GRATTAN Institute

Australia's emissions targets

Tony Wood and Alison Reeve

Overview

Australia's climate change commitment is net-zero emissions by 2050. The latest projections indicate the target of 43 per cent below 2005 levels by 2030 will not be delivered without further policy action. Despite success in some sectors, closing the gap looks tough and net zero by 2050 even harder.

Australia's governments must act now to create greater momentum towards the net-zero goal through setting the 2035 carbon budgets and targets, with policies to meet them. This submission outlines a comprehensive framework for how this should be done. These recommendations accept today's political constraints and build on existing policies and priorities.

Addressing climate change brings costs and benefits, challenges and opportunities. Across the sectors, there will be areas where the benefits of lower-emissions technologies will outweigh any costs of the transition. And there will be other areas where real financial costs will remain even after our best cost-reduction efforts. These costs must be weighed against the costs of the economic and social disruption of climate change itself.

Adopting the recommended framework will connect short-term actions and proven technologies – to bend the curve now – with technology development and deployment to sustain the momentum and get to net zero. Technology must be complemented by policies and markets.

Sector-specific policies include light vehicle emissions standards; bigger roles for the Emissions Reduction Fund, the revised Safeguard Mechanism, and energy efficiency obligations; enhanced electricity grid investment; and better integration of state renewable electricity schemes. Setting clear rules on the use of domestic and international offsetting credits will protect the integrity of policy and help build the market.

In the short term, government funding for immediate, low-cost actions and to support R&D will be required; and well-designed regulation can provide market guidance. In the medium-to-longer term, market-based policies will mobilise finance and deliver outcomes at lowest cost.

This suite of actions can deliver steadily reducing emissions across the economy well into the 2030s, and create real momentum towards net zero by 2050. The Climate Change Authority has an essential role to monitor and report progress, and to make recommendations as required.

All governments need to plan more directly for the physical and economic consequences of a changing climate, and to integrate climate change issues into all decisions on infrastructure planning, land use, and resource extraction. This policy challenge requires greater policy coordination across jurisdictions.

Action today is crucial to build momentum and to avoid locking in emissions for decades to come. Net zero is more than just a target. It is a principle for organising the economy to maximise Australia's chances of flourishing in the next three decades.

1 Introduction

We welcome the enhanced role given to the Climate Change Authority (CCA) to provide evidence-based advice to the Federal Government on its response to climate change. This submission responds to the CCA's Issues Paper, "Setting, tracking and achieving Australia's emissions reduction targets", issued in May 2023.

The issues paper covers four interrelated projects concurrently. This submission focuses on those elements of the issues paper where we have specific and relevant views and knowledge. It draws largely on public reports and submissions we have made in the last couple of years. Accordingly, we have not attempted to address all the matters raised in the issues paper.

Grattan Institute is an independent think-tank focused on Australian domestic public policy. It aims to improve policy outcomes by engaging both decision-makers and the broader community.

2 Setting targets

Australia has three national climate change targets: net zero by 2050, 43 per cent below 2005 levels by 2030 (354 Mt CO_2-e) and a carbon budget for the 2021-2030 decade of 4,381 Mt CO_2-e. We also have a national renewable electricity target of 82 per cent renewables by 2030.

Current indications are that Australia will fall short of the 2030 targets. This has implications for the choice of target in 2035; and also for economic disruption.

At a minimum, the 2035 target should be sufficient to make up for any emissions budget shortfall from 2021-2030. It should be calibrated to minimise climate change impacts on Australia, and to position Australia to benefit from global shifts towards net zero.

2.1 The outlook for lower emissions has improved but the pathway is by no means smooth

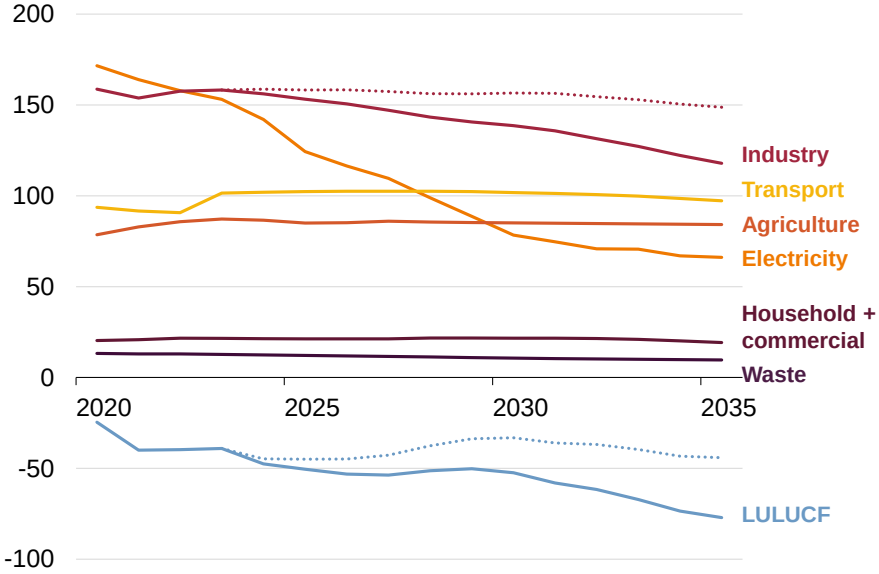
In our 2021 series of reports, *Towards net zero*, we raised the alarm about the potential adverse economic impacts of continuing to avoid putting downwards pressure on ambitions. At that time, our analysis showed that all economic sectors (except electricity) were facing two decades of disruptive change, and/or very high offsetting costs from 2030 onwards.

