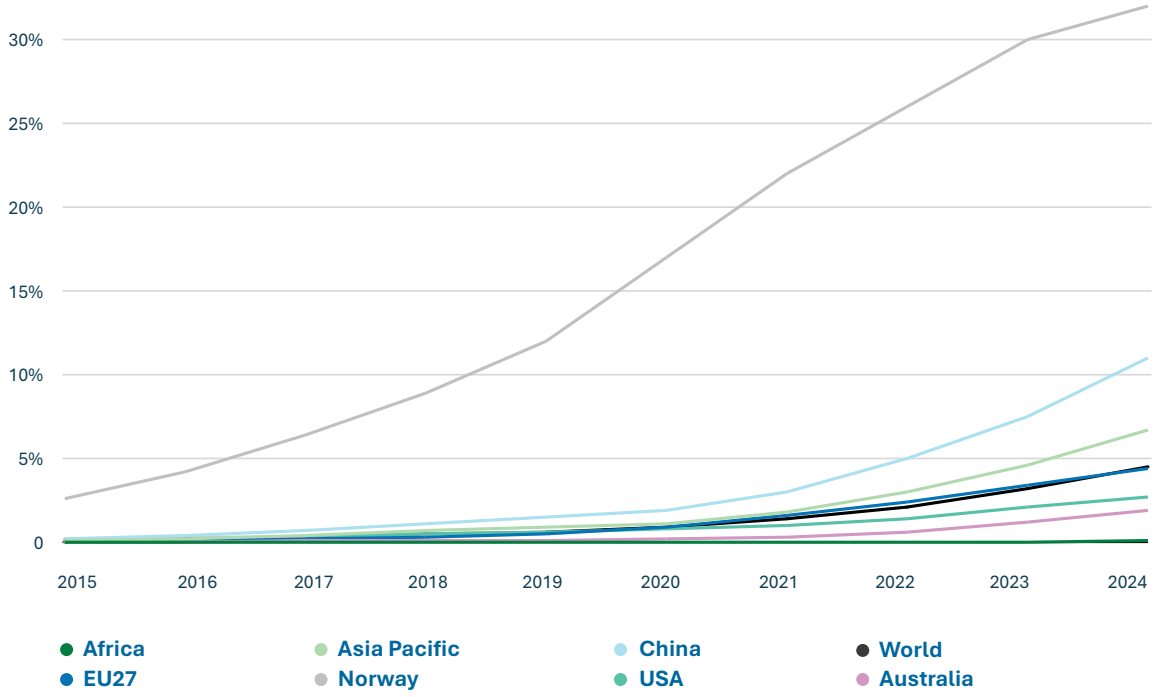
1. For simplicity, illustrative pathways based on the Authority's sectoral assessment are presented linearly; actual progress will follow more variable paths, fluctuating above and below these lines with periods of acceleration and slower movement.
2. In this report, the Authority has allocated historical emissions and projected emissions to different sectors using the same methodology as our *Sector Pathways Review* (CCA, 2024c).
3. The historical emissions and projections do not align in 2024 as the projections are based on historical data that has been recalculated since their publication.

4 International aviation and shipping are not part of Australia's national emissions under UNFCCC reporting requirements so although they have a climate impact, they are out of scope for this analysis. The International Civil Aviation Organization and the International Maritime Organization have responsibility for emissions from international aviation and shipping. Decarbonisation of international transport may drive additional demand for electricity, and feedstocks to produce alternative fuels.

In the next 10 years, Australia should prioritise cutting emissions from its light vehicle fleet and heavy road transport because solutions are increasingly available at a competitive price. Australia can work towards zero emissions vehicles making up the vast majority of new light vehicle sales in 2035. An increase in use of public and active transport can complement the shift to zero-emissions vehicles.

Other countries have already seen a significant uptake of zero-emissions vehicles (Figure 13): over 90% of new vehicles sold in Norway in 2024 were EVs[5] (IEA, 2025e). Falling purchase prices, low cost of ownership, continued charging infrastructure rollout, battery technology improvements that enable more choice when it comes to larger vehicles and longer ranges, and government policies like the New Vehicle Efficiency Standard, could support similarly high uptake in Australia over the next decade. This would position Australia well for more significant emissions reductions beyond 2035.

Figure 13: Share of cars that are EVs in selected countries and regions, 2015–2024



Source: Authority analysis based on data from IEA (2025d).

Note:

Does not include vehicle types other than cars. This chart shows the breakdown of cars in the fleet, rather than the share of EVs in new car sales, which is typically higher.

5 Including battery electric vehicles and plug-in hybrid electric vehicles

The opening of the new Metro rail lines in Sydney and Melbourne, continued investment in public services in other states, and alignment of transport infrastructure investment with decarbonisation plans could all support higher rates of public and active transport.

Battery electric technology and renewable diesel can play an increasing role in reducing emissions from heavy transport. Forty countries, including the United Kingdom, New Zealand and Canada, have signed a Memorandum of Understanding to work towards enabling 100% zero-emissions new truck sales by 2040 (Global Drive to Zero, 2022). With the right policies, Australia could join these countries and quicken zero-emissions truck uptake, resulting in a significant share of light and heavy rigid new truck sales being zero-emission vehicles by 2035.

Battery electric trains can potentially be used in several cases in Australia and can provide modest emissions reductions for rail freight by 2035 (DITRDCA, 2024b).

Australia's aviation sector is expected to continue to expand along with rising incomes and living standards (DITRDCA, 2024a). Developing a strong domestic SAF industry represents an opportunity for Australia to reduce aviation emissions. SAF made from organic feedstocks could make up a material proportion of the domestic aviation fuel mix by 2035. SAF produced using carbon capture and utilisation (CCU), a more energy intense production method, is not expected to play a material role until after 2035. Some airlines have committed to increasing SAF usage. For example, Qantas has committed to SAF making up 10% of Qantas Group's 2030 fuel mix, increasing to 60% by 2050 (Qantas, 2024). Improvements in air traffic management and more efficient aircraft could contribute modest additional emissions reductions.

To achieve the recommended target, the low carbon liquid fuel production pipeline should prioritise SAF, with a smaller portion of domestic production used to help decarbonise other sectors and parts of transport. For example, renewable diesel can be incorporated into heavy vehicle fuelling infrastructure and used in diesel vehicles and machinery in other sectors.

Industry and waste

Australia's industry and waste sector covers the processing, manufacturing and production of goods, and the disposal of materials that have reached their end of life. The major sources of emissions within the sector are the manufacture of alumina and aluminium, iron and steel, lime and cement, ammonia, and landfill waste. In 2024, the industry and waste sector emitted 61 Mt CO_2-e (14% of Australia's emissions). Its emissions have been declining modestly since 2005.

Priority areas for reducing emissions are electrification of industrial processes backed by additional renewables and storage, the uptake of alternative fuels and feedstocks like hydrogen and biofuels, and greater diversion of organic waste from landfill to other treatments, such as composting and anaerobic digestion. The timing and scale of carbon capture and storage (CCS) and CCU deployment is uncertain (Box 8).

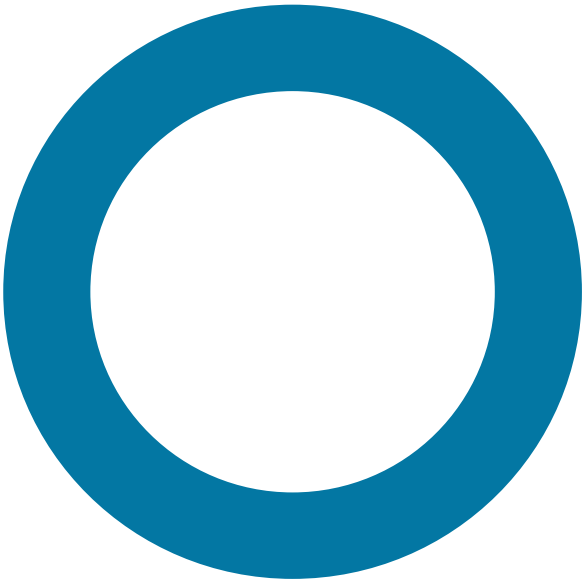
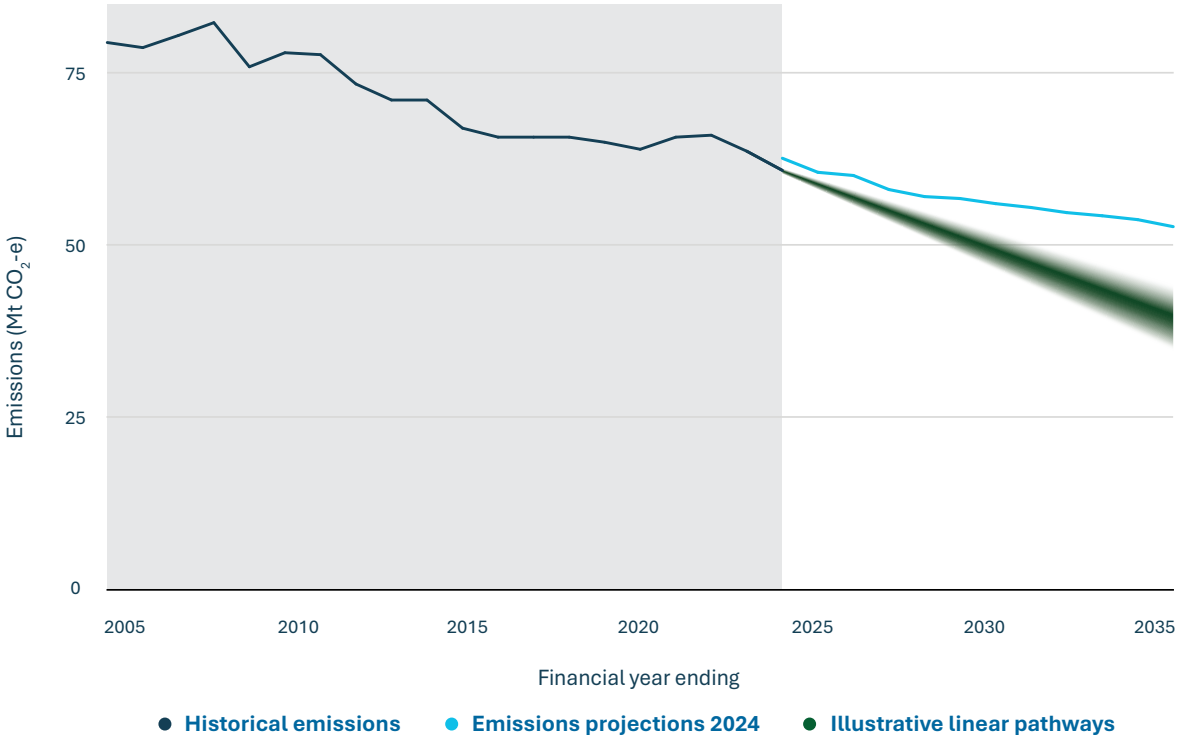


Figure 14: Industry and waste emissions, 2005–2035



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Electrification is an important common thread. With large amounts of cost competitive renewable electricity, Australia's alumina producers could switch to new production processes that eliminate coal and gas for some production steps. Electrification of low- and medium-temperature heat processes (below 250 °C) can also cut emissions from sectors such as food and beverage manufacturing (ARENA, 2019; CCA, 2024c). These upgrades could be rolled out by 2035 at alumina production facilities and in other facilities with heat processes below 250 °C.

For iron and steel making, chemicals manufacturing and cement, alternative fuels like hydrogen and biofuels could play a role in reducing emissions from some higher-temperature processes and as feedstocks, alongside electrification and new production processes. Reliable and affordable access to these inputs will support a growing number of companies to adopt them. For example, the availability and cost-effectiveness at scale of clean hydrogen are crucial for its widespread adoption, including in ammonia and steel production. The Government's

National Hydrogen Strategy 2024 includes a target to produce at least 15 million tonnes of renewable hydrogen per year by 2050 and a 2035 milestone of 3–5 million tonnes per year. This target is intended to support the availability of renewable hydrogen and contribute to cost-reduction efforts.

A sufficient supply of cost competitive electricity, alternative fuels and feedstocks is necessary to support the required rate of decarbonisation in the industry sector. Circularity in metals manufacturing can also drive emissions reductions, as recycled metals require less energy to process.

Box 5: Inert anodes in Australian aluminium smelting likely after 2035

In its initial research on how to set an ambitious and achievable 2035 target for Australia, the Authority looked at existing, new, and emerging technologies. We excluded any technologies we judged unlikely to be ready for deployment by 2035 from further analysis.

For example, the illustrative pathways presented here do not include inert anodes – a technology under development to eliminate emissions from traditional carbon anodes used for aluminium smelting. This technology was excluded because it is unlikely to be developed and deployed at Australian smelters in a timeframe that can make a meaningful contribution to achieving a 2035 target.

Though not immediately deployable, ongoing work is essential to position the industry and the nation to benefit from this technology in the future. Faster technological breakthroughs and easier-than-anticipated adaptation of the technology to Australian smelters may mean inert anodes contribute to emissions reductions before 2035.

Food and garden waste in landfills is a major source of emissions from the waste sector, so channelling waste to dedicated, low-emissions organics processing is an important step. Australian governments are working towards the goal of diverting 80% of waste from landfill by 2030 and the Federal Government has committed to maximising resource efficiency through the Circular Economy Framework (DCCEEW, 2024e, 2024l).

Box 6: Australia's industry and resources sectors will look different in 2035

Global decarbonisation will reshape Australia's industry and resources sectors and provide opportunities to expand domestic production of low-emissions goods like iron, hydrogen, ammonia and critical minerals. Global fossil fuel demand is projected to decline, resulting in lower Australian exports of coal and liquified natural gas (LNG) (Wood Mackenzie, 2024b, 2024c). While we do not know exactly what Australia's economy will look like in 2035, we know it will be different from today.

Expanding the domestic production of low-emissions goods and displacing higher emissions production processes overseas are ways Australia can contribute to reducing global emissions. However, in the near term, this expansion may lead to increased domestic emissions. For example, new iron production projects are expected to use gas as an interim fuel until hydrogen becomes cost competitive (The Superpower Institute, 2025).

Given the uncertainty about the outlook for the industry and resources sectors, the Authority has drawn on government and external projections (such as the Office of the Chief Economist (2025), DCCEEW (2024), and Wood Mackenzie (2024c)) to inform production forecasts used in the assessment of feasible emissions reductions in these sectors. Developing new low-emissions export industries in Australia is crucial to exploiting the nation's comparative advantages to access new markets and thrive in a decarbonising world.

Agriculture

The agriculture sector produces most of the food consumed in Australia and is highly export-oriented, with 72% of the total value of agricultural production sold overseas (ABARES, 2024). In 2024, the agriculture sector produced 87 Mt CO_2-e (19% of Australia's emissions). Since 2005, emissions have fluctuated primarily in line with the size of Australia's cattle herd, which has varied in part to due to periods of drought.

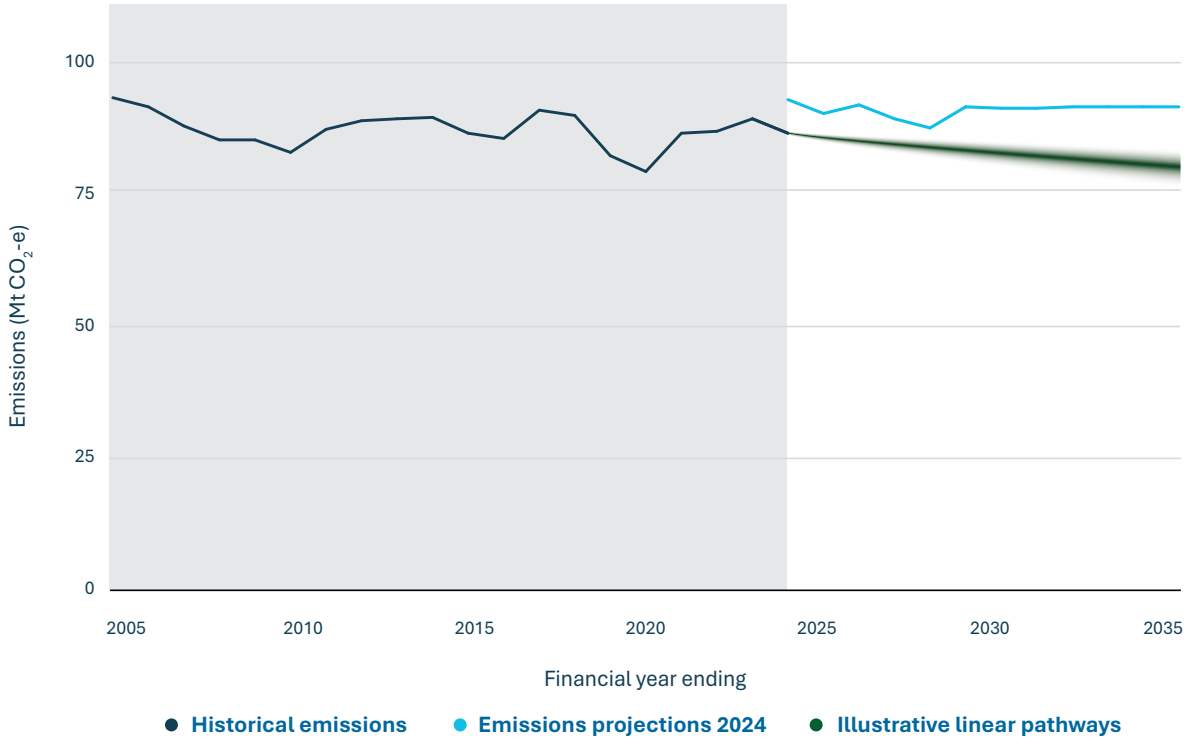
Farmers are already reducing agricultural emissions using available technologies and practices, such as herd and pasture management, and planting improved pastures. This approach can be further scaled up. Frameworks that support increasing sustainability in the agriculture sector and report emissions are emerging, such as the Australian Agricultural Sustainability Framework (ABARES, 2023). Broad adoption of these frameworks will help ensure sustainability for rural and regional communities, and safeguard Australia's food security. Multiple research projects are underway examining opportunities and practices to sequester carbon under perennial

pastures and cropping land (Soil CRC, 2024). Under the Australian Carbon Credits Unit (ACCU) scheme, a total of 2.7 million credits has been issued since 2012 to 44 agriculture projects for sequestering carbon in soil and reducing methane from livestock. Farmers also undertake many of the sequestration activities identified in the Land section below.

Technologies addressing methane emissions from cattle and sheep could reduce more emissions but are at relatively early stages of deployment. Further research and technological advances are needed to realise more emissions reduction opportunities from now to 2035. Markets will be needed to channel finance to the development and commercialisation of agricultural emission reduction technologies.

Priority areas for achieving abatement include reducing livestock emissions through increasing use of methane-inhibiting feed supplements with commercially available products (such as the red seaweed *Asparagopsis,* certain legume species, or biochar from crop residue). Additional action to improve manure management and expand the use of nitrification inhibitor-coated fertilisers, uptake of low-emissions fuels, and the electrification of vehicles and machinery, will also cut emissions in the sector.

Figure 15: Agriculture emissions, 2005–2035



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Methane-inhibiting feed supplements are a feasible option to address emissions from livestock, particularly in more intensive farming activities, such as dairy and feedlots (Beauchemin et al., 2022). Government support for R&D and to reduce costs could drive substantial uptake of feed supplements at feedlots and dairies by 2035. However, uptake for pasture-raised cattle will be limited because of the challenges of delivering supplements to widely dispersed herds. The Authority has not incorporated any potential contribution to emissions reductions that could arise from a change in food consumption patterns or developments in alternatives to animal-derived protein. See our *Sector Pathways Review* (CCA, 2024c) for a brief survey of developments in this area, which we consider are unlikely to materially impact emissions outcomes prior to 2035.

Better management of manure through processes such as composting and anaerobic digestion is another important opportunity for reducing agricultural emissions. Both in Australia and globally, feedlots, dairies, piggeries and poultry farms are adopting improved manure-management practices. Cost remains the primary barrier to uptake, and government support will be required to achieve widespread uptake.

The agriculture sector is also a major user of nitrogen fertilisers, which break down in soil and produce nitrous oxide. Uptake of nitrification and urease inhibitor-coated fertilisers can slow the release of these emissions from paddocks. These fertilisers are available now but at a higher price than traditional alternatives. Addressing this 'green premium' could see these fertilisers replace most fertilisers currently used in the agriculture sector by 2035.

