

# EVERY BUILDING COUNTS

2023 EDITION

**Innovating for a greener, healthier,  
and more equitable built environment**

FOR THE FEDERAL GOVERNMENT



Green Building  
Council Australia




PROPERTY  
COUNCIL  
*of Australia*



Buildings account  
for half of Australia's  
electricity use

...and almost a quarter  
of its emissions.



“The Albanese Government has already taken urgent climate action and as one of our first acts, enshrined our commitment to reach net zero emissions into law.”

**Anthony Albanese**  
Prime Minister

“Energy efficiency policies driven by a national strategy will cut energy costs for households and businesses, reduce pressure on the energy system and help us meet our emissions reduction goals.”

**Chris Bowen**  
Minister for Climate Change and Energy

“The benefits of improved energy performance for all Australians are there waiting to be grasped.

We want to support affordable energy for Australians, ensuring no one gets left behind, while taking strong action on climate change. Action on the demand-side of the market will mean Australians can take control of their energy use.

This is an issue directly affecting the health and welfare of our nation, including low-income and disadvantaged households, and regional communities.”

**Jenny McAllister**  
Assistant Minister for Climate Change and Energy

# ENERGY EFFICIENCY MEASURES IN BUILDINGS COULD DELIVER:

\$20 BILLION

in energy bill savings for  
businesses and households

64MT

of avoided CO2-e emissions by 2050

# ELECTRIFYING THE BUILT ENVIRONMENT COULD DELIVER:

\$49 BILLION

in energy saving between 2024  
and 2050 compared to BAU

199MT

of avoided CO2-e emissions

**WE ARE COMMITTED TO ACHIEVING DECARBONISATION  
BY MID-CENTURY IN ACCORDANCE WITH AUSTRALIA'S  
RESPONSIBILITIES UNDER THE PARIS AGREEMENT.**

**While Australia's leading property companies continue to top  
international sustainability benchmarks, the challenge remains  
to extend this progress across the sector more broadly.**

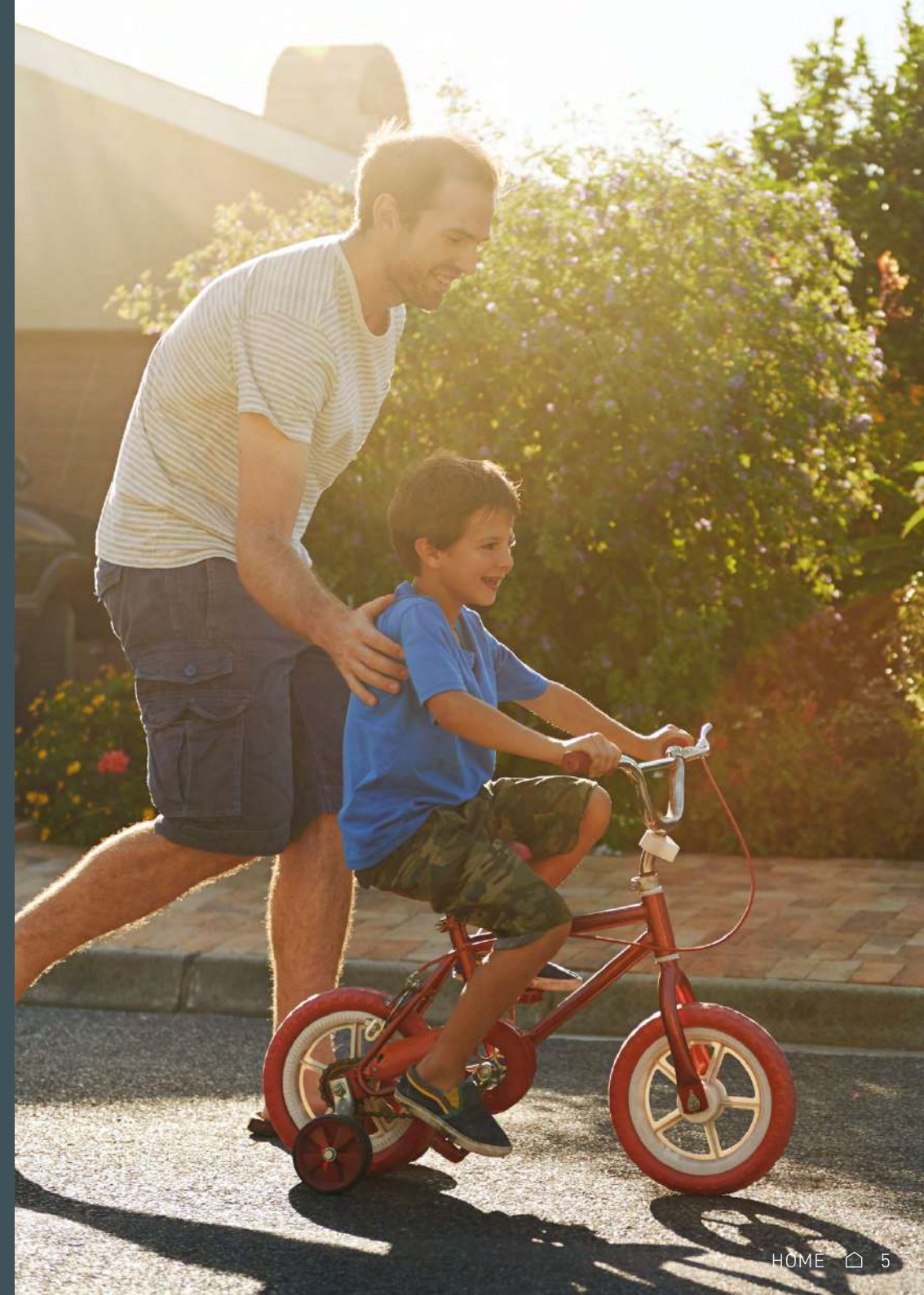
The right policy settings can help our buildings achieve their full potential with consistency and efficacy. Targeted policies are needed for the sector as well as national consistency of processes and programs where possible.

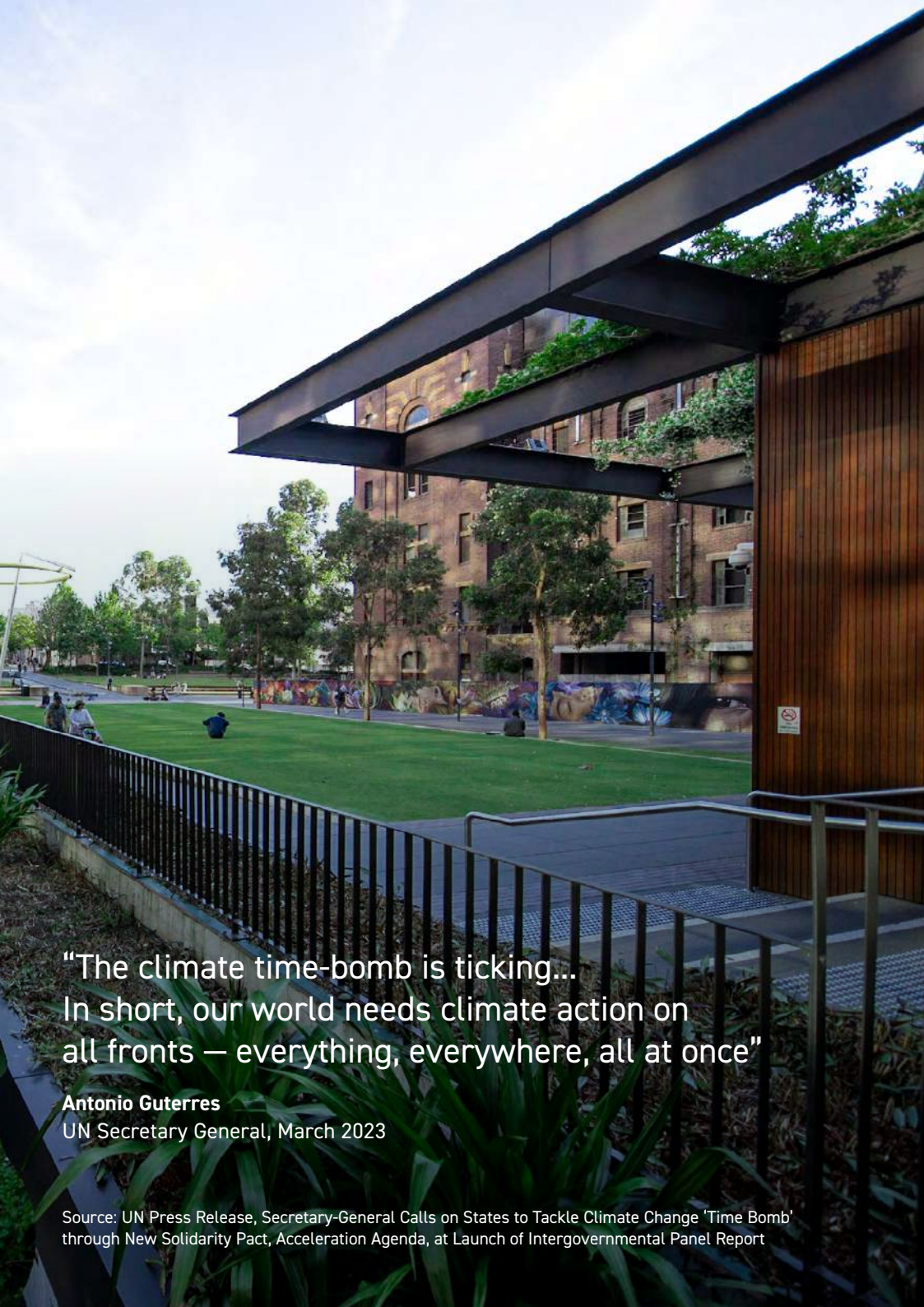
## DRAWING FROM BEST PRACTICE

**WE HAVE ILLUSTRATED MANY OF THE POLICIES OUTLINED IN THIS DOCUMENT WITH BEST PRACTICE CASE STUDIES FROM AUSTRALIA AND OVERSEAS TO INFORM RECOMMENDATIONS WITH THE BEST VALUE FOR GOVERNMENTS AND INDUSTRY.**

This work has resulted in a set of recommendations covering residential, commercial and public buildings that are ready for implementation by the Federal Government.

This report is companion to two others tailored for state and territory, as well as local governments respectively and is the latest in a series of flagship publications showing how government and industry can work together to innovate for a greener, healthier, and more equitable built environment.





## URGENT ACTION

**THE BUILT ENVIRONMENT HAS THE TECHNOLOGY TO DECARBONISE NOW – BUT WE MUST DO THIS AT SPEED AND SCALE TO SMOOTH THE WAY FOR OTHER HARD-TO-ABATE SECTORS.**

Australia's transition to a low emissions economy will be smoother if governments set a clear plan and a steady trajectory for emissions reductions in key economic sectors, and a suite of policies that provide industry certainty.

With the right policy frameworks in place, we can minimise the costs of transition and create economic opportunities across all parts of industry, from sole traders and homeowners to large businesses.

**“The climate time-bomb is ticking...  
In short, our world needs climate action on  
all fronts – everything, everywhere, all at once”**

**Antonio Guterres**  
UN Secretary General, March 2023

Source: UN Press Release, Secretary-General Calls on States to Tackle Climate Change 'Time Bomb' through New Solidarity Pact, Acceleration Agenda, at Launch of Intergovernmental Panel Report

# ZERO-CARBON-READY BUILDINGS

Zero-carbon-ready buildings are buildings that can operate in a low emissions economy.

The International Energy Agency defines them as:

**“A ZERO-CARBON-READY BUILDING IS HIGHLY ENERGY-EFFICIENT AND EITHER USES RENEWABLE ENERGY DIRECTLY, OR USES AN ENERGY SUPPLY (E.G. ELECTRICITY OR DISTRICT HEATING) THAT WILL BE FULLY DECARBONISED BY 2050.”**

Together with a decarbonised grid, zero-carbon-ready buildings deliver the end goal of a decarbonised built environment and feature a number of characteristics:

- High efficiency, high performance
- Fossil fuel free and fully electric
- Powered by renewable electricity
- Grid responsive
- Offset with nature
- Low embodied carbon

## REDUCE



### Built with lower upfront emissions

Built using materials with significantly lower embodied carbon. Emissions are reduced during construction.



### Highly efficient

All buildings and infrastructure are energy efficient. Reduces stresses in the grid.



### Walkable and livable

Transport emissions are reduced by good urban design, promotion of active transport, and low carbon options.



### Grid responsive

Buildings that interact with the grid, including demand response and allowance for electric vehicles.

## ELIMINATE



### Fossil fuel-free

Buildings do not use fossil fuels for heating, hot water, cooking and onsite energy generation.



### Powered by renewables

All energy used in buildings comes from 100% onsite or offsite renewable sources.

## COMPENSATE



### Offset with nature

The balance of emissions are compensated or neutralised through investments in high-integrity, nature-based carbon offsets.