Since then the situation has improved in some sectors but not others (Figure 2.1). The industrial emissions curve is likely to bend thanks to Safeguard Mechanism reforms, though it remains to be seen how much Safeguard abatement comes from land-based offsets rather than industrial emissions reductions. The electricity sector is making good progress, but this is at risk of slowing in the 2030s.

Emissions in transport and agriculture show no sign of shifting (Figure 2.2 on the next page). If this persists to 2035, these sectors

Figure 2.1: Some sectors are bending the emissions curves towards net zero, but not all

Millions of tonnes of carbon dioxide-equivalent (Mt CO_2-e)



Notes: LULUCF = land use, land use change and forestry. Includes abatement from Safeguard Mechanism reforms. Assumes half of Safeguard abatement is achieved through land-sector offsets. Dotted lines indicate baseline scenario before Safeguard Mechanism reforms.

Source: Grattan calculations using baseline scenario in DCCEEW (2022) and Safeguard Mechanism reforms as legislated.

will face a highly disruptive 15 years attempting to reach net zero. The transport sector would need to reduce emissions by 6.5 Mt CO_2-e each year – equivalent to twice Qantas's emissions in 2021-22.[1] The agriculture sector would need to reduce emissions by 5.6 Mt CO_2-e each year – equivalent to slashing Australia's beef cattle herd by 15 per cent on 2021 numbers, every year.[2]

Alternatively, these sectors will face an overly high offset burden. At current prices for Australian Carbon Credit Units (ACCUs), if they were to achieve half their required emissions reductions through offsetting, the transport sector would incur an extra $12 billion in costs over the 15 years, and the agriculture sector $10 billion.[3]

2.2 Australia is off-track to meet its 2030 target

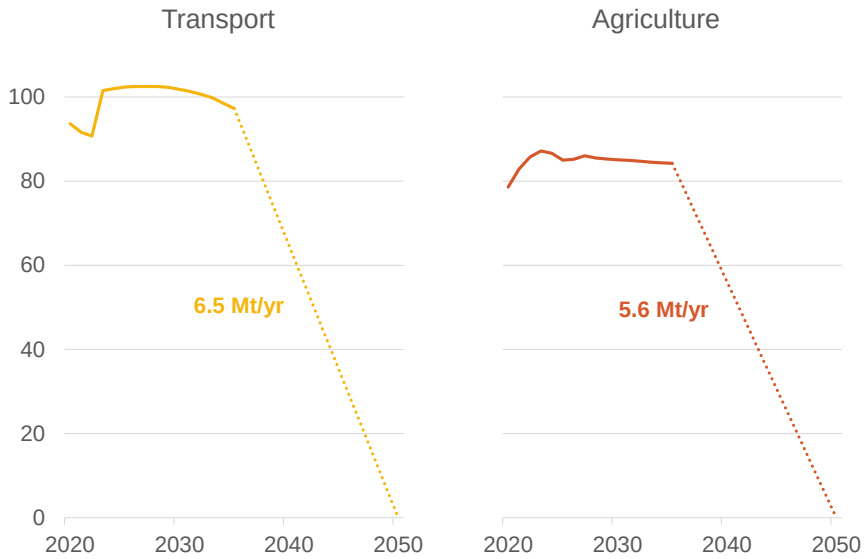
The government's most recent scenarios showed a potential emissions budget shortfall in 2030 of between 216 and 25 Mt CO_2-e (Figure 2.3 on the following page).[4]

The passage through Parliament of the Safeguard Mechanism reforms reduces the potential shortfall from 216 Mt CO_2-e to 60 Mt CO_2-e. While this puts the industrial sector on a glide path towards achieving net zero by 2050, the difficulty of achieving significant reductions in the sector should not be under-estimated.

The government's 2022 emissions projections implied a further 35 Mt CO_2-e of emissions reductions would be achieved through the Rewiring

Figure 2.2: Transport and agriculture are facing a disruptive transition after 2035

Millions of tonnes of carbon dioxide-equivalent (Mt CO_2-e)



Source: Grattan calculations based on DCCEEW (2022).

1. Grattan calculations based on a straight-line trajectory from 2035 to 2050. Qantas reported emissions of 3.06 Mt CO_2-e in 2021-22: Clean Energy Regulator (2023)
2. Grattan calculations based on a straight-line trajectory from 2035 to 2050. Enteric and manure-related emissions from feedlot and pastured beef cattle in 2021 were 37.31 Mt CO_2-e: Clean Energy Regulator (ibid)
3. Grattan calculations based on a straight-line trajectory from 2035 to 2050 and an ACCU price of $30/tonne
4. Without allowing for any voluntary cancellation of ACCUs.

the Nation plan. But by all industry assessments, Rewiring the Nation is not on track to deliver 82 per cent renewable electricity by 2030. A shortfall in 2030 now seems likely.