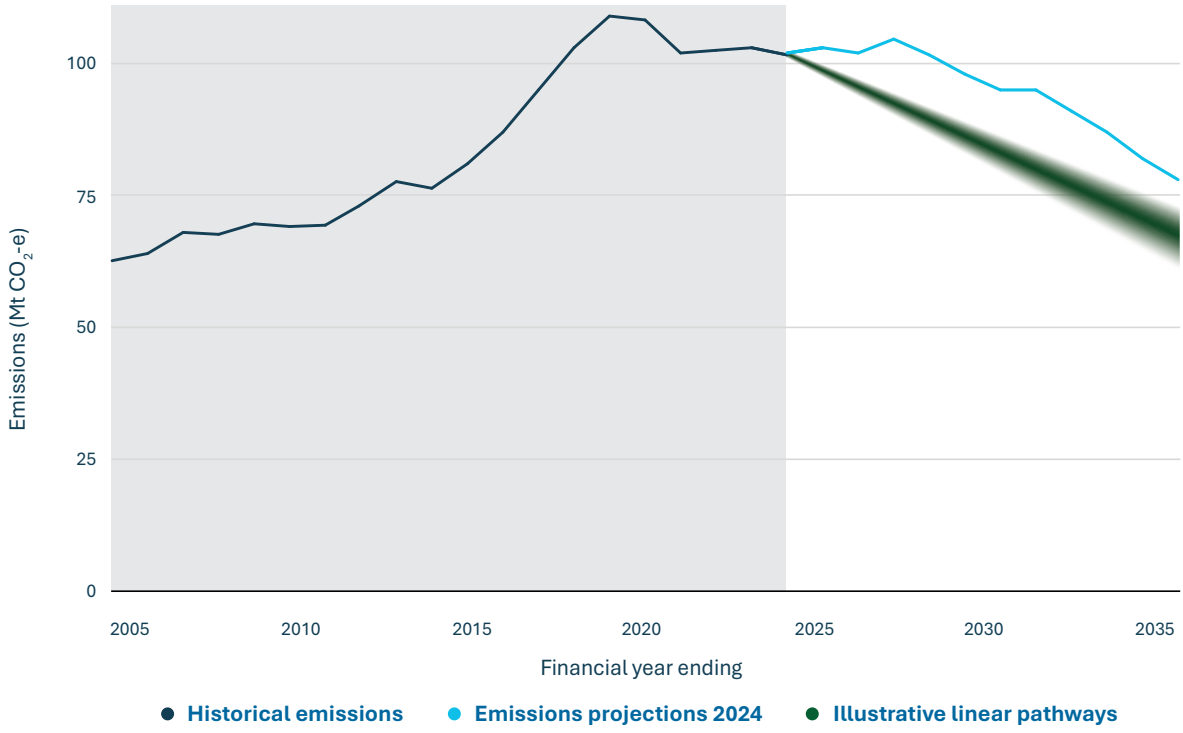
The electrification of farm vehicles and agricultural equipment using onsite renewable energy and batteries can also help cut this sector's emissions through reduced use of petrol and diesel.

Resources

Australia's resources sector comprises the mining and the oil and gas extraction subsectors. In 2024, the resources sector produced 102 Mt CO_2-e (23% of Australia's emissions), with emissions having largely stabilised over recent years. As a result of global decarbonisation efforts, the make-up of Australia's resources sector will likely shift over coming decades (see Box 6).

Priority areas for reducing emissions include switching to grid or renewable electricity for auxiliary power, increasing abatement of fugitives from underground coal mines, implementation of reservoir CCS at gas fields, and shifting to zero-emissions haulage and ancillary fleets (using either electrification or zero-carbon fuels).

Figure 16: Resources emissions, 2005–2035



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The resources sector uses a lot of energy, mainly in the form of gas and diesel. Using renewable electricity instead, and electrifying equipment and vehicles, can reduce emissions while powering mining operations. Miners in the Pilbara are trialling electric haulage trucks, and the Queensland and Commonwealth Governments have commissioned a pre-feasibility study into the electrification of the LNG facilities on Curtis Island (CCA, 2024c).

Fugitive emissions from coal and gas (see Box 7) make up a large proportion of the sector's emissions. Improved practices and new technology can reduce these emissions. Changing flaring practices, deploying gas recovery equipment and plugging leaks can significantly reduce fugitive emissions from gas and LNG facilities (CCA, 2024c). These technologies can improve rates of gas production at relatively low cost.

Alongside these measures, LNG and natural gas producers expect CCS to play a role in managing reservoir carbon dioxide emissions. Two facilities in Australia have already deployed CCS. Additional LNG processing and natural gas production facilities could deploy CCS by 2035.

Box 7: Fugitive methane emissions from the resources sector

Fugitive emissions are the intentional or unintentional release of greenhouse gases during the extraction, production and delivery of fossil fuels. In Australia, the primary sources of fugitive emissions are coal mining and gas activities. Methane is often found within coal seams and gas is composed mostly of methane. Methane has a significantly greater short-term warming potential than carbon dioxide despite its much shorter atmospheric lifetime. As a result, immediate reductions in methane emissions can have a significant near-term impact on limiting warming. Limiting fugitive methane sources represents the most significant and economically viable opportunity to cut methane emissions in Australia (IEA, 2024a). Integrated assessment modelling by Climate Resources indicates reducing methane emissions from energy production in Australia by 75–95% by 2035 would be aligned with limiting global warming to 1.5 ºC (Climate Resources, 2025).

Australia signed up to the Global Methane Pledge in 2022 following its launch at COP26 the previous year (DCCEEW, 2022). Countries participating in the pledge agree to:

- the goal of reducing global methane emissions to 30% below 2020 levels by 2030
- commit to using the highest standard inventory accounting methodology
- advance the accuracy, transparency and comparability of inventory accounting methods.

To progress its commitments under the pledge, and in response to our 2023 Review of National Greenhouse and Energy Reporting (NGER) Legislation, the Government has been improving the way in which companies measure and report their fugitive methane emissions (DCCEEW, 2025f).

Our 2023 NGER review examined methane measurement, reporting and verification. Research organisations around the world are using satellite observations to investigate the accuracy of estimated fugitive methane emissions from coal mining and oil and gas operations, including those in Australia reported under the NGER scheme. In the 2023 NGER review, the Authority concluded that the accuracy of reported fugitive methane emissions may be impacted by the availability and use of lower-order estimation methods (CCA, 2023b).

In addition to updating the legislation and these lower-order methods, the Government has appointed an expert panel to provide advice on atmospheric measurement of fugitive methane emissions. The panel is examining these new approaches to advise whether they could enhance Australia's estimation of fugitive methane emissions (DCCEEW, 2025d).

Box 8: Carbon capture and storage

Carbon capture and storage (CCS), which involves capturing carbon dioxide at the emissions-source and storing it in a geological site, could play an important role in reducing emissions by 2035 and beyond.

CCS is most suitable for industries with concentrated streams of carbon dioxide emissions or without alternative options to decarbonise. These include:

- **LNG production and gas processing**
  Australia currently has 2 operational CCS facilities, both used to manage reservoir carbon dioxide emissions. There is potential to expand CCS deployment more broadly within these sectors.
- **Clean hydrogen production from gas**
  Several clean hydrogen projects have been announced, which could partially decarbonise existing production and help create an export industry.
- **Lime and cement production**
  CCS is unlikely to be used in the Australian cement industry due to high costs and long distances from existing cement facilities to suitable carbon dioxide storage sites. Instead, the cement industry is exploring carbon capture and use (CCU), which focuses on converting captured **carbon** dioxide into value-added products like mineral carbonates for building materials and synthetic fuels such as methanol (CSIRO, 2025b; DCCEEW, 2024g).

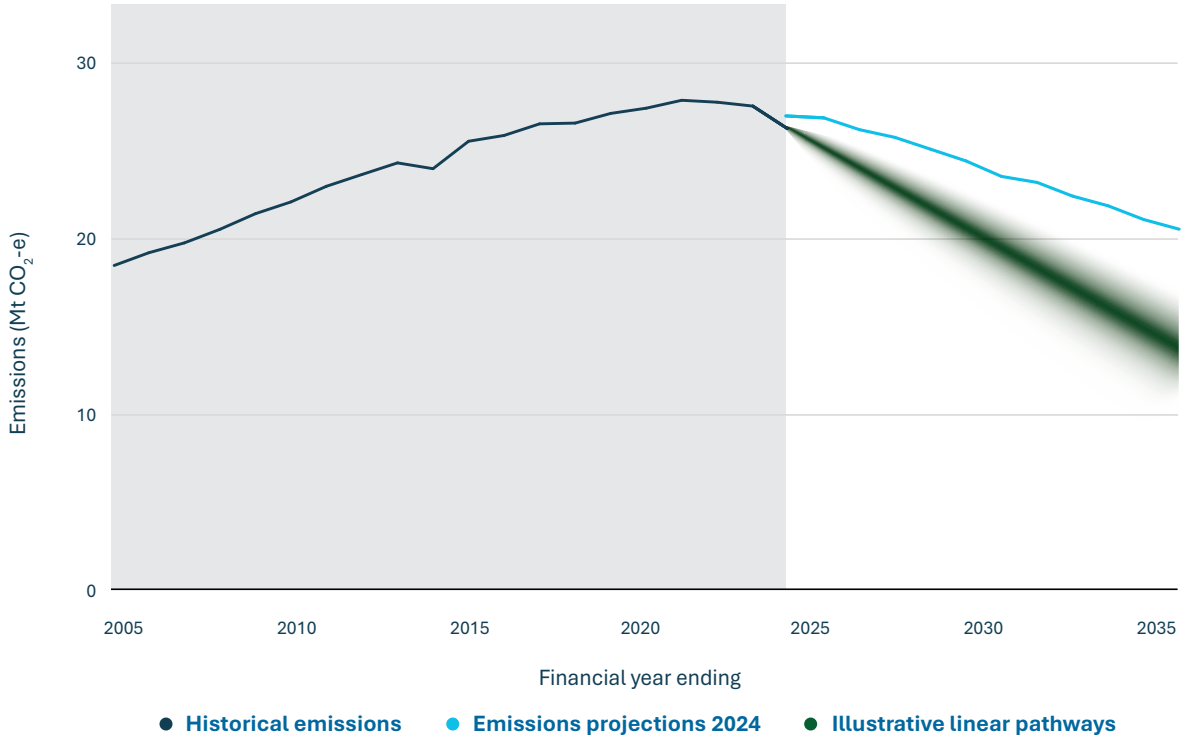
Our analysis of Safeguard facilities shows that 5 underground coal mines emit nearly a third of the total coal mine methane emissions covered by the Safeguard Mechanism (Authority analysis using CER, 2025a). Underground mines in China and the US are already seeing effective commercial uptake of ventilation air methane abatement technologies (UNECE, 2025). Overcoming regulatory and safety barriers and adopting this technology in Australia could contribute to reducing fugitive emissions from coal mines by 2035.

Built environment

The built environment is comprised of residential and commercial buildings, and physical infrastructure (including footpaths, roads and bridges) that provide the settings for human activities. In 2024, the built environment produced 26 Mt CO_2-e of emissions.

Priority areas for reducing emissions in this sector are reducing the use of gas, diesel and biomass in residential and commercial buildings through electrification, decarbonising construction equipment through switching to low-emissions liquid fuels or battery technology, improving management of refrigerant gases and increasing the destruction of gas at appliance end-of-life.

Figure 17: Built environment emissions, 2005–2035



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The solutions for reducing emissions in the built environment are both available and cost-effective. Switching from gas to electric appliances and improving the management of refrigerant gases can significantly reduce emissions. All levels of government are making progress. However, information and data gaps, high upfront costs and challenges with retrofitting buildings are barriers to rapidly reducing emissions at scale (CCA, 2024c).

For houses, apartments and commercial buildings that currently use a mix of electricity, gas and biomass, moving to all-electric appliances is an opportunity to cut emissions. Electrification often improves energy efficiency, meaning an upfront investment can lead to lower energy bills.

Our analysis found electrifying a significant number of existing houses each year to 2035 and making almost all new houses all-electric from 2030 could contribute to achieving an ambitious target. The Victorian and ACT Governments have already committed to phasing out gas connections (ACT Government, 2021; Victorian Government, 2024) and the European Union (EU) has committed to all new buildings being 'zero-emissions' by 2030 (European Commission, 2025c).

The commercial building stock could also make a meaningful contribution if a significant

number of buildings were electrified, and with almost all new commercial buildings built all-electric from 2030. Electrification could become the norm for new commercial buildings, following proposed updates to the National Construction Code due in 2025 (ABCB, 2024).

Improving the thermal efficiency of buildings through simple upgrades like insulation, window glazing and sealing draughts can also reduce how much energy it takes to run them. Retrofitting or replacing Australia's oldest buildings should be a priority as these often have the worst thermal performance. States and territories can incentivise retrofits by requiring the disclosure of energy performance ratings of residential buildings at the point of sale or lease (underpinned by the Commonwealth's expansion of the Nationwide House Energy Rating Scheme (NatHERS) to existing houses), and by mandating minimum energy performance standards for rental properties.

Measures and technologies to shift energy demand in this sector to the times of day when renewable energy is abundant and cheaper will also improve energy performance. These measures can ease growth in electricity demand and help to manage the significant infrastructure buildout required in the electricity sector (see Box 4).

The potential to reduce emissions during construction of buildings is closely aligned to similar opportunities in the transport sector. Although historical adoption is low, there is significant scope to reduce emissions by substituting diesel- and petrol-powered equipment with electric and low-carbon liquid fuel alternatives (Property Council of Australia, 2022).

Refrigerant gases have typically been extremely potent greenhouse gases, but are critical for the operation of refrigerators, air-conditioners and certain heat pumps in Australia's buildings. These gases can leak during equipment installation, operation and maintenance, and at the end of an appliance's life (DCCEEW, 2024h; Martinho et al., 2022). Most appliances using refrigerant gases can be replaced with systems that operate with less potent gasses, and these alternatives are commercially available now. As the sector decarbonises and heat pumps are widely installed, safe management of the growing stock of used refrigerants will be critical.

Land

The land sector includes both sources of greenhouse gases and sinks that store carbon in vegetation and soils. In 2024, the land sector was a net sink of 74 Mt CO_2-e. The land sector has been responsible for 91% of the emissions reductions recorded in Australia's emissions inventory, having shifted from a net emissions source of 77 Mt in 2005 to a net sink of -74 Mt in 2024, a change of -196% (DCCEEW, 2024j).

Priority areas for this sector include increasing the rate of environmental and carbon tree plantings, the protection and management of existing native forests, and reductions in deforestation rates. Other land and agricultural management actions, such as improved pasture management and maintaining and increasing soil carbon, will also be essential in increasing carbon sequestration rates in the land sector.

Figure 18: Land emissions, 2005–2035

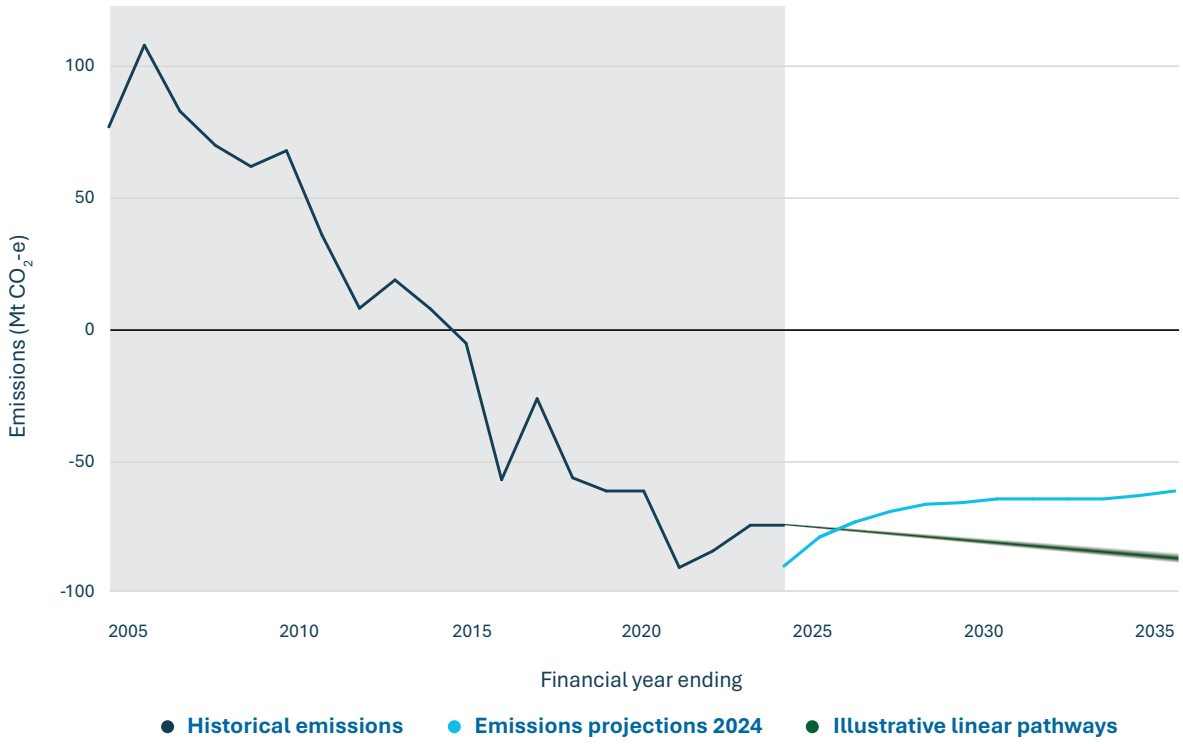

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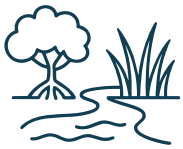
Figure 19: Activities associated with land-sector carbon emissions, sequestration and storage

Carbon or environmental plantings are new tree plantings on previously cleared land undertaken for storing carbon and increasing biodiversity.

Native forest harvest is the selective or complete removal of trees from a forest where the trees are naturally occurring for timber or other wood products, and where the trees are subsequently regrown.

Deforestation is the complete removal of trees and forest with the land being converted to other uses like cropping, grazing or urban development.



Blue carbon refers to the carbon captured and stored by coastal and marine ecosystems, such as mangroves, seagrass beds, and salt marshes.

Soil carbon refers to the mineral and organic carbon captured and stored in soils. It is a vital part of the carbon cycle, influencing soil health, fertility, and climate regulation.

Natural processes and human activity can increase the rates of carbon being stored on land. Activities like tree planting, reducing native forest harvest and deforestation, and better management of wetlands, coastal ecosystems and soil, can all enhance carbon sequestration. Such sequestration activities offer an opportunity to simultaneously achieve productivity, biodiversity and cultural gains and optimise the use of land.

Estimates of the potential contribution of the land sector to the 2035 target contain significant uncertainty given the sensitivity of land sinks to seasonal conditions and changes in climate, and ongoing innovations in the way sectoral emissions are estimated. Estimates of the potential contribution are also highly sensitive to assumptions used in modelling exercises. The sector will need to continue to underpin Australia's growing demand for food, support healthy ecosystems, and remove carbon from the atmosphere.

Tree plantings that help meet the 2035 target could be established across a variety of land types, including marginal farmland, without compromising agricultural production or food security. Planting activities can be undertaken in tandem with agricultural activities such as grazing, provided new plantings are protected until established. Diversifying land use and developing new business activities that sequester carbon can give land managers and farmers new opportunities and income streams on their land (National Farmers Federation, 2018). Plantings could also serve as:

- shelterbelts
- green infrastructure for water retention and temperature regulation
- ecological restoration zones
- habitat corridors for wildlife
- an additional source of income
- cultural landscapes, where reforestation supports First Nations peoples' stewardship and cultural renewal.

Our analysis finds the rate of carbon stored by Australia's land sector is likely to slow in the years to 2035 because of natural processes. As trees and plants age, the rate of carbon sequestration slows (Hoover & Smith, 2023). In addition, the amount of carbon stored on the land is affected by the climate. More carbon is stored in soils during wet periods, while dry periods lead soils to release carbon (Roxburgh et al., 2020). When there is less moisture in the soil, plants also absorb carbon more slowly through photosynthesis (Roxburgh et al., 2020). Existing plantation forests and human-influenced landscapes are ageing, while hotter and drier weather is expected because of climate change, particularly during El Niño weather patterns (Lieber et al., 2023; McPhaden, 2023). In the face of these trends, new efforts to achieve additional carbon sequestration will be needed to maintain the land sector's current emissions sink and to expand it. Stronger policy and regulatory measures to protect carbon-storing ecosystems, both on land and in coastal regions, are vital to maintaining existing land sequestration and reducing new sources of carbon emissions from the sector.

Shifting to more climate-smart agricultural practices, increasing biomass, changing grazing practices, early dry-season savanna fire management, and reducing losses from erosion can also increase the amount of carbon stored in soils (CER, 2025b). Cost remains a significant hurdle to soil carbon projects, including high sampling and operational costs (Pudasaini et al., 2024). And there is a need for more access to science-based data on carbon farming practices and carbon sequestration potential (Pudasaini et al., 2024). Further government and private investment will be required to develop abatement approaches and reduce costs. Greater certainty around abatement rates and permanence will increase landholder and market confidence in actions that boost soil carbon stocks.

Engineered removals

Engineered removals are technologies that capture and store greenhouse gases from the atmosphere. While there is a small amount of engineered removal activity in Australia, these forms of sequestration are not yet recorded in Australia's National Greenhouse Gas Inventory. Work is underway to incorporate such removals into international carbon accounting frameworks, which will pave the way for engineered removals to be reflected in national inventories.

Priority removal technologies include biochar, mineral carbonation, enhanced rock weathering and direct air capture. Engineered carbon removals could make a modest contribution to Australia's emissions reduction efforts in the next decade.