# THIS REPORT WAS PRODUCED BY

## PROJECT PARTNERS



## STEERING GROUP PARTNERS





# METHODOLOGY

We have identified solutions for different building types across the built environment.



All buildings



Government



Commercial



Residential

We have identified the building lifecycle stage to which each recommendation can be applied.



All stages



Design



Construction



Commissioning



Sale/lease



Retrofit



Occupation

We assessed each policy according to the key criteria.



Impact

Emissions reduction opportunity



Ease of implementation

Lack of barriers or challenges for adoption



Cost effectiveness

Industry return on investment

# POLICY THEMES

## THEME 1

ZERO-CARBON-  
READY RESILIENT  
BUILDING PLAN

## THEME 2

ELECTRIFICATION

## THEME 3

INCENTIVISE HIGH  
PERFORMANCE

## THEME 4

MINIMUM  
STANDARDS

## THEME 5

ENERGY  
MARKET REFORM

## THEME 6

GOVERNMENT  
LEADERSHIP

## THEME 7

ROBUST RATING  
TOOLS FOR ALL  
BUILDING TYPES

## THEME 8

TOWARDS  
ZERO EMBODIED  
CARBON

THIS IS AN INTERACTIVE PDF. CLICK THE BOXES TO GO TO EACH THEME.



# KEY RECOMMENDATIONS

1

Set out a long-term strategy for zero-carbon-ready buildings by reforming the Trajectory for Low Energy Buildings and extending it to 2050

THEME 1

2

Require all new residential and commercial buildings to operate on high-quality electric equipment in National Construction Code 2025

THEME 2

3

Accelerate the shift to high performance buildings with targeted incentives

THEME 3

4

Deliver an accelerated trajectory for resilient, all electric, zero-carbon-ready buildings in the National Construction Code

THEME 4

5

Embed the 'energy efficiency first' principle in the National Electricity Objective and other relevant legislation, statements and policies

THEME 5

6

Commit to achieving zero-carbon-ready new and existing government owned and leased buildings by 2030

THEME 6

7

Expand NABERS to cover all building types and extend the Commercial Building Disclosure Program; and empower owners, buyers and renters with a single national rating for home energy performance

THEME 7

8

Adopt a credible national framework for measuring embodied carbon

THEME 8

# RECOMMENDATIONS SUMMARY

## THEME 1 ZERO-CARBON-READY RESILIENT BUILDING PLAN

- 1.1 Set out a long-term strategy for zero-carbon-ready buildings by reforming the Trajectory for Low Energy Buildings and extending it to 2050**
- 1.2 Set out a long-term strategy for climate resilient buildings that can adapt to acute shocks and long term stresses from climate change**
- 1.3 Develop a plan for a just transition by prioritising support for low-income households and vulnerable Australians
- 1.4 Grow the workforce and invest in a skills, research and education agenda necessary to futureproof and transform the built environment

## THEME 2 ELECTRIFICATION

- 2.1 Require all new residential and commercial buildings to operate on high-quality electric equipment in National Construction Code 2025**
- 2.2 Introduce a national plan to phase out fossil gas in existing buildings and appliances
- 2.3 Create a strategy for quality retrofits for existing residential and commercial buildings that prioritises low-income and vulnerable households
- 2.4 Urgently grow skills and market readiness for electrification
- 2.5 Grow the market for strategic electric technologies by removing obstacles to importation and supporting local manufacturing

## THEME 3 INCENTIVISE HIGH PERFORMANCE

- 3.1 Accelerate the shift to high performance buildings with targeted incentives**
- 3.2 Improve the business case for electrifying buildings with targeted incentives
- 3.3 Leverage ARENA and the CEFC to encourage innovation through funding for R&D, pilots and commercialisation
- 3.4 Incentivise NABERS & Green Star ratings for buildings not currently covered by the Commercial Building Disclosure program
- 3.5 Introduce and harmonise energy efficiency & electrification obligation schemes across jurisdictions
- 3.6 Support the creation of industry leadership groups in priority sectors to champion best practice and collaboration

## THEME 4 MINIMUM STANDARDS

- 4.1 Deliver an accelerated trajectory for resilient, all electric, zero-carbon-ready buildings in the National Construction Code**
- 4.2 Drive harmonised compliance, monitoring and enforcement of the National Construction Code
- 4.3 Phase out the sale of gas appliances and equipment
- 4.4 Expand and improve appliance labelling and minimum standards
- 4.5 Support renters with minimum energy performance standards for rental properties
- 4.6 Investigate energy performance standards for existing buildings

# RECOMMENDATIONS SUMMARY (CONTINUED)

## THEME 5 ENERGY MARKET REFORM

- 5.1 Embed the 'energy efficiency first' principle in the National Electricity Objective and other relevant legislation, statements and policies**
- 5.2 Deliver governance reform to meet the 'energy efficiency first' principle
- 5.3 Plan for future grid demand due to electrification with the optimal mix of demand and supply side measures
- 5.4 Adjust or establish markets and programs to reflect the value of energy demand management and other distributed energy resources
- 5.5 Develop robust and high-integrity carbon markets
- 5.6 Reduce barriers and support innovation in distributed energy resources

## THEME 6 GOVERNMENT LEADERSHIP


- 6.1 Commit to achieving zero-carbon-ready new and existing government owned and leased buildings by 2030**
- 6.2 Commit to applying trusted, robust and credible building rating systems such as Green Star and NABERS in all new government projects and existing buildings and accommodation
- 6.3 Lead the development of high-performance housing through government-led projects
- 6.4 Use City Partnerships to drive ambitious climate action on emissions and resilience

## THEME 7 ROBUST RATING TOOLS FOR ALL BUILDING TYPES

- 7.1 Expand the coverage of NABERS to all building types and extend the Commercial Building Disclosure Program**
- 7.2 Empower owners, buyers and renters with a single national rating for home energy performance**
- 7.3 Implement mandatory performance disclosure for homes at the point of sale or lease

## THEME 8 TOWARDS ZERO EMBODIED CARBON

- 8.1 Adopt a credible national framework for measuring embodied carbon**
- 8.2 Introduce embodied carbon targets into the National Construction Code
- 8.3 Create an embodied carbon national database for products and materials
- 8.4 Introduce embodied carbon reduction requirements for government projects
- 8.5 Support Australian product manufacturers and overseas importers to calculate and disclose embodied carbon content



# THEME 1

## ZERO-CARBON- READY RESILIENT BUILDING PLAN



# ZERO-CARBON-READY RESILIENT BUILDING PLAN

-  **1.1** Set out a long-term strategy for zero-carbon-ready buildings by reforming the *Trajectory for Low Energy Buildings* and extending it to 2050.
-  **1.2** Set out a long-term strategy for climate resilient buildings that can adapt to acute shocks and long term stresses from climate change.
- 1.3** Develop a plan for a just transition by prioritising support for low-income households and vulnerable Australians.
- 1.4** Grow the workforce and invest in a skills, research and education agenda necessary to futureproof and transform the built environment.

**RECOMMENDATION 1.1**

**SET OUT A LONG-TERM STRATEGY FOR ZERO-CARBON-READY BUILDINGS**

by reforming the *Trajectory for Low Energy Buildings* and extending it to 2050

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

Australia's national target of net zero emissions by 2050, and 43 percent reduction on 2005 levels by 2030, means that we are committed to transitioning toward a net zero economy. Decisive action across all sectors will be necessary to reach this goal. Buildings present some of the lowest cost emissions reduction opportunities, and the technology already exists today to achieve zero-carbon-ready buildings. A national plan which includes sectoral targets and policies for emissions reduction out to 2050 would leverage opportunities in the sector and expand the progress shown by market leaders in recent years.

**SOLUTION**

The Federal Government should establish a comprehensive national plan, in conjunction with state and territory governments, towards zero-carbon-ready buildings. The plan should encompass a range of measures that accelerate decarbonisation in the built environment and include interim science based targets aligned with Australia's international commitments. It should be underpinned by frameworks to coordinate action across different levels of government, departments, agencies and policy processes.

To support this plan, the Federal Government should extend the Trajectory for Low Energy Buildings, which identifies opportunities for zero-carbon-ready buildings, out to 2050. The Trajectory should be equipped with measurable interim targets and scheduled increases to performance standards.





**RECOMMENDATION 1.2**

**SET OUT A LONG-TERM STRATEGY FOR CLIMATE RESILIENT BUILDINGS**

that can adapt to acute shocks and long term stresses from climate change

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

Many of the medium and long-term impacts of climate change are already locked in due to anthropogenic increases of greenhouse gases in the atmosphere. Australia is already experiencing more extreme weather events as a result, in particular, increases in frequency and severity over time. The built environment is not currently equipped to withstand future climate conditions potentially leading to heightened risks for buildings and occupants. Buildings established today will be in use for decades and must be designed to deliver increased resilience to more frequent and severe extreme weather and preserve the safety of occupants.

**SOLUTION**

The Federal Government should establish a comprehensive national plan, in conjunction with state and territory governments, towards a climate resilient built environment. The plan should encompass a range of measures that establish best practice technical requirements for building construction to ensure occupant safety and preserve buildings (where appropriate and cost effective) in the face of a changing climate. Initially, a nationally agreed set of future climate scenario data would be required to determine structural and resilience requirements in new buildings. This dataset should be used to underpin a comprehensive framework of scheduled updates to regulation, targeted retrofits and land-use planning requirements.



### RECOMMENDATION 1.3

## DEVELOP A PLAN FOR A JUST TRANSITION BY PRIORITISING SUPPORT for low-income households and vulnerable Australians

BUILDING TYPE:



Residential

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

In the absence of decisive government intervention, vulnerable and low-income Australians will be disproportionately affected by the impacts of a changing climate. Scarce access to high energy performance, fully electric, and resilient housing can trigger higher energy bills, negative health impacts and increased exposure to extreme weather events for vulnerable occupants. In particular, retrofitting existing homes to meet higher standards of energy efficiency, electrification and resilience requires a high outlay of capital which is beyond the reach of many households. Government intervention is needed to ensure an equitable and just transition to a zero-carbon-ready, resilient built environment. High efficiency, high performance, all electric homes with integrated solar PV and electric vehicle management should be affordable for all.

## SOLUTION

The Federal Government should work with state and territory governments to develop a plan for a just transition of the built environment. This plan should consider the right policy mix to adequately support vulnerable and low-income Australians through this period of transition. The Federal Government should prioritise actions that balance incentives, minimum standards, information & education campaigns and innovative financial mechanisms to deliver a more efficient and resilient built environment for all Australians.



**RECOMMENDATION 1.4**

**GROW THE WORKFORCE AND INVEST IN A SKILLS, RESEARCH AND EDUCATION**

agenda necessary to futureproof and transform the built environment

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

The transition to low carbon, resilient buildings cannot be achieved without improving the skills and capacity of the workforce. To grow the market’s capacity to deliver sustainable, resilient buildings, Australia must have a construction supply chain that can meet the needs of each industry sub-sector and jurisdiction. In particular, the wide scale electrification of Australia’s built environment will require significant investment into upskilling the supply chain to design for, install and maintain technologies such as heat pumps. Training and education will support industry capacity building, and alongside regulatory compliance, drive industry to deliver higher standards of building performance.

**SOLUTION**

The Federal Government should develop a national education and training agenda for building energy efficiency and resilience. Priority should be placed on ensuring effective compliance with minimum standards through skills training and incentives, and improved mechanisms for dispute resolution. There is an existing workforce specialised in fossil gas equipment that should be targeted to retrain and gain skills in electric technologies.

Market transformation programs should be tailored for specific characteristics in each state and territory and be delivered locally to suit different building techniques, industry contexts and capabilities as well as climate zones.

In addition to operational emissions, the agenda should also support a nationally coordinated strategy to achieve net zero embodied carbon, including large-scale electrification of the residential and commercial buildings sectors (see [Theme 2](#)).



# THEME 2

## ELECTRIFICATION



# ELECTRIFICATION

-  **2.1** Require all new residential and commercial buildings to operate on high-quality electric equipment in National Construction Code 2025.
- 2.2** Introduce a national plan to phase out fossil gas in existing buildings and appliances.
- 2.3** Create a strategy for quality retrofits for existing residential and commercial buildings that prioritises low-income and vulnerable households.
- 2.4** Urgently grow skills and market readiness for electrification.
- 2.5** Grow the market for strategic electric technologies by removing obstacles to importation and supporting local manufacturing.

**RECOMMENDATION 2.1**  
**REQUIRE ALL NEW RESIDENTIAL AND COMMERCIAL BUILDINGS**

to operate on high-quality electric equipment in National Construction Code 2025

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



Design



Construction

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

Many homes and commercial buildings in Australia are already reaping the benefits of being all electric in their operations. Others, though, still operate on fossil gas equipment which is less efficient, has potential negative health impacts,<sup>1</sup> and generates additional network expenses. Recent estimates show that there are 2.9 million gas heating systems and 5.2 million gas hot water systems currently installed in Australian homes.<sup>2</sup> Under business as usual settings, the Residential Energy Baseline Study 2021 predicts that the number of gas hot water systems in homes will increase from 5.2 million in 2022 to 7.2 million in 2040. New homes and buildings can be designed to be fully electric,

but gas connections are currently growing at a rate of 100,000 new connections annually.<sup>3</sup> This is inconsistent with national goals for a net zero future and sustains unnecessary competition for limited renewable gas supplies. Every new building equipped with gas is one more building to retrofit in the future.



