



Australian Government

Built Environment Sector Plan

Treasury and Department of Climate Change,
Energy, the Environment and Water
September 2025



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In the spirit of reconciliation, the Treasury acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples.

Ministerial foreword

Our built environment – homes, workplaces and spaces for community gathering – is at the centre of our lives. Its decarbonisation presents an opportunity to reduce greenhouse gas emissions, and ensure buildings are resilient to a changing climate.

Tried-and-true technologies are already in place to improve our building stock. Accelerating the uptake of these technologies will enable more Australians to save on their energy bills and improve their wellbeing. Innovative construction methods can help unlock further benefits and deliver the quality and quantity of new homes Australia needs now and into the future.

The Built Environment Sector Plan is an Australian Government strategy that provides emissions reduction pathways for the sector, to 2050. Together, the Net Zero Plan and six sector plans (the Plans) articulate Government priorities and ways to reduce greenhouse gas emissions and support ongoing and new investment in low-emissions and renewable activities. The 2035 target and the Plans draw on independent expert advice from the Climate Change Authority, as well as CSIRO, and in-house analysis from Treasury and across government.

Delivering new homes and buildings that are energy efficient and climate resilient across our built environment will create new, highly skilled trades, services, manufacturing and construction jobs. It will be essential to promote these employment and training pathways to ensure that all Australians can access the opportunities that the net zero transition brings.

In achieving these goals, we need to grasp opportunities and ensure no Australian is left behind. Currently, Australians on lower incomes or those renting, are more likely to live in homes that are energy inefficient – meaning higher bills, uncomfortable temperatures, and in the worst case, health problems. A fair and equitable journey to net zero will ensure that savings, wellbeing and health benefits are available to everyone.

Our net zero ambitions, along with the National Housing Accord target to deliver 1.2 million well located homes by June 2029, will help to deliver new homes and buildings that are more energy efficient and with a lower emissions impact. The Built Environment Sector Plan sets out a phased and scalable approach to upgrading existing stock while still delivering new supply.

The Built Environment Sector Plan also adopts a holistic approach to emissions reduction in the built environment. In most cases, solutions are already technically proven, and many have good return on investment.

To realise a fair and equitable transition, the Australian Government will work in partnership with industry and with governments at all levels. A significant work program is underway and will be reviewed and enhanced over the coming years. Together, we will reach net zero by 2050.

A handwritten signature in black ink, appearing to read 'Clare O'Neil'.

The Hon Clare O'Neil MP

Minister for Housing, Minister for
Homelessness and Minister for Cities

A handwritten signature in black ink, appearing to read 'Chris Bowen'.

The Hon Chris Bowen MP

Minister for Climate Change and Energy

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Summary

The Australian Government is committed to achieving our 2035 target of 62–70% below 2005 levels and net zero by 2050, creating new opportunities for businesses, households and workers across Australia.

The Built Environment Sector Plan (BESP) is one of six sector plans (Figure 1) under the Australian Government’s Net Zero Plan, which charts Australia’s pathway to net zero by 2050. The Net Zero Plan outlines five priority areas for action: decarbonising and expanding the electricity network, electrification wherever possible, switching to low-carbon fuels, technology innovation and carbon removals.

The six sector plans provide a more granular analysis of Australia’s emissions reduction opportunities. They outline how each sector contributes to Australia’s transition to net zero and the priority areas for action.

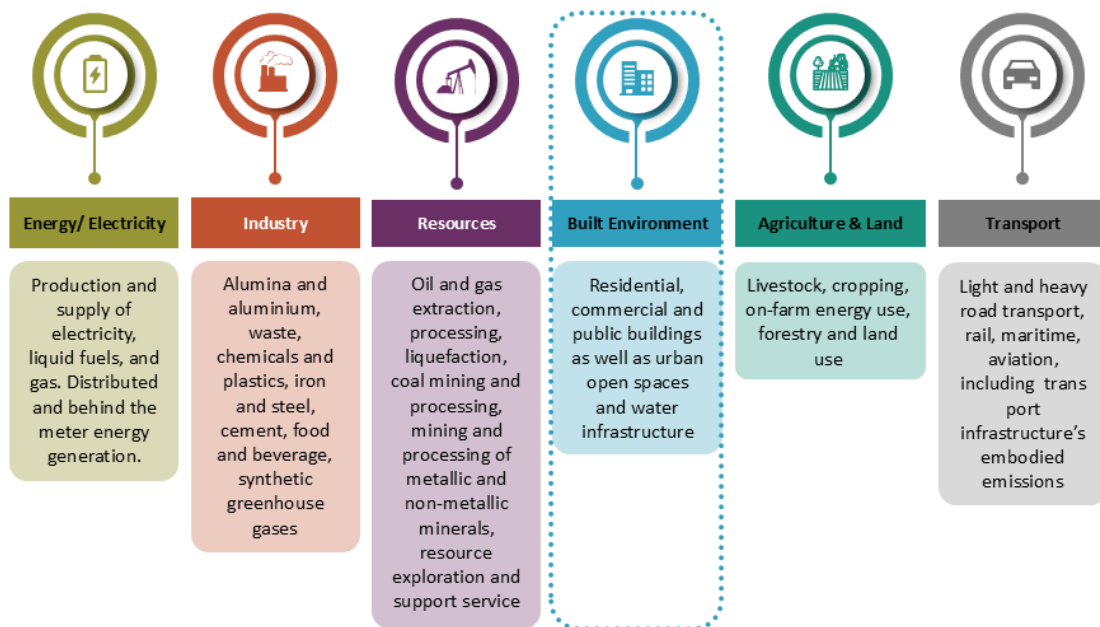


Figure 1 – Scope of sector plans

Our built environment comprises more than 11 million residential buildings and 1 million non-residential buildings, as well as parks, open urban spaces and water infrastructure.

Greenhouse gas emissions from the built environment sector contribute to around 5% of Australia’s direct emissions (Scope 1 emissions), primarily from gas used in buildings for heating, cooking, hot water, and hydrofluorocarbon (HFC) emissions connected to air-conditioning and refrigeration equipment. A small number of direct emissions come from fuel used in construction machinery.

The built environment sector is intrinsically linked to the electricity and energy sector and is responsible for 48% of the emissions arising from electricity generation (Scope 2 emissions). The electricity and energy sector is the largest source of emissions – approximately 34% – of annual national direct emissions.

Indirect emissions (Scope 3 emissions) are also derived from building materials and referred to as embodied carbon. Industry and government are developing systems for measuring the embodied carbon within the built environment, including in the manufacture of steel, concrete and other essential building materials. Scope 1 emissions from materials manufactured in Australia are addressed under the Industrial Sector Plan.

The BESP adopts a holistic approach to emissions reduction in the built environment. It focuses on how to reduce Scope 1, 2 and 3 emissions and considers how to support a fair and equitable transition to net zero to realise the benefits of this transition to households, communities and businesses throughout Australia.

Minimising the use of gas in existing buildings and phasing down HFCs has the greatest potential to impact Scope 1 emissions. Technology is already commercially available; however, the upfront cost to replacing gas with electrical appliances can be a significant financial concern for many households and businesses. Government has an important role to play in ensuring policy settings promote public and private investment, and that these investments are coordinated across all levels of government.

Through the BESP, the Australian Government is setting the long-term strategic intent of this transition to ensure Australia's homes and businesses – and the people occupying them – can benefit from the transition to net zero.

Most of Australia's current building stock will still be in use in 2050. This means that achieving net zero will require millions of homeowners, businesses and building occupants to seize opportunities to electrify, improve energy performance, and install new appliances and equipment. Building upgrades deliver long-term benefits through lower operating costs, increased thermal comfort and improved health outcomes for building owners and occupiers. These decisions will happen in parallel with housing shortages, cost-of-living pressures, pressure on industry and the need to increase resilience in a changing climate.

It is important that the built environment transition is fair and equitable. For example, low-income owner-occupiers face disproportionate upfront cost barriers to retrofitting their home, and renters have limited ability to alter their rental property.¹ Public and social housing includes some of the lowest energy performing homes in Australia and tenants often face challenges in improving their homes' energy performance and thermal comfort. Similarly, First Nations people have a lower rate of home ownership (41% compared to 66% of all households²) and thus are more likely to rent and be impacted, while remote communities face additional costs due to distance and labour shortages.

A mix of policies will be needed to overcome these barriers and drive action. The Australian Government is working closely with state and territory governments, through a range of fora including the Building Minister's Meeting and the work of the Australian Building Codes Board (ABCB). A strong foundation of programs and projects are in place providing the building blocks for future initiatives (see Chapter 4). This includes the Social Housing Energy Performance Initiative

1 Australian Bureau of Statistics, Australia: Aboriginal and Torres Strait Islander population summary, Australian Government, 1 July 2022, accessed 11 August 2025; Australian Bureau of Statistics, Housing: Census, Australian Government, 28 June 2022, accessed 11 August 2025.