Figure 20: Engineered removals, 2005–2035

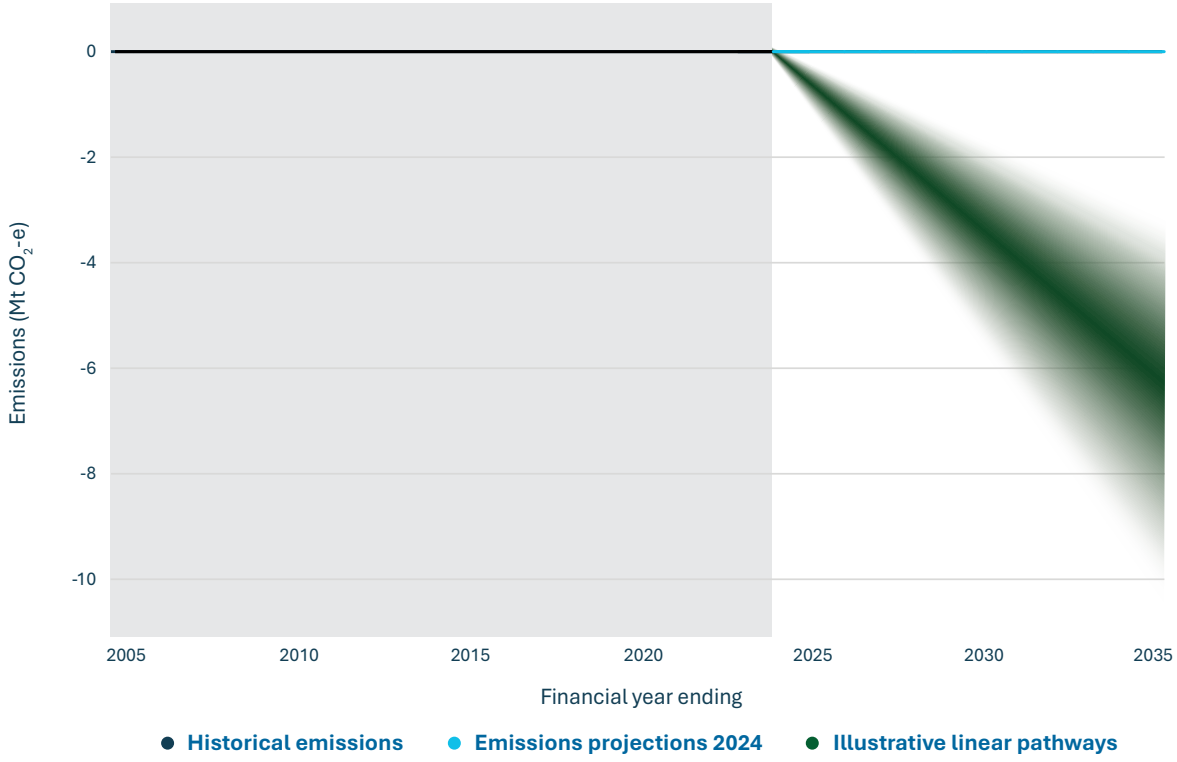


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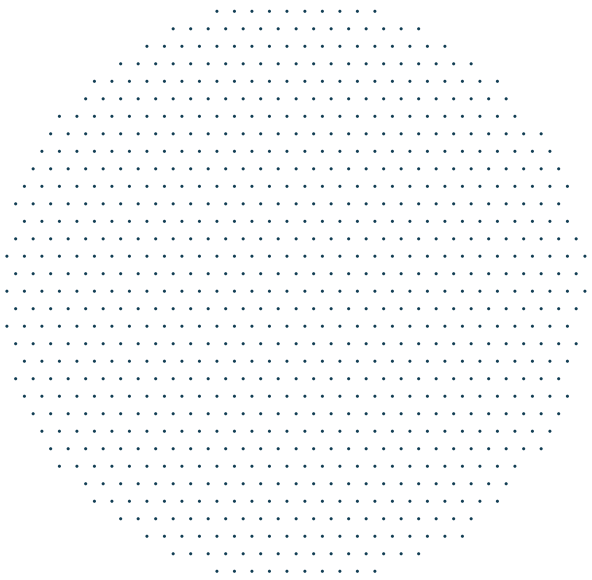
Table 2: Engineered removals technologies

Technology	Description
Biochar	Uses waste materials such as municipal solid-waste organics, cropping waste, residue from forestry operations and sawmills. Because of the availability of suitable waste in Australia, biochar has the potential to remove carbon in the scale of megatonnes per year (see Box 9).
Mineral carbonation	Enables carbon to be stored in rocks rich in calcium and magnesium. Mineral carbonation can occur by reacting carbon dioxide with exposed surface materials such as crushed rocks extracted from mines. Carbon dioxide can also be injected underground to react with underground rocks.
Enhanced rock weathering	Involves adding crushed silicate minerals to agricultural and pasture lands, which draws down carbon dioxide and improves soil fertility. This approach is not energy intensive as large quantities of crushed minerals are available at quarries. More research is needed, however, to determine the quantities of carbon dioxide that can be removed, and the agricultural impacts of adding this material to soils.
Direct air capture	Extracts carbon dioxide directly from the atmosphere using chemical or physical processes. It requires significant energy and suitable sites for long-term geological storage of captured carbon.



Box 9: Biochar is a promising carbon removal technology

Biochar is a proven technology that has the potential to make a meaningful contribution to reducing Australia's emissions. Biochar redirects waste products from releasing carbon emissions and can sequester carbon for the long term. In addition to its potential as a negative-emissions technology, biochar and its byproducts can aid plant productivity and renewable energy production.

Biochar is produced through the thermal decomposition of organic matter in the absence of oxygen. The absence of oxygen prevents combustion and the release of carbon dioxide. Biochar can be used as a fertiliser and soil conditioner to increase agricultural yield and is currently produced around the world at a small scale for this purpose. In Australia, specialty small-volume biochar products are already commercially available. Biochar can also be used in place of coal in some high-heat processes (CSIRO, 2022b). BlueScope has trialled use of biochar products in steel making (ARENA, 2023).

Feedstocks for producing biochar include crop waste, animal manure, food waste or wastewater. Sydney Water currently has a project underway looking at turning biosolids from wastewater into biochar at its North West Treatment Hub (Sydney Water, 2024).

The byproducts of biochar (synthetic gas and bio-oil) can also be useful. Bio-oil can be further refined into wood vinegar, which can be used as an agricultural soil additive. Syngas is a renewable fuel that can be used to generate electricity.

There are 2 established biochar companies in Australia, Rainbow Bee Eater and Biocare, with projects currently underway. The 2 companies are targeting removals of 1 Mt CO_2-e/yr and 0.5 Mt CO_2/yr by 2030, respectively.

For engineered carbon removals to play a sizeable role in Australia's pathway to net zero by mid-century, these technologies will need to scale up and commercialise rapidly in coming years. During the decade to 2035, more work will be needed to advance research and development, piloting deployment and developing scalable market models to ensure their practical delivery.

2.3 Enhancing the policy suite

As the Australian Government considers its third NDC, Australians should be encouraged by how much practical progress the nation has already made. These gains should provide confidence that focused and sustained policy action can drive down emissions. For example, with the support of federal, state and territory government policies:

- **Australia's electricity system is rapidly decarbonising.**
  Renewables provided 43% of electricity in Australia's main national grid in the first quarter of 2025 (AEMO, 2025) and the share of total electricity generation from renewable sources has more than doubled in just 6 years (DCCEEW, 2024d). Renewables are now the least-cost pathway for new-build electricity (CSIRO, 2025c).
- **Rooftop solar has become a national success story.**
  More than 4 million Australian households and businesses are generating clean energy from their rooftops – the highest per-capita rate in the world. This expansion reduced their energy bills by about $6 billion a year (Clean Energy Council, 2024; DCCEEW, 2024c).
- **Transport is beginning a major transition.**
  Strong growth in EV sales has been supported by incentives and public charging infrastructure. Electric and plug-in hybrid new car sales have surged from less than 4% of new car sales in 2022 to almost 10% in 2024 (DCCEEW, 2025h).
- **Land sector emissions have declined significantly.**
  Reforestation, improved land management, reduced land-clearing rates, and the regeneration of native vegetation have all contributed to a significant reduction in land sector emissions. Under the ACCU scheme, annual sequestration from tree plantings across Australia for the period 2010–2020 averaged 2.1 Mt CO_2-e (CSIRO, 2022a).
- **Heat pump installations have taken off.**
  More than 100,000 heat-pumps (for hot water and heating) were installed each year in 2023 and 2024 – up 5-fold from 2019 (CER, 2025c).
- **Building rating schemes have cut energy consumption.**
  Participants of the National Australian Built Environment Rating System (NABERS) energy rating scheme have reduced their energy consumption by 30–40% since the program began in 1999 (NABERS, 2025).

Australia's existing policies – anchored by national emissions reduction legislation, sectoral initiatives and funding programs – provide a strong platform for progress. But achieving an ambitious target, sharing the benefits fairly, and prospering in the process, will require an enhanced policy response. The settings in some key measures – such as the Safeguard Mechanism, CIS and NVES – need to be extended. There are opportunities either to expand their reach or introduce select initiatives to address gaps and barriers to implementation. All levels of government have critical roles.

In its *2023 Annual Progress Report* (CCA, 2023a), *2024 Annual Progress Report* (CCA, 2024a) and *Sector Pathways Review* (CCA, 2024c), the Authority has identified practical and actionable steps to build on the existing policy foundations. Box 10 maps some policy areas for further consideration. The Authority stands ready to investigate these areas and develop recommendations to help achieve Australia's emissions reduction targets.

Box 10: Policy areas for further consideration

Market mechanisms	Extending, expanding and refining the core suite of existing market mechanisms to enhance their effectiveness. These include the Safeguard Mechanism, the ACCU Scheme, the CIS, and the NVES
Investment and finance mechanisms	Providing greater visibility and certainty to market participants about existing finance mechanisms
	Directing government investment, finance or tax concessions to drive the uptake of key technologies
	Reviewing existing taxation arrangements to ensure they are fit for purpose for the net zero transition
Regulations, standards and mandates	Refining and building on existing standards and regulatory frameworks (e.g. National Construction Code)
	Introducing mandates – including government procurement mandates – to establish new markets (e.g. for low-carbon liquid fuels / sustainable aviation fuel (SAF))
	Improving approval frameworks and timelines
	Streamlining regulation and reducing red tape
Workforce, skills, regional and industrial strategy	Collecting and sharing data to enable better workforce planning
	Working with businesses, education institutions and community groups to develop a fit-for-purpose education and training system
	Promoting Australia as a destination of choice for migrants with the specific skills required to deploy green infrastructure and new green industries
Research, development and innovation	Prioritising research, development and deployment of identified priority technologies
Information, planning and coordination tools	Strengthening governance across all levels of government
	Improving coordination between all levels of government on the planning and delivery of enabling infrastructure and services
	Facilitating low-emissions industrial precincts
	Nationally coordinating building electrification and retrofits
International trade	Continuing to roll out measures to maintain the competitiveness of Australian businesses as global decarbonisation accelerates
	Negotiating decarbonisation agreements with trading partners

Crucially, the actions for success extend beyond the federal climate change portfolio. Decarbonisation is a whole-of-economy challenge that touches transport, industry, resources, energy, environment, land use, education, skills, workforce planning, urban planning and regional development. Many of the policies needed to unlock faster emissions reductions already exist in some form – market-based mechanisms, financing instruments, efficiency standards, skills programs – that must be scaled up and better aligned. Clearer links between climate goals and mainstream policy domains – ideally set out in the Government's Net Zero Plan and sectoral emissions reduction plans – will be needed to translate ambition into action.

At the same time, known barriers continue to slow progress. Lengthy approval processes for major projects delay clean energy deployment. Skills and workforce shortages, particularly in the energy and construction sectors, may slow progress and inflate costs. Data gaps hinder planning, and supply chain constraints also drive up costs. The persistence of a 'green premium' – where low-emissions options cost more – remains a challenge, particularly in sectors without mature alternatives (CCA, 2024c). Removing these obstacles is as important as setting appropriate targets. The prospect and means of removing those hurdles have been considered in developing this advice.

In a period of economic pressures and cost-of-living concerns, government support plays a critical role in addressing the green premium, lowering transition costs and building confidence. Australia has several strong funding mechanisms already in place – such as the Clean Energy Finance Corporation, the Australian Renewable Energy Agency, Future Made in Australia initiatives, the National Reconstruction Fund and others. However, there are gaps in the funding landscape and better coordination across funding entities is needed (IGCC, 2024; Treasury, 2024). Support needs to be better matched to real-world implementation challenges. There is also work to do to ensure investment reaches under-represented sectors, such as heavy industry and agriculture, and low-income communities.

Scaling up investment will require a combination of tools. Increased public funding is necessary but will not be sufficient by itself. Priorities should include unlocking more private – including foreign – capital, improving the functioning of carbon and energy markets, and considering reforms to taxation settings. Investment incentives, procurement policies, and public-private finance partnerships can all play a role. The introduction of the climate risk disclosure regime and the sustainable finance taxonomy are important milestones already in place on the road to an investable policy framework. More sophisticated and stable policy frameworks will be needed to lower investment risk and make long-term emissions projects more bankable (see also Part 4).

Box 11: Governments can enable and support private sector ambition

Businesses will play a crucial role in decarbonisation, with government support. The UK Government's plan to develop clean energy industries is centred on private investment, as it pursues a goal to double annual private investment in clean energy by 2035 (UK Government, 2025).

The plan gives the UK Government an enabling role by providing a 'clear mission' to drive investment certainty, making public investments that act as catalysts to unlock private investment, lowering investment barriers, and addressing workforce issues. The plan was developed in consultation with industry stakeholders and aims to build partnerships between government and industry.

Finally, there is an opportunity to review and streamline the existing mix of climate change policies. Australia's policy landscape is crowded and complex, with overlapping programs across multiple jurisdictions sending inconsistent signals to the market. This complexity slows progress and adds unnecessary cost. Simplifying and clarifying the policy architecture – without losing momentum – will help deliver faster results, build public understanding and support, and spur productivity gains. The result can be more effective policies and lighter regulatory and administrative burdens for government agencies, businesses and households. As the Authority discussed in its Sector Pathways Review, an important next step is to move towards more clear and consistent signs of the real cost of greenhouse gas emissions across the economy. That way, the cost of these emissions can be incorporated more efficiently in the decisions and activities that lead to them (CCA, 2024c).

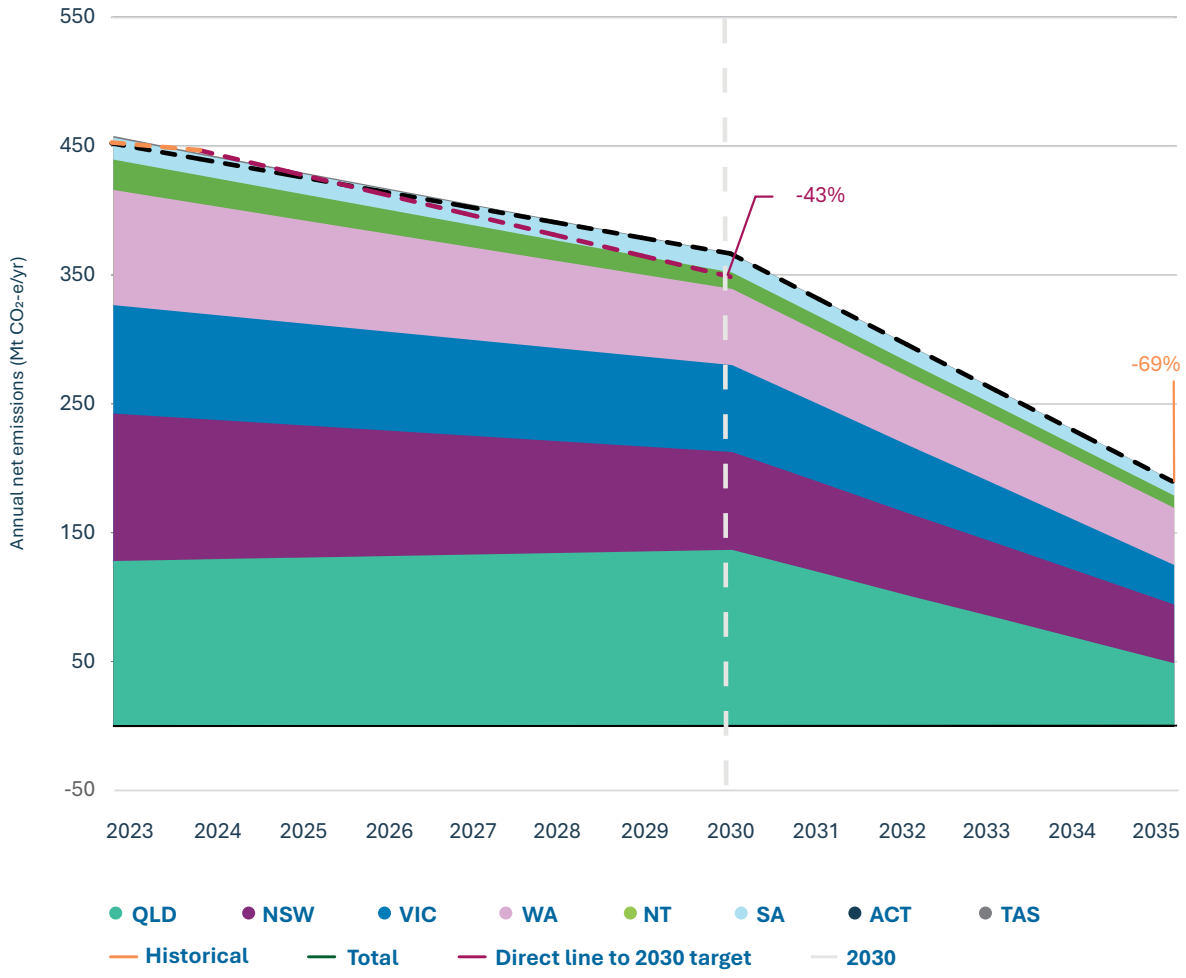
2.4 State, territory and local government action

In a federation, individual states and territories can and should set their own emissions reduction targets. These targets reflect local contexts: differing economies, energy systems, political mandates, climate risks and decarbonisation opportunities.

While some jurisdictions are yet to set 2035 targets on the way to their net zero emissions targets by 2050, New South Wales, Victoria and Queensland have set targets in the range of 70–80% below 2005 levels for 2035 (Queensland Government, 2024; Victorian Government, 2023; New South Wales Government, 2023). Together these states account for almost three-quarters (72%) of national emissions (DCCEEW, 2025c). If Australia's states and territories reduced emissions at the annual average rates required to meet their own announced emissions reduction targets,

national emissions would fall to approximately 69% below 2005 levels by 2035 (CCA analysis, 2024). The extent to which the states and territories have implemented policies to deliver on their targets varies among them, as does their capacity to do so. Australian Government leadership will be key for coordinating and delivering measures required for Australia's transition to net zero.

Figure 21: Analysis of possible state and territory emissions reduction trajectories, 2023–2050



Sources: Authority analysis based on emissions data (DCCEEW, 2025c) and state and territory target announcements.

Note:

Each state and territory's emissions are assumed to decline linearly from 2023 to point targets, including some targets that are post-2035 (such as net zero by 2050). Where a target is specified as a range, the less ambitious end of the range is used.

Local governments in Australia play a critical and increasingly acknowledged role in driving and enabling decarbonisation at the community level. Positioned closest to citizens, they are essential to build social license for climate action through direct engagement, place-based initiatives, and transparent information flows that empower households and businesses to participate in the transition.

Local governments are also implementers of state and federal climate policies, while leveraging their planning, infrastructure and procurement functions to cut emissions and catalyse low-carbon investment. As employers and service providers, local councils also have a responsibility to support a just transition – ensuring climate action delivers equitable outcomes across regions, income groups and industries. With deep local knowledge and trusted relationships, councils are uniquely placed to align climate ambition with community needs.

Strategic coordination between governments remains essential, particularly where borders are shared, infrastructure is interconnected, or investment and approval decisions and social impacts span jurisdictions (Cities Power Partnerships, 2025; Climateworks Centre, 2024; Ironbark Sustainability, 2024). Intergovernmental cooperation on standards, data and timelines can multiply the impact of individual efforts. A diverse but coordinated federation can move faster and go further than a uniform approach, provided the systems are in place to learn, align, and lift together. The National Cabinet and a regular summit convened by the Prime Minister, could play a greater role in coordinating action to meet 2035 targets and forthcoming net zero plans.

Importantly, the recommended national target of 62–70% is not – and should not be – the average or sum of state ambitions. An ambitious target at any level – national, state and business – can help push the whole system forward, creating a clear signal for markets, international partners and subnational governments alike. This kind of federal leadership can raise expectations, motivate action, unlock investment, and create conditions for states and territories to elevate ambition over time and communities to be ready for climate impacts that are to come.