## SOLUTION

The National Construction Code should, in the next revision, require all new buildings to be designed and delivered as fully electric buildings.

This change to the code is in line with the Federal Government's own emissions and renewable energy policies and keeps Australia in alignment with similarly developed economies. Many regions of the US and Europe, including France and Germany, are already blocking new gas connections and equipment in buildings. The changes to building supply chains are profound and the technology enabling electrification must be secured in a competitive global market. Federal leadership to support electrification and build industry capacity is urgently needed.

## ACT GAS TRANSITION PLAN

The ACT Government has committed to transitioning away from the use of fossil gas by 2045, as it currently accounts for over 20 percent of the region's emissions. To prepare for this, the government will introduce regulation to prevent new gas connections immediately and focus on electrifying existing buildings.

This profound and complex transformation cannot be delivered overnight. A plan will be put in place to phase out fossil gas over the next 20 years, so the transition will be done in a sustainable and responsible manner. The government aims to enable homes and businesses to save money by transitioning their appliances during key decision points, such as replacing obsolete equipment. As part of this effort, the government is undertaking an education campaign to encourage residents to switch to electric equipment.

**RECOMMENDATION 2.2**

# INTRODUCE A NATIONAL PLAN TO PHASE OUT FOSSIL GAS

in existing buildings and appliances

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

Many of the buildings in operation today will still be in use in 2050 when we are due to achieve net zero as a nation. We cannot achieve a net zero economy without decarbonising the built environment. ASBEC's Unlocking the Pathway report shows that 100 percent electrification with renewable electricity is the lowest cost, fastest emissions reduction pathway for Australia's built environment. However, it is not a zero-cost option. The supply chains to Australia's millions of buildings are complex and international with most energy consuming appliances manufactured overseas. There will be a need to secure a supply of electric equipment in a competitive international market and upskill local professionals. A national electrification plan will be required to establish new supply chains, provide certainty to business and phase out fossil gas equipment and appliances.

## SOLUTION

A national electrification plan for buildings will provide the market with the signals appropriate to ensure a smooth transition of the existing building stock to all electric and the economic roll back of gas delivery systems.

The electrification plan will require ambitious reach, but some parts of it are already well underway. Australian home owners have been quick to embrace solar PV, and with system costs continuing to decline, the Australian Energy Market Operator predicts much higher penetration in future. Government coordination at every level will be key to a rapid transition. A planned phasing out of gas to buildings will likely need to occur on a geographic basis as parts of the gas network lose connections and the cost of maintenance is carried by a declining number of customers.

A communities based program of information, engagement and planned gas phase out will assist in understanding the many challenges. These will include renovating heritage buildings, working with main street food retail, supporting health care facilities through the change and developing solutions for different styles of apartment blocks.



## FOSSIL GAS PHASE OUT IN THE NETHERLANDS

The Netherlands has been exploring the challenges of phasing out gas from homes, not just because of the emissions associated with burning fossil fuels, but also because depletion of their largest domestic gas field has been linked with earthquakes in the area. The Programme for Nature Gas-free Districts was created in 2018 to support districts to transition towards fossil gas free heating. The programme provides local government with funds to support electrification and energy efficiency measures. The National Government also provides co-investment opportunities. This programme has unlocked economies of scale and significant learnings on retrofitting existing buildings to be zero-carbon-ready.

**RECOMMENDATION 2.3**

**CREATE A STRATEGY FOR QUALITY RETROFITS**

for existing residential and commercial buildings that prioritises low-income and vulnerable households

BUILDING TYPE:



Commercial



Residential

LIFECYCLE STAGE:



Retrofit

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

The electrification of homes and commercial buildings will require changing out millions of gas appliances and replacing them with cleaner, healthier and vastly more efficient electric equipment. During the initial phases of the transformation the upfront capital cost can impede take up. Linking appliance upgrades with efficiency improvements like insulation and shading contributes to an optimised whole-of-energy system and a built environment compatible with a low carbon economy.

**SOLUTION**

A national buildings retrofit program will ensure that cleaner, healthier, more efficient and more comfortable buildings are available to all. The strategy needs to incorporate financial incentives but also focus on the technologies that will integrate with renewable electricity. Millions of heat pumps, energy storage systems, and EV chargers will require design, manufacture, distribution and installation, creating new jobs and developing new skills.

Targeted incentive programs will be critical to ensure that this clean, 100 percent renewable future is affordable for all, including renters and social and community housing occupants.





RECOMMENDATION 2.4

URGENTLY GROW SKILLS AND MARKET READINESS FOR ELECTRIFICATION

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



ISSUE

Much of Australia's building sector workforce including architects, designers, installers, maintenance workers and tradespeople, is not equipped for the immediate and urgent change required to electrify our buildings. To transition 85 percent of homes off gas by 2040<sup>4</sup> requires retrofitting hot water systems in 5,000 homes every week until 2040, starting in 2023. The challenge is significant and government will be required to build skills and market readiness to deliver electrification at scale.

SOLUTION

Australians need a broad-based information program that describes the benefits of electrification, encouraging homeowners to make the change from gas. Simultaneously, training and information packages are required across the professions and trades that support electrification of the built environment so that everyone understands the role they can play in the electrification transformation.

Improving our homes and buildings - making them more comfortable, safer and cleaner - requires thousands of skilled tradespeople, accelerating the installation of solar, connecting heat pump hot water systems, changing out gas heating systems, rewiring to meet improved standards, and insulating for higher resilience to weather extremes. A national strategy must identify the skills and resources necessary for this momentous renovation project.



**RECOMMENDATION 2.5**

# GROW THE MARKET FOR STRATEGIC ELECTRIC TECHNOLOGIES

by removing obstacles to importation and supporting local manufacturing

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



Construction



Design



Commissioning



Occupation



Retrofit

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

Zero-carbon-ready homes and buildings can largely be delivered using technology that is available today, but having all the products and appliances accessible in the right place at the right time remains rare due to poor information, capital costs, supply chain inertia and even regulatory barriers.

Technology doesn't remain static. Innovation can bring even more efficient, less polluting products like heat pumps, inverters, and two-way car chargers. Nations around the world are already seeking access to the best technology, and Australia should not miss out by delaying our search for adequate supplies.

## SOLUTION

Technology roadmaps covering R&D, manufacture, import, deployment and training are urgently required for strategic electric technologies like heat pumps, integrated energy storage and vehicle chargers. Roadmaps can define where resources can be deployed to realise vibrant new industries while also ensuring that trades are equipped to deliver the technology into homes and buildings.

Roadmaps can also guide the deployment of funding to ensure that the technology that electrifies our homes and buildings is affordable for all, overcoming higher capital costs so that operational savings and benefits are enjoyed by all parts of the community. Government incentives and funding programs will spur the market and provide "learning by doing" opportunities that must be supported with technology roadmaps.

## VICTORIAN GAS SUBSTITUTION ROADMAP

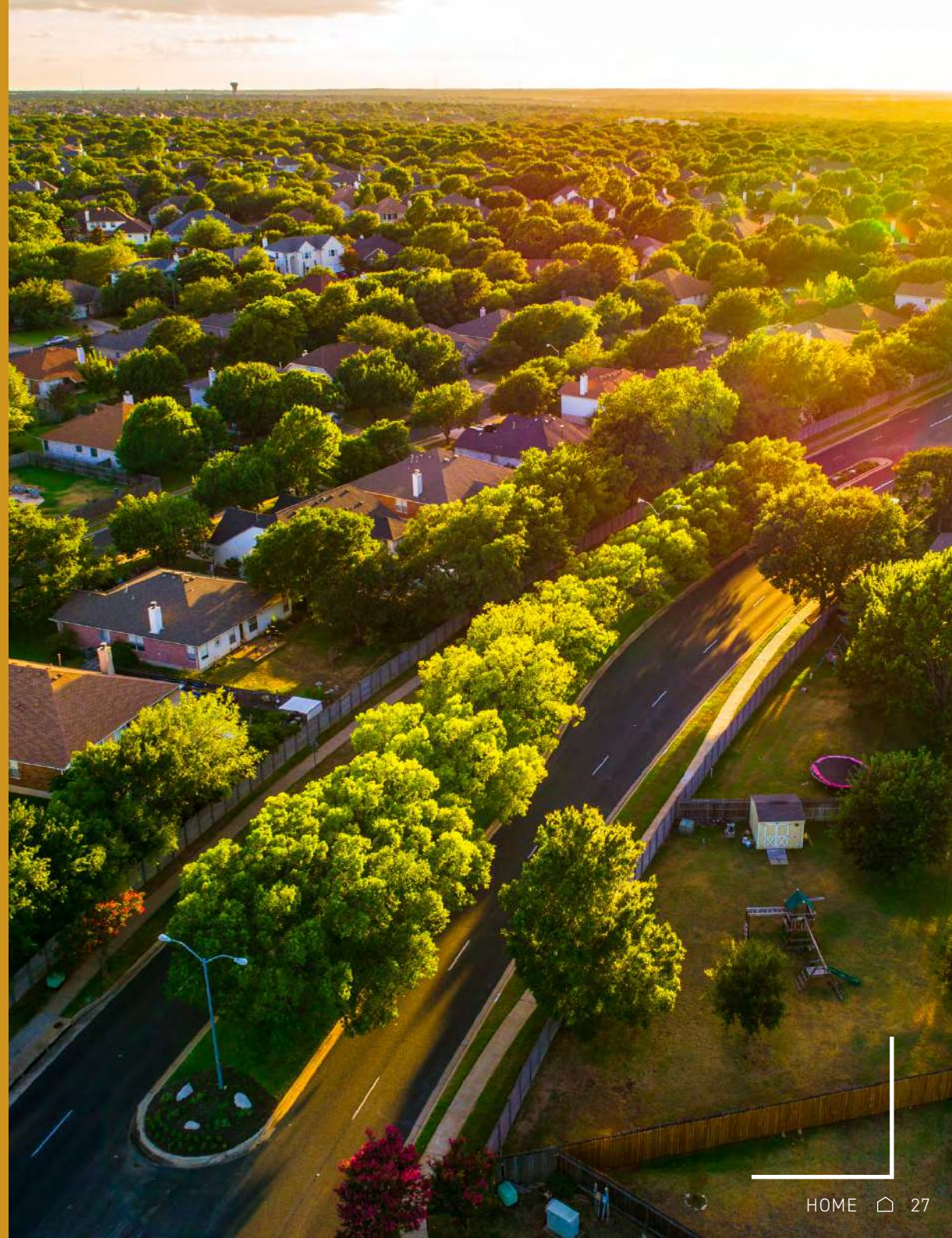
Until recently, fossil gas was considered a low cost transition fuel to displace coal powered electricity generation. However, the falling cost of renewables and geopolitical events such as Russia's inexcusable invasion of Ukraine have sent shocks through supply chains and driven the price of gas up.

The gas sector currently contributes about 17 percent of Victoria's net emissions. The Roadmap outlines a suite of policies that the Victorian Government will use to transition the state away from fossil gas and towards cleaner sources of energy. This will include driving energy efficiency, electrification, hydrogen and biomethane to reduce energy bills for consumers and cut carbon emissions.

The Roadmap was funded by a \$331 million commitment in the 2022-23 state budget and builds on a record \$1.6 billion of investment into Victoria's clean energy future.



THEME 3  
INCENTIVISE  
HIGH  
PERFORMANCE



# INCENTIVISE HIGH PERFORMANCE

-  **3.1** Accelerate the shift to high performance buildings with targeted incentives.
- 3.2** Improve the business case for electrifying buildings with targeted incentives.
- 3.3** Leverage ARENA and the CEFC to encourage innovation through funding for R&D, pilots and commercialisation.
- 3.4** Incentivise NABERS & Green Star ratings for buildings not currently covered by the Commercial Building Disclosure Program.
- 3.5** Introduce and harmonise energy efficiency & electrification obligation schemes across jurisdictions.
- 3.6** Support the creation of industry leadership groups in priority sectors to champion best practice and collaboration.

## RECOMMENDATION 3.1

# ACCELERATE THE SHIFT TO HIGH PERFORMANCE BUILDINGS

with targeted incentives

BUILDING TYPE:



Commercial

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

Market leaders have made significant progress in recent years, however energy efficiency and resilience investments remain a low priority for most stakeholders in the built environment. This is due to barriers such as the perceived difficulty of building upgrades, high upfront costs and long payback periods. Financial incentives can drive accelerated uptake of energy efficiency and distributed energy technologies in new and existing buildings, by helping to reduce the gap between energy efficiency outlays and returns, and motivating action by building owners and tenants.