2.3 What could make up the 2030 shortfall?

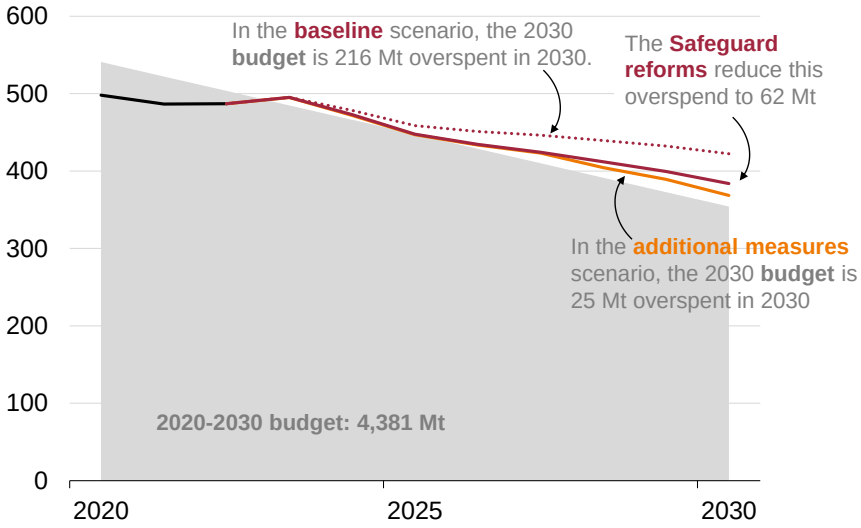
Revisions to the Safeguard Mechanism and earlier closure of coal power stations, along with bold projections for the growth of rooftop solar, are expected to deliver the bulk of emissions reductions to 2030. There are five coal power stations slated for closure in the next seven years,[5] and the Safeguard covers 215 large-emitting facilities. The government is forecasting rooftop solar will grow from 16 GW in 2022 to 41 GW in 2035.

The challenge for government is that meeting the emissions budget shortfall requires changing emissions patterns in other sectors. In these sectors, emissions come from a large number of small sources, whether the 5 million homes that use gas, the 24 million cattle expelling methane,[6] or the tailpipe emissions from more than 18 million light vehicles.[7]

Household electrification would need to proceed at the pace of around 1000 houses per day to cover the emissions shortfall, which seems logistically difficult.

Vehicle emissions standards, if introduced, would take time to achieve significant abatement. The government's discussion paper indicated an ambition to achieve 3 Mt CO_2-e of abatement over the period 2025-2030. A more ambitious standard (such as the one modelled by

Figure 2.3: Australia is not on track for its 2030 targets
Millions of tonnes of carbon dioxide-equivalent (Mt CO_2-e)



Note: Does not include Rewiring the Nation or voluntary ACCU cancellation.

Source: Grattan calculations based on DCCEEW (2022) and Safeguard Mechanism reforms as legislated.

5. Muja (2024), Eraring (2025), Callide B (2028), Yallourn (2028), and Vales point (2029).
6. Wood et al (2021a).
7. Wood et al (2021b).

Grattan in 2021) could achieve abatement of up to 30 Mt CO_2-e[8] – still not enough to close the gap should Rewiring the Nation fail to deliver.

Achieving an 82 per cent renewable electricity target by 2030 requires transmission and generation projects to achieve final investment decisions by 2027 at the latest – otherwise, they will simply not be built in time.

Rewiring the Nation's lack of progress comes down to broadly two problems: inflation, workforce and supply chain impacts on construction costs; and community opposition to expanding transmission and renewable generators into unindustrialised landscapes. Neither of these is easy to solve quickly. And both require considerable action (some of it politically difficult) by state governments as well as federal.

Of course, it is possible that unrelated events may close the gap without the government doing anything further. Slower-than-projected economic growth would reduce emissions. A swift end to the Ukraine war may reduce coal and gas production as international prices moderate. But conversely, events can push emissions in the other direction. Hope is a poor substitute for policy.

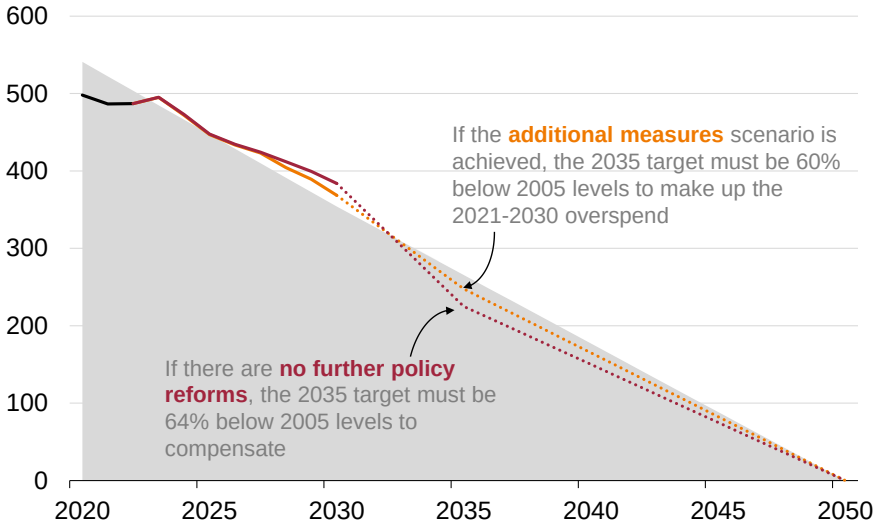
2.4 Making up the shortfall via the 2035 target

The Paris Agreement requires targets in subsequent target periods to be at least as ambitious as those that preceded it. While this is open to interpretation, in our view this implies the 2035 would need to represent a point on a straight line between the 2030 target and net-zero in 2050. This point would represent reductions of 57 per cent on 2005 levels and a five-year carbon budget of 1,504 Mt CO_2-e.