Part 3

Navigating impacts and opportunities

Key points

- Australia is navigating 2 currents at once: the decarbonisation efforts underway in its industries, regions and communities, and the net zero transition happening worldwide. The Authority's 2035 targets advice aligns Australia's strengths with global shifts so Australia can reduce emissions and prosper as the world decarbonises.
- Australia's economy is projected to continue performing strongly towards a 62–70% emissions reduction target. The Australian economy is primarily composed of segments with low-emissions and cost-effective pathways to decarbonisation. This combination creates a strong foundation for change over the next decade, while enabling a more phased approach to address hard-to-abate emissions.
- Macroeconomic modelling conducted by the CSIRO – one of 5 inputs to our analysis – shows Australia can cut emissions to 62–70% below 2005 levels by 2035 while maintaining robust economic growth.
- Australia's regions face both opportunities and disruption from decarbonisation. With a clear 2035 target and coordinated investment, tailored regional transition plans can support economic diversification, unlock green industrial growth, and ensure communities are partners in a just transition that reflects their unique strengths and evolving industrial pathways.
- Ensuring this transition is fair and inclusive is essential to secure the social licence needed to unlock Australia's full decarbonisation potential. Investing in training, infrastructure, and community co-design of transition pathways – particularly in regions – can boost workforce participation, build trust, and align clean industry growth to local needs and priorities.

3.1 Socio-economic resilience during decarbonisation

Sustaining economic growth and Australia's overall high living standards throughout the net zero transition are national imperatives. Acting early and boldly delivers better outcomes than a late or incremental approach. Recent energy price spikes are a clear example of the costs of delay. As fossil fuel generators near the end of their life, inadequate planning and slow deployment of replacement renewable generation has exposed the energy system to volatility and supply shortfalls. This has raised the prospect of the operation of coal fired power stations being prolonged in some states, as seen in New South Wales. This uncertainty creates reliability and affordability risks for households and businesses alike (AEMO, 2024b). These pressures are the result of decisions deferred years ago.

Building the infrastructure for a net zero economy – including renewable energy, storage, electrified industrial processes, zero-emissions transport and energy efficient buildings – requires coordinated and early investment. The high capital cost of new technology (e.g. green hydrogen, zero-carbon industrial plant, electric heavy vehicles) is best managed through certainty and sequencing. Without it, businesses risk being forced to invest in long-lived, emissions-intensive technologies that lock in costs and emissions for decades. This 'carbon lock-in' has been a key concern of the Business Council of Australia, which warns that 'delayed decisions create higher costs and lower economic return' (BCA submission, 2024). Meanwhile, countries that move decisively can capture first-mover advantages in emerging green export markets. Delay risks forfeiting strategic economic benefits.

Business success from 2025 to 2035 and beyond hinges on decisive, well-integrated climate and commercial strategy. According to the EY Net Zero Centre's *Charting Australia's path to 2035 and beyond,* achieving a 65–75% emissions reduction is not only feasible, but many of the necessary technologies generate net savings. For example, switching to electric appliances and systems could deliver savings of $6,000 per household over a decade, and EVs could lower total cost of ownership by around $1,200 per year (EY, 2025).

At the same time, the costs of inaction – i.e. the costs of unabated emissions, seen in the impacts of climate change – are rising. Climate change is already driving more frequent and severe national disasters that carry growing human and economic tolls (see Part 1). Deloitte Access Economics estimated that unchecked climate change could cost the Australian economy $3.4 trillion by 2070, while bold action could add $680 billion and create over 250,000 jobs (Deloitte, 2020). These growing costs are a problem decades in the making and the response requires long-term vision. Thankfully, there are positive examples of forward planning: early installation of utility-scale power and batteries in South Australia has helped the State achieve over 70% renewable electricity share while maintaining reliability, providing a glimpse of a cleaner, cheaper energy future.

Early, coordinated action is Australia's best insurance policy against climate risks, energy volatility and lost economic opportunity. Planning and acting now is cheaper, fairer and smarter than cleaning up later.

To better understand how different national targets and global decarbonisation pathways may impact economic outcomes, the Authority engaged the CSIRO to undertake detailed economic modelling as one of the 5 inputs to its mixed methods approach (see Part 1.3 for more detail on the Authority's assessment methodology). Economic modelling does not predict the future but can provide valuable insights into the interplay between domestic and global economic forces to support informed decision-making. It is important to note macroeconomic modelling is one of 5 inputs rather than the sole determinant of the Authority's advice. Modelling outcomes informed but did not dictate the Authority's recommended target, which also took account of qualitative factors, such as barriers to the adoption of technologies and stakeholder considerations beyond the scope of econometric analysis (see Part 1).

Modelling by the CSIRO projects Australia's economy could grow at 2.7%[6] per year in pursuit of an emissions reduction target of 62–70% below 2005 levels by 2035, as the world constrains warming to 1.5–2 °C above pre-industrial levels. This growth rate is consistent with pre-COVID economic growth rates[7], projected growth in the absence of a 2035 target, and modelled growth under a less ambitious target (2.7% annual growth under a 57% target by 2035). This growth rate is also higher than that modelled by the CSIRO for a much higher target (2.5% annual growth to achieve 100% emissions reduction by 2035) (Authority analysis of CSIRO, 2025c).

Figure 22 compares the annual growth rate of 3 economic indicators between 2020 and 2035 for different target scenarios as modelled by the CSIRO. The CSIRO projects no material difference in measures of economic wellbeing between scenarios where Australia cuts emissions by 57% in 2035 versus 2005 levels and those with stronger action in the range of as much as 75%, regardless of a 1.5 °C or 'below 2 °C' global temperature outcome. Under those scenarios, real wages are projected to grow by more than 1.8% per year. Real household consumption is projected to grow by at least 2.6% per year to 2035 (CSIRO, 2025c), which is comparable to the growth rate in the pre-COVID decade.[8] Both measures represent significant improvements in Australian living standards for emissions reductions targets up to 75% below 2005 in 2035.

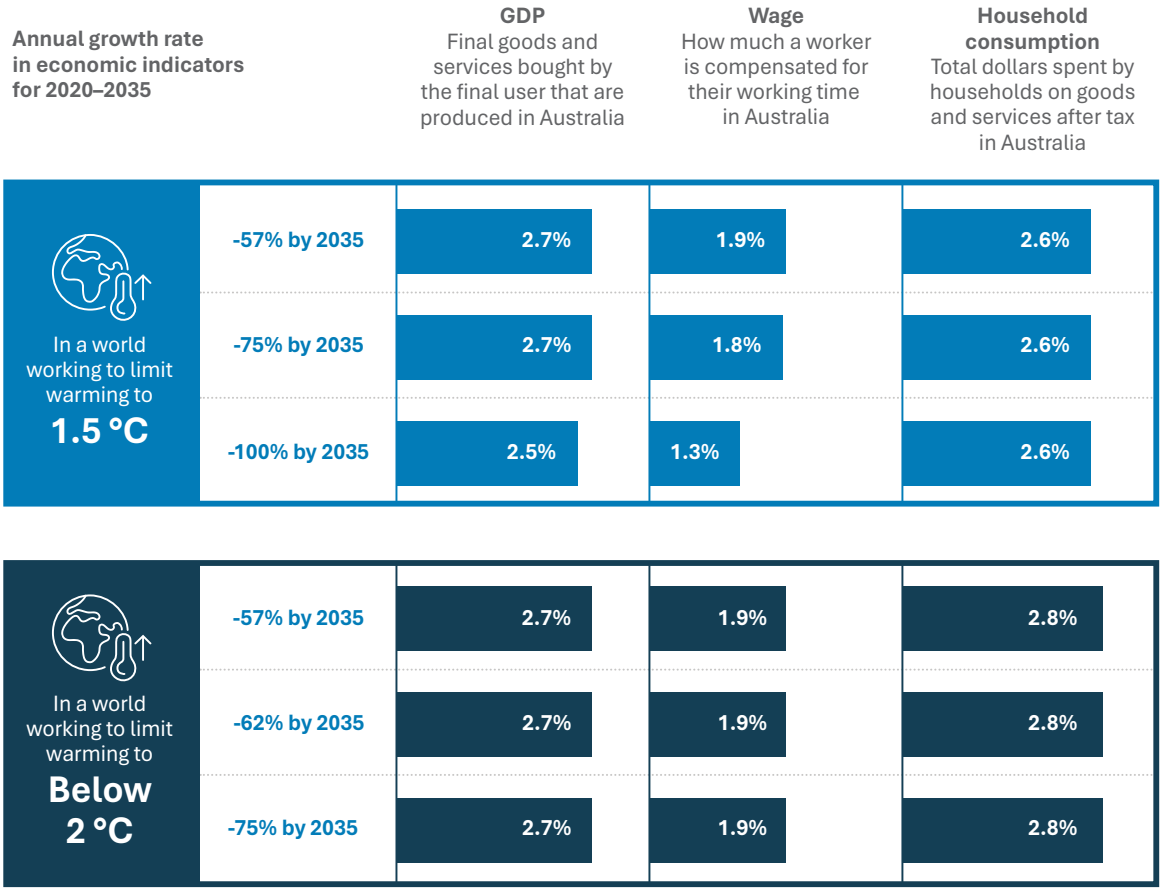
Notably, the modelling of an accelerated transition of 100% emissions reductions by 2035 *does* project lower rates of growth across key economic metrics, reinforcing the need to balance ambition with economic resilience. This outcome partly occurs because the economy's structure alters more rapidly to reach net zero in 2035. Adverse economic impacts could erode wellbeing and social cohesion, undermining progress. This result reinforces why an orderly, inclusive economic transition is essential to ensure Australia enjoys sustainable momentum towards prosperity and resilience.

6 Rates in this paragraph are compound average growth rate in real GDP between 2020 and 2035.

7 In the decade 2009-10 to 2018-19 (preceding the COVID-19 pandemic), Australia's average growth rate was 2.6% (Treasury, 2023).

8 Household final consumption grew by approximately 2.7% per year in the decade to 2018-19 (ABS, 2024).

Figure 22: Annual growth rates in economic outcomes for 2020–2035 at different levels of emissions reductions



Source: Authority analysis of CSIRO (2025b).

Note:

All values are in real 2023–24 Australian dollars that have been adjusted for inflation.

The CSIRO modelling findings are consistent with other major macroeconomic studies. These studies have consistently found efforts to cut emissions will have manageable impacts on Australia's national economy – and in some instances, a net-positive one (see, for example: (CCA, 2014; CSIRO, 2023a; DISR, 2021; Garnaut, 2008; McKibbin, 2015; Treasury, 2011)).

The economic rationale is clear: upfront transition costs must be balanced by the avoidance of major climate-related disruptions and the emergence of substantial new growth opportunities in a decarbonising global market.

Some regions might experience more economic disruption as Australia transitions to net zero emissions, particularly those centred on coal-fired power generation or fossil fuel extraction. Strategic investment and planning can help these regions to manage the risks while capitalising on the opportunities. Part 3.3 discusses regional strategic planning in more detail.

Beyond macroeconomic measures of wellbeing, the transition to net zero envisages a host of co-benefits for Australia. Phasing out fossil fuel use leads to better air quality and health benefits (CAHA, 2023; Puzzolo et al., 2024). Improving energy efficiency and switching to renewable energy in housing improves household health outcomes while enhancing resilience to climate impacts (Climateworks Centre, 2023a; Lozinsky et al., 2025). Increasing land- and sea-based carbon sequestration can have positive impacts on soil health, biodiversity, erosion and ecosystem services, as set out in Part 2.

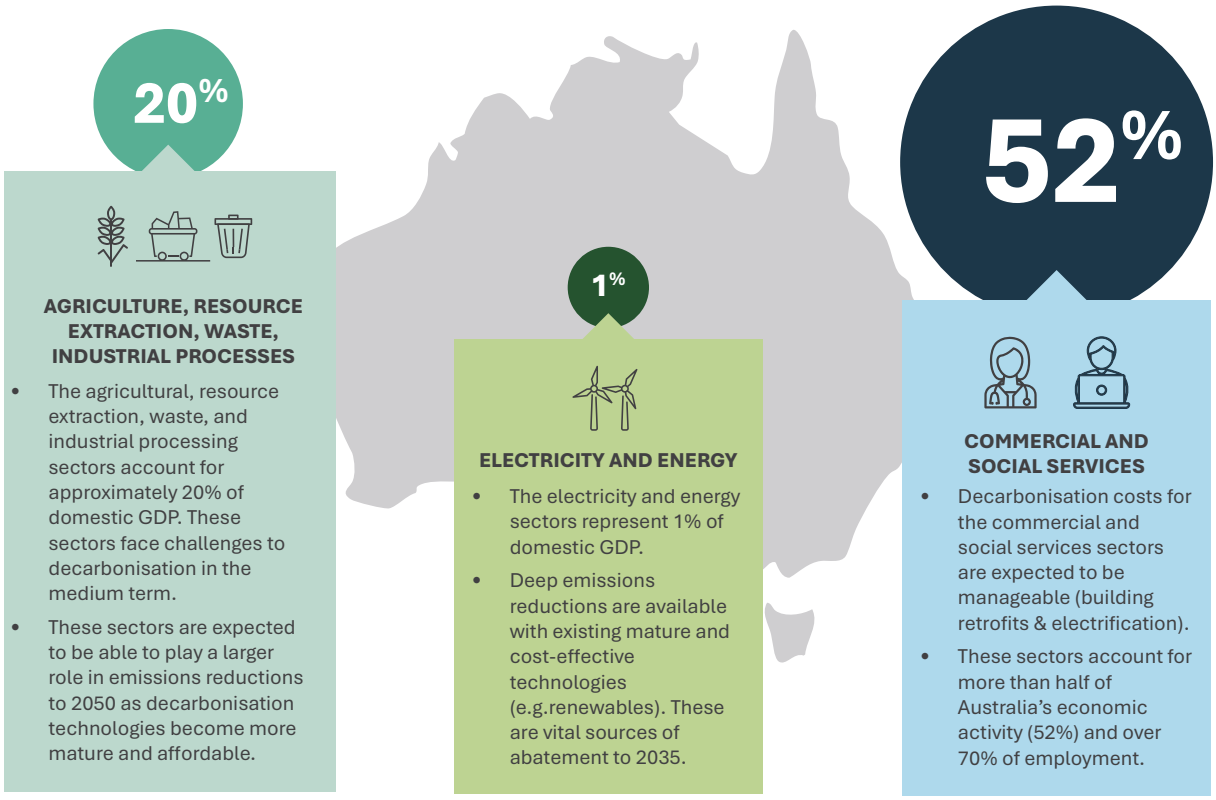
Climate change and its impacts are also significant drivers of mental health issues in Australians. Repeated exposure to the threat or impact of extreme weather events is becoming the new normal and can lead to increased incidence of anxiety, post-traumatic stress disorder and depression, as well as disrupting social and government support networks, compounding challenges and delaying recovery. The presence of an ambitious plan to tackle climate change may improve mental health outcomes related to anxiety about climate impacts. Realised emissions reductions on a global scale will also alleviate the physical impacts responsible for compounding mental health issues (Doctors for the Environment Australia, 2025).

Hence, action on climate change is not only economically sensible but drives overall benefits for society as Australia works with the rest of the world to avoid the catastrophic impacts of a warming world.

3.2 Cost-effective emissions reduction opportunities

The majority of Australia's economic output is concentrated in activities with low emissions intensity and affordable opportunities to decarbonise. Consistent with other advanced economies, Australia's industrial base has shifted towards lower emissions service delivery and consumption over the last 40 years, and this trend is likely to continue (Treasury, 2023). Figure 23 summarises some of Australia's sector decarbonisation profiles and their share of gross domestic product (GDP).

Figure 23: Sector profiles and their share of domestic GDP



Source: Authority analysis reported in CCA (2024c).

Notes:

1. GDP values are based on the 2022–23 financial year. Percentages are based on Gross Value Added (GVA) divided by GDP, consistent with formulas used in the Australian Bureau of Statistics (ABS) Yearbook. GVA is a measure of an industry's contribution to GDP.
2. The electricity and energy sectors' GVA includes the electricity supply, gas supply and petroleum and coal product manufacturing subsectors. It does not include downstream users of electricity, which are a significant share of Australia's GVA.
3. The remaining 27% of GDP not represented in this figure comprises the transport sector (5%), construction (7%), ownership of dwellings, and adjustments for taxes and subsidies on products.

Commercial and social services – including IT, financial and professional services, education and healthcare – account for more than half of Australia's economic activity and more than 70% of employment (CCA, 2024c). These industries are relatively low emitting, with emissions primarily from the built environment sector. They will face some decarbonisation costs, such as building retrofits and the transition to renewable electricity. These costs are expected to be manageable relative to their overall economic scale and are unlikely to materially affect sector competitiveness.

The electricity and energy sector is Australia's highest-emitting and most emissions-intensive sector (analysis of (CCA, 2024c). As set out in Part 2, cost-effective renewable technologies are already enabling deep emissions reductions but accelerated deployment will require dedicated policy attention of governments.

Other key sectors are also expected to be able to replace existing assets with cost-effective low-emissions alternatives as they reach their end of life. In the transport sector, EVs are forecast to achieve cost parity with internal combustion engine vehicles, which currently account for more than half of all transport emissions, this decade or early next, across most major markets (BNEF, 2024). This will allow Australian households and businesses to make their next light vehicle purchase an EV at no greater expense than a traditional vehicle (CCA, 2024c).

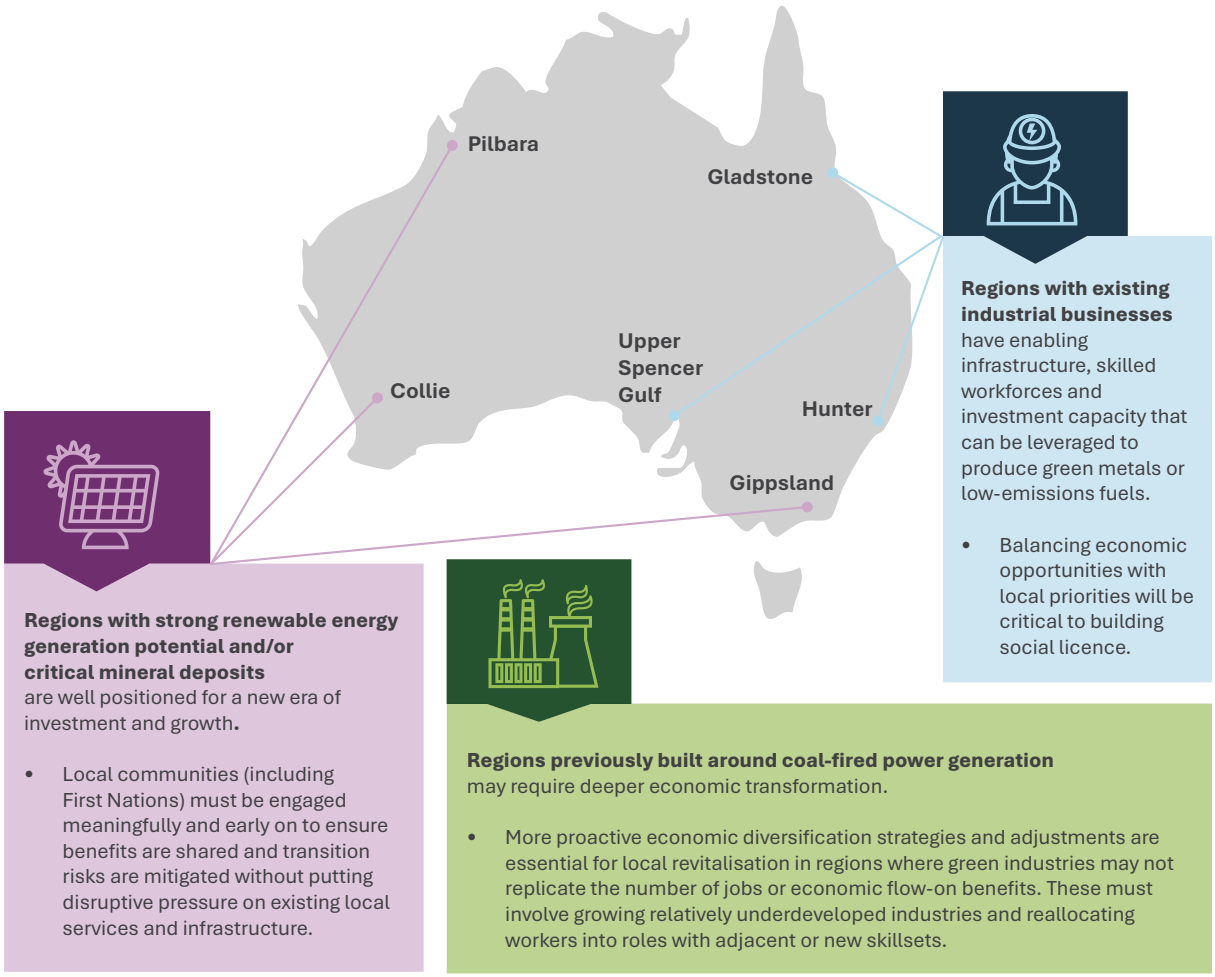
Some sectors – such as agriculture, fossil fuel resource extraction, waste, and industrial processes (including cement and metals production) – involve emissions-intensive activities. These activities face more significant technological and economic barriers to decarbonisation. The Authority's advice accounts for these divergent capacities to reduce emissions, as set out in Part 2. These sectors combined are expected to make a smaller contribution to national emissions reductions by 2035 than the electricity sector alone. They should play a larger role in emissions reductions to 2050 as decarbonisation technologies become increasingly affordable.