The transition to fully electric buildings involves upfront costs that many home and commercial building owners will prefer to avoid. In this case, direct incentives and tax concessions for electric appliances are a proven enabling mechanism.

## SOLUTION

The Federal Government should work with state and territory, as well as local governments to deliver financial incentives that encourage the built environment towards fully electric buildings with reduced emissions. Priority should be placed on:

- Incentives linked to the installation of electric appliances replacing gas.
- Immediately modernising the 10 percent Clean Building Managed Investment Trusts (MIT) withholding tax regime by:
  - expanding the regime to all buildings held for rental purposes (regime is currently limited to offices, hotels and shopping centres)

- applying the rate to buildings that have been refurbished to achieve the necessary NABERS or Green Star ratings (regime is currently limited to newly constructed buildings)
  - applying the test on an asset by asset basis (regime currently requires all of the MIT's assets to satisfy the Green Star rating requirements)
  - committing to reviewing the scope of the tax regime with a possible expansion to include climate resilience and fuel switching in buildings.
- Extending the instant asset write-off scheme to include energy efficiency upgrades of buildings up to 150k.
  - Green depreciation, which would see the deferment of taxable income in early years in exchange for bringing forward investment in large upgrades that exceed the instant asset write-off threshold.
  - Rates and charges relief for buildings that satisfy a performance standard, for instance stamp duty and land tax concessions for high performing buildings.

## RECOMMENDATION 3.2

# IMPROVE THE BUSINESS CASE FOR ELECTRIFYING BUILDINGS

with targeted incentives

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

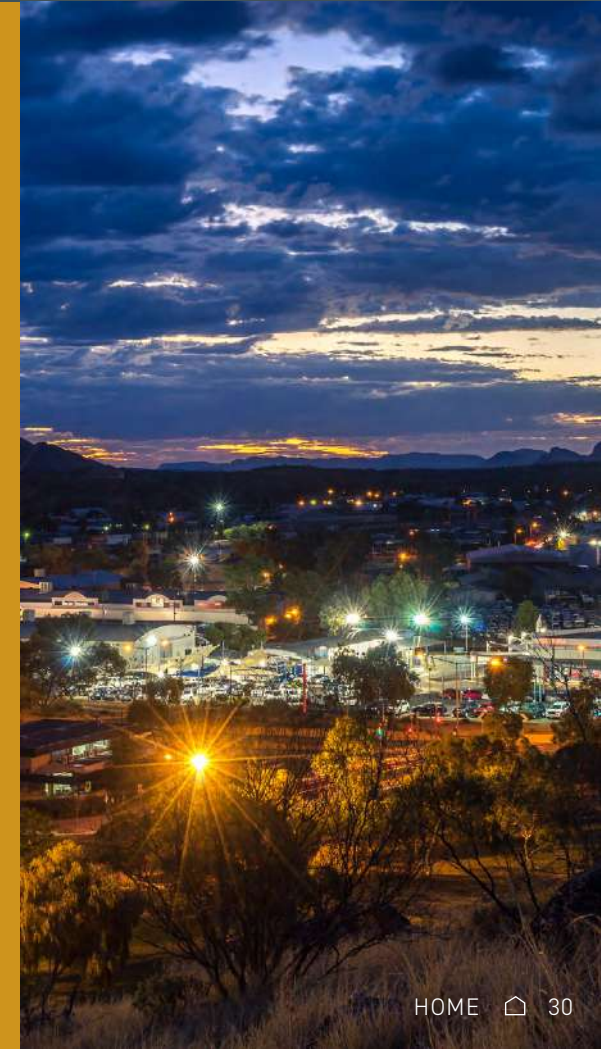
Most buildings standing today will still be operational in 2050. Findings from ASBEC's report, *Unlocking the pathway: Why electrification is the key to net zero buildings*, highlight electrification of equipment as the fastest and cheapest way to decarbonise building operations. Electric equipment can achieve higher efficiency levels than alternative technologies and when combined with renewable electricity, delivers a net zero solution to building services.

State and territory schemes are beginning to emerge in support of electrification but there is no unified, national approach to date. In the absence of federal leadership there is a risk that an unnecessary patchwork of regulatory frameworks will emerge across Australia. This will create superfluous red tape and lead to costs for businesses that will ultimately be passed on to purchasers.

## SOLUTION

The business case for new buildings to be all electric is well-established, but this is not always the case for existing buildings. While electrification is still the least-cost way to decarbonise building operations in existing buildings, it is not always a no cost solution. Existing buildings can be complex and costly to electrify. Heat pumps and thermal storage tanks often require more physical space than gas boilers and increased electrical capacity to produce the same HVAC and hot water services. The Federal Government should identify opportunities for targeted incentives and co-investment programs to support the business case for electrification in all building types.

Australia has many examples of using direct incentives to transform markets. For instance, the Small Scale Renewable Energy Scheme<sup>5</sup> has resulted in the highest penetration of solar on homes in the world. Good program design has seen transaction cost minimised while over a quarter of homes have had solar installed.



**RECOMMENDATION 3.3****LEVERAGE ARENA AND THE CEFC TO ENCOURAGE INNOVATION**

through funding for R&D, pilots and commercialisation

**ISSUE**

R&D, pilot programs and efforts to commercialise new approaches and technologies can unlock new opportunities for resilience, energy savings and distributed energy in the built environment. Australia currently lacks a cohesive research agenda on energy and resilience issues, and faces many gaps in the support for built environment innovation. As a result, there is no nationally agreed program to prioritise and deliver low carbon, high resilience construction methods or technologies, or to consider future opportunities for the built environment and other sectors like demand side initiatives and transport that will become increasingly integrated in buildings.

**SOLUTION**

The Federal Government should leverage existing high performing bodies like the Australian Renewable Energy Agency (ARENA) and the Clean Energy Finance Corporation (CEFC) to deliver an innovation and commercialisation agenda in the built environment. ARENA and the CEFC should be well resourced and their future assured. They should be tasked with delivering innovation for our energy grids, the built environment, transport and their integration with each other.

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**RECOMMENDATION 3.4**

**INCENTIVISE NABERS & GREEN STAR RATINGS**

for buildings not currently covered by the Commercial Building Disclosure Program

BUILDING TYPE:



Commercial

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

NABERS and Green Star are world leading rating tools that have equipped the Australian built environment with uniquely robust sustainability credentials. They have been widely adopted by market leaders through schemes like the Commercial Building Disclosure Program and voluntary action by industry. Evidence tells us that once building owners and managers become aware of their energy performance they tend to improve over time.<sup>6</sup> There remain large segments of the market across many asset types that have not yet engaged with these rating tools and have been isolated from their benefits.

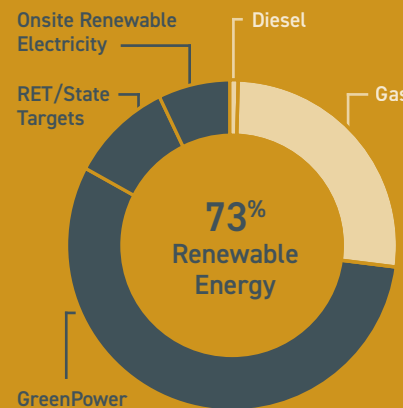
**SOLUTION**

The Federal Government should work with state and territory governments to incentivise the uptake of robust rating schemes like Green Star and NABERS. The Commercial Building Disclosure Program doesn't carry any minimum performance requirements but has still been instrumental in improving the energy performance of commercial office buildings as a cohort through disclosure. The Federal Government should encourage other building types to follow suit by co-funding their initial engagement with NABERS or Green Star. This would be particularly effective for smaller and mid-tier buildings where energy efficiency isn't always an immediate priority.

This initiative should be supported by an information campaign to spread awareness of the NABERS Renewable Energy Indicator, a simple breakdown of the building's energy sources, that will encourage the uptake of electrification.

**Example of NABERS Renewable Energy Indicator**

Source: NABERS



**NABERS RENEWABLE ENERGY INDICATOR**

NABERS is taking action to provide clear and transparent information about the proportion of renewable energy used in a building. The Renewable Energy Indicator (REI) is a new indicator which displays the proportion of renewable energy that a rated building is running on. Both onsite renewable energy generation and offsite renewable energy purchases are recognised. These help building owners and tenants be more transparent in their sustainability journey to net-zero-carbon-ready buildings.

The REI will be included and displayed on the NABERS certificate for free with every NABERS Energy rating.

This information will be useful for building managers, tenants and investors to better understand the energy use profile of any given building.



**RECOMMENDATION 3.5****INTRODUCE AND HARMONISE ENERGY EFFICIENCY & ELECTRIFICATION OBLIGATION SCHEMES**

across jurisdictions

**ISSUE**

To achieve maximum emissions reductions at least cost, actions across all sectors and jurisdictions should be consistent with each other so that the most efficient and effective measures can be actively implemented. While energy efficiency obligation (EEO) schemes exist in New South Wales, Victoria, South Australia and the ACT, each is different and requires bespoke applications to access incentives. To improve program design and administration, and reduce costs for delivering energy efficiency upgrades, these schemes should be harmonised and integrated.

**SOLUTION**

The Federal Government should encourage the objective of harmonised EEO schemes across all states and territories. Initially, support will be needed for states and territories to introduce schemes where they do not already exist and align them with existing programs. Best practice elements of harmonised EEOs will include; consistent application and rules, a national market for white certificates, eliminating subsidies for gas appliances and increasing subsidies for electric equivalents, as well as wide coverage of sectors. State and territory-based schemes should be developed to support the long-term goal of a single national scheme to maximise their impact and effectiveness.

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



Commissioning



Retrofit

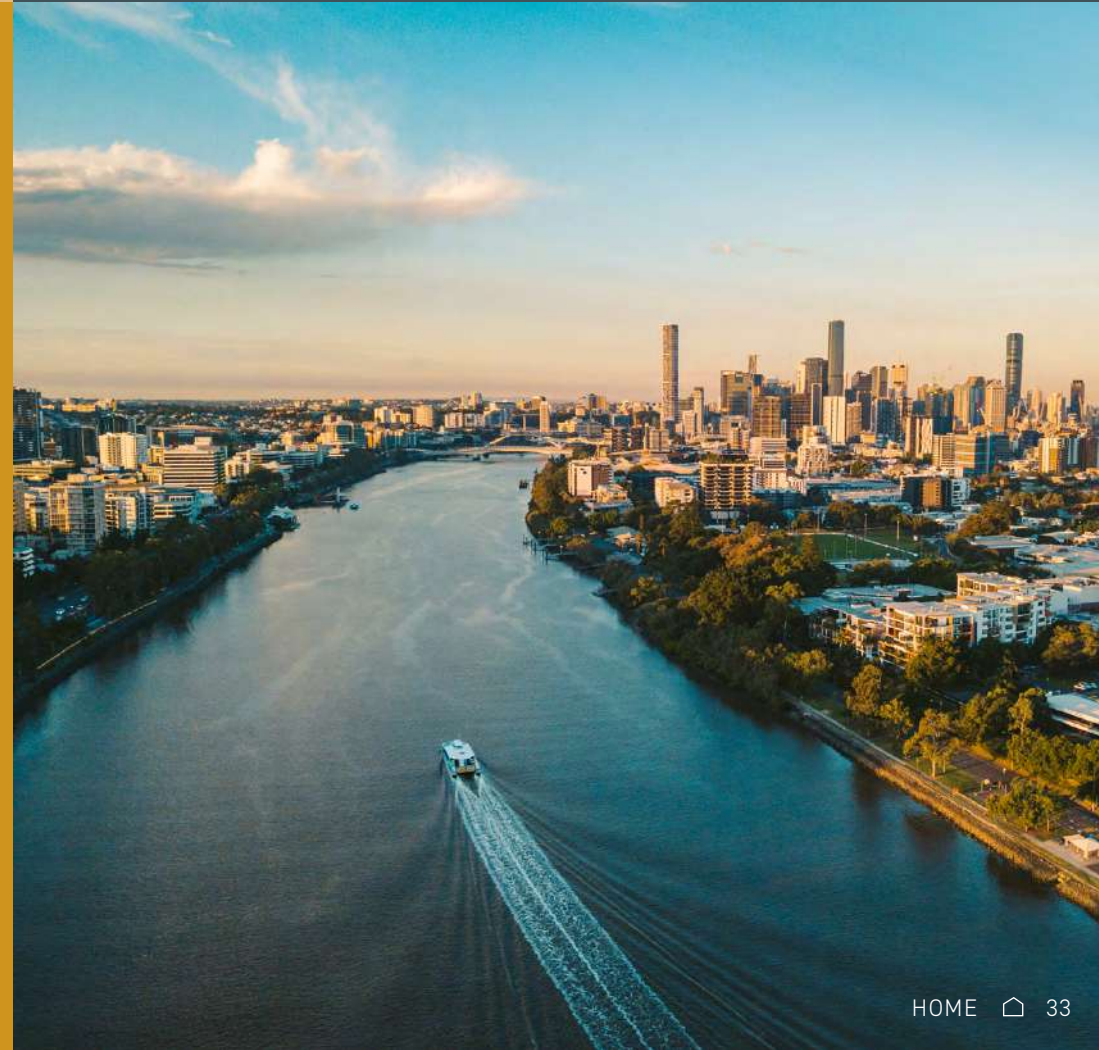
IMPACT:



EASE:



COST EFFECTIVENESS:



**RECOMMENDATION 3.6****SUPPORT THE  
CREATION OF INDUSTRY  
LEADERSHIP GROUPS**

in priority sectors to champion  
best practice and collaboration

BUILDING TYPE:



Commercial

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:

**ISSUE**

The breadth and diversity of the built environment is a major challenge for policy development. Targeted approaches for specific market segments can be a way to overcome this challenge, and the Federal Government should explore collaborative approaches in particular sectors to build on successes and accelerate market transformation. Industrial, health and retail are among the sectors where a body of leading organisations with substantial market presence exists. The Federal Government can lead or support industry-led groups to accelerate action in these sectors.