However, this assumes the 43 per cent target and the budget of 4,381 Mt CO_2-e are achieved. It does not account for making up a shortfall. While there is no obligation under the Paris Agreement Rules

Figure 2.4: Using the 2035 target to make up a budget shortfall implies a tougher abatement task

Millions of tonnes of carbon dioxide-equivalent (Mt CO_2-e)



Note: Does not include Rewiring the Nation or voluntary cancellation of ACCUs.

Source: Grattan calculations based on DCCEEW (2022) and Safeguard Mechanism as legislated.

8. Terrill et al (2021).

for countries to compensate for over-expenditure against one budget period in the following period, provided they do not reduce ambition, Australia could choose to do so, either as part of achieving other goals in international negotiations, or because it reduces the economic cost of failing to adjust.

Compensating for the projected 2030 shortfalls via the 2035 target implies the 2035 target would be between 60 and 64 per cent below 2005 levels, and a corresponding reduction in the five-year carbon budget. This is before any consideration of 'fair shares' of the global abatement task, or climate science, or state targets.

2.5 Being clear about risk and reward

Climate targets should be linked to the goal of limiting global temperature rise. Australia may only be responsible for slightly less than 1 per cent of global emissions, but one quarter of total global emissions come from countries in the same boat.[9] Together, the impact of these emissions on global temperatures is significant.

The current target for 2030 is consistent with limiting global temperature rises to around 2°C.[10] Others have described the profound negative effects this level of temperature rise could have on the economy, society, and the environment.[11] Even a 1.5°C temperature rise will cost business, households and governments.

In advising government on the 2035 target, the CCA should make very clear the risks that are being accepted by adopting targets consistent with different temperature rises, and how these affect the economy and the budget.

However, there are also potential rewards from reorienting the economy towards net zero. Australia could benefit from a global boom in demand for critical minerals. And it could capitalise on its advantages in renewable energy and raw materials to capture parts of global value chains, such as steel, aluminium, and ammonia.[12] As the CCA itself articulated in 2021, 'It no longer makes sense to think about lowering carbon emissions as a cost. It is a source of competitive advantage.'

But we will not capture these benefits if we wait. Becoming a 'clean energy superpower' is the ambition of many countries, and some already have a substantial headstart compared to Australia.

In advising the government on targets, the CCA should fully articulate the potential benefits that can be realised through greater ambition.

2.6 2050 target

The most recent IPCC Synthesis Report notes that all global (modelled) pathways that limit temperature rise to 1.5℃ or 2℃ involve 'rapid and deep and, in most cases, immediate greenhouse gas emissions reductions in all sectors this decade.'[13] The UN has called on developed countries to commit to reaching net zero as close as possible to 2040.[14]

A choice to move the 2050 target date is beyond the scope of the issues paper. But the CCA may wish to consider the extent to which having the flexibility to do so should inform the choice of a 2035 target.

9. Our world in data (2023). Includes LULUCF emissions.
10. Climate Analytics (2022).
11. See Bedo and Molloy (2020) for an accessible summary.
12. Wood et al (2022).
13. IPCC (2023, p. 20).
14. Guterres (2023).

3 Policy framework

There is no national policy framework to deliver on national emissions reduction targets. Progress to date has been achieved via sector-based policies targeted at specific sectors and this approach also applies current 2030 targets.

Beyond 2030 it will become increasingly necessary to deliver emissions reductions in other sectors (Figure 3.1).

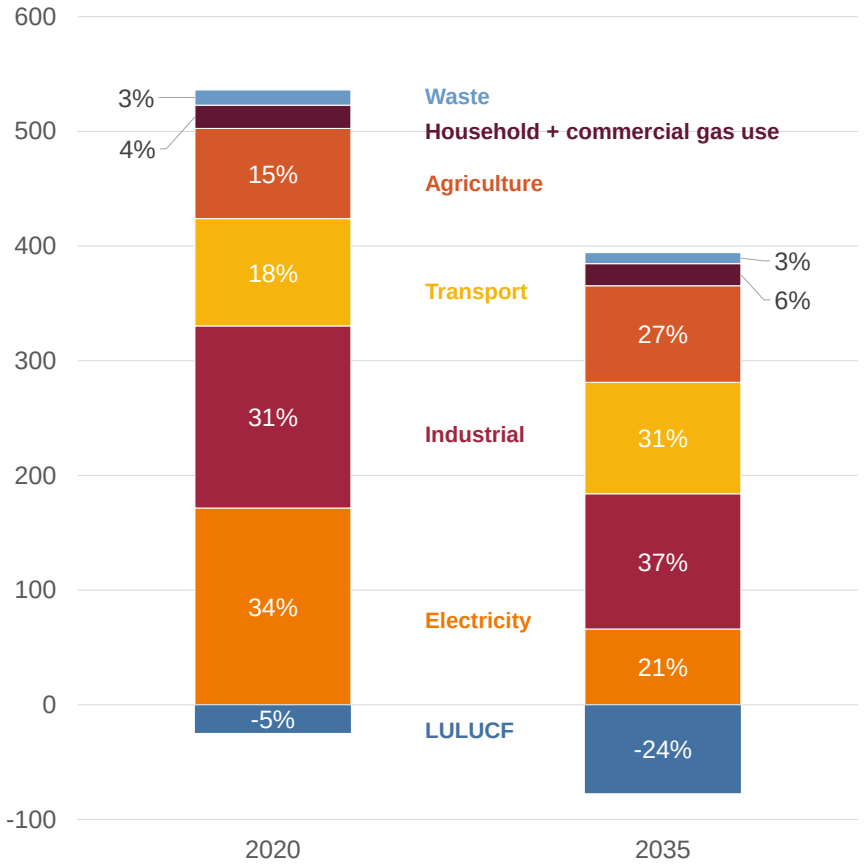
An economy-wide carbon price is politically unlikely for now and is only one part of a comprehensive national framework:

- A proportional allocation of the carbon budget to sectors.
- Sector-specific policies where they can be effective.
- Extension of inter-sector trading of carbon credits across sectors for economic efficiency. Australian Carbon Credit Units, Safeguard Mechanism Credits and possible vehicle emission credits are moves in this direction.
- Support for technology development in hard-to-abate sectors.
- Regulation in sub-sectors less amenable to carbon prices such as household gas consumption and light vehicle transport.
- Evolution of methods, technologies and policy mechanisms for domestic offsets and international integration
- Tracking and reporting progress, best achieved with targets, policies, and mechanisms that sum to the national targets.

A series of Grattan reports published in 2021 make recommendations on sector-based policies to close the gap between today's projections and future targets. This is a practical model that will require

Figure 3.1: By 2035, transport and agriculture will make up larger proportions of total national emissions

Millions of tonnes per annum of carbon dioxide-equivalent (Mt CO_2-e)



Note: Assumes half of abatement from Safeguard is achieved via land sector offsets. Does not include Rewiring the Nation.

Source: Grattan calculations based on DCCEEW (2022) and Safeguard Mechanism as legislated.

coordination across sectors and between the Federal Government and the states and territories.[15]

3.1 Sector pathways

Figure 2.1 on page 4 shows where progress has been made, what is projected with announced policies, and what is yet to come.

3.1.1 Electricity Generation

Electricity's emissions fell from 197 Mt CO_2-e in 2005 to 172 Mt CO_2-e in 2020, having peaked at 205Mt CO_2-e in 2010.[16]

The projected fall to 79 Mt CO_2-e in 2030 in the baseline scenario is due to a combination of growth in renewable energy (grid and behind the meter) to 68 per cent of generation and a fall in coal and gas generation, particularly as coal generators age and exit the market. It represents a 60 per cent emissions reduction against the 2005 level, i.e., more than a proportional share for the sector.

The baseline projection to 66 Mt CO_2-e in 2035 extends the assumptions of growth in renewables and coal closure.

As noted in Chapter 2, current industry consensus is that investment in renewable electricity generation and the transmission to support it is well behind what would be necessary to deliver the current target of 82 per cent renewables share.

The pathway to net zero for the electricity sector lies in increasing the momentum of renewables investment while ensuring that the non-renewables share is also falling with the closure of coal-fired generation. One way to deliver this momentum would be to consider modifying current sector-based policies such as the Renewable Energy Target (RET) or the Electricity Safeguard. Alternatively, a low-emissions target for the sector may also be an option. The advantage of adapting the Electricity Safeguard (currently a non-binding constraint on the sector) is that it could enhance policy links with the industry sector.

Addressing the availability and cost of physical resources (labour and materials) and maintaining an acceptable reliability standard are constraints that need urgent attention.

3.1.2 Industry

Annual emissions from industry grew from 130 Mt CO_2-e in 2005 to 162 Mt CO_2-e in 2019, much of this driven by expansion of gas and coal exports.[17] Previous projections indicated the emissions would hover around this level until 2030. The legislated revisions to the Coalition's Safeguard Mechanism have put the covered sub-sector on track to deliver its proportional share of emissions reduction, being a target of 99 Mt CO_2-e in 2030. How much abatement is achieved within the sector versus through land-based offsets remains to be seen.

A pathway to net zero for industry could build on the Safeguard Mechanism by lowering the coverage threshold to 25,000 t CO-2e per annum, supporting technologies in difficult industries, and aligning the sector's aggregate baseline with the 2035 target.

To achieve net zero, the Government will need to ensure that using emissions intensity baselines does not allow sector emissions to grow rather than decline; and that new entrants with large emissions do not lead to over-budget carbon expenditure that cannot be covered by the use of ACCUs.[18]

15. The full series of reports is available on Grattan's website at www.grattan.edu.au/towards-net-zero/
16. DCCEEW (2022).
17. Wood et al (2021c).
18. Wood et al (2023a).

For the thousands of facilities below the lower threshold, governments will likely need to consider mechanisms such as existing state-based energy efficiency obligations.

The Federal Government has created a suite of funds, one of the objectives being to close the cost gap for transformational industrial development. Although there is little detail yet available, the recently announced Hydrogen Headstart program is an example.