3.3 Regional development: Mitigating risks and maximising growth opportunities

Australia's regions will be at the forefront of both the opportunities and the economic disruption created by decarbonisation. They are home to emissions-intensive industries that face structural decline, such as coal-fired power generation and fossil fuel extraction. Regions are also uniquely positioned to host the next wave of green industrial growth, from large-scale renewable energy generation to low- and zero-emissions manufacturing and mining. Yet these growth opportunities do not always align temporally or map neatly to regions with industries facing disruption. Realising the potential opportunities and managing these risks will require targeted investment, coordinated planning and inclusive, place-based transition strategies. A clear and credible target of 62–70% by 2035 would provide the strategic guidepost for aligning these necessary actions.

Regions such as Gladstone, the Hunter, Collie, Gippsland, the Pilbara and the Upper Spencer Gulf currently share a reliance on emissions-intensive industries (Climateworks Centre, 2023b; NZEA, 2025b). The pathways and pace of decarbonisation for these industries vary significantly, as set out in the Authority's *Sector Pathways Review* (CCA, 2024c). Some industrial regions have the potential to transition to producing goods such as green metals and low-emissions fuels and chemicals. They can achieve this outcome by leveraging advantages in their enabling infrastructure, skilled workforces and the investment capacity of current industrial businesses (NZEA, 2025a). Regions with strong renewable energy generation potential and critical minerals deposits are also well-placed for a new era of low-emissions mining.

Figure 24: Australia's regions will need tailored approaches to effectively navigate the transition



Communities built around coal-fired power generation require deep support for economic transformation and more proactive diversification and adjustment strategies. The renewable energy industry can play a role in supporting regions but it may not replicate the number of jobs or economic flow-on benefits of the activity it replaces (Centre for Policy Development, 2022).

Some regions richly endowed with fossil fuels may also be able to leverage emissions-intensive resources to develop zero-emitting products. For example, Gippsland's expansive lignite (brown coal) reserves have been studied for several potential applications, including:

- production of clean hydrogen when coupled with carbon capture, utilisation and storage
- use in a range of carbon products required for renewable energy, batteries, waste remediation and other modern uses
- improvement of soil and crop production.

Further research and support for the next wave of entrepreneurs will be important to realise these opportunities (Australian Carbon Innovation, 2024; Regional Development Victoria, 2024).

Renewable energy generation, critical minerals production, and carbon and environmental markets are also introducing new economic activity into some agricultural regions and the indigenous estate (DCCEEW, 2024n, NRM Regions Australia & CMI, 2025). While this development can deliver regional growth and diversification, it raises complex land use and community impact considerations. Tailored strategies for job creation, service delivery and social cohesion – grounded in a deep, place-based understanding – can help ensure Australians on the frontlines of these changes can shape and benefit from this transition. Balancing economic opportunity with local priorities will be critical to building durable social licence.

With Australia's next NDC guiding domestic action and investment, all levels of government have a role to align policy, economic development, and community engagement to enable just and inclusive transitions for rural and regional Australians. Most Commonwealth portfolios will need to be active contributors. A logical next step is establishing firm national timelines for the phased closure of coal-fired power stations and the scaled development of green export industries. This outcome will enable a managed reduction in fossil fuel production – initially for domestic energy, and subsequently for international trade (see Part 4). While not all this activity will occur within the 2035 timeframe, meeting net zero by 2050 will require the domestic energy transition to accelerate and the shift to green exports to be well in train by then.

Such clarity can give communities, investors, and businesses the confidence to pursue economic diversification and adjustment strategies that exploit each region's unique strengths and comparative advantages. The Australian Government could catalyse effective place-based transformation by equipping Commonwealth agencies, including the Net Zero Economy Authority, as well as state and local governments with the mandate and resources to coordinate and co-design tailored, detailed transition plans for Australian regional communities. These plans must integrate economic, social, and community development priorities to ensure holistic and inclusive outcomes, consistent with the Australian Government's Regional Investment Framework (NZEA, 2025a). South Africa's Just Energy Transition Partnership and Spain's coal transition policies exemplify how targeted support and reinvestment have the potential to drive inclusive, equitable change (European Commission, 2021; IEA, 2023c).

3.4 Ensuring equitable distribution of transition costs and benefits

Widespread backing in Australia for an ambitious 2035 target and the net zero transition will hinge on the benefits and costs being shared fairly – both across regions and the broader community. Achieving this result requires deliberate policy design in partnership with affected stakeholders, and a sustained focus on implementation. Actions that promote a fair and inclusive transition can also unlock greater decarbonisation potential, multiplying their impact, and driving stronger economic, social and wellbeing outcomes.

Training and workforce development provides a strong example of these dual benefits. In some regional areas, emissions-intensive sectors offer many stable and well-paid local jobs (JSA, 2025). Rapid decarbonisation of these regions without alternative employment for workers risks causing economic and social upheaval (e61 Institute, 2023). At the same time, Australia faces labour shortages in critical trades and occupations required for the build-out of renewable energy infrastructure (JSA, 2023).

Strategic investment in skills and training can assist workers to transition into emerging clean energy and manufacturing industries, while helping to address capability gaps that would otherwise hold back growth (JSA, 2023). Deploying more training facilities and programs aligned with local demand directly in Australia's regions is a practical step toward unlocking these dual benefits. One example is the Hunter Net Zero Manufacturing Centre of Excellence, which is supporting delivery of NSW Renewable Energy Zones (REZs) (Box 12).

Box 12: Regional workforce training in action: Hunter Net Zero Manufacturing Centre of Excellence

The Australian and New South Wales Governments are jointly investing $56.2 million to establish the Hunter Net Zero Manufacturing Centre of Excellence at TAFE NSW's Tighes Hill campus (DEWR, 2024). The Centre will provide high-quality training to support the region's transition from traditional mining, energy and manufacturing industries to cleaner, renewable energy sources (DEWR, 2025). The Tighes Hill campus was identified as a favourable site as it is located near both the New England and Central West Orana REZs (Institute for Regional Futures, 2023).

Similarly, strategies that expand access to employment for underrepresented groups – including women, First Nations people and older Australians – can improve social and economic wellbeing while expanding the regional workforce. In many communities, securing this opportunity requires lowering barriers such as the lack of availability of childcare, access to transport, affordable housing, and physical and mental health services (JSA, 2023). Structured benefit-sharing mechanisms – such as locally led community benefit funds that pool contributions from industry partners – can offer a powerful way to drive co-investment with government and close critical service gaps (Regional Australia Institute, 2024).

Actively including rural and regional communities in planning and decisions involving decarbonisation will lead to greater sharing of both the rewards and challenges. This approach builds trust, gains public support and creates the momentum needed to implement solutions effectively and on a large scale (Colvin et al., 2023).

The Hay Shire Council's development of community-led principles for renewable energy projects is a leading example. The council developed the principles through extensive local consultation following the NSW Government's declaration of the South-West REZ. The principles clearly outline the types of development the community supports, the conditions under which they give support, and the benefits they expect in return (Hay Shire Council, 2024). Crucially, the process has also identified the community's priorities for industry co-investment in local infrastructure and services. This process allows clean energy project developers to propose community contributions that directly and collaboratively address the area's greatest needs, instead of taking an ad hoc, project-by-project approach.

First Nations participation is vital for ensuring socially just transitions. First Nations peoples have occupied and cared for Australia's land and sea for more than 65,000 years (McConnell et al., 2021). Their ongoing contributions to culture, traditional knowledge and caring for Country are important for the country's economic prosperity. But Australia is still grappling with its enduring legacy of colonisation and the ongoing pursuit of justice and equity for First Nations people. First Nations people have contributed the least to the problem of climate change yet are some of the most severely affected by climate impacts (National First Peoples Gathering on Climate Change 2021, 2021). The higher prevalence of poor-quality housing, energy insecurity, chronic illness and other disadvantage place First Nations communities at greater risk from climate warming than other Australians (Quilty et al., 2022). First Nations people have not shared equally in Australia's prosperity, which has largely been derived from natural resources extracted from Country. The transition to net zero presents an opportunity to share prosperity equitably. Australia's First Nations Clean Energy Strategy (2024), programs such as the Indigenous Land and Sea Corporation (2025), and collaborations like the Indigenous Carbon Industry Network (2025) illustrate how traditional knowledge and market-based mechanisms can align to provide economic opportunities and sustainable outcomes. The development of solar farms on traditional lands by the by the Ngarluma Aboriginal Corporation is an example of this approach in action (see Box 13).

The transition to net zero also offers an opportunity to elevate First Australians as partners in international decarbonisation. The First Nations Trade and Investment Advisory Group of the Department of Foreign Affairs and Trade (DFAT) aims to help First Nations businesses tap into an array of trade and economic opportunities, including in clean energy (DFAT, 2025g).

Empowering inclusive transition efforts through co-ownership and shared governance ensures local governments, First Nations groups, and regional stakeholders have an active role in shaping new projects and business models.

These strategies deepen community support, foster sustainable skills and capabilities, and align development more closely with the needs and priorities of the people directly impacted.

Box 13: Just transition in action: First Nations clean energy joint ventures

Joint ventures between Traditional Owner groups and renewable energy companies can support economic development in First Nations communities and accelerate Australia's clean energy build-out together. Early evidence suggests these renewable energy partnerships are delivering better outcomes and a fairer deal for First Nations people (University of Melbourne, 2025).

As of April 2025, the First Nations Clean Energy Network is tracking over 20 such projects – some involving partnerships with major international energy and industrial players. For example, the Ngarluma Aboriginal Corporation is currently developing solar farms on the traditional lands of the Ngarluma people in Western Australia. This venture includes partnering with Rio Tinto on an 80 megawatt (MW) solar farm that will provide power for the company's iron ore operations. It will also create employment and local business opportunities for Ngarluma people (First Nations Clean Energy Network, 2025).

Targeted policy interventions are also necessary to ensure financially disadvantaged groups can access benefits of the transition. Reducing household emissions requires homeowners to meet the upfront costs involved in making building upgrades and purchasing low-emissions goods, while the financial benefits are spread out over time. These costs can be a significant barrier to low-income and low-wealth groups (Deloitte, 2024; McKinsey, 2022). Additionally, some groups, such as renters and residents in public housing, lack the choice and control to make low-emissions modifications to their dwellings (Deloitte, 2024). Policies that address these barriers can enable more Australian households to participate in the transition, leading to bigger emissions reductions and a range of co-benefits for financially disadvantaged groups, including mitigating energy poverty, delivering cost of living relief, and improving health outcomes (Deloitte, 2024; The Senate Economics References Committee, 2025).

Part 4

International context and insights

Key points

- The world is decarbonising and the time is right for Australia to commence a strategic shift from being a net exporter of emissions to a net exporter of abatement.
- Despite global headwinds, most of Australia's trade partners are continuing to decarbonise.
- While recent actions of the US Government may delay global progress, on balance they are unlikely to hold back Australia's decarbonisation efforts. With many clean energy projects in the US stalled, and the expertise and innovation capacity sidelined, Australia now has a strategic opportunity to attract displaced capital, capability and innovation to accelerate its own transition and secure a competitive edge.
- Australia's third NDC can play an important role in attracting investment and positioning Australia as a major exporter of low-emissions products.
- It will be crucial to complement domestic abatement with new partnerships with key trading partners to decarbonise transnational supply chains, particularly iron and steel production. Northeast Asian trading partners should be the priority focus for these endeavours.
- Australia should advocate for a stronger focus on clean trade and investment partnerships between governments and businesses at an action-focused UN climate conference next year (COP31).

4.1 Decarbonisation trends among Australia's trading partners

Australia's trade partners are decarbonising

The global transition to renewable energy and other efforts to reduce emissions have accelerated in recent years, despite strong headwinds such as pandemics, geopolitical conflicts, high inflation, and trade wars.

- Global electric vehicle (EV) sales are set to account for 1 in 4 cars sold in 2025, up from 1 in 50 cars only 6 years earlier (BNEF, 2025a).
- While it took 68 years to reach 1 TW of installed solar PV capacity globally in 2022, it took just 2 more years to reach 2 TW (Global Solar Council, 2024).
- An estimated USD 2 trillion (AUD 3 trillion) was invested globally in clean technologies in 2024, almost double the amount invested in fossil fuels (IEA, 2024f).

At the 2023 global climate conference in the United Arab Emirates, Australia was one of 130 countries that formally agreed to transition away from fossil fuel use in their energy systems and work towards tripling global renewable energy capacity (UNFCCC, 2023).

Despite recent challenges, governments and businesses around the world remain committed to acting on climate change. Cost-competitive energy is an important source of competitive advantage and renewables provide cost-effective electricity generation (IRENA, 2024). Rapidly decarbonising the global energy system can result in trillions of dollars of net savings compared to continuing with a fossil fuel-based system (Way et al., 2022). The economic reality of renewable energy means businesses and governments are likely to continue to invest in decarbonisation even with the US withdrawing from the Paris Agreement, winding back climate policies and promoting the production of fossil fuels (The White House, 2025a, 2025b). The inevitable worsening of adverse physical impacts of climate change – some of which are already locked into the future – will reinforce the need for countries to take stronger action to reduce greenhouse gas emissions.

Major economies, such as the EU, appear set to continue to lead the world on climate action. The EU has ambitious and legislated emissions reduction goals (European Commission, 2025a), paired with a carbon border adjustment mechanism (CBAM) that aims to cover 50% of the emissions included in the EU Emissions Trading System (IEA, 2024c). While European liquified natural gas (LNG) imports are forecast to increase in 2025 to near all-time highs (IEA, 2025b), gas consumption appears to be on a downward trend, falling by 20% between 2021 and 2024 (IEEFA, 2025a). The EU has also announced a €100 billion (AUD180 billion) Clean Industrial Deal to accelerate decarbonisation, re-industrialisation and innovation (European Commission, 2025d). The EU's total emissions decreased 8.9% between 2022 and 2023, falling to 37% below 1990 levels (equivalent to 30% below 2005 levels) (European Environment Agency, 2025). The dramatic drop in emissions in the EU is largely attributable to an 18% reduction in emissions from the energy sector in the wake of Russia's invasion of Ukraine. Renewables made up 45% of EU electricity production in 2023 after record-breaking deployment of wind and solar in the previous 2 years (European Commission, 2024a; Eurostat, 2024).

China is also likely to continue its strong recent record of clean energy technology investment and deployment. China currently leads the world on renewables installation and manufacturing of clean energy technologies (IEA, 2024d). While construction started on 94.5 GW of coal power capacity in 2024 (Global Energy Monitor, 2025), renewable energy

additions reached about 357 GW in 2024, with 367 GW forecast for 2025 (Bloomberg, 2025a). In 2023, China commissioned as much solar PVs as the entire world did in 2022, and its wind energy additions expanded 66% year-on-year (IEA, 2024g). Earlier this year, this rapid growth in renewable energy caused a decline in China's carbon dioxide emissions, potentially signalling a peak in emissions has been passed (Carbon Brief, 2025a).

Other countries are also showing commitment to action on climate change. In early 2025, both Japan and the United Kingdom communicated their 2035 NDCs to the United Nations Framework Convention on Climate Change (UNFCCC) (Department for Energy Security and Net Zero, 2025b; Ministry of the Environment Japan, 2025). The UK's 2035 target commits to an 81% reduction on 1990 levels (equivalent to a 78% reduction on 2005 levels), while Japan is targeting emissions reductions of 60% by 2035 and 73% by 2040 on 2013 levels (equivalent to 58% and 72% reductions on 2005 levels). The UK's 2035 target has been described as 'ambitious' by observers (WRI, 2025). China, South Korea and India are working towards achieving net zero between 2050 and 2070, and are set to announce new interim targets for 2035 in coming months (Indian Ministry of Environment, Forest and Climate Change, 2023; Ministry of Ecology and Environment of the PRC, 2022; Government of the Republic of Korea, 2021).

This continued momentum of global action reinforces the imperative for Australia to sustain strong action on climate change. Despite Australia's relatively small contribution to global emissions compared to larger economies such as China and the US, in 2022 Australia's per capita emissions were higher than almost all developed countries. Australia's 2022 per capita emissions of around 17 t CO_2-e were higher than the US (16.5 t CO_2-e) and more than 1.8 times as high as China's (9.0 t CO_2-e) (UNFCCC, 2025e; UNFCCC, 2025f; Climate Watch, 2025; UN, 2024; Treasury, 2023).

Achieving the recommended target of 62-70% below 2005 levels, and with population growth as projected by the Intergenerational Report (2023), Australia's per capita emissions will decline to 7.5–5.9 t CO_2-e per person per year over the next decade.

Australia's exports also make a significant contribution to global emissions. The emissions overseas from use of Australia's coal and gas exports are more than double the amount generated by Australia's entire economy (CCA, 2024b).

All countries have different histories and contexts: no single measure can fully explain a nation's ambition or progress towards decarbonisation. A country's NDC should represent its highest possible ambition given its national circumstances. Reaching global net zero by mid-century will require coordination and collaboration that maximise the relative strengths and capacities of all nations.

Box 14: Canada's decarbonisation pathway

While not a major trading partner of Australia's, Canada is often considered a likeminded country, facing similar challenges despite its different geography and energy mix. Both countries are major fossil fuel exporters and rely heavily on extractive and emissions-intensive, trade-exposed industries for economic activity, jobs and government revenue.

Both also have vast, decentralised geographies and face similar infrastructure and grid integration challenges. As federations, they also face similar cross-government coordination challenges. Canada and Australia also have large indigenous populations whose lands, rights and futures are deeply tied to land and resource management. Despite these similarities, Canada and Australia are on different decarbonisation pathways.

Approximately 82% of Canada's electricity already comes from non-emitting sources: 70 percentage points from renewable sources (62 percentage points from hydropower), plus nuclear energy. Although it still faces challenges reducing emissions from producing and transporting oil and gas, Canada is further along than Australia in decarbonising its electricity system (Natural Resources Canada, 2024). These differences illustrate the importance of considering each country's national circumstances when comparing decarbonisation pathways and targets. No single metric – not the target, emissions intensity of the economy nor per capita emissions – can reveal the full story of a nation's pathway to net zero emissions nor the level of effort required to reach it.

Canada has submitted a 2035 target of 45–50% reduction below 2005 levels, excluding the land sector (Government of Canada, 2025). The recommended target for Australia–62–70% below 2005 levels by 2035–applies to the whole economy, including the land sector. Excluding the land sector, this target would translate to emissions reductions of 40–49% from the remaining sectors of the Australian economy.

The Canadian Government's independent climate advisory body noted that any target less ambitious than a 50% reduction on 2005 levels would put Canada behind on its legislated net zero by 2050 target and require deeper decarbonisation with higher risks and costs in the future (NZAB, 2024).

Box 15: New Zealand's decarbonisation pathway

New Zealand, Australia's neighbour, shares deep cultural and historic links. Much like Australia, New Zealand has abundant renewable energy resources, with electricity generated from geothermal and wind more than tripling since 1990 (New Zealand Ministry of Business, Innovation and Employment, 2024). Both New Zealand and Australia are home to significant First Nations populations whose territorial rights and cultural futures remain closely linked to land and resource management practices. Nonetheless, New Zealand faces different decarbonisation challenges to Australia.

In 2023, renewables accounted for 88% of New Zealand's electricity generation, its highest level since 1981 (New Zealand Ministry of Business Innovation and Employment, 2024). Hydropower contributed 60%, geothermal 18%, and wind and solar the remaining 10%. For the first time, residential electricity consumption surpassed industrial consumption to become the largest sector of electricity consumption (New Zealand Ministry of Business Innovation and Employment, 2024).

More than half of New Zealand's total emissions come from pastoral livestock and there are limited mitigation solutions currently available that suit pasture-based farming systems (Government of New Zealand, 2024). Agriculture is the largest sector of New Zealand's tradeable economy, representing 70% of merchandise exports (New Zealand Ministry for Primary Industries, 2023).

New Zealand's *Climate Change Response Act* enshrines a 2050 target in legislation, requiring greenhouse gases, other than biogenic methane, to reach net zero. Biogenic methane is targeted to reduce by 24–47% below 2017 levels by 2050.

The New Zealand Government has noted the scale of emissions reductions required to meet its 2030 target is greater than what can be achieved in an economically feasible way through only domestic action, and it is open to explore cooperation under Article 6 (Government of New Zealand, 2024).

New Zealand has submitted a 2035 target of 51–55% below gross 2005 levels (Government of New Zealand, 2025).

Trading partners' continued action on climate change will also have important implications for Australia's export industries. Australia's current export profile is heavily concentrated on fossil fuels, creating exposure to shifting global demands. In 2023–24, LNG ($70 billion), metallurgical coal ($56 billion) and thermal coal ($38 billion) were among the nation's largest sources of export revenue, eclipsed only by iron ore ($141 billion) (DISR, 2025a).