**SOLUTION**

The Federal Government should support the creation of leadership groups in priority sectors, such as industrial, education, student accommodation, retirement living & aged care, and health and retail sectors, to support innovation, demonstrate opportunities, connect stakeholders, proliferate learnings about best practice and develop industry skills and capability.

**BETTER BUILDINGS  
PARTNERSHIP**

The Better Buildings Partnership is a leading collaboration of property owners, managers and influencers that plays a key role in improving the performance and sustainability of existing buildings in the City of Sydney area and across Australia.

With the partnership representing over 50 percent of the office floor space across Sydney's CBD, these commercial landlords have an important role to play in improving the energy, water and waste efficiency of Sydney's existing buildings.

75 percent of BBP members are committed to achieving net zero emissions across scope 1 and 2 by 2030 and 5 members are certified carbon neutral. Between 2006 and 2021, BBP members have also displayed;

- A 63% reduction in emissions,
- A 49% reduction in energy use, and
- A 65% reduction in potable water consumption.

# THEME 4 MINIMUM STANDARDS



# MINIMUM STANDARDS

-  **4.1** Deliver an accelerated trajectory for resilient, all electric, zero-carbon-ready buildings in the National Construction Code.
- 4.2** Drive harmonised compliance, monitoring and enforcement of the National Construction Code.
- 4.3** Phase out the sale of gas appliances and equipment.
- 4.4** Expand and improve appliance labelling and minimum standards.
- 4.5** Support renters with minimum energy performance standards for rental properties.
- 4.6** Investigate energy performance standards for existing buildings.

**RECOMMENDATION 4.1**

# DELIVER AN ACCELERATED TRAJECTORY

for resilient, all electric, zero-carbon-ready buildings in the National Construction Code

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



Design



Construction



Retrofit

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

Progress in improving energy efficiency across the building sector has been slow, with overall energy intensity improving between two to five percent over the decade from 2005 to 2015. This is despite market leaders delivering world class low-energy buildings, suggesting a widening gap between industry leaders and the rest of the market. Minimum requirements for new buildings and fitouts, with a forward trajectory for strengthened requirements over time, can play a role in closing this gap. The National Construction Code (NCC) is an existing instrument that is fit-for-purpose to deliver an accelerated trajectory for resilient, all electric, zero-carbon-ready buildings.

## SOLUTION

Our homes and commercial buildings can be cleaner and healthier while saving money when they are efficient and fitted with all electric technology.

Working with its state and territory counterparts through the Building Ministers' Meeting and the Energy Ministers' Meeting, the Federal Government should lead the revision of the national trajectory for future upgrades to minimum energy performance requirements in the NCC, starting with a step change for commercial buildings in 2025. The Australian Building Codes Board has commenced work to develop a case for these performance changes. The revised trajectory should be transparent, have broad industry support, and be consistent with the long-term goal of a net zero emissions economy.



## RECOMMENDATION 4.2 DRIVE HARMONISED COMPLIANCE MONITORING AND ENFORCEMENT

of the National Construction Code

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



Design



Construction



Retrofit

IMPACT:



EASE:



COST EFFECTIVENESS:



### ISSUE

Non-compliance with the National Construction Code is an ongoing issue. It is not only unlawful, but also undermines the rights of building purchasers and occupants who are not receiving what they are legally entitled to, and provides an unfair advantage to operators who cut corners. While non-compliance impacts a number of different areas, there is a need for a specific focus on energy efficiency compliance if the NCC is to support the transition of new buildings to becoming zero-carbon-ready.

### SOLUTION

The Federal Government should support a coordinated approach with state and territory governments to address issues relating to compliance and enforcement highlighted through the Shergold Weir Building Confidence Report.

While focused primarily on safety issues, many of the recommendations from the review have relevance to energy efficiency. The Australian Buildings Codes Board (ABCB) has delivered a model framework for the consistent implementation of Building Confidence Report recommendations for states and territories to adopt.

The Federal Government should work with the Building Ministers' Meeting to deliver a harmonised implementation of the ABCB's model guidance throughout all states and territories. The model guidance includes but is not limited to the registration and training of building practitioners, publication of state and territory government audit strategies and identification of defects, consistent requirements for documentation of performance solutions involving complex energy modelling, and on-site inspections timed to ensure compliance with energy efficiency provisions can be verified.



**RECOMMENDATION 4.3****PHASE OUT THE SALE OF GAS APPLIANCES AND EQUIPMENT**

## BUILDING TYPE:



All buildings

## LIFECYCLE STAGE:



Design



Construction



Retrofit



Occupation

## IMPACT:



## EASE:



## COST EFFECTIVENESS:

**ISSUE**

In 2020-21, fossil gas accounted for 27 percent of the energy consumed in Australia.<sup>7</sup> It was used in large scale electricity generation, but also had applications in the built environment through onsite building equipment such as water and space heaters, and appliances such as gas stoves. While it is less emissions intensive than coal, it remains a fossil fuel and must be eliminated in economic sectors where viable substitutes are available. In the built environment, electrification can replace fossil gas and presents many benefits by comparison. Phasing out fossil gas and electrifying buildings will deliver cleaner, healthier and more efficient outcomes while also removing the need to fund parallel gas and electricity networks.

The Australian Energy Market Operator Integrated System Plan's step change scenario delivers the 82 percent renewable electricity outcome adopted by the Federal Government. Included in this scenario is a reduction in gas use in homes by 85 percent by 2040, a transformation involving the replacement of millions of hot water and heating systems while also accelerating the pace of solar PV, energy storage and EV charging infrastructure.

**SOLUTION**

The Federal Government should establish a national plan to phase out the sale and installation of gas appliances and equipment in buildings over time and unlock the benefits of electrification. Unlocking the Pathway,<sup>8</sup> a report by ASBEC, finds that electrification would save the economy \$49 billion between 2024 and 2050 over the 'business as usual' scenario with fossil gas and offsets. It would also save 199 Mt CO<sub>2</sub>-e before offsets. Policies to encourage electrification should be developed and introduced as a priority now, and then ramped up over time to support the transition. This should include clear pathways to prompt change in the market, such as reducing tariffs on heat pumps and rapidly scaling up their supply chains, and working with appliance suppliers to substitute electric for gas stoves, heaters and hot water systems.



**RECOMMENDATION 4.4**

**EXPAND AND IMPROVE APPLIANCE LABELLING**

and minimum standards

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

The Equipment Energy Efficiency (E3) program has been effective at implementing labelling and minimum energy performance standards for appliances. The Greenhouse Energy Minimum Standards (GEMS) regulations save the average Australian household between \$140 and \$220 on their electricity bill each year<sup>9</sup> (about 10 to 15 percent of the average annual bill). McKinsey<sup>10</sup> identified appliance energy efficiency measures as a negative cost source of abatement. The Department of Climate Change, Energy, the Environment and Water estimates that GEMS regulations to date have provided emissions abatement at a negative cost of around \$200/tonne. There is significant scope to increase the performance of this program by expanding it to new products.

**SOLUTION**

The Federal Government should build on the success of the E3 program by expanding it to new products and establishing a trajectory of cost effective upgrades to minimum standards over time. New products should be prioritised on their predicted uptake and relative energy consumption. In particular, heat pumps are currently not captured by labelling or minimum standards and should be elevated as a priority for the Federal Government.





## RECOMMENDATION 4.5

# SUPPORT RENTERS

with minimum energy performance standards for rental properties

BUILDING TYPE:



Residential

LIFECYCLE STAGE:



Sale/lease



Retrofit



Occupation

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

Australia does not have nationally consistent minimum energy efficiency standards for rental properties, which are typically less energy efficient and have less distributed energy than owner occupied residences. This means that renters only have limited ability to make changes to the properties they live in, whilst landlords have little incentive to invest in upgrades. Introducing minimum energy performance standards for rental properties would help to overcome the landlord-tenant split incentive, and ensure that all households have an acceptable level of energy efficiency. This would also benefit low-income and disadvantaged households, who are more likely to live in inefficient homes and have less efficient appliances.

## SOLUTION

The Federal Government should coordinate and fund a nationally consistent approach to deploying minimum energy efficiency standards for existing rental properties by state and territory governments. These standards could include requirements for basic, cost-effective measures, such as insulation, draught sealing and low-flow shower heads. Alongside these standards, state and territory governments should review mechanisms for tenants to initiate upgrades to rental properties, and investigate incentives that encourage landlords to upgrade rental properties, as well as safeguards to avoid any unintended consequences around housing affordability, such as significant rent increases.

## FRENCH *LOI CLIMAT ET RÉSILIENCE*

The French *Loi Climat et Résilience* presents a legislated schedule of increases to minimum rental standards over time. Underpinned by a comprehensive energy rating scheme for the energy performance of homes, the *Diagnostic de Performance Énergétique* (DPE), the regulation requires houses earmarked for rental to meet energy performance standards. The DPE energy rating scheme assesses the energy performance of homes on a scale from A to G, with A being the most energy efficient and G being the least.

The regulation will prohibit the rental of the poorest performing homes rated G, from 2025 onwards. The stringency of this program increases over time to include F rated homes from 2028 and E rated homes from 2034.

This was done to address split-incentives, and power imbalances between owners and renters. In France, as in Australia,<sup>11</sup> renters tend to have less efficient housing which leads to higher bills and poorer health outcomes.

**RECOMMENDATION 4.6****INVESTIGATE ENERGY PERFORMANCE STANDARDS**

for existing buildings

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



Commissioning



Retrofit

IMPACT:



EASE:



COST EFFECTIVENESS:

**ISSUE**

Many countries and subnational jurisdictions are exploring the implementation or bolstering of energy efficiency standards for existing buildings.<sup>12</sup> While Australia's National Construction Code (NCC) is vital to ensuring that new buildings perform to a minimum standard, it only affects existing buildings when they are substantially upgraded or rebuilt. A review of Australia's energy policies by the International Energy Agency<sup>13</sup> stated that energy efficiency in existing buildings deserves more attention at both national and state levels because of the long lifetime of buildings. In addition, the triggers for adoption of the NCC energy efficiency requirements in renovations vary significantly across jurisdictions.

**SOLUTION**

Many of the buildings standing today will still be in operation in 2050. The Federal Government should investigate the options, benefits and costs of introducing minimum energy performance standards for existing buildings to reduce emissions and improve comfort. Possible considerations include strengthening the requirements of the NCC to apply to a greater number of renovations in existing buildings, as well as strengthened rental standards (see [Recommendation 4.5](#)).

If the application of minimum standards goes beyond renovations and rental properties, it should be underpinned with extended lead times and a strong incentives program.



# THEME 5

## ENERGY MARKET REFORM



# ENERGY MARKET REFORM

-  **5.1** Embed the 'energy efficiency first' principle in the National Electricity Objective and other relevant legislation, statements and policies.
- 5.2** Deliver governance reform to meet the 'energy efficiency first' principle.
- 5.3** Plan for future grid demand due to electrification with the optimal mix of demand and supply side measures.
- 5.4** Adjust or establish markets and programs to reflect the value of energy demand management and other distributed energy resources.
- 5.5** Develop robust and high-integrity carbon markets.
- 5.6** Reduce barriers and support innovation in distributed energy resources.

**RECOMMENDATION 5.1**  
**EMBED THE 'ENERGY EFFICIENCY FIRST' PRINCIPLE**

**in the National Electricity Objective and other relevant legislation, statements and policies**

BUILDING TYPE:



LIFECYCLE STAGE:



IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

The best way to deliver consumers energy needs for warm and affordable homes is through an integrated mix of demand-side and supply-side measures. However, the legal framework for national energy markets laws do not currently drive visibility, consideration or development of demand-side measures in energy markets. They primarily consider energy supply, with energy demand considered from a consumer protection perspective. Several areas of the national energy legal framework require reform to better facilitate demand-side participation.