2 Australian Bureau of Statistics, [Australia: Aboriginal and Torres Strait Islander population summary](#), Australian Government, 1 July 2022, accessed 11 August 2025; Australian Bureau of Statistics, [Housing: Census](#), Australian Government, 28 June 2022, accessed 11 August 2025.

which is providing crucial energy performance upgrades to more than 100,000 social housing properties across Australia to ensure lasting benefits. These programs and projects will be progressively reviewed and adapted.

A phased and scaled approach will be important to provide industry with the best opportunity to grow and train the skilled workforce needed to transition existing stock while still delivering new supply – working towards meeting the National Housing Accord target of 1.2 million new homes.

Development of the BESP has been informed by stakeholder engagement, including ministerial level forums, industry and consumer meetings and one-on-one engagements.

Independent expert advice from the Climate Change Authority and in-house analysis from across government has informed the path forward. This includes insights from Australia's Net Zero Transformation: Treasury Modelling and Analysis and supplementary energy market modelling conducted by the Department of Climate Change, Energy, the Environment and Water.

The work of the Energy and Climate Change Ministerial Council, advancing the Update to the Trajectory for Low Energy Buildings, has also been integral.



Introduction

Australia's built environment comprises more than 11 million residential buildings and 1 million non-residential buildings. It includes parks, open urban spaces, water infrastructure, and buildings with high levels of electricity consumption, such as data centres (for more details refer to the Energy and Electricity Sector Plan).

Residential buildings (our existing homes) are the largest share of the built environment, making them the biggest abatement opportunity through electrifying and improving the energy efficiency of existing residential building stock.

Reducing emissions across the Australian economy and environment is critical to mitigating and adapting to the impacts of climate change. The Government's net zero target and transition pathways provide a predictable and stable path for Australian households, communities and businesses to realise the opportunities and benefits of this transition.

Our homes are important spaces for our health and happiness, and are the largest value asset many Australians may own. The Australian Government recognises the importance of secure and affordable housing for all Australians, which is why the Government set an ambitious target of an additional 1.2 million homes by mid-2029.

Occupants and owners can retrofit technology to upgrade their home's electrification and energy performance. This technology is commercially available and has long-term benefits for occupants and owners. Scale and cost are the biggest barriers stopping people from upgrading the electric and energy performance of their homes. Other barriers include:

- insufficient knowledge
- lack of time to consider electrification and energy performance upgrades
- behavioral biases
- lack of agency
- complexity with ownership structures (for example, split incentives between landlords and tenants or joint decision-making in strata properties).

The cost to electrify commercial buildings can also be high (anywhere between \$100,000 and \$5 million³). There are specific barriers including uncertain returns on investment, long payback periods and technical constraints such as insufficient space in service areas for heat pumps.




For these reasons, actions under the BESP seek to achieve the following key outcomes:

- A low-emissions and low-energy built environment to support Australia's emissions reduction targets.
- A built environment that is fit for purpose, liveable, provides thermal comfort and is resilient to a changing climate.
- A fair and equitable built environment transition where no one is left behind.

3 Climate Change Authority, [Sector Pathways Review](#), Australian Government, 2024, page 147.

Built Environment Sector Plan

Table 1 – Outcomes and supporting objectives of the Built Environment Sector Plan

| Outcomes | Supporting objectives |
|--|--|
| Emissions reduction  | <p>A low-emissions and low-energy built environment to support Australia's targets.</p> <ul style="list-style-type: none"> • Electrification of existing and new buildings (Scope 1). • Phasing down hydrofluorocarbons (HFCs) used in refrigeration and air conditioning, by 2036 (Scope 1). • Flexible electricity demand in existing and new buildings to support the transition to variable renewable generation in the electricity sector (Scope 2). • Solar and coordinated energy storage with continued solar uptake, paired with choices for batteries, bidirectional integration of electric vehicles and other consumer energy resources (Scope 2). • Retrofitting existing buildings to improve thermal performance and efficiency of appliances with capacity for further upgrades as conditions change (Scope 2). • Increasing material efficiency and/or use of lower emissions materials to reduce embodied carbon in new building construction and existing building retrofits (Scope 3). |
| Climate resilience and liveability  | <p>A built environment that is fit for purpose, liveable, provides thermal comfort and is resilient to a changing climate.</p> <ul style="list-style-type: none"> • Residential, commercial and public buildings are designed and constructed to ensure improved resilience of buildings and their occupants to climate-related hazards expected during their life. • Retrofitting existing residential, commercial and public buildings to improve resilience and thermal comfort with capacity for further upgrades as conditions change. • Public urban spaces including parks and gardens are designed and managed to ensure climate change resilience. • Climate-ready planning through urban design, building location and orientation. |
| Fair and equitable transition  | <p>A fair and equitable built environment transition where no one is left behind.</p> <ul style="list-style-type: none"> • Support for lower income and disadvantaged households and businesses (including tenants, culturally and linguistically diverse cohorts, and those in remote communities) to electrify and undertake upgrades to their home to improve energy performance. • There is a holistic and inclusive approach to decarbonising the built environment where the needs, interests and resources of all social groups are integrated equally into policy and decision making. • First Nations cultural values are considered in decision making about places and processes. |

Chapter 1. Benefits of taking action

The transition to net zero presents a range of opportunities and substantial benefits to Australia's households, communities and businesses.

Benefits for households

As Australia transitions to net zero, and our electricity grid reduces reliance on emissions intensive fuels such as coal, households can play an important part in our electrified future.

Energy costs are a significant proportion of household spending. Households spend around 5% of their disposable income on energy, on average. This proportion more than doubles to 11% for households in the bottom 20% of incomes.⁴ Electrification technologies can significantly reduce these costs (Figure 2). Electric appliances typically reduce energy costs as they are more efficient than fossil fuel alternatives.

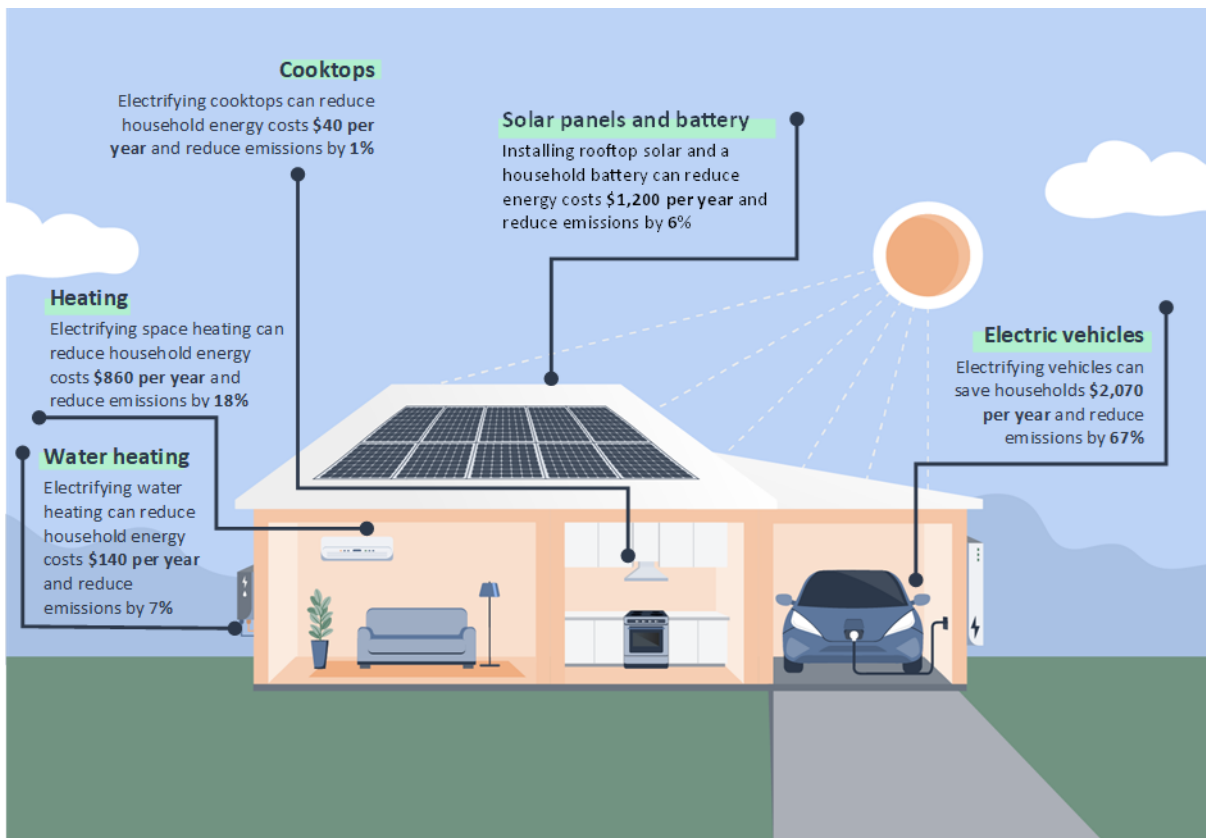


Figure 2 – Treasury (2025) [Australia's net zero transformation: Treasury modelling and analysis](#), Treasury, accessed 16 September 2025.