As key trading partners accelerate efforts to decarbonise, demand for fossil fuels is expected to decline. Under announced climate pledges, the International Energy Agency projects global coal consumption could fall from 12% in 2022 to 4% of total final energy consumption by mid-century, with gas decreasing from 16% to 10% over the same period (IEA, 2023d)[9]. The modelling conducted by the CSIRO for the Authority projects Australia's fossil fuel sector outputs will reduce 30% by 2035 if trade partners take action consistent with limiting warming to 1.5 °C, or 13% if the pace of global action aligns with 2 °C of warming (CCA, 2024c). The magnitude of these long-term projected shifts underscores the need for early, strategic planning to safeguard Australia's economic resilience.

9 As per the International Energy Agency's Announced Pledges Scenario.

Table 3: Analysis of Australia's top 2-way trade and investment partners' positions on renewables and clean economies

Name	Net zero targets	Trade with Australia AUD billion (2023–24)	Share of total 2-way trade % (2023–24)	Top 3 goods exports	Country outlook
China 	2060	325.5	25.7%	Iron ore & concentrates, natural gas, coal	In mid-2024 China had twice as much wind and solar capacity under construction than the rest of the world combined. It continues to build new manufacturing capacity for solar panels, batteries and other clean exports. China is leading on EV manufacturing and uptake, with over 70% of global EV production and sales of EVs approaching 50% of new car sales in 2024. While coal capacity in China has been growing, new additions are dwarfed by investments and construction of clean energy.
US 	2050	125.8	9.9%	Beef, gold, pharmaceutical products	The US has generated investment of USD 115 billion from Q3 2022 until Q1 2025 in US-based manufacturing for clean energy and clean transportation technologies, primarily through their *Inflation Reduction Act* (IRA). While the US Government has weakened the IRA, renewable deployment is continuing. For example, California is targeting 100% clean energy by 2045, while Texas has become the leading US state for solar deployment.

Table 3: Analysis of Australia's top 2-way trade and investment partners' positions on renewables and clean economies (cont.)

Name	Net zero targets	Trade with Australia AUD billion (2023–24)	Share of total 2-way trade % (2023–24)	Top 3 goods exports	Country outlook
Japan 	2050	113.4	9.0%	Coal, natural gas, iron ore & concentrates	Japan is reducing the role of fossil fuels in its energy system, with generation from gas, coal, and petrol set to decline from 73% in 2023 to 30–40% by 2040 on current plans. Nuclear remains part of its energy mix and is projected to increase. It is investing in clean energy innovation and holds the largest number of hydrogen-related patents globally.
Republic of Korea 	2050	70.7	5.6%	Coal, natural gas, iron ore and concentrates	South Korea is one of the world's largest steel manufacturers and is working to keep this title by ramping up green steel production. The country is investing in hydrogen to become a key input for its manufacturers.
India 	2070	50.1	4.0%	Coal, gold, vegetables	India is working towards installing 500 GW of zero-emissions electricity capacity by 2030: greater than the total capacity of the country's grid in 2024. It currently has over 200 GW of renewable energy capacity and has recently added new capacity at the rate of 24 GW a year. However, India is also deploying fossil fuel generation to meet the high growth in demand required for economic development.

Table 3: Analysis of Australia's top 2-way trade and investment partners' positions on renewables and clean economies (cont.)

Name	Net zero targets	Trade with Australia AUD billion (2023–24)	Share of total 2-way trade % (2023–24)	Top 3 goods exports	Country outlook
Singapore 	2050	47.3	3.7%	Natural gas, crude petroleum, gold	Singapore intends to achieve Net Zero by 2050 and is collaborating with Australia on decarbonising supply chains through the Singapore–Australia Green Economy Agreement. The agreement aims to drive growth while reducing emissions, including through decarbonising shipping, opening up cross-border electricity trade and promoting sustainable finance and green investment.
New Zealand 	2050	37.8	3.0%	Telecom equipment & parts, telecom and ICT services, medicaments	New Zealand generates 86% of its energy demand through renewables and has a nationwide emissions trading scheme. Through the Australia–New Zealand 2+2 Climate and Finance Dialogue, New Zealand is in cooperation with Australia on promoting the proliferation of low-emissions vehicles and developing a trans-Tasman sustainable finance architecture, among other initiatives.

Table 3: Analysis of Australia's top 2-way trade and investment partners' positions on renewables and clean economies (cont.)

Name	Net zero targets	Trade with Australia AUD billion (2023–24)	Share of total 2-way trade % (2023–24)	Top 3 goods exports	Country outlook
UK 	2050	34.5	2.7%	Gold, telecom and ICT services, lead	The UK has an established offshore wind industry that is rapidly growing. It has national targets and incentives for building retrofits and energy efficiency, which are boosting demand for efficient appliances e.g. heat pumps.
Total		805.0		63.6%	

Source: Net zero targets, trade with Australia, share of total 2-way trade and top 3 goods exports information: (DFAT, 2024a, 2025b, 2025l, 2025e, 2025c, 2025i, 2025k, 2025h, 2025f; Net Zero Tracker, 2025)

Note:

For country outlook information: (Agency of Natural Resources and Energy Japan, 2025; Barbar et al., 2023; Bloomberg, 2025a; California Energy Commission, 2025; Columbia Business School, 2025; DCCEEW, 2024a; DFAT, 2024c, 2025j; EIA, 2024; European Commission, 2024b; Global Energy Monitor, 2024; IEA, 2024e, 2025d; Indian Ministry of New and Renewable Energy, 2024a, 2024b; Indian Ministry of Power, 2024; Ministry of the Environment Japan, 2025; MIT CEEPR, 2025; Solutions for Our Climate, 2024; Strategic Energy Europe, 2025; UK Government, 2018, 2024; Wood Mackenzie, 2024a; World Economic Forum, 2024).

Recent actions of the US Government are unlikely to materially hinder Australia's decarbonisation efforts

The US Government's approach to international trade and climate action – as the world's largest economy and second-largest emitter – is an important consideration in the context of global emissions reduction efforts and Australia's NDC. Following the inauguration of the new US Administration in January 2025, the Authority has closely monitored the unfolding policy landscape.

The withdrawal of the US from international action on climate change is a significant risk to global progress. This threat is evidenced by declining multilateral cooperation in areas like sustainable finance (Bloomberg, 2025b; NGFS, 2025), and reduced commitments to climate finance (Carbon Brief, 2025b). Domestically, the US Government is winding back measures supporting a clean energy transition and erecting barriers to international trade. In July 2025, the US Congress passed the 'One Big Beautiful Bill', including an accelerated repeal or restriction of significant renewable energy tax credits and climate policies. These include incentives for vehicle tailpipe standards, EV subsidies, wind and solar projects, energy efficient home subsidies, and for residential solar and batteries (Yale Climate Connections, 2025). These actions are likely to result in slower emissions reductions (The Economist, 2025) or potentially higher emissions (Larch & Wanner, 2024) in the US and may also slow breakthroughs in clean technologies.

On balance, the Authority's analysis finds the opportunities for Australia to attract displaced capital, capability and innovation, and build new trade relationships, could offset any new risks to Australia's ability to achieve a 62–70% target by 2035.

The Authority has observed that:

- Developments in the US could result in capital outflows and more investment in clean energy and technology in other countries, including Australia.
- Within the US, many subnational governments and private industry are maintaining commitments to climate action. The cost competitiveness of, and ongoing advances in, technologies such as solar PV, battery storage and electric vehicles will help underpin their continued deployment.
- Shifting international trade patterns present an opportunity for Australia to strengthen supply chains by forging new trade relationships.

Changes to US Government policy may create a more challenging environment for global investment, including in decarbonisation

In addition to major rollbacks to the IRA and climate research programs, the US Government has also imposed trade measures that could have significant flow-on implications for global decarbonisation. For example, tariffs are likely to result in higher global inflation and lower global gross domestic product (GDP) (OECD, 2025b; PIIE, 2024). These global impacts would flow through to Australia, with the OECD projecting Australian GDP growth in 2026 to be 0.7 percentage points lower than previously projected (OECD, 2025b). Modelling by the Australian Treasury projects that higher tariffs could cause an overall 0.1% hit to GDP by 2030 (Chalmers, 2025). Trade tensions between the US and its trading partners may further reduce global GDP growth and lead to higher inflation than would otherwise be the case (OECD, 2025b; PIIE, 2024).

Rising uncertainty may also present other challenges for the global economy. The increase in economic policy uncertainty seen over recent months may reduce credit supply and delay spending decisions by companies and households (Global Policy Uncertainty, 2025; International Monetary Fund, 2024; OECD, 2025b). The US Government's introduction and subsequent pause of 'reciprocal' tariffs caused dramatic, short-term shifts in financial markets, and provide an example of the uncertainty of the current trade environment.

US states, businesses and history give cause for cautious optimism

The policies and priorities of the current US Administration will become clearer over time. That said, developments during the first Trump Administration, in subnational jurisdictions and in the private sector, suggest some cautious optimism is warranted.

Once the US commenced withdrawing from the Paris Agreement for the first time in 2017, some large US states significantly stepped up their action to reduce emissions (Yale Environment 360, 2017), including California which is the fifth-largest economy in the world (Government of California, 2024). Local governments, businesses and communities representing 159.5 million people and USD9.46 trillion in GDP continued driving action on climate change (We Are Still In, 2020).

Since then, subnational and private sector action has contributed to important shifts in climate and energy policy trends around the US. This action is likely to continue.

For example:

- Texas, traditionally a fossil fuel powerhouse, now generates more large-scale renewable energy than anywhere else in the US. Market demand for cleaner energy together with tax and regulatory incentives created a strong forward project pipeline (American Clean Power, 2024).
- Many US states are pursuing subnational emissions reduction targets and climate policies, and continuing to engage with UNFCCC processes (Brookings Institute, 2025; C2ES, 2025; TCS, 2025).

The need for strong and urgent action to address climate change will become even more compelling as the impacts of climate change worsen and the costs of abatement fall. As climate change progresses, North America is forecast to experience intensifying climate impacts, including more frequent and severe flooding, droughts, heatwaves and storms. These could lead to displacement of people and elevate risks to food and freshwater systems (IPCC, 2022c, 2023; NASA, 2024). These intensifying impacts will provide impetus for future US administrations to recommit to climate action.

The rollback of the US IRA is unlikely to have a material impact on Australia's ability to decarbonise its existing industries to 2035

While changes to US climate policy are amplifying market uncertainty and volatility, they are unlikely to have a major impact on Australia's access to clean energy products, such as solar modules, wind turbine components and batteries.

Since its introduction in 2022, the IRA has been the main federal US policy for incentivising the manufacture of clean energy products. Between 2022 and 2024, the policy led to a rapid increase of US investment in manufacturing for solar modules and batteries (Rhodium Group, 2024). The IRA was projected to provide USD87 billion in advanced manufacturing tax credits by 2028 (IRA Tracker, 2025). Amendments recently agreed by the US Congress will significantly curtail support for wind and solar power, EVs, hydrogen and energy efficiency, while support for nuclear power, battery storage, geothermal and carbon capture was largely preserved (albeit with restrictions on certain foreign sources of inputs). Given Australia imports the majority of its clean energy products, including solar modules and wind turbines, from China and the broader Asia Pacific, the changes are not expected to have a major impact on Australia (Climate Council, 2023b; US Studies Centre, 2024). That said, further diversifying Australia's imports of clean energy products, particularly for solar panels, would provide better protection from potential future supply chain shocks (US Studies Centre, 2024).

The significant rollback of the IRA is unlikely to have a material impact on the availability of emerging decarbonisation technologies for Australia in the period to 2035. The US has traditionally been one of the leading countries for clean energy innovation (IEA, 2021). The IRA provided funding for industrial decarbonisation demonstration projects within the US, including green aluminium and steel facilities (US DoE, 2024a), and low-emissions cement manufacturing (US DoE, 2024b). While the removal of this funding may delay US research and development, and reduce the level of innovation globally for the period of the current administration, the longer-term impacts of the US withdrawing funding for clean energy innovation are difficult to predict. Australia can continue to benefit from research and development underway outside the US (EHPA, 2025; Envirotec, 2025; European Commission, 2023; Heidelberg Materials, 2023; Rio Tinto, 2024; S&P Global, 2022). While government funding for research and development is significant, the vast majority of investment in research and development comes from the private sector (Brookings Institute, 2022).

US policy shifts may create new opportunities for Australia to attract green finance

The winding back of US climate policies and investment measures creates an opportunity for other countries to step forward and seize a larger share of global green capital. That includes clean energy investment previously attracted under the IRA (Bloomberg, 2025c; Net Zero Industrial Policy Lab, 2024;PIIE, 2024).

Australia's well-regarded financial system, open trade policy, renewable energy endowments and recent policy innovations all contribute to making it an attractive destination for green finance. The recent introduction of mandatory climate-related financial risk disclosure requirements will also provide investors with greater transparency and more comparable information about an entity's exposure to climate-related risks and opportunities (Australian Treasury, 2024). The Australia Government has also worked with the finance sector to develop a voluntary sustainable finance taxonomy, designed to mesh with international frameworks. This arrangement will make it easier for entities covered by sustainability reporting regulations to invest into sustainable activities (Australian Sustainable Finance Institute, 2024). The forthcoming Net Zero Plan and sector plans should further strengthen confidence in Australia as an investment destination for green industries.

Articulating a clear pathway for stronger domestic action to 2035, and an intention to boost Australia's contributions to low- and zero-emission global supply chains, would further enhance Australia's attractiveness as a location for green investment (IGCC, 2025). This stance is a 'no regrets' approach regardless of policy changes in the US, as there is a large and growing pool of capital globally seeking low- and zero-emission investment and partnership opportunities in stable, trusted business environments.

The impact of tariffs can be mitigated by targeting new trading relationships

Australia's decarbonisation options and broader economy could be affected both directly and indirectly by the imposition of new and higher tariffs. Since the inauguration of the current US Administration in January, tariffs have been repeatedly introduced, increased, decreased or paused. This volatility makes it difficult to predict with certainty what specific impacts of US trade policy will be in the short, medium or long term. However, from a macroeconomic perspective, more volatile trade relations can lead to increases in inflation, investor caution and slower economic growth on a global scale (PIIE, 2025).

It will be important for Australia to continue monitoring changes to the US's global tariff on steel and aluminium imports. The US buys 10% of Australia's aluminium exports and 16% of iron and steel exports (Australian Aluminium Council, 2025; Australian Steel, 2024; Trading Economics, 2024)[10]. Recent modelling by the Productivity Commission indicates US trade policy measures will have a marginal direct impact on the Australian economy, but the risks and uncertainties they trigger may have far reaching costs (Productivity Commission, 2024).

Higher US tariffs on Chinese imports may present challenges and opportunities for Australia. These tariffs could result in a decline in production in China, and hence China's demand for critical minerals from Australia. In 2024, 95% of Australian spodumene (lithium ore) exports went to China (DISR, 2025b). However, higher US tariffs on Chinese and Asia Pacific imports may benefit Australia by boosting the availability of clean energy products otherwise destined for the US, such as wind turbines, solar modules and EVs, suppressing prices. While this development may reduce costs and potentially accelerate access to key products for the energy transition, it could also affect the viability of Australian businesses supplying inputs into the production of these goods.

Diversifying trade into the Asia-Pacific region could help Australia to strengthen its supply chains and position itself to succeed as an exporter of low-emissions products (University of Melbourne, 2024).

4.2 An investable NDC

An NDC should form part of Australia's partnership proposals as a potential major exporter of low-emissions products

Climate action, an environmental necessity, is emerging as a powerful new model for economic growth (OECD, 2025a). NDCs are emerging as the foundation for credible markets in green goods, economic efficiency, environmental sustainability, and social equity (Energy Transitions Commission, 2024). Moving toward 'investable' NDCs is the natural evolution of this system – an approach rooted in the principles of the Paris Agreement.

Since the establishment of the Paris Agreement 10 years ago, focus has gradually shifted from setting domestic targets to the practical challenges of global implementation. NDCs in some countries have evolved beyond simple commitments set out as national targets to now serving as strong signals of intent, providing clarity and confidence to trade partners and potential investors (OECD, 2024a).

10 Australian export of iron and steel was worth USD 1.5 billion in 2023. According to Trading Economics, Australian exports to the US were USD 238 million: 15.8% of total export.

Advice requirements

Achieving the goals of the Paris Agreement will require mobilising inputs, skills and capital through robust and diverse international supply chains. In this context, Australia's national circumstances position it to shift from being a net exporter of emissions in a fossil fuel-dominated world, to a net exporter of abatement in a decarbonised world. Australia's coal and gas exports currently contribute more than one billion tonnes of CO_2 when used abroad, or more than double the nation's own emissions (CCA analysis, 2025). Global demand is expected to decrease for coal (by 75%) and oil and gas (by 40%) by 2050, from 2022 levels, under announced climate commitments (IEA, 2022a, 2024b). Modelling conducted by the CSIRO for the Authority projects Australia's falling fossil fuel output will be more than offset by growth in output of non-fossil fuel resources (up to 80% by 2050) (CCA, 2024c).

The development of low-emissions export industries may temporarily add to Australia's domestic emissions. For example, the domestic production of energy-intensive, low-emissions goods such as 'green iron', may result in more emissions until Australia's renewable capacity can fully support this industry. However, this would occur in the context of overall declining emissions across the economy, and the exported iron would likely displace more emissions-intensive iron production overseas. Furthermore, most emissions from new industry growth would likely be subject to Safeguard Mechanism obligations, limiting the net additions to Australia's emissions.

An ambitious, achievable and investable NDC will benefit both Australia and the rest of the world. New low-emissions export industries could substantially increase Australia's export revenues, with estimates ranging from $40bn to $1tn by 2040–2060 (EY, 2023b; The Superpower Institute, 2024). Experts estimate that under a very ambitious growth scenario, with massive levels of investment, Australia's green commodity exports could scale up over the coming 3 decades to displace an estimated 6.7% to 9.6% of global emissions (The Superpower Institute, 2024). If coal and gas exports decline in line with International Energy Agency scenarios, Australia's net export emissions have the potential to decline significantly through to 2050 (IEA, 2023b). The Australian Government's Future Made in Australia agenda and its enabling policies have started the nation down this path.

Nationally determined targets, when viewed through a trade-focused lens, redefine climate action as an opportunity for competitive advantage, whereas historically they were seen as a cost burden (African Development Bank Group, 2024; IIGCC, 2024). Now the true burden of climate change is understood to be the cost of inaction: the rising risk of physical impacts and the increasing costs of adapting and responding to disasters.

A trade-focused approach to NDCs expands policy considerations beyond domestic borders to international trade routes, placing global supply chains at the heart of climate strategy. Ambitious developed countries are considering not just their own domestic emissions reduction potential, but also opportunities along supply chains, both upstream and downstream (Department for Energy Security and Net Zero, 2025a).

Box 16: What makes an NDC investable?

Investable NDCs are those capable of attracting the necessary financial resources for implementation. These NDCs bridge the gap between ambition and action by offering clear, market-aligned pathways for investment (IIGCC, 2024).

Key characteristics of investable NDCs and their supporting infrastructure

- **Clarity and transparency**
  Detailed sectoral pathways and investment needs, developed with robust stakeholder engagement to ensure alignment with market realities. This clarity signals opportunities to investors, making the NDC a roadmap for clean investment.
- **Policy and regulatory support**
  A stable policy environment and innovative financing mechanisms – such as market-based measures and market reforms – that provide investor confidence in the feasibility and sustainability of the NDC.
- **Mutual benefit agreements**
  Strategic partnerships that activate the Paris Agreement ratchet mechanism, enable cooperation on trade pathway emissions accounting and carbon leakage issues.