**SOLUTION**

The European Union has adopted the principle of 'energy efficiency first' to ensure that energy efficiency is elevated when policies and investments in energy are being considered. To embed this principle in Australia, the National Electricity Objective and other key laws, strategies and policies should be updated to promote visibility and engagement with demand-side energy market participation and facilitation, and require market bodies to consider solving energy network problems through demand-side interventions, before exploring supply-side interventions.

A principle of 'energy efficiency first' should be considered and promoted when making market rules, when creating market forecasts and plans, during regulatory investment tests for transmission and network projects, and in consideration of network and retail pricing proposals.



**RECOMMENDATION 5.2**

# DELIVER GOVERNANCE REFORM

to meet the 'energy efficiency first' principle

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:

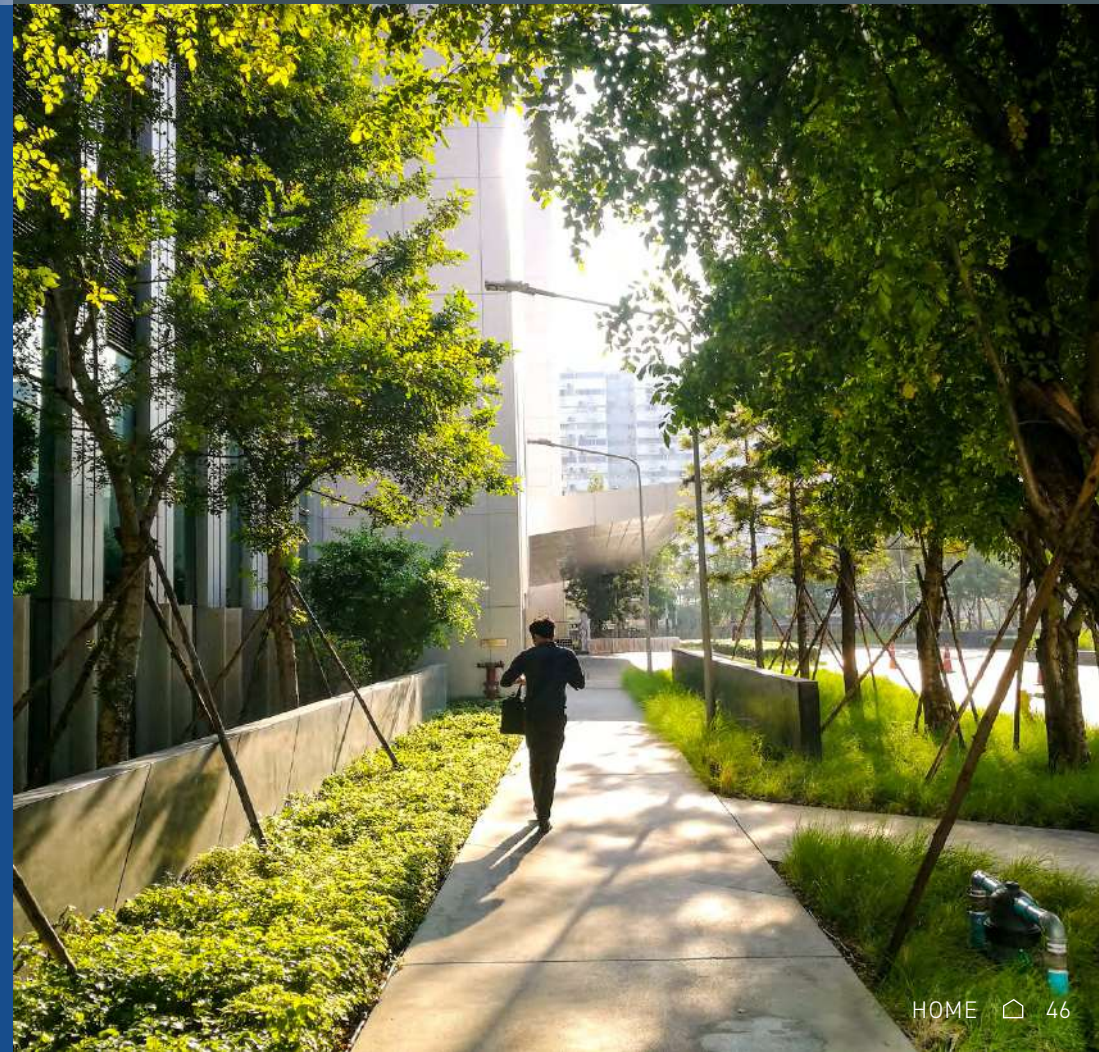


## ISSUE

Currently, the institutions governing Australia's energy markets do not have clear guidance requiring them to consider energy use management as a potential solution to meet consumers' energy needs. Furthermore, there are limited mechanisms for coordinating action on energy management and action on energy supply between and within levels of government. This leads to both insufficient and uncoordinated action on energy efficiency and other forms of energy demand management.

## SOLUTION

Australian governments should establish a national demand side organisation to lead on energy management, ensure that relevant institutions are considering demand-side options including energy efficiency, load-shifting and demand response in their analysis and coordinate work on energy management. In addition, Australian governments should provide clear guidance to energy market bodies that they should take a least-cost energy services approach, and require the addition of demand-side experts to the boards of the Australian Energy Market Commission, Australian Energy Regulator and Australian Energy Market Operator.



## RECOMMENDATION 5.3 PLAN FOR FUTURE GRID DEMAND

due to electrification with the optimal mix of demand and supply side measures

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



### ISSUE

The National Energy Market (NEM) is undergoing a once-in-a-century transformational change. Carbon intensive electricity generation infrastructure is being replaced with low-cost renewables supported by firming capacity, and the capacity of the NEM must be increased to accommodate higher demand from the electrification of new sectors such as the built environment and transport. Today the NEM delivers just under 180 TWh of electricity per year, but demand could potentially double to 320 TWh per year by 2050.<sup>14</sup>

Demand side measures, such as energy efficiency, load-shifting and demand response can lower total energy demand and demand at key times, reducing the need for expenditure on generation, storage and networks and lowering the cost of transforming the NEM. However, the current planning for the future of the grid does not extensively explore the use of energy management to reduce the cost of guaranteeing access to reliable and clean electricity systems.

### SOLUTION

The Federal Government - together with state and territory counterparts and market bodies - should consider both energy supply and energy demand management options when planning to meet consumers' energy needs. Australia needs to invest in detailed, granular and up-to-date data, and expand its capacity to model least-cost energy services, building on the people and systems that contributed to the Australian Energy Market Operator's Integrated System Plan (ISP). The ISP should consider the least-cost energy services and optimal mix of demand and supply side measures to meet consumers' energy needs.



**RECOMMENDATION 5.4**

**ADJUST OR ESTABLISH  
MARKETS & PROGRAMS**

to reflect the value of energy demand management and other distributed energy resources

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

Energy efficiency, load shifting, demand response, electric vehicles, batteries and digitalisation of buildings<sup>15</sup> can deliver a number of valuable services to energy markets that reduce the total cost of ensuring that the grid is clean and reliable. However, the energy markets do not currently provide incentives that reflect the full value of these services and numerous reviews of the National Electricity Market (NEM) and other jurisdictional energy markets have found a bias toward the supply-side. This results in underinvestment in demand management and other distributed energy resources, and therefore a more expensive energy system.

While tariff reforms could improve market signals, there are significant limits to what is possible. There is not the political will to provide truly cost-reflective tariffs which vary with the time and location of energy use, and smaller consumers are unlikely to be responsive to extremely complex tariff signals. Furthermore many decisions in energy markets are not made by consumers, including network investments which are made by regional monopolies. Without significant reforms, ongoing underinvestment in demand management and distributed energy resources is likely to persist.

**SOLUTION**

Correcting the historical bias towards supply-side measures requires enhanced governance, the creation of markets for demand-side services, and ensuring the demand side is considered when developing measures such as capacity markets. Governments and market bodies should consider a range of measures to provide accurate price signals to incentivise investment in energy management and other distributed energy resources that benefit the electricity system.

In particular, governments should ensure that: demand-side measures are considered in the proposed capacity mechanism; better baselining methodologies are developed for the Wholesale Demand Response Mechanism; and consumers are rewarded for investments that reduce the need for expenditure on the network, potentially through the development of a demand-side capacity procurement process.



## RECOMMENDATION 5.5 DEVELOP ROBUST AND HIGH-INTEGRITY CARBON MARKETS

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



### ISSUE

Australia will need a series of policies that create high-integrity markets for carbon offsets if our economy is to transition to net zero in an efficient manner. Many property organisations rely on carbon offsets as an interim measure to deliver on their sustainability objectives, taking a ‘last, but not later’ approach where offsets are applied last in the sequence of carbon mitigation but not delayed because of the complexities in determining offset integrity.

Currently, local and international offsets are available to be purchased, but obtaining information on their origin, credibility and environmental integrity can be challenging. This in turn can undermine net zero and carbon abatement claims made by organisations.

### SOLUTION

Offsets offer an economically sound approach to early carbon mitigation and the development of markets should be encouraged, particularly where co-benefits such as biodiversity enhancement can also be achieved. Determining additionality, avoiding leakage, and ensuring permanence present complex challenges and if the case is not well-made, offsets present a reputational risk to those relying on them.

The Federal Government should establish a robust and high-integrity carbon market to allow an efficient transition to net zero. To achieve this, the Federal Government should act to increase the integrity of the supply of high-quality carbon offsets. The governance framework of the Emissions Reduction Fund and the methods used to create and sell Australian Carbon Credit Units should be reformed to spread responsibilities and introduce independence of key functions. Further, the role of the Clean Energy Regulator should be limited to project compliance in accordance with recommendations of the Chubb review.

The Federal Government should also engage internationally to support and finalise Article 6 rules under the Paris Agreement for global cooperation through carbon markets.



**RECOMMENDATION 5.6**

**REDUCE BARRIERS AND SUPPORT INNOVATION**

in distributed energy resources

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

It is widely acknowledged that Australia's regulatory environment imposes barriers to innovation and alternative utility infrastructure and supply. For instance, Australian companies that wish to deploy district-based utilities face many 'first mover' costs, including overcoming regulatory complexities, substantial delays, ad hoc processes and costs for connecting to the grid. This has created many barriers to the uptake of distributed generation, embedded networks and demand response in Australia.

**SOLUTION**

Reforms that address barriers to the connection of distributed energy, embedded networks and demand response should be adopted, including a nation-wide consistent approach on how standards for connection are set, governed and applied. The Federal Government should implement recommendations from the Energy Efficiency Council's report, 'Clean Energy, Clean Demand' and Property Council and Clean Energy Finance Corporation's joint report, 'Distributed Energy in the Property Sector: Unlocking the Potential', which identifies barriers to distributed energy in property, and proposes solutions to address them.



**THEME 6**  
GOVERNMENT  
LEADERSHIP



# GOVERNMENT LEADERSHIP

-  **6.1** Commit to achieving zero-carbon-ready new and existing government owned and leased buildings by 2030.
- 6.2** Commit to applying trusted, robust and credible building rating systems such as Green Star and NABERS in all new government projects and existing assets and accommodation.
- 6.3** Lead the development of high-performance housing through government-led projects.
- 6.4** Use City Partnerships to drive ambitious climate action on emissions and resilience.

**RECOMMENDATION 6.1**

**COMMIT TO ACHIEVING ZERO-CARBON-READY**

**new and existing government owned and leased buildings by 2030**

BUILDING TYPE:



Government



Commercial

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

The Federal Government has a significant market presence in Australia's property sector and can leverage it to drive improvements in building energy performance. This would not only deliver significant financial savings for the public sector and taxpayers, but also contribute to emissions reduction and build skills and capability in the market. The Government already has a commitment for a net zero APS by 2030 and should reinforce this objective with a built environment specific target. This would place the Federal Government in a leadership position and in doing so, encourage similar commitments from subnational governments and Australian property companies.

**SOLUTION**

The Federal Government should commit to a trajectory of performance improvements for all government owned and leased properties over time, with the aim of achieving zero-carbon-ready new and existing buildings by 2030. This should include defence accommodation and office buildings that are currently excluded from the Government's pledge. Measures could include strong minimum standards for new buildings and fit-outs, targets for onsite energy efficiency and requirements around electrification and renewable energy, and offsite renewable energy and offsets. The benefits of NABERS energy ratings should be augmented with a holistic building rating through Green Star, and mechanisms to improve compliance and implementation should be introduced or enhanced.

**ENERGY EFFICIENCY IN GOVERNMENT OPERATIONS**

Established in 2006, the Energy Efficiency in Government Operations (EEGO) policy is a scheme designed to reduce the energy consumption and greenhouse gas emissions of government buildings, facilities, and operations.

The EEGO policy establishes requirements across government operations that include:

- Setting energy efficiency standards for government buildings and facilities;
- Implementing energy management programs to monitor and reduce energy consumption;

- Investing in energy-efficient technologies and renewable energy sources;
- Promoting sustainable procurement practices to purchase energy-efficient products and services; and
- Providing education and outreach to increase awareness of energy-efficient practices among government employees and the public.