Note: Annualised real costs from 2030 to 2050, including upfront, financing and ongoing costs. Assumes a typical two-to-three-person household with two vehicles, average consumption for home heating, cooking and hot water, and purchases a 10.6kW solar system and 10kWh battery. For more detail, see 'Australia's Net Zero Transformation: Treasury Modelling and Analysis'.

⁴ Treasury analysis of 2015–16 ABS Household Expenditure Survey of spending on power and vehicle fuel.

Households can electrify household appliances, such as cooktops, hot water systems, space heating and vehicles and they can reduce costs further by installing rooftop solar and home batteries.

Electric appliances can have higher upfront costs. However, lower ongoing running costs can result in cost-savings for households over time. The Australian Government's Household Energy Upgrades Fund and Cheaper Home Batteries Program, as well as programs run by state and territory governments, can help households get started by offsetting upfront costs. The Nationwide House Energy Rating Scheme (NatHERS), which previously provided ratings for new homes and is now being expanded to include existing homes, gives information to help households identify cost-effective upgrades and choose better performing homes. Banks can use the ratings to verify green finance for upgrades, assisting them to lend capital to Australians to overcome upfront costs.

Cheaper Home Batteries Program

The Government is rolling out the Cheaper Home Batteries Program to help more people install batteries.

Australian households, businesses and community organisations can get a discount of around 30% on the upfront cost of installing small-scale battery systems (5 kWh to 100 kWh). Since 1 July, Australians have installed over 55,000 batteries which represents over 1GWh of extra battery storage capacity.

This program is helping consumers reduce electricity bills at the same time as reducing broader system costs. This will support Australians to make the most of cheap and clean solar power, storing it for later use, while reducing peak demand and creating a more stable electricity grid.

Homes with highly energy efficient thermal shells (well insulated walls and roofs) need less energy to keep warm or to cool, resulting in lower energy bills and better resilience to heatwaves and cold temperatures. Research by Climateworks Centre found that quick-fix thermal upgrades packaged with fully electrified appliances would deliver a positive benefit-cost ratio for most Australian households. These upgrades, combined with rooftop solar, would provide annual net savings on average of between \$909 and \$1,578 from the first year. ^[5]

Electrification and improved thermal performance can improve occupants' health. Pollutants from gas cooking and heating appliances are linked to higher rates of childhood asthma. Exposure to gas stove emissions is associated with over 12% of the total asthma burden in children aged 14 years or under.⁵ Extreme temperatures increase the risk of heart problems and exacerbate existing health conditions.⁶

Renewable electricity generation, storage and electrification can also increase energy security, particularly for households in rural and remote areas. By reducing reliance on grid infrastructure and

5 LD Knibbs, S Woldeyohannes, GB Marks, & CT Cowie, 'Damp housing, gas stoves, and the burden of childhood asthma in Australia'. *Medical Journal of Australia*, 2018, 208(7):299–302. doi:10.5694/mja17.00469

6 S Hundessa et al, 'Global and regional cardiovascular mortality attributable to nonoptimal temperatures over time'. *Journal of the American College of Cardiologists*, 2024, 83(23):2276–2287. doi:10.1016/j.jacc.2024.03.425

transported fossil fuels, such as diesel and bottled gas, homes are more resilient when isolated due to natural disasters and extreme weather events. Where solar panels and a battery are used (in isolation or in connection to the grid) homes are also shielded from fluctuations in electricity prices.

Benefits for the community

Electrification and energy–efficiency upgrades can also benefit communities, not just individual households.

High thermally performing buildings can deliver widespread community health benefits on a regular basis and during heatwaves, reducing stress on the healthcare system. Temperature control is vital for occupant wellbeing and alleviating associated healthcare and economic impacts.⁷

The Victorian Healthy Homes Program found that thermal shell upgrades and energy efficiency measures resulted in significant health improvements for vulnerable, elderly occupants. The benefits included healthcare cost savings alongside physical health and quality of life improvements. The savings to the healthcare system were estimated to be \$887 per person over the winter period.⁸ Similarly, a home insulation subsidy in New Zealand was associated with reduced hospitalisations, particularly for respiratory disease, asthma, and ischaemic heart disease in older adults.⁹

Improving energy efficiency and enabling load shifting, helps reduce peak electricity demand, reducing the scale of investment needed to maintain and enhance our electricity grid. This is discussed in the Electricity and Energy Sector Plan

Benefits for business

The transition to net zero presents a range of opportunities and benefits for Australian businesses. This includes opportunities to improve the energy performance of the premises they lease or own, and the opportunities that come with increased consumer demand for higher energy performance technologies. Electrification and energy performance upgrades can include installation of solar and batteries, increased insulation, installation of energy efficient lighting, upgraded heating, ventilation and air conditioning systems, and the installation of building management systems (used to automate a wide range of building elements such as temperature control, ventilation, lifts, doors, sound systems and lighting).

Energy bills can make up a significant proportion of ongoing business costs. Therefore, opportunities to reduce and manage these costs through upgrades and electrification can be effective cost saving initiatives. By tracking energy consumption, building managers and occupants have a greater ability to control their energy use and determine which upgrades are needed. Other stakeholders, including customers, investors and banks are also increasingly seeking trusted, benchmarked and verified

7 Race for 2030 Cooperative Research Centre, [Enhancing home thermal efficiency](#), Race for 2030 CRC, 2023, accessed August 2024, page 78.

8 Climateworks, [Climate-ready homes: building the case for a renovation wave in Australia](#), Climateworks website, November 2023, last accessed 11 August 2025, page 29.

9 C Fyfe et al, 'Association between home insulation and hospital admission rates: retrospective cohort study using linked data from a national intervention programme', *BMJ*, 2020, 371(m4571):n.p. doi: 10.1136/bmj.m4571

information about the energy performance of buildings to inform their decisions. Through the use of tools developed by the National Australian Building Energy Rating System (NABERS) program, participants have achieved an average of 30–40% less energy use over a 10-year period.¹⁰ The range of NABERS tools will be expanded by the Government to ensure a broader range of commercial buildings can understand and act to reduce their energy consumption and costs.

As well as saving money, businesses that electrify and improve their facilities' energy performance can enhance the asset value and its marketability to prospective buyers or tenants who value sustainability and thermal comfort. Additionally, electrification eliminates the indoor air pollution associated with gas appliances and removes the risk of gas leaks and fires, presenting work health and safety benefits.

¹⁰ NABERS (National Australian Built Environment Rating System), [What is NABERS?](#), Australian Government, n.d., last accessed 13 August 2025.

Chapter 2. Emissions from the Built Environment

This plan focuses on how to reduce Scope 1, 2 and 3 emissions. The sources of these within the built environment are outlined below.

Scope 1 emissions

Scope 1 emissions are the 'direct' emissions released into the atmosphere as a direct result of an activity. When considering these emissions in the built environment, this refers to the direct emissions from fuel sources used within our houses and businesses, such as natural gas, diesel, wood and the release of hydrofluorocarbons, or HFCs.

In 2024, the built environment accounted for 22 million tonnes of carbon dioxide equivalent (MtCO₂-e) or 5% of scope 1 national emissions. Residential buildings account for 13 MtCO₂-e (3% of national emissions) and commercial and public buildings account for 9 MtCO₂-e (2% of national emissions).¹¹

¹¹ Department of Climate Change, Energy, the Environment and Water, [National Greenhouse Gas Inventory Quarterly Update: December 2024](#), Australian Government, 30 May 2025, last accessed 14 August 2025.