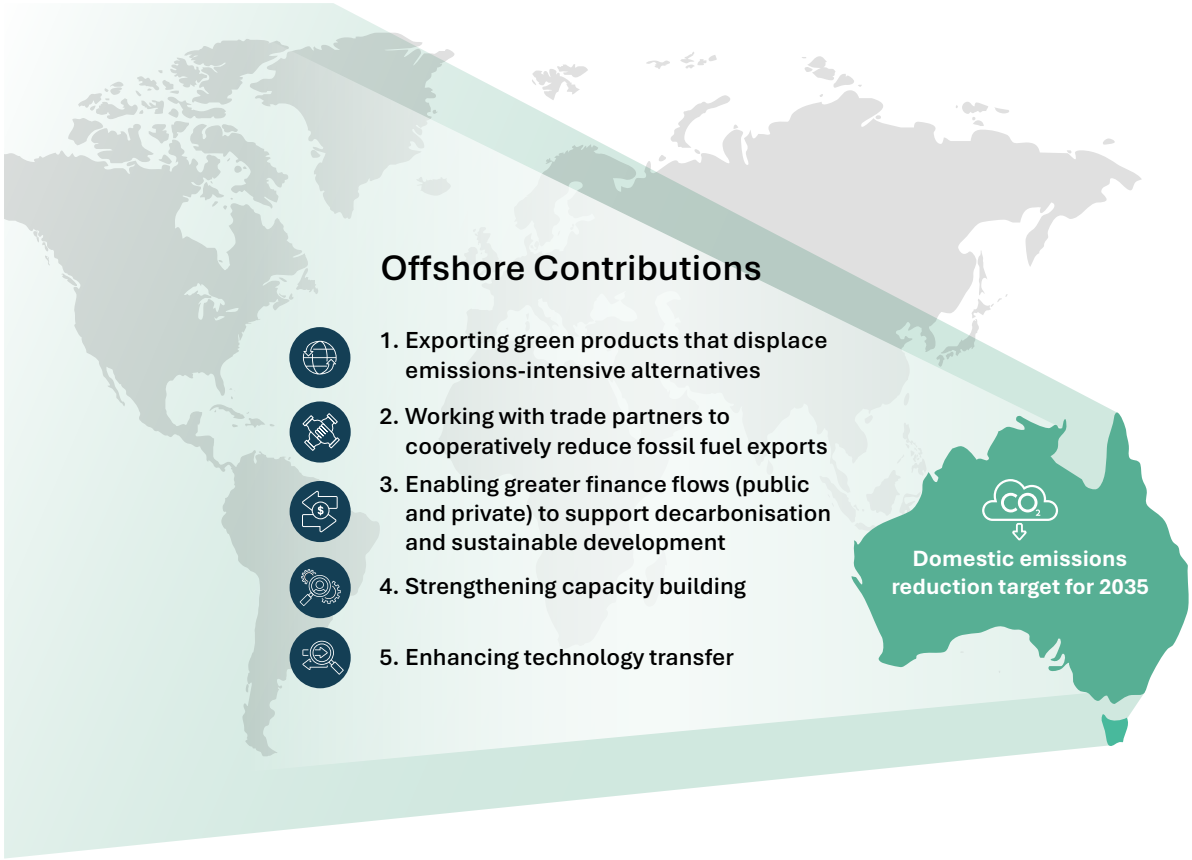
The Paris Agreement's ratchet mechanism requires countries to regularly update and strengthen their NDCs (UN, 2025). It relies on transparency and mutual accountability to build trust among nations, encouraging increasingly ambitious action to collectively meet global climate goals.

As countries transition from target-setting to implementation, investable NDCs offer a pathway for transformative climate action. By aligning national efforts with international market conditions and leveraging global supply chains, nations can turn climate action into a driver of economic growth and global cooperation (PRI, 2024). Australia, with its unique national circumstances, is well-positioned to lead this shift, which could help to shape the future of green markets and international climate diplomacy (see also Part 4.3: A framework for global climate ambition).

Australia can help drive deeper cuts to global emissions beyond our borders

Australia's contributions to the goals of the Paris Agreement (Figure 25) will extend far beyond the 2035 target recommended in this report. They will emerge from working with trade partners to phase down fossil fuels, transition to low-emissions alternatives, and support Australia's neighbours to develop sustainably and adapt to climate risks. Offshore contributions can form part of a country's NDC without contributing to a reduction in that country's own emissions. They can instead be expressed in supporting materials outside the NDC, with or without quantified estimates of the scale of the contributions. Offshore contributions can complement – and are not a substitute – for efforts to reduce domestic emissions as far and as fast as possible.

Figure 25: Australia's offshore contributions to the goals of the Paris Agreement

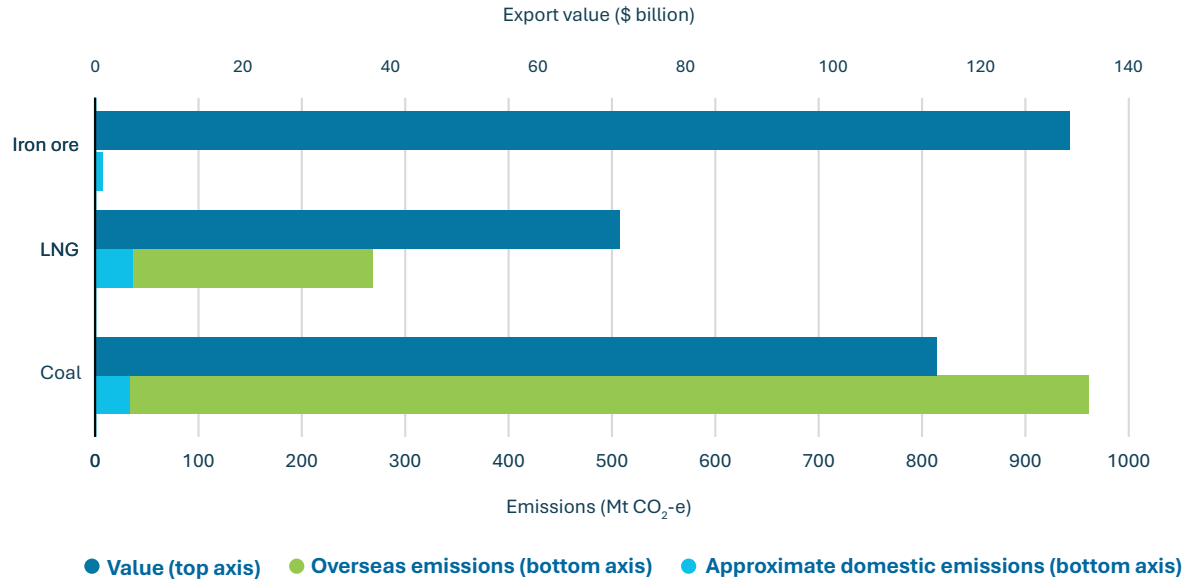


Australia's biggest opportunities to contribute to cutting global emissions lie beyond our borders:

- **Increasing green exports**
  Australia has abundant natural resources, renewable energy endowments and a skilled workforce, together with geographical proximity and status as a trusted trading partner. This combination allows Australia to collaboratively play an important role in helping partner countries to reduce emissions (EY, 2023a; The Superpower Institute, 2024).

- **Reducing emissions-intensive exports**
  Emissions associated with the use of Australian coal, oil and gas in their end markets are substantially more than Australia's domestic emissions (Figure 25). Accounting for emissions from the use of iron ore and bauxite exports increases Australia's supply chain emissions even further (Centre for Policy Development, 2023).
- **Climate finance to support sustainable development**
  As an important development partner in the Asia-Pacific region (DFAT, 2024b, 2025a), Australia has an opportunity to directly support decarbonisation, the building of resilience to climate change impacts and the economic transformation of nations with less financial capacity to act.

Figure 26: Value of exports and associated emissions for coal, LNG and iron ore, 2021–22



Sources: Authority analysis based on data from CER (2024), DCCEEW (2024i; 2024k) and DISR (2025a).

Notes:

Overseas emissions from coal and gas are estimated based on the emissions from the combustion of these fuels abroad, using export volumes, fuel energy contents and combustion emissions intensities consistent with the National Greenhouse Account Factors. The domestic emissions are approximated based on national emissions inventory and Safeguard Mechanism data.

Decarbonising the Asian region is key to achieving the global climate goals. Greenhouse gas emissions in Asia now account for more than half of all the world's emissions, with populations projected to increase and economic growth and energy security remaining priorities for nations in the region (Asian Development Bank, 2023; Government of Japan, 2024).

Australia's key energy partners, including Japan, South Korea and China, are keen to meet their domestic energy needs through low- and zero-emission products and the export of carbon dioxide to be sequestered elsewhere (IEEFA, 2025b; Ministry of Ecology and Environment of the PRC, 2021). Based on identified government policies, the majority of the region's energy demand to 2030 is still expected to be met by fossil fuels (IEA, 2022b). This reality highlights that managing down fossil fuel exports presents a challenge to trust and energy security, but also an opportunity for Australia to collaborate on the supply and uptake of low- and zero-emission alternatives. Doing so would support global decarbonisation, ensure continuity in diplomatic engagement, and redirect inbound investment flows to Australian growth industries (DFAT, 2024c).

International collaboration to decarbonise can take many forms, and the Australian Government is already pursuing several initiatives:

- Australia is one of 11 partner countries that launched the Asia Zero Emission Community (AZEC) in 2023, alongside Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, the Philippines, Singapore, Thailand, and Vietnam. The platform seeks to further advance decarbonisation in Asia toward the goal of carbon neutrality while achieving economic growth and energy security, creating various pathways tailored to each country's circumstances (Government of Japan, 2024).
- The Australia–Japan Partnership on Decarbonisation through Technology advances cooperation in a range of areas, including clean hydrogen and ammonia, and low-emissions steel and iron ore (DCCEEW, 2025b).
- The Indo-Pacific Economic Framework (IPEF) Clean Economy Agreement, with 14 members including Australia, Japan, Korea, India, Southeast Asian nations and the US, sets out a framework for regional clean economy cooperation (DFAT, 2025d).
- The Singapore–Australia Green Economy Agreement provides a framework for shared efforts to decarbonise shipping and support cross-border electricity trade (DFAT, 2024c). Under this Agreement, the Australia–Singapore Initiative on Low Emissions Technology for Maritime and Port Operations is seeking to accelerate development and deployment of low-emissions fuels, like hydrogen (CSIRO, 2025a).
- The Australian Government has agreed to a $660 million collaboration on H2Global under a new Energy and Climate Partnership with Germany. This pact intends to drive trade in renewable hydrogen and hydrogen derivatives between the 2 countries (DCCEEW, 2024b). Work is also underway on a Green Metals for Sustainable Steel initiative (GlobH2E, 2024). These 2 projects build on existing collaboration to support renewable hydrogen supply chains, including the Australian–German HySupply feasibility study and joint projects under the HyGate initiative.
- In November 2024 Australia accepted the 2009 amendment to the London Protocol, allowing carbon dioxide to be shipped to and sequestered in Australia (DCCEEW, 2025g).

Another strong opportunity for global emission reduction lies in forging new regional supply chains based on complementary industrial activities. For example, Malaysia, Vietnam and India have the largest solar manufacturing capability outside of China, and their economies are rapidly urbanising (DFAT, 2023d). Australia is well placed to provide these 3 countries with the critical minerals and knowledge required to expand manufacturing bases and decarbonise their growing energy systems. In return, this assistance would diversify and strengthen Australia's clean technology supply chains.

Long-term investment partnerships and supply agreements with countries such as Japan have supported the growth of Australia's coal and LNG industries in recent decades (Australian Embassy Tokyo, 2023). Similar partnerships could provide solid foundations for a progressive scale-up of production for low- and zero-emission exports – such as processed minerals and chemicals – alongside a managed phasedown of fossil fuel trade (Aisbett et al., 2023). A clear national timeline on such a phasedown – domestically and in exports – could provide a strong signal to investors and trade partners that Australia's priority is supporting regional decarbonisation with new export goods (Aisbett et al., 2023; IGCC, 2024). Developing a timeline in consultation with trade partners will ensure regional energy security remains well supported (see also Part 4.3).

Climate finance can support less developed countries to do more

Australia's total Official Development Assistance (ODA) spend – which includes climate finance (DFAT, 2023a) – is just less than 0.20% of gross national income (GNI) (ABS, 2024). This is well below the UN's recommended target of 0.70% of GNI (CCA analysis, 2025; (OECD, 2016, 2024b). Australia is the largest development partner in the Pacific (DFAT, 2025a). By increasing official climate finance contributions, Australia can support countries in the region to reduce emissions and build resilience at a scale not possible with national resources alone. In addition to the provision of official climate finance, Australia can align its general international development aid with the goal of enabling emissions reductions in developed countries. One example of this prospect is that Australia is a signatory to the Clean Energy Transition Partnership agreed at COP26 in Glasgow (DFAT, 2023b). The partnership aims to end direct public financing for new, unabated fossil fuel projects.

Beyond the Pacific, Australia can build upon existing innovative financing instruments, such as the Southeast Asia Investment Financing Facility (Export Finance Australia, 2024), to diversify how it delivers climate finance to emerging economies in Southeast Asia. Instruments such as loans, equity, insurance and guarantees can be deployed at a larger scale than grants and draw in private finance by lowering risk for investors (DFAT, 2023c). Boosting participation in multilateral funds like the World Bank will also ensure Australia can continue to advocate for climate finance in the Asia Pacific and ensure funds are spent on shared regional mitigation and adaptation priorities.

Internationally Transferred Mitigation Outcomes could play a role in the future

Australia should not need to use international offsets to meet the 62–70% target by 2035. However, if due to unforeseen circumstances, Australia falls short of meeting this target domestically, it would have the option of importing units to fulfil its commitment. In this way, internationally transferred mitigation outcomes (ITMOs) can serve an important risk reduction role.

The Paris Agreement's Article 6 provides for countries to collaborate and exchange mitigation outcomes (UNFCCC, 2025a). Trades under Article 6 can create opportunities for finance, capacity building and national benefits for seller countries, while providing lower-cost mitigation outcomes for buyer countries (UNFCCC, 2025a).

The market for ITMOs is currently in its early stage. Some countries have indicated a willingness to participate in trading, and have started to sign bilateral agreements. These include Switzerland, Singapore and Japan (UNEP, 2025). For future NDCs, trading of ITMOs could be considered prior to setting a new target and take into account a trading partner's level of ambition. This approach would reduce the potential perverse incentive for exporting countries to set weak targets that would enable them to sell surplus abatement (see Part 4.3).

The Authority has previously recommended the Government develop a National Carbon Market Strategy. Currently, international offsets purchased by Australian companies to meet voluntary commitments do not contribute to meeting Australia's national target (CCA, 2022), international offsets are not eligible for use under the Safeguard Mechanism (DCCEEW, 2025i), and ACCUs are not eligible for export under Article 6 (CCA, 2023c).

In the future, the Australian Government could support the flow of private finance towards decarbonisation projects in developing countries – such as renewable energy infrastructure projects – by accepting ITMOs for use under schemes such as the Safeguard Mechanism. The Government has committed to considering the appropriate treatment of international units as part of the 2026–2027

review of the Safeguard Mechanism (DCCEEW, 2024m). Such financial flows could enable Australia's trading partners to decarbonise and neighbours to develop more rapidly using renewable energy systems. These emissions trading arrangements would likely reduce the cost of achieving the targets recommended in this report, which would enable Australia to strengthen its ambition. However, the Authority holds the view that until a National Carbon Market Strategy is in place, it makes sense for Australia to focus its efforts on supply chain decarbonisation partnerships instead of shopping for offsets.

4.3 A framework for global climate ambition: Aligning national targets with international partnerships

A new kind of cooperation

The next breakthrough in international climate policy will likely not come from another universal agreement. In this era of realignment for a net zero transition – marked by rerouting of trade flows and shifting relationships in a complex, multipolar world – it will be much more likely to come from new forms of international cooperation and partnerships that drive trade and investment in low-emissions products. This outcome would enable an orderly withdrawal from emissions-intensive products, referred to here as 'decarbonisation deals'.

Countries are already considering how they can accelerate decarbonisation through international trade (see above). Connecting this thinking to NDCs could drive greater ambition under the Paris Agreement. Parties could harness trade arrangements, agreements and industry partnerships to drive deeper emissions cuts and adjust their emissions reduction targets based on cooperative outcomes. This cooperation could enable countries to set more ambitious targets, with or without trading carbon credits. Decarbonisation deals could be bilateral or plurilateral, with or without the explicit involvement of the private sector. They could be explicitly linked to or sit alongside parties' NDCs.

Many of the investments required for the transition to net zero involve long-lived assets. By deepening efforts now, trade partners and businesses can collaborate to direct investment towards clean technologies.

This innovation does not require amendments or additions to the Paris Agreement rulebook, which would require the agreement of the 195 Parties to the agreement via consensus-based decision-making at annual Conferences of the Parties (COP). At COPs, countries often announce voluntary political declarations, bilateral and plurilateral partnerships and coalition-based or regional initiatives to signal ambition, build momentum and advance cooperation on specific climate priorities. This approach – involving a smaller subset of countries – offer a pragmatic, flexible and faster path forward to overcome one of the most persistent – and underappreciated – weaknesses of the Kyoto and Paris climate architecture: the 'accounted for elsewhere' problem. This could be an important development of a COP hosted by Australia in partnership with the Pacific.

For decades, countries have measured and managed emissions within territorial boundaries, with less regard for the carbon embedded in their exports and imports. This approach marks a limitation of internationally agreed methods of carbon accounting. It fails to address the complexity of international supply chains for economic activities that cause emissions, and the need for countries to cooperate to achieve global cuts in emissions of the scale required, and with outcomes that are mutually beneficial. It has hampered global efforts to reduce emissions and seen the international trade system function largely at odds with climate ambition by outsourcing emissions to trade partners. Goods flow across borders, often without consideration of their

carbon intensity. Emissions embedded in supply chains have largely been treated as someone else's problem, and countries have generally not adopted policies to encourage the import of low-emissions goods. As a result, countries and companies have had little incentive to reform emissions-intensive exports for fear of losing market share, and been provided with too little incentive to scale up low-emissions alternatives.

The time has come to flip that script. Rather than seeing cross-border emissions as a risk or cost, nations can collaborate on cross-border emissions as a mutually beneficial way to reduce global emissions. Now is the time, with supply chain transparency, low-emissions credentials, and climate-aligned finance reshaping global trade.

Countries like Australia are well-placed to lead this innovative improvement to the international climate policy architecture. In addition to its bid for the presidency role in the upcoming COP31 in partnership with the Pacific, Australia is working to transition from an emissions-intensive economy to a potential future as a major exporter of low-emissions products. This is in prospect due to Australia's capacity to substitute emissions-intensive exports with cleaner alternatives.

Under a possible Australia–Pacific presidency, an action-focused COP31 could discuss accounting for supply chain emissions and new forms of cooperation to foster decarbonisation deals. At the time of writing, 28 nations have submitted their third NDCs, with more – including Australia – due to submit this year (UNFCCC, 2025c). Australia could lead by example by including consideration of Scope 3 emissions in its NDC. Decarbonisation deals to facilitate trade and investment in low-emissions products, and the transition away from emissions-intensive products, could be struck between nations following the setting of their targets. This achievement would help reduce the cost of achieving those targets and could catalyse a wave of updated and strengthened NDCs in the future. An Australian COP in 2026 could spark discussions around bilateral and plurilateral decarbonisation deals and activate agreements around the world.

Decarbonisation deals will need to operate within the obligations of existing trade agreements and rules. The principles of the World Trade Organisation (WTO) specify that countries should not discriminate between trading partners. At the same time, WTO agreements permit members to take measures to protect the environment, provided they are applied in the same way to both national and foreign businesses (WTO, 2025). By working within the framework of existing trade agreements and rules, countries can ensure new trade and investment arrangements operate in a way that enables fair competition, lowering the cost of decarbonisation in the process.

Decarbonisation deals as an innovation in target setting

The core of this new approach is a simple but powerful idea: countries can support achievement of their national targets by aligning them with specific bilateral and plurilateral forms of cooperation, including sectoral or commodity-specific agreements. New arrangements could explicitly identify the emissions outcomes of trade and lay out how countries can collectively exceed what they would otherwise achieve alone (see conceptual scenarios below). They could function alongside existing NDCs. Nations could choose to refer to agreements in their future NDCs or opt not to. This approach achieves the intended outcome, regardless.

Businesses could play a role and benefit from this innovation. For example, government collaboration could reduce the 'offtake risk' for new suppliers. That is, the risk the output of a new production facility is not able to be sold. This process would require governments to work more closely with companies that would help deliver these arrangements, providing benefits to domestic economies. Proponents (and governments) making a significant capital outlay would have a degree of certainty for their capital-intensive new green industries.

Unlike existing market frameworks, such as Article 6 of the Paris Agreement – which allows for emissions trading through 'corresponding adjustments' (see Part 4.2) – this model could integrate target setting directly into the arrangement itself. That difference amounts to a key distinction. Article 6, while valuable, carries a perverse incentive if used in the absence of strong support mechanisms: it rewards countries for setting less ambitious targets that they can easily exceed and sell the resulting surplus abatement (European Commission and Government of Portugal, 2021). Decarbonisation deals, by contrast, could incentivise both partners to raise ambition. They could be premised on shared benefit: mutual confidence in supply and abatement, higher combined ambition, and tangible co-benefits such as energy security, economic development, job creation, and improved air quality.

Building on private sector momentum and emerging trade measures

This model also aligns with and reinforces momentum underway in capital markets and boardrooms. Private sector investment and activity will deliver the outcomes needed for this new form of cooperation, although partnership and coordination between governments, companies and communities is required.

Investors and multinational firms are increasingly accounting for Scope 3 emissions – those embedded in supply chains – when setting science-based targets (SBTI, 2023; WRI, 2022). This shift is being driven by voluntary commitments, evolving regulatory frameworks and transparency requirements in jurisdictions such as the EU and Australia (ASIC, 2025; European Commission, 2025b). However, more needs to be done to stimulate greater action. The growth of environmental, social and governance (ESG) disclosure obligations, and moves by governments to require climate-related financial disclosures is pushing firms to examine and decarbonise their upstream and downstream value chains.