The EEGO policy can have a significant impact on reducing energy consumption, saving taxpayer money, and mitigating the effects of climate change. Given the policy is now over 15 years old, the Federal Government should take action to update its content.

**RECOMMENDATION 6.2**

**COMMIT TO APPLYING TRUSTED, ROBUST AND CREDIBLE BUILDING RATING SYSTEMS**

such as Green Star and NABERS in all new government projects and existing assets and accommodation

BUILDING TYPE:



Government



Commercial

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:

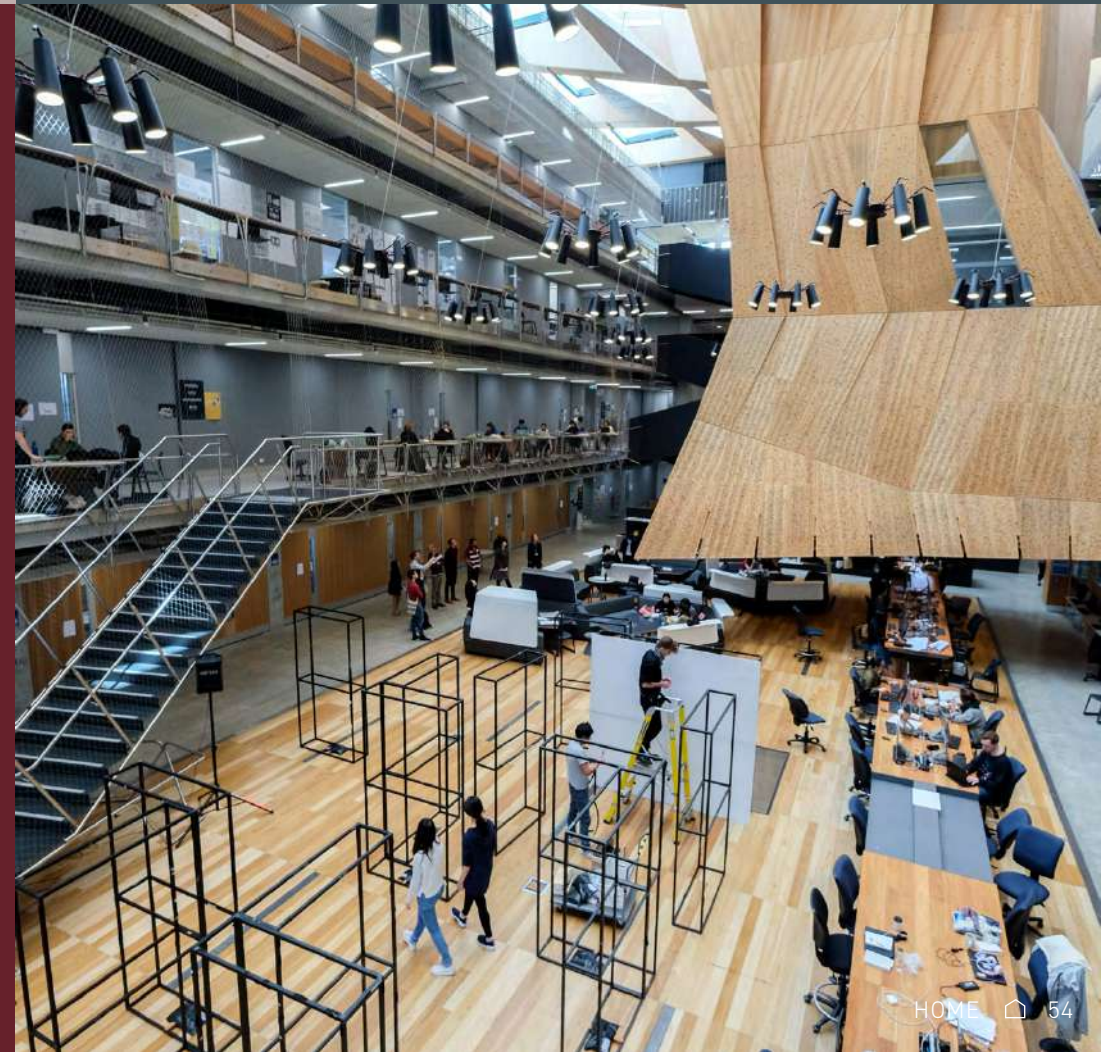


**ISSUE**

Voluntary rating and benchmarking systems such as Green Star and NABERS have long been embraced by the private sector to establish the design parameters and verify the performance of high-quality buildings. However, they have not seen the same level of adoption in the public sector. By leveraging these tools through procurement processes, governments can integrate requirements that will help lower emissions in public projects, create a market for sustainable building products and improve community facilities.

**SOLUTION**

The Federal Government should require the adoption of building sustainability rating systems such as Green Star and NABERS to drive sustainable outcomes in public projects. These rating systems should be adopted by the Federal Government through its owned and leased buildings including commercial offices, industrial facilities, and defence & social housing. Government should also support industry adoption of these rating systems and make their use a requirement where federal funding is provided to states and territories for social infrastructure projects.



**RECOMMENDATION 6.3**

**LEAD THE DEVELOPMENT OF HIGH-PERFORMANCE HOUSING**

through government-led projects

BUILDING TYPE:



Residential

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

Poor performing homes affect not only Australians' health and comfort but also impact the economy through reduced productivity and increases in public health spending. Occupants in public and community housing are more likely to live in inefficient homes and have less efficient appliances, putting them at risk of higher energy bills as well as increased allergies, respiratory diseases and mortality through energy poverty. High priority should be given to delivering highly efficient new housing projects and upgrading the worst-performing public and community housing stock.

**SOLUTION**

Working with state and territory governments, the Federal Government should co-fund design upgrades for new projects and performance upgrades to the worst performing public and community housing stock around Australia. Upgrades should be targeted at areas with the highest temperature variation, areas with high risk factors and dwellings that require large amounts of energy for heating and cooling and could include insulation, shading, draught proofing and more efficient fixed appliances.



**RECOMMENDATION 6.4**

# USE CITY PARTNERSHIPS

to drive ambitious climate action on emissions and resilience

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

Our cities are the lifeblood of Australia's economy. They are magnets for innovation and commerce, and offer Australians the employment, educational, civic, cultural and lifestyle opportunities they seek. Australia will remain one of the most urbanised countries in the world with our future population growth to be concentrated in our largest cities. This will intensify pressure on the environment through greater demand for energy and natural resources and we will need to reimagine the way cities are governed, as well as how they can assist people adapt to and mitigate climate change.

The task is clear. Australian cities must shift towards high amenity, high liveability, medium density metropolitan living supported by great public transport. The Federal Government is uniquely positioned to maximise resilience and climate change outcomes for the community through its investment in infrastructure projects. City Partnerships present an important opportunity for integrated strategic planning and coordination which can enable government leadership.

## SOLUTION

City Partnerships present a unique opportunity to align federal, state and local governments with a collective vision for the future. The Federal Government should embed ambitious sustainability outcomes in City Partnerships by associating investment in projects with clear requirements around emissions reduction and climate resilience in our buildings, cities and communities.

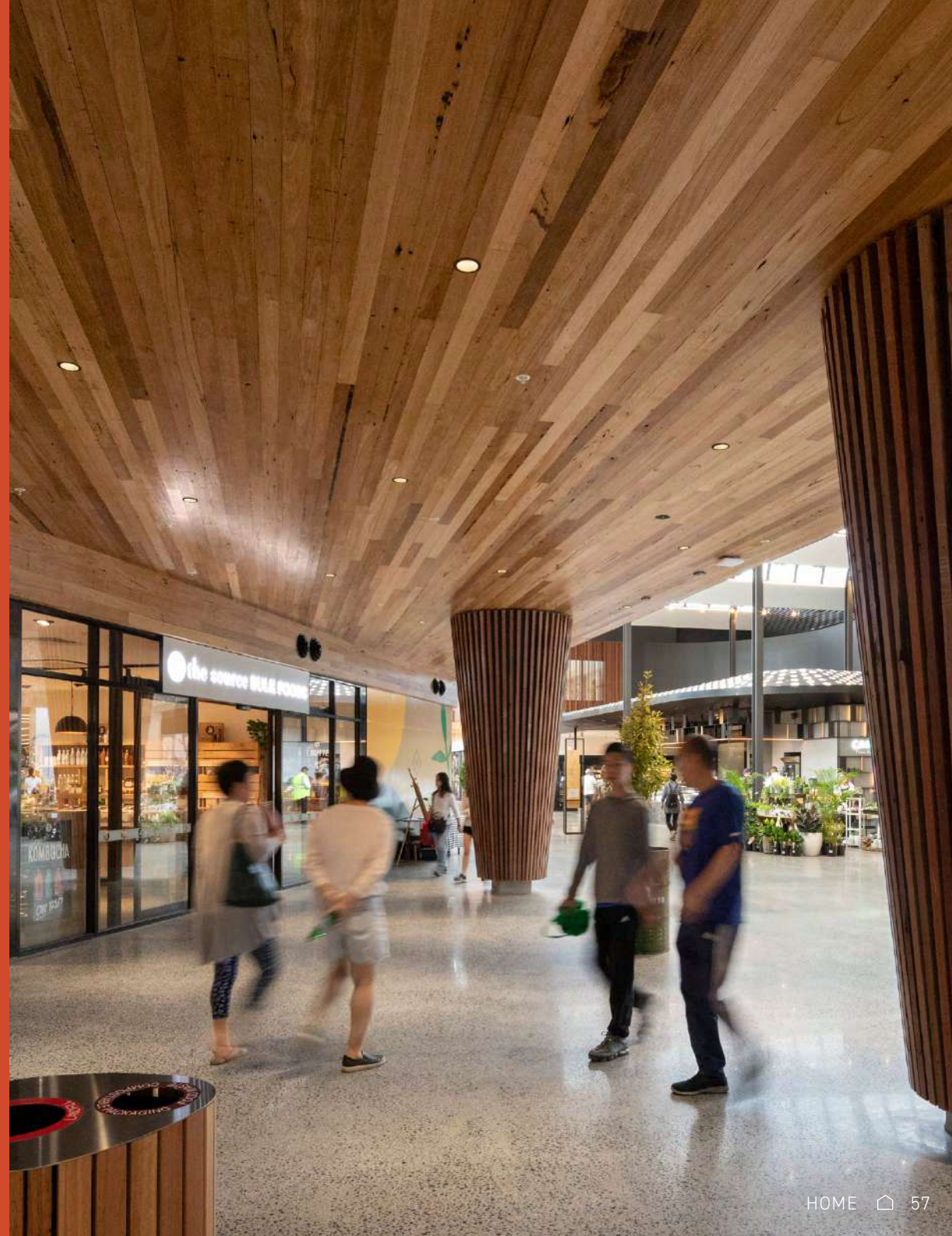
Once established, the Cities and Suburbs Unit should be tasked with refreshing the National Urban Policy framework to deliver on modern sustainability objectives, hardwired into City Partnerships.

Measures and data sets required to give evidence and communicate progress should be developed with state and territory, as well as local government input and focus should be given to consistent approaches for benchmarking and data gathering. The establishment of integrated strategic metropolitan planning and transport authorities, as well as statutory independent development corporations, which are tasked with guiding development, managing procurement and engaging with the community and industry, are important governance reforms to guide major, complex urban renewal projects into the future.





# THEME 7

## ROBUST RATING TOOLS FOR ALL BUILDING TYPES



# ROBUST RATING TOOLS FOR ALL BUILDING TYPES

-  **7.1** Expand the coverage of NABERS to all building types and extend the Commercial Building Disclosure Program.
-  **7.2** Empower owners, buyers and renters with a single national rating for home energy performance.
- 7.3** Implement mandatory performance disclosure for homes at the point of sale or lease.

**RECOMMENDATION 7.1**

# EXPAND THE COVERAGE OF NABERS TO ALL BUILDING TYPES

and extend the Commercial Building Disclosure Program

BUILDING TYPE:



Government



Commercial

LIFECYCLE STAGE:



Sale/lease



Occupation

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

Since 2011 the National Australian Built Environment Rating System (NABERS) has been used as the benchmarking tool for Australia's Commercial Building Disclosure Program. The commercial office sector has seen approximately 60 percent reduction in carbon intensity since 2011.<sup>16</sup> NABERS is only available in nine sectors of the built environment, with major parts of the economy unable to participate in the program. This impedes the expansion of mandatory disclosure of energy performance into new sectors.

## SOLUTION

The Federal Government should provide long term funding commitments to support the expansion of NABERS to other building types and the regular review and expansion of the Commercial Building Disclosure Program to cover more building types. This would ensure the breadth of Australia's built environment can benefit from the ongoing measurement, verification and performance management of buildings the program provides.

NABERS should be further leveraged to drive emissions abatement in buildings through a targeted national program. The Federal Government should fund emissions reduction in buildings by establishing a national program targeting annual improvements in certified NABERS Energy ratings, modelled on the NABERS method in the NSW Energy Savings Scheme.