Built Environment Sector Plan

Table 2 – Sources of scope 1 emissions from the built environment

| | |
|-----------------------------|--|
| Natural gas use | <ul style="list-style-type: none"> In 2024 around 5 million homes were connected to the gas network accounting for 17% of total gas consumed in Australia.¹² The 2021 Residential Baseline Study found that approximately 57% of gas use in homes was used for space heating, 36% water heating, 6% cooking and 2% for other uses.¹³ Non-residential buildings used 40 PJ of gas in 2020.¹⁴ This was approximately 15% of non -residential building energy consumption.¹⁵ |
| Hydrofluorocarbons | <ul style="list-style-type: none"> HFCs are a group of synthetic greenhouse gases with global warming potential many times higher than carbon dioxide. HFCs are commonly used as refrigerants in commercial and domestic refrigeration and air conditioning equipment. Together, residential and commercial refrigeration and stationary air–conditioning constitute 32% of the built environment’s Scope 1 emissions.¹⁶ Emissions primarily occur through leakage during installation, operation, maintenance, end of life decommissioning and disposal of equipment. |
| Diesel | <ul style="list-style-type: none"> Diesel is used in machinery for construction purposes. It powers more than 75% of heavy construction equipment.¹⁷ It is also used for backup generation in hospitals and commercial buildings where avoiding interruptions to power is vital. Many small and remote communities rely on diesel generators, either in individual buildings or as part of a micro–grid. Emissions from the combustion of diesel are a very low percentage of total built environment sector emissions. Abatement actions are addressed in the Transport Sector Plan and Electricity and Energy Sector Plan. |
| Wood | <ul style="list-style-type: none"> Wood heating provided approximately 6% of residential energy in Australia in 2019, primarily for space heating.¹⁸ Abatement of emissions from wood is addressed by state and territory governments. |
| Water infrastructure | <ul style="list-style-type: none"> Emissions from water infrastructure contribute a small amount to emissions in the built environment. Emissions from wastewater treatment are covered under the Industry Sector Plan. |

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- 12 Wood, T., Reeve, A., and Suckling, E. (2023), [Getting off gas: Why, how, and who should pay?](#), Grattan Institute
- 13 Monash Climate Change Communication Research Hub, [Switching on: benefits of household electrification in Australia](#), Monash University, 2023, page 5. [Note: Due to rounding, percentages do not sum to 100%.]
- 14 Strategy. Policy. Research. [Commercial building baseline study 2022: final report](#), Department of Climate Change, Energy, the Environment and Water, 2022, last accessed 13 August 2025.
- 15 Strategy. Policy. Research. [National totals and by climate zone – Commercial Building Baseline Study 2022](#), Department of Climate Change, Energy, the Environment and Water, 2022, last accessed 13 August 2025. [Total energy use considered as total of gas and electricity use.]
- 16 Climate Change Authority, [Sector pathways review](#) (Built environment chapter), Australian Government, 1 July 2024, page 5.
- 17 Department of Climate Change, Energy, the Environment and Water, [Construction](#), Australian Government, n.d., last accessed 13 August 2025.
- 18 Energy Rating, [2021 Residential Baseline Study for Australia and New Zealand for 2000 to 2040](#), Australian Government, 11 November 2022, last accessed 13 August 2025. (Table 4 in 2021 RBS_OutputTablesV1.9.2-AU)

Scope 2 emissions

Scope 2 emissions are the ‘indirect’ emissions such as the emissions from the offsite production of electricity used to power homes and businesses.¹⁹

In 2024 the built environment contributed 73Mt CO₂-e or 48% of Australia’s Scope 2 emissions. Residential buildings account for 39 Mt CO₂-e and commercial and public buildings account for 34 Mt CO₂-e.²⁰

The decarbonisation of the electricity system will greatly reduce the built environment’s Scope 2 emissions, and this is addressed in detail in the Electricity and Energy Sector Plan.

Scope 3 emissions

Scope 3 emissions are the indirect emissions in the supply chain and are often referred to as ‘embodied carbon.’ Embodied carbon represents the sum of the greenhouse gas emissions associated with materials and construction processes through the lifecycle of a building, (including material extraction, transportation, manufacturing, construction, use, replacement, demolition and end of life). These emissions are ‘locked in’ by the decisions made during the planning, design, procurement, delivery and maintenance of new construction projects.²¹

The term ‘upfront embodied carbon’ refers to the emissions generated during the material production and building construction phases of the building’s life. Infrastructure Australia has estimated that the upfront embodied carbon of Australia’s construction pipeline for building and infrastructure from 2022–23 to 2026–27 will be responsible for producing between 37–64 Mt CO₂-e per year. Upfront embodied carbon in commercial buildings can be calculated using the NABERS Embodied Carbon rating tool.

19 Scope 2 emissions are the ‘indirect’ emissions such as the emissions from the offsite production of electricity used to power homes and businesses. In 2024 the built environment contributed 73Mt CO₂-e.

20 Department of Climate Change, Energy, the Environment and Water, [National Greenhouse Gas Inventory Quarterly Update: December 2024](#), Australian Government, 30 May 2025.

21 Infrastructure Australia, [Embodied carbon projections for Australian infrastructure and buildings](#), Australian Government, 15 July 2025, page 20.

Chapter 3. Pathway to 2050

This chapter provides an overview of the main actions underpinning the built environment sector's net zero transition to 2050.

Australia's emissions pathway

Economic modelling and analysis by the Australian Treasury explores three plausible scenarios for Australia's transition to net zero by 2050. This work informed the development of the Government's Net Zero Plan and sector plans. The modelling and analysis includes potential economy-wide and sector-specific emissions reductions pathways. The Baseline Scenario – in which Australia efficiently builds on existing climate policies and trends to achieve its net zero targets – is referenced in this chapter.

While scenario-based analysis is a powerful tool in helping inform Australia's net zero pathway, it is not possible to precisely predict how the transition will unfold. The future is uncertain and there are many factors that will influence the net zero transition, including changes in technology, global dynamics and community responses.

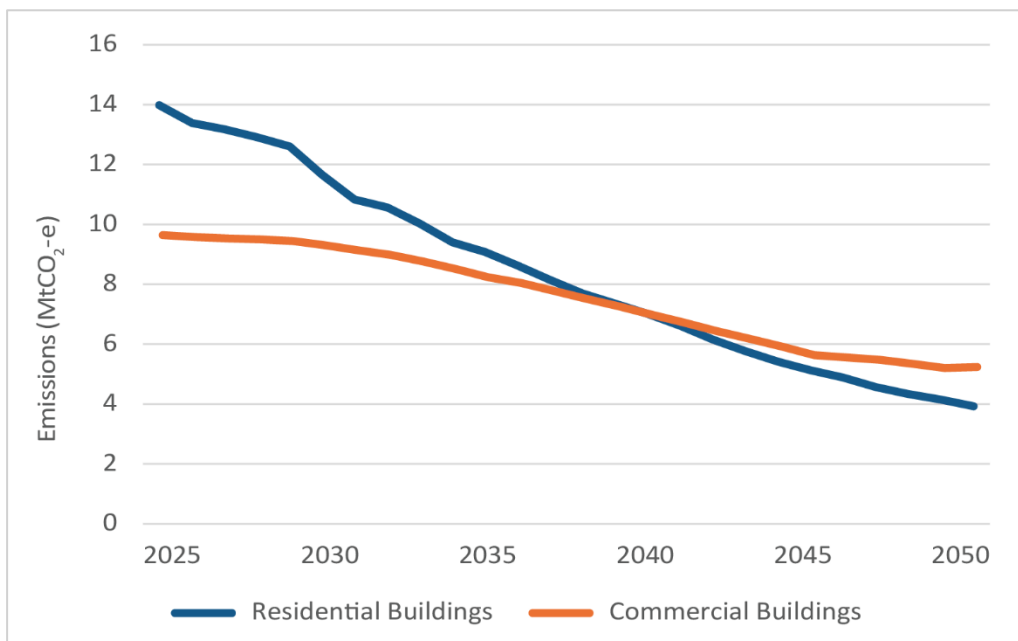


Figure 3 – Scope 1 emissions in the Built Environment sector, Baseline Scenario

Source: Treasury (2025) [Australia's net zero transformation: Treasury modelling and analysis](#), Treasury, accessed 16 September 2025.

The Treasury's Baseline Scenario illustrates how the Built Environment sector could efficiently contribute to whole of economy net zero by 2050 across both Scope 1 and 2 emissions.

Scope 1 emissions in the Built Environment sector are projected to fall to 9 Mt CO₂-e in 2050.

Much of this reduction in direct emissions is driven by electrification of the residential sector. The projected impact of electrification is substantial, driven by the prospect of energy bill reductions and

other household motivations. However, electrification alone will not reduce all emissions. By 2050, there are projected to be 4 Mt CO₂-e of remaining emissions by households.

Emissions from commercial buildings are projected to decline by 4 Mt CO₂-e to 2050, driven by the electrification of commercial heating and cooling, some fuel-switching in construction machinery, and efficiency improvements. The Commercial Building Disclosure Program improves the energy efficiency of Australia's large office buildings by requiring the disclosure of energy ratings and emissions information. Expanding Commercial Buildings Disclosure to a wider range of buildings will contribute to this decline in emissions.

Improvements to residential and commercial energy efficiency due to electrification and greater thermal performance means total energy usage in the built environment sector is expected to remain relatively stable to 2050. At the same time, the emissions intensity of the sector decreases substantially by 2050.

Growing renewable penetration to 2050 reduces the built environment's Scope 2 emissions relative to today and enables its electrification.