As we outlined in our 2022 report, *The next industrial revolution*, the design of these funds is critical if they are to play a role in transformational change. They should focus on opportunities for export-led growth that capitalises on Australia's strategic advantages. They should avoid locking in future emissions or underwriting growth in emissions. They need to have stable long-term settings, recognising the long timeframes involved in commercial decisions around industrial assets. And they need to be administered at arm's length from government, through independent agencies.[19]

3.1.3 Household and commercial gas use

Household gas use accounted for 9.5 Mt CO_2-e of emissions in 2020; the commercial sector around 2 Mt CO_2-e. These emissions come from many small sources – gas for heating water, heating spaces, and cooking – that are widely scattered. There are 4.5 million gas water heaters in Australian homes, 5 million gas stoves or cook-tops, and 2.7 million home heating systems using mains gas.[20]

Emissions patterns from these sources change very slowly. Assets that use gas tend to be replaced only when they reach the end of their useful life. A gas water-heater installed today will still be burning gas in 2035. An industrial furnace installed today could still be burning gas in 2063.

To reach net zero, governments need to start changing asset replacement patterns now. Victoria and the ACT in particular have significant emissions from household gas use, and have net-zero goal dates of 2045, five years earlier than the national target date.

Governments should provide certainty about direction and timing by setting dates for the end of gas. They should prepare and roll out long-term, consistent, targeted communications campaigns on why households should switch to all-electric, and how best to do it. Governments should also ban new gas connections to homes, shops, and small businesses.

Governments need to lower the cost hurdles to household electrification, because electric cook-tops, home heaters, and water heaters often cost more to buy than the gas equivalents. Governments should pay for upgrades to social, community, and Indigenous housing, and provide low-interest loans or similar financing agreements for homeowners, and tax incentives for landlords.

And lastly, at a future date, governments should phase out the sale of natural gas appliances, so that the last remaining gas appliances are replaced with electric ones.

These activities must be supported by plans to safely decommission the gas network, and upgrade the electricity grid so it can cope with the extra demand.

3.1.4 Transport

Annual emissions from transport grew from 82 Mt CO_2-e in 2005 to 93 Mt CO_2-e in 2020. The reasons include population growth, larger vehicles, increased freight movements, and more flights. Emissions dropped sharply, by 7 Mt CO_2-e, in 2020 due to the COVID-19

19. Wood et al (2022, pp. 29–42).
20. Wood et al (2023b). Assumes every house with a gas connection has a gas stove. Excludes LPG appliances.

pandemic, but the Federal Government projects they will rebound and reach 100 Mt CO_2-e by 2030.[21]

Modest adoption of electric vehicles is projected to mean transport emissions will fall slightly to 99 Mt CO_2-e by 2035.

A pathway to net zero for transport requires emissions standards that phase out carbon-emitting light vehicles by 2035. Policy needs to extend to heavy vehicles, road and rail by the early 2030s. Low-emission technologies that approach commercial viability in shipping and aviation will need to be developed ahead of deployment beyond 2030.

The Federal Government has made a start with its proposed national fleet emissions standard for new passenger and light commercial vehicles. This sub-sector is responsible for around 60 per cent of overall transport emissions. If the standard tightens to zero emissions by 2035, it will signal an end date for the sale of new petrol and diesel light vehicles, consistent with other major economies and with International Energy Agency advice. And it would encourage car manufacturers to supply low- and zero-emissions vehicles that meet Australian consumers' range and performance demands.

Governments will need to work with electricity distribution grid companies and charging facility suppliers to ensure that charging infrastructure keeps pace with the growth in electric vehicles.

Cutting emissions in the light vehicle fleet may ease the immediate pressure to find emissions reductions in other modes of transport, such as aviation and long-distance trucking, where affordable alternatives to fossil fuels are harder to identify. In these sectors, governments should make small bets on all the alternatives, and plan scenarios for each should it become the clear winner.

21. DCCEEW (2022).

In the next few years, governments should work with industry to test all options for reducing heavy vehicle and aviation emissions. These could include:

- Support targeted trials of zero-emissions trucks to assess their performance under Australian conditions and practices.
- Develop national standards and certification for renewable hydrocarbons (low-emissions fuels, generally made from biomass or waste, that can be blended up to 100 per cent with no engine modification), based on their emissions intensity, building on work already being done on hydrogen.
- Establish a renewable fuel standard for diesel, aviation fuel, and shipping fuel, that requires fuel wholesalers and retailers to buy certificates or to blend small amounts (e.g. 1 per cent) of renewable hydrocarbons into fuels sold by 2025, with the target rising in following years.

The transition of the trucking fleet and the average lifetime of the vehicles means that momentum will need to be created in the 2026-2035 decade.

While diesel trucks remain widespread, the Federal Government should apply progressively tighter carbon emission requirements on the engines and tyres of new diesel trucks.

To make it easier and more viable for owners to choose a cleaner truck, the Federal Government should scrap regulations requiring Australian trucks to be 2 per cent narrower than the global norm, and update regulations that limit allowable loads based on tyre configurations and tyre widths.