## RECOMMENDATION 7.2

# EMPOWER OWNERS, BUYERS AND RENTERS

with a single national rating  
for home energy performance

BUILDING TYPE:



Residential

LIFECYCLE STAGE:



Sale/lease



Occupation

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

Australian homeowners and renters value energy performance, but lack a credible and widely accepted benchmark to easily assess the energy efficiency of homes. A single, robust rating scheme consistently applied across the country would not only make it easier to compare the efficiency of homes, but would also create a market for better performing homes, whilst providing added consumer protection for buyers and tenants. Work has been underway for several years on the development of a rating tool for homes, but it is yet to be released for public usage.

## SOLUTION

Working with state and territory governments, the Federal Government should elevate the development of a single, national rating scheme as a political priority to facilitate disclosure of performance in residential buildings, that includes:

- Providing benchmarks for market comparison of best practice sustainability performance;
- Disclosing the status of solar PV provision, energy storage, EV charging, and electrification of heating and hot water systems;
- Ensuring there is a single input tool for calculating the rating and a single, public facing communication of results to avoid disparities and confusion; and
- A best practice governance model based on NABERS that brings the federal, state and territory governments and industry together to collectively manage benchmarks for new homes.



## RECOMMENDATION 7.3 IMPLEMENT MANDATORY PERFORMANCE DISCLOSURE

for homes at the point of sale or lease

BUILDING TYPE:



Residential

LIFECYCLE STAGE:



Sale/lease

IMPACT:



EASE:



COST EFFECTIVENESS:



## ISSUE

The energy efficiency of a home has demonstrated positive impacts on running costs, occupants' health, and emissions intensity.<sup>17</sup> Occupants value these attributes but currently lack the information to make an educated decision. When consumers purchase a fridge or a television, they can see its energy performance, but when they purchase a house there is no information available. This information gap is leading to suboptimal outcomes for occupants and an Australian housing market that is trailing similarly developed economies on energy performance.

## SOLUTION

In the first instance, the Federal Government should prioritise the delivery of a single national rating scheme for the energy performance of homes. Once this is available, and demonstrated to be reliable, the Federal Government should implement a mandatory disclosure scheme. Options could include disclosure at the point of sale or leasing or at set intervals. Mandatory disclosure has delivered world-leading outcomes in the commercial building sector and this success should be replicated for residential buildings. It will also unlock a host of initiatives such as green loans by banks and green door approvals from local councils.

## NEW ZEALAND HOMESTAR PROGRAM

The Homestar program is a rating tool and certification system that evaluates the sustainability of homes in New Zealand. Developed by the New Zealand Green Building Council, Homestar rates homes on a scale of 1 to 10, with 10 being the highest performance homes.

The program takes into account a range of factors that contribute to the overall sustainability of a home, including energy efficiency, water usage, indoor air quality, and the use of environmentally-friendly materials and construction practices. Homestar certification is voluntary, and homeowners and builders can use the program to assess the sustainability of new homes.



Homestar-rated homes are designed to be more comfortable to live in, healthier for occupants, and more environmentally sustainable overall. The program is an important part of New Zealand's broader efforts to reduce carbon emissions and promote sustainable development across the country.



**THEME 8**  
TOWARDS  
ZERO EMBODIED  
CARBON



# TOWARDS ZERO EMBODIED CARBON

-  **8.1** Adopt a credible national framework for measuring embodied carbon.
-  **8.2** Introduce embodied carbon targets into the National Construction Code.
- 8.3** Create an embodied carbon national database for products and materials.
- 8.4** Introduce embodied carbon reduction requirements for government projects.
- 8.5** Support Australian product manufacturers and overseas importers to calculate and disclose embodied carbon content.

**RECOMMENDATION 8.1**  
**ADOPT A CREDIBLE NATIONAL FRAMEWORK**

for measuring embodied carbon

BUILDING TYPE:



LIFECYCLE STAGE:



IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

Embodied carbon is defined by the World Green Building Council as “carbon emissions associated with materials and construction processes throughout the whole lifecycle of a building or infrastructure”.<sup>18</sup> In 2019, it made up 16 percent of Australia’s built environment emissions. Without intervention this share will balloon to 85 percent in 2050<sup>19</sup> at a time when Australia must achieve net zero emissions in line with the Paris Agreement. Australia currently has no accepted framework for measuring embodied carbon in a trusted, accurate and repeatable way.

**SOLUTION**

There is an urgent need to develop and adopt a national framework to measure, verify and compare embodied emissions in new buildings and major refurbishments. This will be essential to allow building owners and investors to set robust and measurable targets for reducing embodied emissions in buildings. The NSW Government is progressing the development of an embodied carbon tool through the NABERS program. Once it is complete, the Federal Government should adopt it nationally, integrate it into construction regulation and apply it to government projects.





**RECOMMENDATION 8.2**

# INTRODUCE EMBODIED CARBON TARGETS

into the National Construction Code

BUILDING TYPE:



LIFECYCLE STAGE:



IMPACT:



EASE:



COST EFFECTIVENESS:

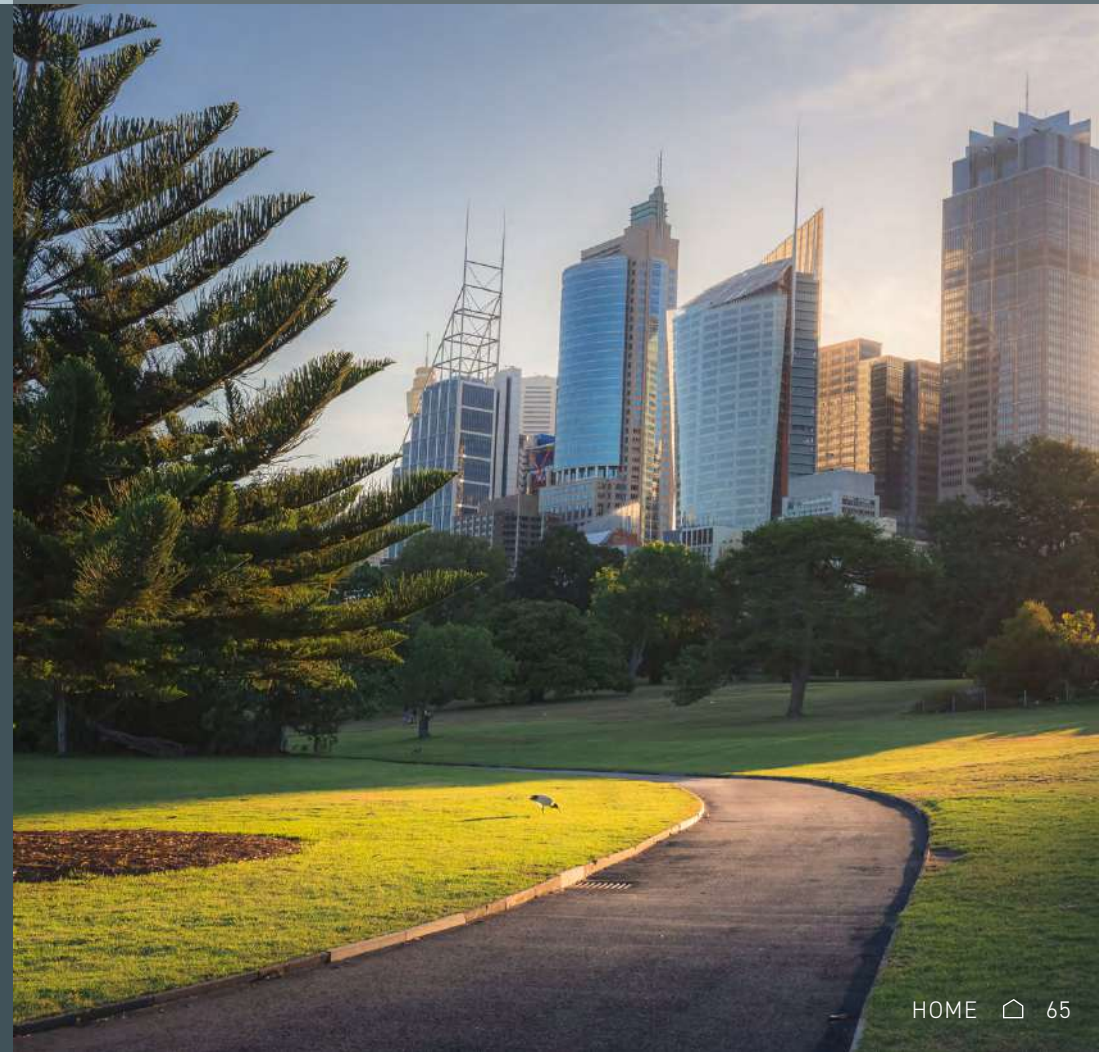


## ISSUE

Australia has minimum energy performance standards for operational emissions incorporated into the National Construction Code (NCC). However, as buildings electrify and the grid decarbonises, embodied emissions will replace operational emissions as the greatest source of emissions. Without intervention, embodied emissions will go from 16 to 85 percent of the built environment's total carbon footprint by 2050. Industry leaders are already taking voluntary action to reduce these emissions, but minimum standards will be required to ensure the rest of the industry follows.

## SOLUTION

The NCC is a readymade framework with a track record of delivering operational emissions reductions in new buildings and major refurbishments. This tool should be leveraged to deliver similar outcomes for embodied carbon. The Federal Government should introduce minimum requirements for reporting and reducing embodied carbon into the NCC. A forward schedule of increases to minimum standards should be built into the Trajectory for Low Energy Buildings. This will provide industry with visibility and certainty on upcoming changes to requirements and allow them to adjust their designs and supply chains accordingly.



**RECOMMENDATION 8.3**

**CREATE AN EMBODIED CARBON NATIONAL DATABASE**

for products and materials

BUILDING TYPE:



All buildings

LIFECYCLE STAGE:



All stages

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

Built environment organisations seeking to make informed material choices to reduce their embodied emissions can be faced with information that is inconsistent or incomplete. Further, seeking independent guidance through lifecycle analyses can lead to drastically different outcomes depending on the method and assumptions used. This makes it difficult for industry to ensure that their material selections are leading to genuine environmental outcomes. The Federal Government's Guarantee of Origin Scheme provides a good initial framework to leverage to deliver reliable information on the embodied carbon of products and materials.

**SOLUTION**

The Federal Government should create and maintain a national embodied carbon database for products and materials. This will provide industry with the information necessary to use their procurement choices to reduce their embodied carbon. It will also be a necessary input to the development of a national framework for measuring embodied carbon. This database should be underpinned by an independently verified certification scheme to ensure results are robust and replicable.



**RECOMMENDATION 8.4**

**INTRODUCE EMBODIED CARBON REDUCTION REQUIREMENTS**

for government projects

BUILDING TYPE:



Government

LIFECYCLE STAGE:



Design



Construction



Retrofit

IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

The Federal Government can use its significant market presence to drive improvements in embodied emissions. This would assist with meeting our commitment to net zero by 2050 and contribute to developing skills and capability in the market. A schedule of reductions to embodied emissions over time would place the Federal Government in a position of leadership and in doing so, encourage similar commitments from subnational governments and Australian property companies.

**SOLUTION**

The Federal Government should commit to reducing its own embodied carbon footprint over time with the aim of achieving net zero by 2050 or before. Measures could involve minimum standards for new buildings and fitouts, and targets to increase them over time. This will contribute to the development of skills and expertise in the market as well as reduce the cost of low carbon materials through economies of scale.



**RECOMMENDATION 8.5**

**SUPPORT AUSTRALIAN PRODUCT MANUFACTURERS**

and overseas importers to calculate and disclose embodied carbon content

BUILDING TYPE:



LIFECYCLE STAGE:



IMPACT:



EASE:



COST EFFECTIVENESS:



**ISSUE**

There is currently no agreed way to calculate and disclose embodied emissions content for products and materials. There also appears to be a significant divergence in outcomes when these calculations are undertaken by consultancies. The Federal Government could ensure good environmental outcomes by supporting manufacturers to disclose the embodied carbon in their products. This will also assist in creating a level playing field between local and international manufacturers and avoid the issue of emissions-intensive products being manufactured overseas to sidestep local regulation.

**SOLUTION**

The Federal Government should develop robust standards to support product manufacturers and importers to calculate and disclose embodied emissions content. This will play the essential role of shifting emissions reduction efforts up supply chains by creating a market signal that favours lower embodied emissions products. To ensure that local manufacturers are not disadvantaged by this initiative, it will be necessary to apply the same regulation to product importers.



# APPENDIX: SOURCES



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## Theme 8: Towards Zero Embodied Carbon

<sup>18</sup> Embodied Carbon and Embodied Energy in Australia's Buildings, GBCA and Thinkstep ANZ (2021).

<sup>19</sup> Embodied Carbon and Embodied Energy in Australia's Buildings, GBCA and Thinkstep ANZ (2021).

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[www.everybuildingcounts.com.au](http://www.everybuildingcounts.com.au)