Electrify, where possible

Reducing direct (Scope 1) emissions will rely on switching energy use from fossil fuels (such as gas and diesel) to electricity. Electrification is a simple way to decarbonise buildings, and the cost of technologies is expected to fall as adoption and innovation grows. Electrification of equipment and appliances in existing building stock is the largest opportunity to reduce Scope 1 emissions from the sector. Pairing electrification with energy efficiency, renewables and demand flexibility measures will help reduce strain on the electricity generation sector and increase savings for building occupants.

Supporting the transition away from gas as a fuel source for space and water heating is important. The 2021 Residential Baseline Study found that approximately 57% of gas use in homes was for space heating and 36% water heating, while only 6% was used for cooking.²² It is estimated that currently 125,000 gas hot water systems are replaced with electric systems annually.²³ In non-residential buildings, gas makes up 15% of the sector's energy use.²⁴

Supporting electrification with an orderly transition away from natural gas as a fuel source forms a key part of this plan and aligns with the Future Gas Strategy, which aims to support decarbonisation across the economy and meet our long-term emissions targets while seeing gas supply shift to higher-value, non-substitutable uses.

22 Monash Climate Change Communication Research Hub, [Switching on: benefits of household electrification in Australia](#), Monash University, 2023, page 5. [Percentages do not add to 100% due to rounding.]

23 Climate Change Authority, [Sector pathways review](#) (Built environment chapter), Australian Government, 1 July 2024, page 7.

24 Strategy. Policy. Research. [National totals and by climate zone – Commercial Building Baseline Study 2022](#), Department of Climate Change, Energy, the Environment and Water, 2022, last accessed 13 August 2025. Total energy use considered as total of gas and electricity use.

Increase energy efficiency

At the same time as electrifying buildings, it is vital to improve their energy efficiency, and the energy efficiency of the appliances and equipment used within them. Upgrading buildings to improve their thermal performance and choosing the right combination of efficient “smart” appliances and efficient equipment to support demand flexibility will maximise benefits to households and businesses. In turn, this will reduce Scope 2 emissions from our houses and businesses. Efforts to enhance energy efficiency of buildings and reduce overall demand on the electricity sector can also reduce demand for electricity and current and new generation sources.

Energy rating and standards programs provide critical information and signals to households and businesses to improve energy efficiency and reduce costs. Expanding these proven programs in the residential and commercial built environment supports the market to choose and invest in improved energy efficiency.

The Greenhouse and Energy Minimum Standards (GEMS) program is the government’s primary tool for regulating the energy efficiency of appliances and equipment to ensure that Australian consumers have access to a range of efficient appliances and energy efficiency information to support their purchasing decisions.

Improve design and decarbonise materials

Embodied carbon (Scope 3) is primarily produced in the manufacture of building materials such as cement and steel.²⁵ Buildings are one of the largest sources of embodied carbon. Improving building design, reducing construction waste, moving to low emissions materials and adopting circular economy principles can reduce embodied emissions. Steps taken now can help generate future demand for low emission materials.

Urban planning and precinct design can also play an important role in decarbonising the built environment, as highlighted in the National Urban Policy²⁶ which provides a framework for creating sustainable and resilient urban environments. Effective planning includes orienting buildings and developments to maximise energy performance, comfort and climate resilience. Providing tree canopies and careful selection of roof and road treatments can help address the urban heat island effect. Smart planning and design can also support reduced energy consumption. With good design less air-conditioning is needed to manage summer heat and winter sun is used to warm buildings during the cooler months of the year.

Harness low emissions technology

As detailed in the Energy and Electricity Sector Plan, households are already investing in solar systems, batteries, and other energy management solutions. Over time, this means that households and businesses will play a more active role in both generating and storing electricity. What was once a

25 Materials and Embodied Carbon Leaders Alliance Working Group 5c – Aluminium (WG5c), [*Low emissions aluminium: the challenges and opportunities for advancing Australia’s low carbon future*](#), Materials and Embodied Carbon Leaders Alliance, 2022, page 5.

26 Infrastructure Australia, [*National Urban Policy*](#), Australian Government, 29 November 2024.

relatively straightforward, one-directional market where large generators supplied electricity to consumers, is evolving into a decentralised model that supports two-way power flows.

This transformation is being led by the uptake of consumer energy resources (CER) – such as rooftop solar panels, electric vehicles and home battery storage – which enable households, industries and businesses to generate, store and manage their own electricity. Complementary services like virtual power plants, aggregation services, bidirectional charging and home energy management systems can further empower consumers to optimise their energy use and benefit from the transition to net zero.

As CER deployment accelerates and innovative technologies are developed, the electricity system is becoming more dynamic, with a greater number of participants and increasingly blurred lines between supply and demand. While this creates a more complex system, it also unlocks opportunities to reduce overall system costs and deliver better value to consumers.

Virtual power plants (VPPs) are starting to aggregate solar and battery installations into larger systems, trading energy between them and the grid, and maximising the system benefits that these resources can provide.²⁷ Batteries and VPPs can help reduce grid demand and reduce the need for new investment in electricity generation sources.²⁸

Opportunities to use emerging technologies like Artificial Intelligence (AI) and robotics in the design, construction and demolition of buildings, including through prefabricated and modular construction methods, can help reduce emissions in the construction phase, reducing waste and embodied emissions. AI also has the potential to deliver significant benefits for our electricity systems by optimising energy usage, supporting grid stability through predictive maintenance, and better integrating renewable energy by improving predictions of supply and demand.

Phase out hydrofluorocarbons (HFCs)

The built environment sector also includes emissions from sources with a high global warming potential, such as HFCs used in refrigeration, air conditioning and some hot water systems.

A global phase-down of HFC production and imports was agreed under the Montreal Protocol on Substances that Deplete the Ozone Layer in 2016. The global phase down of 85% of HFCs will reduce HFC emissions equivalent to up to 72 billion tonnes of carbon dioxide (CO₂) by 2050. This is the equivalent of well over one year of total global greenhouse gas emissions.²⁹

Australia's phase-down of imports of HFCs is underway, with importers required to hold licences for all imports of bulk HFCs from 1 January 2018. The phase down uses an annual import quota to reduce use of new HFCs by 85% from baseline by 2036, leading to reduced emissions over time as low or

27 Australian Energy Market Operator, [Integrated System Plan](#), AEMO, 26 June 2024, last accessed 11 August 2025, page 50.

28 Australian Energy Marker Operator, [Integrated System Plan](#), AEMO, 26 June 2024, last accessed 11 August 2025, page 51.

29 Department of Climate Change, Energy, the Environment and Water, [Montreal Protocol on Substances that Deplete the Ozone Layer](#), Australian Government, 26 September 2024, last accessed 11 August 2025.

lower global warming alternatives replace HFCs.³⁰ Bulk imports of HFCs are capped at around 2 Mt CO₂-e from 2036.³¹

Strategies to support proper maintenance, installation and decommissioning of equipment using refrigerants can reduce these emissions. Since 1993, product stewardship arrangements for refrigerants, including HFCs, have led to the recovery of more than 10 million kilograms of refrigerant gases. This is equivalent to avoiding 18.5 million tonnes of carbon dioxide emissions and preserving millions of tonnes of stratospheric ozone.³²

30 Department of Climate Change, Energy, the Environment and Water, [HFC import quota](#), Australian Government, 2024, last accessed 11 August 2025.

31 Department of Climate Change, Energy, the Environment and Water, [Australia's HFC phase-down – key information](#), Australian Government, 3 October 2021, last accessed 11 August 2025.

32 Refrigerant Reclaim Australia, [About RRA](#), RRA, n.d., last accessed 11 August 2025.

Chapter 4. Foundational actions

This section sets out Australian Government actions underway.