To accelerate the switch to zero-emissions trucks, the Federal Government should then set binding zero-emissions sales targets for

sellers of new trucks. Targets for rigid trucks should reach 100 per cent, and for articulated trucks 70 per cent, by 2040.[22]

3.1.5 Agriculture

The agriculture sector was responsible for 15 per cent of Australia's emissions in 2020, emitting 73 million tonnes. This is down from 86 million tonnes in 2005, mainly due to lower livestock numbers: cattle and sheep are responsible for 75 per cent of emissions in the sector. Assuming herd numbers recover from recent years of drought, emissions are projected to rise, reaching 79 million tonnes by 2030 and staying around that level through to 2035.[23]

The pathway to net zero for agriculture is likely to require an initial mix of support and regulation covering the quarter of agricultural emissions coming from on-farm activities, including vehicles, manure management, and fertiliser use. The reality is that there are not yet credible ways to eliminate methane from grazing cattle and sheep, the largest source of sector emissions.

It will take time to implement better manure and fertiliser management across the nation's 50,000 broadacre farms; and electric vehicles and equipment are not yet fully available to substitute for diesel ones. Nonetheless, there are things that can be done now.

The Federal Government should sharpen the incentives for farmers to deploy low-emissions technologies and practices that are available. This will require improving the Emissions Reduction Fund.

The Government should also invest more in programs that deliver practical advice to farmers. The Carbon Farming Outreach Program is only funded for three years, which is not sufficient to support a multi-decade transformation of the sector.

Without major changes in meat consumption, it is difficult to see gross emissions from agriculture falling by even 50 per cent by 2050. Addressing this issue of emissions from grazing livestock means supporting R&D into methods to reduce emissions from livestock,

Governments have a crucial role in supporting R&D of farming practices that might enable Australia's livestock producers to thrive in a net-zero future. Even with this support, it is likely that the agriculture sector will still be a major source of emissions in 2050 – which must be offset at the expense of taxpayers, farmers, and consumers.

Overall, Australian farmers stand to benefit considerably from actions that reduce emissions and limit climate change. Smarter land management can boost farm productivity and store carbon, creating carbon credits (ACCUs) that will be in-demand as the economy approaches net zero. The more that farmers can reduce emissions, the fewer credits they will need to offset their own emissions, and the more they can sell to others – diversifying their revenue stream. Curbing emissions today is the key to maximising this economic opportunity. Section 3.2 covers offsetting – including by farmers – in more detail.

3.1.6 Land use

The land sector includes land-based processes that are not directly related to agricultural production, such as land clearing, forestry, and changes in soil carbon content. It is the only sector that currently removes more carbon from the atmosphere than it emits, reducing Australia's emissions by 39 Mt CO_2-e in 2020 (compared to sector emissions of 85 Mt CO_2-e in 2005). This net reduction is projected to increase to 43 Mt CO_2-e by 2035.[24]

The main contribution that land use will make to smoothing the pathway will involve the creation of offset credits.

22. Terrill et al (2022).
23. DCCEEW (2022).
24. Ibid.

3.2 Offsets

Offsetting is a difficult part of the net-zero conversation. Some see it as an excuse to delay reductions, others as bringing about unacceptable social change, particularly in rural areas. It has been plagued by integrity problems, and there is understandable cynicism about its potential.

In future, demand for offsetting units should be driven by strong policies to reduce emissions and achieve net zero. Some sectors have fewer options to reduce emissions than others, and will come to dominate the demand for units as net zero gets closer (Figure 3.2). International markets for units may also be a source of demand.

The theoretical physical limit for Australian supply of offsetting units is unlikely to be a barrier; but beneath this limit there is considerable uncertainty about costs, measurement, and permanence (Figure 3.3 on the following page). Having a good supply of offsetting units by 2050 as part of achieving net zero will require policies that encourage emissions reductions, and considerable effort to deploy removal projects.

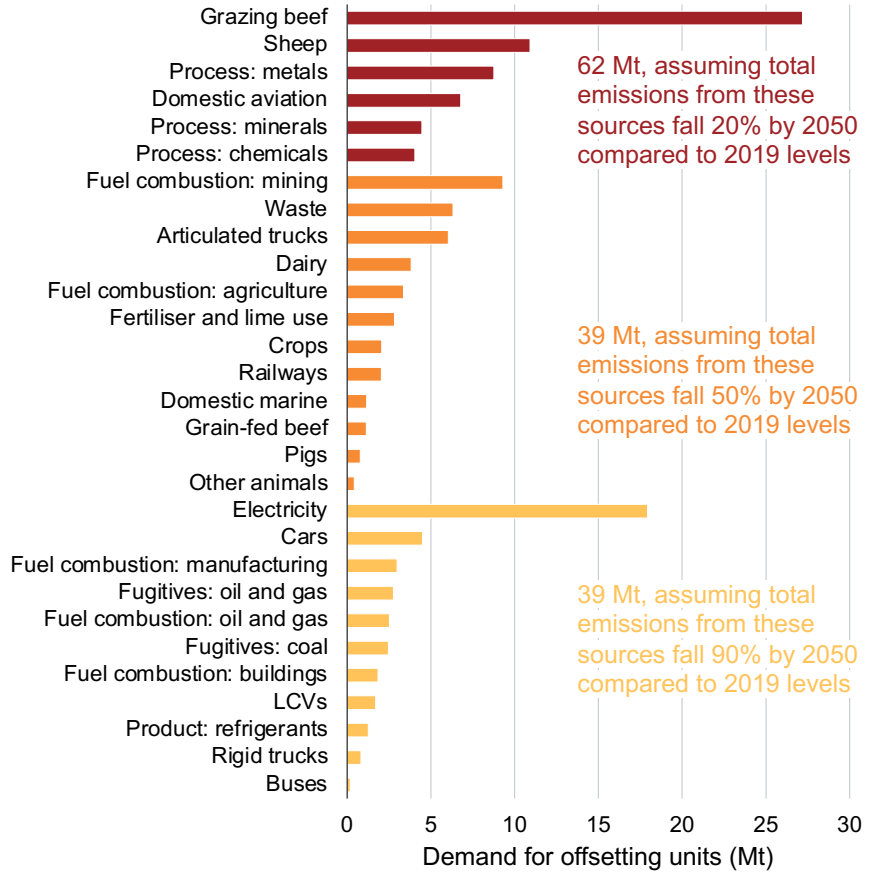
None of this changes the reality: in pursuit of net zero, offsetting will be required because there will be emissions we cannot eliminate, and some where we will not be willing to pay the price to do so. The only option to deal with these emissions is to deliberately remove carbon dioxide from the atmosphere to offset them.