At the same time, CBAMs, such as the EU's, are formalising the link between trade and emissions. CBAMs send a clear message: emissions embodied in trade are no longer invisible. Decarbonisation deals offer a complementary and more constructive and cooperative mechanism – especially for major trade partners – by providing a framework for joint action rather than unilateral penalties.

Importantly, this model of bilateral and plurilateral cooperation ***complements*** and ***strengthens*** existing multilateral arrangements, including the Paris Agreement and WTO-compatible climate and trade agreements. It addresses gaps that those mechanisms currently leave open, particularly in areas where target setting, trade, and transition finance intersect.

The Australian opportunity: Partnership, transition, and trust

Australia has unique strengths to bring to this model. Its emerging Guarantee of Origin scheme offers a credible and transparent basis for tracking emissions intensity across export commodities such as hydrogen, low-emissions fuels and metals (DCCEEW, 2025e). The recent Carbon Leakage Review further sharpens Australia's focus on competitiveness and emissions integrity in globally traded sectors (DCCEEW, 2025a). Australia is a valued and trusted international partner, and could work closely with traditional and new trade, energy and climate partners to establish new forms of cooperation. Australia also has significant sequestration potential through land and ocean sinks, CCS, and engineered removals – an asset for joint target setting with trusted partners (CCA, 2023d).

Japan stands out as a natural, early partner in this approach. As one of Australia's largest export markets, Japan has strong interest in ensuring energy security while decarbonising its economy through its Green Transformation (GX) strategy (Government of Japan, 2023). Japan's Joint Crediting Mechanism (JCM) already provides a platform for bilateral cooperation on emissions reduction, and it is actively

exploring the role of low-emissions LNG, CCS, and hydrogen in its future energy mix. Bilateral efforts to enhance decarbonisation outcomes through trade and investment, with shared assumptions about energy supply, and emissions reductions, could be prospective.

A practical path to higher ambition

The 'decarbonisation deal' concept is not a replacement for global cooperation under the Paris Agreement – it is a necessary complement. The Paris Agreement established crucial architecture for making and monitoring progress (e.g. Article 6, global stocktakes). But global emissions are yet to peak (UNEP, 2024). Bilateral and plurilateral trade and decarbonisation arrangements offer the opportunity for a major breakthrough. Such an advance would help ensure current commitments are met and unlock further ambition and emissions reductions required to avert the most dangerous impacts of global warming. New forms of cooperation and partnerships can align trade and climate goals, drive sectoral decarbonisation, and enable countries to move faster and further than they could alone (Aisbett et al., 2023). They also provide a constructive mechanism to tackle politically sensitive issues – such as the gradual wind-down of fossil fuel exports, through collaboration, not unilateral action that exports serious social and economic risks.

National economies are deeply interconnected through cross-border trade, investment, and supply chains, which means that both emissions and economic value are generated from activities that span across jurisdictions. Effective climate action requires countries to work together to reduce emissions and do so in ways that support shared economic prosperity. Coordinated approaches to carbon abatement can reduce the risk of trade distortions, carbon leakage, and inefficiencies in global supply chains. Integrating emissions reduction efforts with economic cooperation ensures that climate ambition, energy security and economic growth are pursued hand in hand, delivering mutually beneficial outcomes for all countries involved.

What is needed now is leadership. Countries with strong climate ambition, robust trade linkages, and credible low-emissions exports must step forward to pilot this work. Governments must equip their climate, trade, and industry ministries to work together. Institutions should begin tracking and validating these arrangements to build trust and transparency.

The old logic of climate policy – accounting only for your own domestic emissions – is no longer fit for purpose. A new logic is emerging, built on collaboration, mutual benefit, and shared ambition. New forms of cooperation and partnership that tie trade to decarbonisation goals can bring the global trading system into the climate fold and unlock the next wave of global progress.

Conceptual scenarios

Decarbonisation deals are partnership arrangements between governments and businesses that support industry restructure, reduce emissions, and improve economic outcomes for all participants.

In the following 2 illustrative scenarios, Australia strikes decarbonisation deals with hypothetical trading partners. The 2 scenarios are extremely simplified to illustrate the concept. They do not take account of any nation's domestic regulatory environments, the value of emissions reductions (carbon price), or carbon leakage, but could be valuable complements to carbon border adjustment measures.

Reaching new decarbonisation deals would take time as parties consider broader economic consequences and make the necessary domestic adjustments. However, there may be some opportunities to reach agreement on decarbonisation deals more quickly under existing partnership arrangements. The purpose of these conceptual scenarios is to spark conversations about what is possible.

Conceptual Scenario 1: A green iron–green steel decarbonisation deal

The traditional model

- Australia: Exports coal and iron ore (high-grade hematite) and has excellent renewable energy resources.
- Trade partner: Imports iron ore from Australia and produces steel using coal-based blast furnaces. It has limited variable renewable energy.

This system generates significant emissions, primarily during the ore-to-steel conversion process using metallurgical coal. In this hypothetical scenario, Australia emits **10 Mt CO_2-e** through mining and shipping[11] coal and iron ore, and its trade partner emits **100 Mt CO_2-e** through integrated iron and steel production, with total production chain emissions of **110 Mt CO_2-e.**

The new model: The green materials partnership arrangement (illustrative)

Green steel made from direct reduced iron (DRI) using renewable hydrogen, is a pathway to significantly reduce greenhouse gas emissions in steel production. However, transporting hydrogen for DRI is looming as too expensive to be viable in many cases. Instead, using hydrogen where it is made, to process ores, is shaping as a compelling commercial opportunity for Australia's unique endowment of renewable and mineral resources.

In response to consumer demand for low-emissions steel, Australia and its trade partner – current suppliers of iron ore and coal-based steel respectively – form a Green Materials Partnership Arrangement:

- Australia invests in renewable-powered DRI technology, producing green iron for export instead of raw ore. Emissions initially increase until the renewables rollout is complete and emissions drop to **5 Mt CO_2-e**. This includes reduced international shipping emissions because refining the ore locally means less mass needs to be transported to the partner country.
- The trade partner transitions steel production from coal-based methods to electric arc furnaces, which convert green iron to steel using clean electricity, enabled through workforce transition planning. Emissions fall to **10 Mt CO_2-e.**

Table 4: Hypothetical emissions under traditional and green steel production chains

	Traditional supply chain (Mt CO_2-e/year)	Green steel deal (Mt CO_2-e/year)
Australian and international shipping emissions	10	5
Trade partner emissions	100	10
Total emissions	110	15
Net Savings	-	95

11 International shipping emissions are included in this figure but are not counted in Australia's National Greenhouse Gas Inventory.

A country weighing whether to agree to give up emissions-intensive production – in this case the trade partner – will rightly consider the value and jobs at stake, but must also weigh the growing risk that these jobs would be lost anyway to renewable-rich countries as a consequence of emissions reduction targets and programs. Proactively managing the transition together with trade partners, through agreements such as this, can preserve competitiveness and create new, lower-emissions jobs as high emissions industries disappear.

Outcomes (illustrative)

Australia:

- gains 20,000 jobs in DRI processing
- onshores more value from iron exports
- becomes a trusted supplier of green materials to trade partners
- boosts infrastructure in regional mining communities
- leverages Guarantee of Origin scheme to verify embedded emissions
- phases down coal exports in collaboration with trade partner.

Australia's trade partner:

- secures access to low-emissions feedstock
- transitions to clean technology through a managed program of adjustment and investment
- loses 40,000 jobs as iron making shifts to Australia, and 20,000 more from efficiency gains in moving to electric arc furnaces (out of 80,000 integrated iron and steel making jobs)
- retains 20,000 steel making jobs in key industrial regions by avoiding further industry decline
- avoids border carbon adjustment tariffs and maintains market access
- lowers emissions, which can translate to a more ambitious national target.

Strategic implications

This Green Materials Partnership Arrangement demonstrates a new model of supply chain-aligned emissions cooperation, which:

- moves climate ambition into the real economy
- encourages co-investment and shared value
- unlocks deep decarbonisation in hard-to-abate sectors
- builds resilience through friendshoring and collaborative reduction of coal trade.

Conceptual Scenario 2: An abated LNG decarbonisation deal

Background

Australia is a major exporter of liquefied natural gas (LNG). Its trade partner is a long-term buyer of LNG from Australia and relies on it for energy security, especially during its transition away from coal.

Neither country's targets fully account for the emissions generated from the LNG trade between them. Historically, Australia accounts for emissions from LNG production and liquefaction, while its trade partner accounts for emissions from combustion during use, but these emissions are treated separately, and opportunities to reduce them collaboratively are not leveraged.

The agreement: 'Abated LNG' deal

Australia and its trade partner enter a bilateral partnership arrangement to jointly reduce the lifecycle emissions from their LNG trade and align those reductions with more ambitious national targets. The arrangement is implemented through trade via private companies in the respective countries for the basis of private and public benefit with 2 main components:

1. **Carbon capture and storage (CCS)** The trade partner installs post-combustion carbon capture technology at gas-fired power plants. The captured carbon dioxide is compressed and shipped back to Australia, where it is injected and permanently sequestered in a certified geological storage basin.
2. **Premium for sequestration integrity** LNG importing companies agree to pay a premium above market LNG prices for 'green LNG', which covers the costs of LNG and carbon dioxide transport back to Australia, injection and monitoring. Australia provides its trade partner with long-term certainty of LNG supply, and both countries benefit from integrity-assured sequestration of emissions.

Outcomes (illustrative)

- The deal covers **100 Mt CO_2-e** of LNG-related emissions.
- **85 Mt CO_2-e** are captured and permanently sequestered through post-combustion CCS.
- The remaining **15 Mt CO_2-e** include fugitive and production-side emissions in Australia before the LNG is exported, residual emissions from capture inefficiencies, and emissions from transport and logistics of both LNG and captured carbon.
- Australia's national emissions remain broadly the same and its export earnings rise.
- The trade partner's emissions are **85 Mt CO_2-e** lower than they would have been in the absence of the deal, enabling it to strengthen its target.

Benefits

- **Climate** – Removes **85 Mt CO_2-e** that would otherwise have been emitted to the atmosphere.
- **Trade** – Reinforces energy cooperation and security of supply.
- **Economy** – Unlocks investment in CCS infrastructure and supports transition industries in both countries.

Strategic implications

This 'abated LNG' deal becomes a model for how decarbonisation deals can unlock deeper decarbonisation of cross-border value chains. It goes beyond carbon accounting by:

- aligning target setting with real-economy trade flows
- incentivising both parties to be more ambitious
- creating mutual benefits rather than zero-sum offsets.

The model is especially relevant to countries like Australia and Japan, which already have strong trade ties, CCS capacity, and aligned interests in energy transition, hydrogen, and emissions transparency.

Appendix A

Advice requirements

Appendix A: Advice requirements

Australian legislation establishes a regulated process and principles to guide development of advice about Australia's emissions reduction targets. The Climate Change Authority, Australia's expert advisory body, is required by law to advise the Minister on the greenhouse gas emissions reduction targets that it considers should be included in the Nationally Determined Contributions (NDCs) to be communicated by Australia in accordance with Article 4 of the Paris Agreement (*Climate Change Act 2022,* section 15).

Article 4(3) of the Paris Agreement states that each Party's successive NDC will represent a progression beyond the Party's then current NDC and reflect its highest possible ambition, reflecting its common but differentiated responsibilities, in the light of different national circumstances.

The Australian Government must receive and have regard to the Authority's advice before submitting an NDC, must respond within 6 months of receiving the Authority's advice, and may seek advice from other sources (Climate Change Act, sections 15(2A), 15(6) and 15(7)).

In developing its advice, the Authority must make provision for public consultation (Climate Change Act, section 15(3)).

← *See Part 1.3, Appendix B and the Authority's consultation webpage*

The Authority's advice must include advice on:

- the social, employment and economic benefits of any new or adjusted greenhouse gas emissions reduction targets and associated policies, including for rural and regional Australia (Climate Change Act, section 15(1A)(a)); and
- the physical impacts of climate change on Australia, including on rural and regional Australia (Climate Change Act, section 15(1A)(b)).

← *See Parts 1.6, 2.2, 2.3, 3 and 4*

← *See Part 1.1, 1.6, 2.4, 3.1 and 3.4*

The Authority's advice must also include an explanation of how the greenhouse gas emissions reductions targets have taken into account the matters set out in Article 2 of the Paris Agreement (Climate Change Act, section 15(3A)).

← *See Parts 1.1, 1.3, 1.5 and Appendix A. See also Parts 2, 3 and 4*

Article 2 of the Paris Agreement

1. *This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:*

   (a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

   ← *See Part 1.1, 1.3, 1.5, 2.2, 3.1 and 4*

   (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and

   ← *See Parts 1.1, 1.2, 1.5, 2.2, 3.1, 3.3, 3.4 and 4*

   (c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

   ← *See Parts 1.5, 2.1, 2.3, 3.2. 3.4 and 4*

2. *This Agreement will be implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.*

   ← *See Parts 1.5, 2, 3.4 and 4*

Further, the *Climate Change Authority Act 2011* (section 12(a)) requires that in performing its functions, the Authority must have regard to the principle that any measures to respond to climate change should:

i. be economically efficient
ii. be environmentally effective
iii. be equitable
iv. be in the public interest
v. take account of the impact on households, business, workers and communities
vi. support the development of an effective global response to climate change
vii. be consistent with Australia's foreign policy and trade objectives
viii. take account of the matters set out in Article 2 of the Paris Agreement
ix. boost economic, employment and social benefits, including for rural and regional Australia.

The Authority had regard to this principle throughout all phases of this project, as evidenced throughout this report.

Appendix B

Mixed methods approach

Appendix B: Mixed methods approach

The Climate Change Authority designed an integrated, multi-disciplinary, mixed methods approach to underpin rigorous, evidence-based advice on Australia's emissions reduction targets for 2035. This approach combined quantitative rigour, qualitative insight, participatory consultation and deliberative synthesis to ensure recommendations are defensible, credible and grounded in reality. It reflects established practice in academic, policy and strategic advisory contexts where complex, systemic issues require multi-dimensional insight.

There is no textbook or mandatory method for determining national emissions reduction targets under the Paris Agreement – such is the nature of a 'nationally determined' target. The Paris Agreement calls for targets that reflect 'highest possible ambition', ratchet up over time with no backsliding, and sit alongside a portfolio of other contributions, including climate finance, technology transfer and capacity building. The Authority's methodology for developing this advice is founded on:

- the Authority's legislated principles and requirements (see Appendix A)
- the objective to respond to the scientific imperative with an ambitious and achievable 2035 emissions reduction targets for Australia
- the principle that the Paris Agreement will be implemented to reflect common but differentiated responsibilities and respective capabilities of countries, in the light of different national circumstances.

Five complementary components formed the analytical foundation of this mixed methods approach:

1. Scientific and policy research
2. Macroeconomic modelling
3. Sectoral pathways analysis
4. Consultation and engagement
5. Geoeconomic analysis

Together, these components provided a comprehensive understanding of what is at stake, what is achievable, and how strategic ambition can best be calibrated in an uncertain and rapidly evolving environment. The Authority undertook work across these diverse streams in parallel over a period of more than 2 years and then drew the resulting insights together into an integrated whole.

The integration of the work streams described above allowed triangulation across data sources and disciplines. For example:

- Science-based research informed the selection of scenarios for economic analysis.
- Sectoral assessments challenged or validated the results of formal macroeconomic modelling.
- Consultation revealed rich sociological insights beyond what formal modelling or desktop research could show.

This work strengthened the reliability of findings, enabled contextual interpretation of model outputs, and ensured equity and impact considerations were integrated throughout this work. In turn, this mixed methods approach ensured that the pathways and recommendations presented are not only technically and economically sound but also institutionally, socially and geopolitically informed.

The final step involved a deliberative synthesis process to bring these analytical components together. This approach involved iterative review of findings across streams, the critical examination of outliers and uncertainties, and structured, expert reasoning on the implications for Australia's national targets.

The sections below provide further details on each of the 5 complementary components of the Authority's mixed methods approach.

1. Scientific and policy research

Scientific and policy research was a critical and central input to ensure the scenarios and recommendations reflect physical realities and feasible policy frameworks. This stream included:

- assessing alignment with the Paris Agreement goals, the latest climate science and global emissions budgets
- examining expected physical climate impacts across Australia.

This stream grounded the analysis in scientific evidence, helping us to determine what is necessary considering the latest evidence on the impacts of climate change and projected future risks.

2. Macroeconomic modelling

The Authority partnered with the CSIRO to evaluate the economic, technological and emissions implications of 6 scenarios using a multi-model approach. This downscaled a combination of International Energy Agency and Intergovernmental Panel on Climate Change scenarios to the Australian context.

These scenarios explored 4 levels of Australian ambition with net zero years ranging from 2050 to 2035, and linear trajectories that, in 2035, achieved between 57% and 100% reductions below 2005 levels. These domestic scenarios were modelled in the context of a global pace of action consistent with limiting long-term global warming to 1.5 °C and/or below 2 °C.

Scenarios considered in macroeconomic modelling by the CSIRO

By 2035, Australia reduces emissions relative to 2005 levels by...	In a world limiting warming to...	
	Below 2 °C	**1.5 °C**
-100%	*Not modelled*	1.5 °C world **-100% by 2035**
-75%	Below 2 °C world **-75% by 2035**	1.5 °C world **-75% by 2035**
-62%	Below 2 °C world **-62% by 2035**	*Not modelled*
-57%	Below 2 °C world **-57% by 2035**	1.5 °C world **-57% by 2035**

The models employed to undertake this analysis were:

- **GTEM: CSIRO's 'Global Trade and Environment Model'**
  A computable general equilibrium (CGE) model used to simulate global macroeconomic dynamics and trade flows. It captured how other nations' ambition could shape global markets and affect Australia's terms of trade, investment climate and export competitiveness.
- **AusTIMES: The 'Australian TIMES' model**
  A least-cost energy system model (an Australian implementation of The Integrated MARKAL-EFOM System (TIMES)) used to identify optimal technology deployment pathways and emissions reductions across sectors. It assessed transition costs, abatement potential and technology choices under varying policy and market assumptions.
- **LUTO: The 'Land Use Trade-Offs' model**
  A spatially detailed model estimating land use change, carbon sequestration potential, and associated co-benefits. LUTO assessed the land sector's role in achieving national emissions reduction targets, particularly in nature-based solutions.

These models provided a quantitative foundation for understanding trade-offs and system-wide interactions, and were used to stress-test potential decarbonisation pathways under different global conditions. This included considering how decarbonisation at different rates – domestically and globally – may impact diverse regions and industries around Australia.

For further information, refer to *Modelling Sectoral Technology and Emissions Pathways to 2035 and Net Zero Emissions* (CSIRO, 2025c).

3. Sectoral pathway analysis

The Authority conducted sector-by-sector analysis of technologies, barriers and policies to test modelling results and explore achievability within real-world constraints. This work included leveraging expert insights and deep sector analysis to assess:

- abatement potential and deployment timelines for low-carbon technologies
- infrastructure requirements and bottlenecks
- workforce and skills availability, including transition readiness in affected regions
- financial and supply chain feasibility
- sector-specific policy incentives and barriers.

This layer of analysis ensured that the pathways and recommended targets are not only economically efficient in theory but achievable in practice – accounting for commercial, technical and operational realities across 6 sectors.

For further information, refer to the Authority's *Sector Pathways Review* (CCA, 2024c) and Part 2 of this report.

4. Consultation and engagement

Structured stakeholder engagement was critical for shaping assumptions, understanding acceptability (i.e. 'social licence'), and identifying both risks and opportunities that may not be visible through modelling and quantitative analysis alone.

The consultation process included:

- **three public consultation papers,** which resulted in **more than 560 written submissions** in response, offering valuable perspectives, evidence and ideas

- **more than 500 events and meetings** across the country to hear and learn from business leaders, community advocates, First Nations people, young Australians, unions, regional representatives, academics, peak bodies and more.

Consultation revealed rich insights into how emissions reduction pathways might be experienced by different regions, communities, industries and demographic groups. These insights helped illuminate the human and institutional dimensions of transition, including regional capacity to adapt, perceived fairness of cost and effort sharing, and the social acceptability of proposed policies or investment choices. They directly informed considerations of achievability of targets, the pace of transition in different sectors, and the equity implications of different approaches, including regional and income-based distributional effects. Consultation feedback also validated or challenged technical pathways and market signals identified in the modelling.

For further information, refer to the Authority's consultation page.

5. Geoeconomic analysis

To understand how global dynamics could reshape market conditions, investor preferences and decarbonisation options, the Authority undertook a targeted stream of international policy and market research. This stream included:

- analysing the climate policies and industrial strategies of Australia's trade partners
- assessing emerging trade measures including carbon border adjustment mechanisms and green trade measures
- tracking climate-aligned capital flows and investor expectations
- identifying risks of stranded assets and lost market access under divergent decarbonisation trajectories
- interpreting foreign policy and geopolitical trends affecting technology, supply chains, and critical minerals
- reviewing opportunities to innovate within the global climate negotiations architecture.

This analysis ensured the Authority's 2035 targets advice reflects not only domestic capacity but also global shifts that will increasingly shape competitiveness and resilience.

For further information, refer to Part 4: International context and opportunities.

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