Accelerate electrification and increase energy performance

Energy performance (electrification or fuel switching, energy efficiency and demand management) will play a key role in the built environment sector reducing greenhouse gas emissions. Energy performance provides an opportunity to manage the scale of increased national demand for electricity, especially during periods of peak demand and provides an important opportunity for households and businesses to reduce energy bills. A significant number of initiatives are underway including:

- The **National Energy Performance Strategy** which was announced on 5 April 2024 and is the Australian Government's approach to improving energy performance across the economy. The National Energy Performance Strategy includes 47 actions supporting energy efficiency, electrification and demand flexibility. Funding for actions under the National Energy Performance Strategy includes:
 - The \$1 billion Household Energy Upgrades Fund providing discounted consumer finance products to help households upgrade the energy performance of their homes.
 - \$800 million in Australian Government funding for the \$1.1 billion Social Housing Energy Performance Initiative in partnership with all states and territories.
 - The \$100 million Community Energy Upgrades Fund providing grants to support local councils, which own and operate many public sporting, community and cultural facilities, to make their facilities more energy efficient, cut their emissions and reduce their energy bills.
- The **Small-Scale Renewable Energy Scheme** which encourages investment in small scale renewable energy. It provides incentives to households and businesses to install systems like rooftop solar, solar batteries, solar water heaters and air sourced heat pumps.
- The **Cheaper Home Batteries Program** under the Small-Scale Renewable Energy Scheme which is expected to support over one million new battery installations by 2030.
- The **Sustainable Finance Strategy** which has been developed in close coordination with financial regulators and other key stakeholders. It supports Australia's pathway to net zero by providing a framework to reduce barriers for investment into sustainable activities. The strategy included development of a sustainable finance taxonomy (classification system), which will be relevant for capital raising activities including bank lending.
- The **Australian Government's Green Treasury Bonds Program** which enables investors to back projects that progress Australia's transformation to net zero and support environmental objectives, including through investment in low-carbon construction and the circular economy.
- **Australian Public Service Net Zero in Government Operations Strategy** is expanding minimum energy performance standards for government purchases of services, including higher standards for offices and introducing standards for data centres, warehouses, hotel accommodation and consideration of embodied carbon in new construction.

Ensuring a fair and equitable transition

The Australian Government is committed to ensuring fair and equitable access to the benefits of the transition to net zero for all Australians, and that consideration is given to vulnerable consumers, small business and community organisations. Benefits can include improved health, amenity, resilience and financial benefits.

As consumers choose to transition away from natural gas it is important that low income and disadvantaged Australians are not left paying costly supply charges for a network supporting a dwindling consumer base. The cost of staying connected to the gas network will grow in the absence of targeted action as network costs are spread across a smaller group of consumers. Electrification and energy performance upgrades require upfront capital, which low -income cohorts are often unable to access. Hence, action to lower carbon emissions needs to be carefully managed to address social and economic inequalities. Disadvantaged cohorts that will be considered include:

- **Low-income owner occupiers:** 55% of households in the bottom two income quintiles with a mortgage spend more than 30% of their income on housing, a sign of financial stress.³³
- **Private renters:** There are 2.4 million private rental properties in Australia,³⁴ with more than 270,000 tenanted by people on the lowest 20% of income.³⁵ Women are overrepresented in low-income and renter households and as heads of single-parent households, facing disproportionate hardship with rising energy costs.
- **People living in social housing:** There are 452,000 social housing dwellings in Australia. This encompasses people living in either public or community housing. The majority (298,000) of these dwellings are public housing.³⁶ The remainder are a combination of First Nations housing, Community Housing Provider managed First Nations houses, and Community Housing Provider managed social housing.
- **Older Australians and people with disability** are particularly vulnerable to extreme weather and may require additional adjustments to their home. Additionally, we need to ensure that changes intended to improve outcomes for net zero and resilience do not have unintended negative consequences.

33 Australian Institute of Health and Welfare, [Housing affordability](#), Australian Government, 15 July 2025, last accessed 11 August 2025.

34 Australian Institute of Health and Welfare, [Home ownership and housing tenure](#), Australian Government, 15 July 2025, last accessed 11 August 2025.

35 Australian Council of Social Services, [Funding and financing energy performance and climate-resilient retrofits for low-income housing](#), Analysis & Policy Observatory, January 2024, page 24.

36 Australian Institute of Health and Welfare, [Housing assistance in Australia: social housing dwellings](#), Australian Government, 24 June 2025, last accessed 11 August 2025.

- **People living in regional and remote areas** may face higher costs for building and renovating homes, making energy efficiency upgrades more expensive. While solar power and batteries can improve energy security and reduce reliance on gas and diesel,³⁷ installation can be difficult and expensive.³⁸
- **First Nations households and individuals may** have unique needs. First Nations people are more likely to be part of other disadvantaged cohorts, such as renters.³⁹ Remote Indigenous communities in Australia are among the most energy insecure in the world,⁴⁰ and remote communities often experience high rates of unreliable and unaffordable energy supply.⁴¹

To support a more fair and equitable transition, the Australian Government is investing \$800 million in the expanded **Social Housing Energy Performance Initiative** in partnership with all state and territory governments, to deliver energy performance upgrades to over 100,000 social housing properties by 2028–29. The initiative is supporting social housing tenants, including those in First Nations housing in some jurisdictions, to benefit from solar systems, batteries, efficient electric appliances, and insulation. This will provide tenants with sustained savings on energy bills, and improved comfort and health. Upgrades are currently being rolled out across Australia, including to First Nations housing in regional and remote communities.

The **First Nations Clean Energy Strategy** (the Strategy) was released on 6 December 2024 and aims to maximise the enormous, nation-wide potential for First Nations peoples to benefit from the clean energy transformation. Priority actions identified in the Strategy will underpin progress on outcomes of the National Partnership Agreement on Closing the Gap through self-determined participation in large project development, business development and project ownership, energy efficient housing and access to reliable and affordable clean energy at the household level.

The \$70 million **First Nations Clean Energy Program** will support implementation of the Strategy and fund design and delivery of the program to empower and enable First Nations peoples' leadership and participation in the clean energy transformation.

The **Community Energy Upgrades Fund Program** will provide \$100 million in matched competitive grant funding for energy efficiency and electrification upgrades to deliver reduced energy bills and emissions for local government owned and/or operated facilities.

37 Clean Energy Regulator, [Solar power for remote Indigenous communities](#), Australian Government, 23 March 2024, last accessed 7 August 2025.

38 M Nixon & E Dobson, [Remote outback communities go solar to protect food during wet season](#), ABC News, 30 January 2025, last accessed 11 August 2025.

39 Australian Bureau of Statistics, [Australia: Aboriginal and Torres Strait Islander population summary](#), Australian Government, 1 July 2022, last accessed 11 August 2025; Australian Bureau of Statistics, [Housing: Census](#), Australian Government, 28 June 2022, last accessed 11 August 2025.

40 Department of Prime Minister and Cabinet, [First Nations communities to have their say on the energy transition](#) [media release], 14 November 2023, last accessed 11 August 2025.

41 S Quilty, NF Jupurrurla, RS Bailie & RL Gruen, [Climate, housing, energy and Indigenous health: a call to action](#), *Medical Journal of Australia*, 2022, 217(1):9–12.

Support consumers to make informed decisions

Ensuring the public has easy access to credible, accessible information to make confident choices and suitable investments is critical for emissions reductions. For communities and people who identify as culturally and linguistically diverse, providing easily understandable information on the opportunities and processes to upgrade is paramount to promoting uptake. Improvements in measurement, reporting and disclosure for building emissions and performance will also improve the data necessary for financiers and investors to have confidence in the sustainability credentials of building projects and meet requirements under sustainable finance frameworks.

Current Australian Government initiatives include:

- The **Nationwide House Energy Rating Scheme (NatHERS)**, which provides new and existing homes with a home energy rating of 0 to 100 based on the energy expected to be used by the home, as well as a thermal performance rating from 0 to 10 stars based on the home's heating and cooling needs. Previously available for new homes only, the Government is rolling out NatHERS to existing homes to provide critical information to help consumers choose better performing homes and make cost-effective upgrades.
- The **National Australian Built Environment Rating System (NABERS)** which rates commercial buildings from 0 to 6 stars across a range of commercial buildings types and the Government is investing in the National Australian Built Environment Rating System (NABERS) for non-residential buildings.
- **NABERS Embodied Carbon** rating tool which enables eligible new buildings and partial rebuilds to measure, verify, and compare their upfront embodied carbon with similar buildings. The tool provides a certified measure of carbon intensity, incorporating material, transport and construction emissions.
- The **Commercial Building Disclosure Program**, which requires office buildings over 1000m² to obtain and disclose their NABERS energy rating and tenancy lighting assessment when offered for sale or lease. The Government is expanding the Commercial Building Disclosure (CBD) program to more commercial building types beyond office buildings.
- **Greenhouse and Energy Minimum Standards** which help consumers purchase efficient appliances with an energy star rating. Appliance standards have improved over time due to minimum energy performance standards for appliances and equipment required under the *Greenhouse and Energy Minimum Standards Act 2012*.
- **CSIRO's RapidRate™**, an artificial intelligence tool developed to provide a quick estimate of the NatHERS energy ratings of established homes.

Continue collaboration with states and territories

Each level of government holds different responsibilities regarding building construction, urban planning, electrification, energy performance and material efficiency. Under the Australian Constitution, states and territories are responsible for the regulation of building and planning activities and are primarily responsible for the mechanisms that encourage households and small and medium businesses to switch from gas to electricity.