Processes to permanently remove carbon dioxide from the atmosphere are uncertain or expensive – or both. Emitting is certain: we know that every tonne of emissions in the atmosphere contributes to global temperature rise. For this reason, offsetting is not a direct substitute for avoiding or reducing emissions in other ways.

Australia has the structures in place to support offsetting. Our governments should be clear about the role of offsetting in each policy they implement in pursuit of net zero. They should also make sure

Figure 3.2: All sectors are likely to have some demand for offsetting units in 2050

Emissions source



Notes: Mt = million tonnes. LCVs = Light Commercial Vehicles. Chart shows possible demand for offset units if emissions fall from current level by the percentages shown in 2050. Emissions from some very small sources (e.g. motorcycles and military fuel use) are not included. Note that some sectors may offset from within their own sector (for example, beef-cattle farmers undertaking soil carbon management).

Source: Wood et al (2021d).

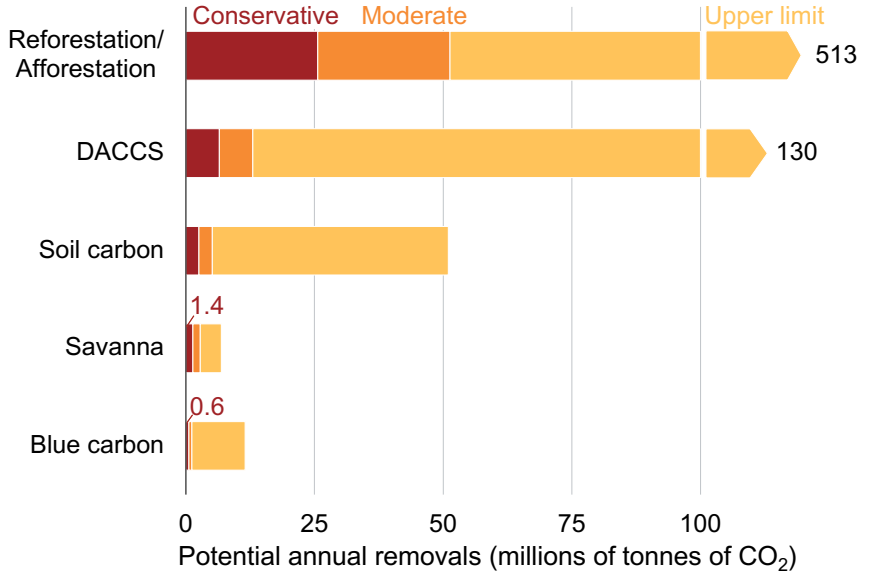
certification for offsetting units maintains high integrity. Otherwise, companies and individuals will bear costs with no corresponding drop in emissions.

As policies begin to drive demand for offsetting units, governments should step back from being the major buyers, and focus on underwriting the development of technologies and practices to remove carbon dioxide from the atmosphere. This includes acting more as a buyer of last resort for high-quality Australian offsetting units; or buying units to offset government emissions.

There is still considerable uncertainty about the costs, permanence, and measurement of many offsetting activities. Additionality is the most contentious (and hardest to measure) criteria. No policy will ever achieve perfect additionality, but it can be managed and maximised. The government could allocate resources to commissioning regular independent reviews of ERF projects which supposedly met the offset integrity standards, to assess whether they genuinely were additional. This could provide a basis to adjust methods to ensure additionality. Existing projects could be grandfathered, but new ones would need to meet tighter standards. This will minimise the 'deadweight loss' of non-additional projects. These are barriers to scaling up the offsetting market. Government should support R&D and early-stage deployment to help lower these barriers, particularly in improving measurement.

Imports and exports of offsetting units will become more important as all countries move towards net zero. There is no need to assume Australia must be self-sufficient in offsetting units, but local supply requires our governments to implement strong policies to drive emissions reduction coupled with policies to encourage removal of carbon dioxide from the atmosphere. The Federal Government should introduce rules to support international trade in offsetting units, both for exports and imports.

Figure 3.3: Physical limits to Australia's potential to remove carbon from the atmosphere are well above economic and technical limits



Notes: DACCS = direct air capture with carbon storage. A full explanation of assumptions and sources can be found in Appendix B of Wood et al (2021d).

Source: Wood et al (ibid).

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