The Australian Government works with state, territory and local governments through a range of forums on the development and delivery of initiatives outlined in their strategic plans. These include:

- The **Energy and Climate Change Ministerial Council** who are delivering outcomes in line with the Update to the Trajectory for Low Energy Buildings, with a goal to achieve a net zero emissions building sector by 2050, while lowering costs for households and businesses and improving building thermal comfort for all Australians. It provides strategic direction for collaboration between the state, territory and Australian governments to progress energy efficient, low emissions, sustainable and forward-thinking long-term buildings policy.
- The **National Consumer Energy Resources Roadmap** which is working to broaden consumers' access to consumer energy resources including solar, batteries, electric vehicle chargers, water heaters and air conditioners.
- The **Building Ministers' Meeting** who are responsible for the **National Construction Code** which sets minimum energy efficiency standards for buildings. These are then given legal effect through state and territory regulations.
- The **Planning Ministers' Meeting** who are working together to progress nationally significant planning reforms. These include planning reforms to facilitate more and well-located housing; national principles to embed natural disaster and climate risk considerations in land use planning decisions and progressing the National Urban Policy.
- Launched in November 2024, the **Australian Government's National Urban Policy** provides a coordination framework to ensure all levels of government effectively work together. The Policy includes a shared vision for sustainable urban growth, developed jointly with state and territory governments and in consultation with the Australian Local Government Association.

Support materials efficiency

Using material resources more efficiently, and encouraging the use of low emissions products, is an important method for reducing emissions across all sectors. Applying circular economy principles is a way of managing resources that focuses on using materials more efficiently and reducing waste. Many businesses are already moving toward a circular economy for economic reasons, and because it aligns with emerging consumer preferences. This includes using products and materials made from recycled content, replacing single-use products with reusable options, offering repair and reuse services and reducing waste.

The Australian Government is supporting these actions through implementing **Australia's Circular Economy Framework** to accelerate Australia's transition to a circular economy. The framework will help encourage more efficient and productive use of our resources with its goal of doubling Australia's circularity by 2035.

The framework identifies the built environment as one of the four priority sectors for the circular economy transformation as there is great potential for application of circularity practices. Early design decisions – such as using prefabricated, modular, flexible layouts and designing for longevity, reuse, decommissioning and repair – can dramatically lower the need for new resources, cut emissions and reduce waste. By retaining existing goods, assets and materials for longer, not only is the embodied carbon of a building reduced – but so is the need for new extraction and processing activities and their associated impact.

The following circular economy strategies are pathways to reduce emissions:

- prioritising refurbishment and adaptive re-use over demolition
- designing for modularity and disassembly
- designing for longevity
- inclusion of recycled content and diversion of waste from landfill
- using waste heat from one facility, such as a data centre, to heat another, such as an office or swimming pool.

The **NABERS Embodied Carbon** rating tool, developed in collaboration with states and territories, enables the consistent measurement of emissions arising from the construction of commercial buildings. The 0 to 6 star rating encourages building owners to choose low carbon materials, improve building design, recycle, reduce construction waste and adapt existing structures where possible. In June 2024 Building Ministers agreed to include a voluntary pathway in the 2025 update of the National Construction Code for commercial buildings to measure and report on embodied carbon using the NABERS method.

Innovate to expand emissions reduction

Investment in innovative research and industry development is helping the built environment sector reduce emissions. The Australian Government is partnering with other levels of government, research institutions and private enterprises to develop and implement new technologies and systems. Innovation in the sector is relatively low, as highlighted by the recent Productivity Commission report on residential construction productivity. To build more homes and reduce emissions, construction innovation and productivity needs to grow. Initiatives underway include:

- **Modern methods of construction**, such as prefabricated and modular construction have many benefits, such as increased speed of delivery, efficient use of materials and reduced waste. There are also benefits to regional and remote Australia, where on-site building costs are up to double those in metropolitan areas.⁴²

Australian Government initiatives include:

 - \$49.3 million over 2 years from 2025–26 to partner with states and territories to support the prefabricated and modular construction projects.
 - development of a voluntary manufacturers' certification scheme to support regulatory compliance.
 - \$120 million committed in National Competition Policy funding for states to support regulatory neutrality between modern methods of construction and traditional buildings.
- The Australian Government has also committed \$14.5 million to support Mineral Carbonation International to produce low carbon building materials using carbon dioxide captured from hard to abate industries, through the Carbon Capture Technologies Program.

42 Nous Group, [*Efficient system costs of remote Indigenous housing*](#), National Indigenous Australians Agency, 2017, page 20.

- **Cooperative Research Centre** initiatives:
 - Building 4.0 Cooperative Research Centre – \$28 million to develop an internationally competitive, dynamic and thriving Australian advanced manufacturing sector, delivering better buildings at lower cost and the human capacity to lead the future industry.
 - SmartCrete Cooperative Research Centre and La Trobe University – \$21 million to develop a Low Carbon Concrete Centre, accelerating the decarbonisation of concrete and improving confidence in low-carbon concrete-based products.
- **Australian Renewable Energy Agency** initiatives:
 - \$59.1 million to support low emissions steel, iron and renewable hydrogen research, development and commercialisation projects.
 - \$750 million of the Future Made in Australia Innovation Fund, administered through the Australian Renewable Energy Agency, to support innovative green metal projects including iron, steel, alumina and aluminium.⁴³
- Low or no cost loans from the **Clean Energy Finance Corporation** such as their \$100 million commitment to Wesfarmers to support renewable energy upgrades and energy storage solutions across Bunnings and Officeworks sites.

Create a resilient built environment

Efforts are underway to ensure the impacts of climate change are managed. Emissions reduction policies will help reduce impacts, but they cannot eliminate them, and the impacts of a changing climate will disproportionately affect vulnerable and disadvantaged Australians. Impacts such as flooding, bushfires, heat stress, extreme rainfall events, storms and hail, coastal erosion and intensified cyclones, will be experienced more acutely across Australia.

The **National Climate Risk Assessment (NCRA)** and **National Adaptation Plan (NAP)** are complemented by the transition pathway outlined in the Net Zero Plan and Sector Plans (including the BESP). The NCRA provides the first comprehensive government-led assessment of the risks Australia faces because of climate change. The NAP establishes a framework for adapting to the risks identified within the NCRA.

The NCRA identified that there are critical risks to essential infrastructure and the built environment in Australia. The impacts of climate change on this sector will present risks to supply chains that are necessary for the distribution of goods and services, Australia's labour markets, capital and trade. Critical infrastructure (e.g. transport, energy and telecommunications infrastructure) is vulnerable to most climate hazards including but not limited to bushfires, heatwaves, extreme wind and flooding. All these hazards are projected to increase in frequency and/or severity with increasing global warming.

43 Australian Renewable Energy Agency, [Future Made in Australia Innovation Fund](#), ARENA, 2024, last accessed 11 August 2025.

Adapting the built environment to be resilient to climate change impacts provides an opportunity to support broader environmental and social co-benefits. For example, Improving the thermal comfort and energy performance of Australia's building stock is critical to supporting the health and wellbeing of at-risk individuals and communities.

There is significant work already underway across all levels of government and the private sector to improve the resilience of the built environment including initiatives already covered such as NatHERS, the Updated Trajectory for Low Energy Buildings and the National Energy Performance Strategy. To boost action, in June 2024, Building Ministers agreed to include climate resilience as a specific objective of the Australian Building Codes Board. This will give the Australian Building Codes Board a clear mandate to develop future National Construction Code requirements that reduce the impact of natural hazards on housing and other critical community facilities.

Chapter 5. Moving forward

A phased and scalable approach

As mentioned, the technology to support the transition to net zero is already available, and this is already being taken up and incentivised by industry, consumers and governments at all levels. Supporting a transition to net zero in the built environment requires a phased and scaled approach to ensure we can transition existing stock while still delivering new supply – and meet the National Housing Accord target of 1.2 million new homes over the next five years.

| Objectives | 2025–2030: Accelerate upgrades | 2030–2035: Continuing action | 2035–2050: Realising our net zero ambition |
|---|--|--|---|
| A low-emissions and low-energy built environment to support Australia's targets. | <ul style="list-style-type: none"> Energy efficiency upgrades and electrification are supported with clear, accessible, information, standards and programs. Continued expansion of ratings and disclosure for buildings and appliances. Frameworks to reduce embodied carbon are established. Modern methods of construction are supported through R&D. Policies to reduce refrigerant emissions (HFCs) implemented. Appliance and equipment efficiency and demand flexibility is improved. | <ul style="list-style-type: none"> Households and businesses have the information they need. Consumer energy resources support grid stability. Continued development of standards for existing homes and commercial buildings. Support minimum energy performance standards for commercial buildings ☐ Continuing to improve appliance and Continuing to improve appliance and equipment efficiency standards, and demand flexibility, as new technologies come online. Continuing work to reduce refrigerant emissions and embodied carbon. | <ul style="list-style-type: none"> All energy users that can, have electrified. The electricity grid is supported by homes and businesses. Standards for new buildings and appliances improve as new technologies come online. Refrigerant emissions reduced and HFC phase down completed in 2036. Embodied carbon is minimised. |
| A built environment that is fit for purpose, liveable, provides thermal comfort and is resilient to a changing climate | <ul style="list-style-type: none"> Work with states and territories to improve urban planning. Implement the National Adaptation Plan. Ensure decision makers have the information they need to consider climate risks. | <ul style="list-style-type: none"> Continue to accelerate and mainstream adaptation action across all levels of government, business and households. | <ul style="list-style-type: none"> The built environment is liveable, fair, equitable, productive, innovative, sustainable and resilient as outlined in Australia's National Urban Policy. |

Built Environment Sector Plan

| | | | |
|---|---|--|---|
| A fair and equitable built environment transition where no one is left behind. | <ul style="list-style-type: none">• Energy performance upgrades for social housing are delivered to benefit vulnerable cohorts.• A nationally consistent framework for rental energy efficiency standards is available to jurisdictions that choose to implement it. | <ul style="list-style-type: none">• Ongoing updates to the framework for nationally consistent energy efficiency standards for rental properties for jurisdictions that choose to implement.• Continue work with state and territory support for vulnerable households. | <ul style="list-style-type: none">• All households benefit from improved energy performance and lower energy costs. |
|---|---|--|---|

Future Direction

The Australian Government will expand several existing programs that have successfully led decarbonisation covering commercial and residential buildings, as well as appliances to continue to drive towards net zero. These include:

- NatHERS for existing homes implementation
- Expansion of Commercial Buildings Disclosure
- Expansion of the National Australian Built Environment Rating System (NABERS)
- Greenhouse and Energy Minimum Standards (GEMS) modernisation.

These are existing programs that will be expanded, significantly reducing implementation risk and building on the Government's track record of delivery success.

Expanding the Commercial Building Disclosure (CBD) Program

Trusted energy ratings, minimum performance standards and strong disclosure regulations are critical to establishing the right policy settings for further industry and private sector investment and action in the built environment. The CBD Program improves the energy efficiency of Australia's large office buildings by requiring the disclosure of energy ratings and emissions information. The Government will invest around \$10 million to expand the existing CBD Program, which currently only covers office buildings, to consider most commercial building types by 2035 in accordance with the Commercial Building Disclosure Roadmap. The Roadmap will be published by Government as a first step to provide industry with a clear pathway for the program's expansion.

Accelerating and investing in the National Australian Built Environment Rating System (NABERS)

The Government will invest around \$10 million to expand NABERS to prepare the commercial buildings sector for expansion of the CBD Program by developing new tools and providing discounted NABERS ratings, maximising its effectiveness. Australia's NABERS rating tools for commercial buildings are seen as world leading, with their focus on the actual energy performance of buildings. NABERS will work with sectors in scope for expansion of CBD to improve voluntary disclosure rates in the run up to mandatory disclosure, incentivising building owners to seek ratings and ensuring assessor capacity leads sector expansion. The development and refinement of NABERS tools will also enable NABERS and its partners to deliver useful products for industry in areas such as energy flexibility and embodied carbon.

Greenhouse and Energy Minimum Standards (GEMS)

The *Greenhouse and Energy Minimum Standards Act 2012* (GEMS Act) and program is the primary driver for improving the energy performance of the appliances we use in our homes, buildings and industry. Sending the right signals about the value of efficient, electric appliances, enabled for demand flexibility, gives consumers the information they need to make informed choices and take pressure off their bills. The Government will invest around \$16 million to modernise the GEMS Act and update the program so the Government can ensure the Act is fit-for-purpose now and into the future, this will reduce emissions and deliver real bill savings by regulating a greater range of more efficient products and equipment across residential, commercial and industrial sectors.

Expanding Nationwide House Energy Rating Scheme (NatHERS) to existing homes

In July 2025, the Government released stage 1 of the expansion of the Nationwide House Energy Rating Scheme (NatHERS) to existing homes. The Government will invest around \$33 million to continue and scale-up the roll out of NatHERS ratings for existing homes. This will provide ratings and upgrade information for more households across Australia, to better inform decisions on how to cut energy bills, reduce emissions and improve their home's resilience and comfort.

Previously, NatHERS was used for new home designs and major renovations – with more than 90% of new builds using NatHERS to demonstrate compliance with the energy efficiency requirements of the National Construction Code. NatHERS ratings consider the energy efficiency of the building, as well as its major fixed appliances and any on-site solar or batteries.

There are expected to be a range of other users of NatHERS for existing homes ratings:

- Banks may use the ratings to verify green loans, helping them access green capital markets to lend money for home upgrades. This will make more finance available to Australians and drive energy performance improvements in existing housing stock.
- Governments may use the ratings to underpin and target home energy upgrade programs, and in time, state and territory governments may use the ratings for home energy rating disclosure schemes at the point of sale or lease.
- Various businesses will benefit from new business opportunities, jobs and professional development to meet the demand for skills, services and products to rate and improve energy performance.

Investing in these trusted and effective programs will deliver emissions and energy savings in the built environment for households, communities and businesses.

Furthering Community Energy Upgrades – Game On: Teaming up for climate action

Building on the success of the Community Energy Upgrades Fund, the Government will provide \$50 million to deliver energy performance upgrades for community sports clubs to climate-proof community sports facilities, promote inclusive climate action and harness the potential of sport as a vehicle to engage everyday Australians in the energy transition.

Sport provides a powerful opportunity to engage millions of Australians in positive action to address climate change. Energy upgrades will unlock savings that can be directed back to grassroots sport. Upgrades include installing solar and batteries, electrification, energy efficiency upgrades and lighting, and climate adaptation improvements.

Monitoring progress

The *Climate Change Act 2022* sets up a strong framework to ensure Australia remains on track to reach net zero emissions. It requires the Minister for Climate Change and Energy to report progress through an Annual Climate Change Statement to Parliament, including progress towards emissions targets, and whether current policies are effective. This regular reporting ensures transparency and accountability. It also creates a clear cycle for reviewing and improving climate policies over time.

The BESP outlines a range of measures to reduce greenhouse gas emissions and their success will depend on all levels of government, the community and industry working together. Progress will be reviewed by the Australian Government and state and territory governments through the Building Ministers Meeting, Planning Ministers Meeting and Energy and Climate Change Ministerial Council which provide important fora for collaboration.

Continued stakeholder engagement will also be key to achieving the BESP's goals and to identify and grasp new opportunities. A range of stakeholder consultation and vehicles for input will be rolled out over the life of the plan.

Delivering on the objectives of net zero sector plans will be assessed by the Climate Change Authority in its five yearly review of Australia's progress against emissions reduction targets. Key metrics of success will include declining emissions, increasing electrification rates and use of low-carbon fuels, and improvements in Australia's energy performance. Further metrics will be developed to support a fair and equitable transition.

Acronyms and Glossary

Acronyms

| Term | Definition |
|----------------------|---|
| ABCB | Australian Building Codes Board |
| BESP | Built Environment Sector Plan (this document) |
| CEFC | Clean Energy Finance Corporation |
| CER | Consumer energy resources |
| CO ₂ | Carbon dioxide |
| CO ₂ -e | Carbon Dioxide equivalent is a standard unit used to compare the emissions of different greenhouse gases based upon their global warming potential in terms of the equivalent amount of carbon dioxide emissions. |
| CSIRO | Commonwealth Scientific and Industrial Research Organisation |
| DCCEEW | Department of Climate Change, Energy, the Environment and Water |
| HFCs | Hydrofluorocarbons |
| kW | Kilowatt |
| Mt CO ₂ e | Million tonnes of carbon dioxide equivalent |
| NABERS | National Australian Built Environment Rating System |
| NatHERS | Nationwide House Energy Rating Scheme |
| NAP | National Adaptation Plan |
| NCRA | National Climate Risk Assessment |
| NEM | National Electricity Market |
| PJ | Petajoule (One petajoule is 1015 joules (1 million billion) or 278 gigawatt hours). |
| R&D | Research and development |
| t | Tonne |
| TWh | Terawatt hour |

Glossary

| Term | Definition |
|--------------------|--|
| Abatement | A reduction in atmospheric greenhouse gases through emissions avoidance or removal of carbon from the atmosphere. |
| Decarbonise | To stop or reduce carbon gases, especially carbon dioxide, being released into the atmosphere as the result of a process, like the burning of fossil fuels. |
| Electrification | Switching from energy sources, such as liquid fuels or gas, to electricity. |
| Greenhouse gases | Any gas (natural or produced by human activities) that absorbs infrared radiation in the atmosphere, leading to warming effects. Greenhouse gases include carbon dioxide, methane and nitrous oxide. |
| Net zero emissions | The sum of anthropogenic greenhouse gas emissions to the atmosphere and anthropogenic removals of greenhouse gases from the atmosphere. |