EVERY BUILDING COUNTS

2023 EDITION

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

FOR STATE AND TERRITORY GOVERNMENTS

Green Building Council Australia

PROPERTY COUNCIL of Australia

Buildings account for half of Australia's electricity use

...and almost a quarter of its emissions.

Sources: Australian Government Department of Climate Change, Energy, the Environment and Water, 2023;
Australian Government, Department of Industry, Science, Energy and Resources, National Energy and Emissions Audit 2020

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 and national consistency of processes and programs where possible.

Sources: ASBEC, Low Carbon, High Performance, 2016; ASBEC, Unlocking the Pathway: Why Electrification is the Key to Net Zero Buildings, 2022

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, OCCUPANTS, AND INDUSTRY.

This work has resulted in recommendations covering residential, commercial and public buildings ready for implementation by State and Territory Governments.

This report is a companion to two others tailored for the Federal Government and 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.

“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

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, a steady trajectory for emissions reductions in key economic sectors, and a suite of policies providing industry certainty.

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

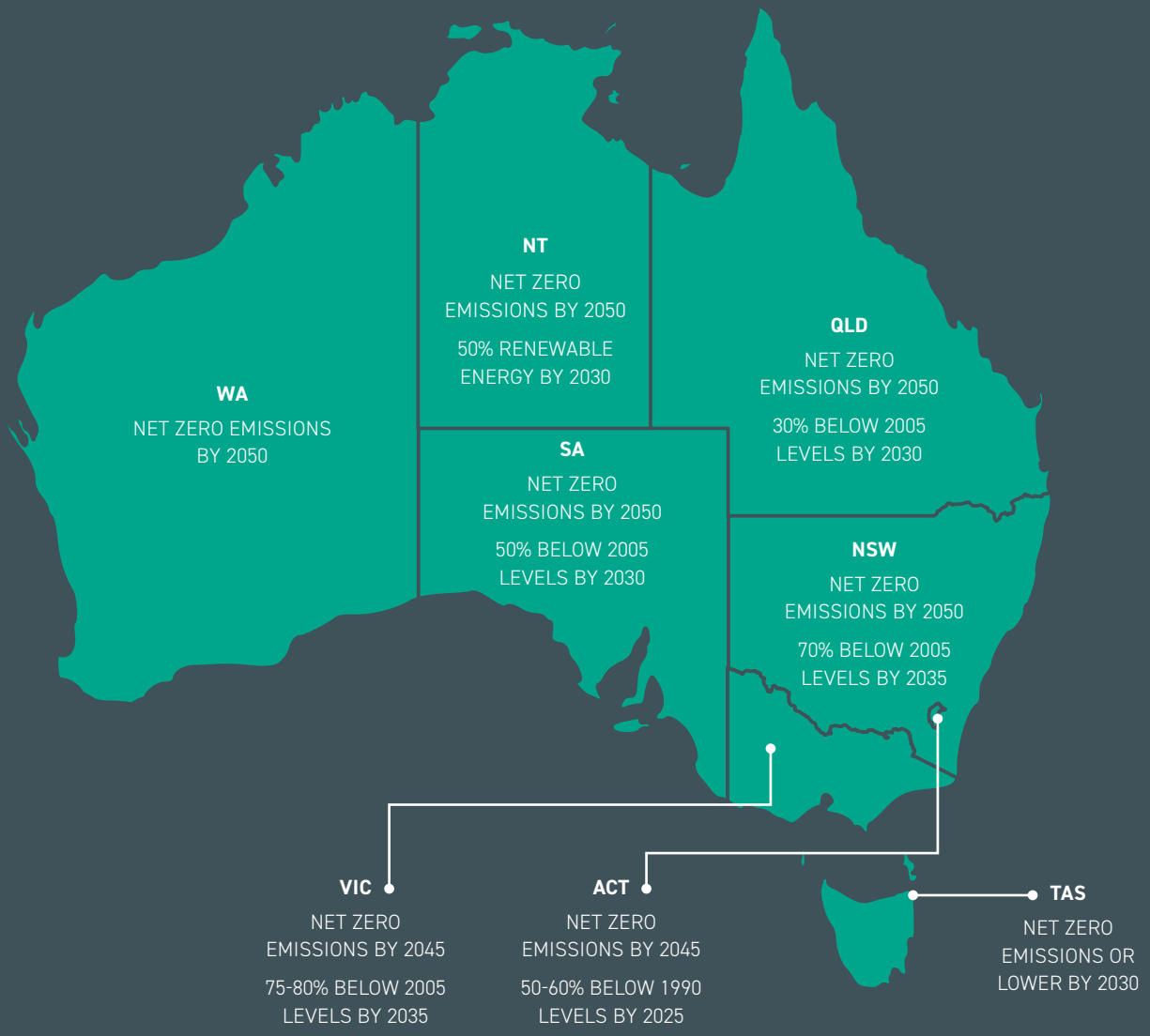
THE TRANSITION TO A LOW EMISSIONS ECONOMY IS UNDERWAY AND GATHERING PACE ACROSS AUSTRALIA.

At the sub-national level, all State and Territory Governments have chosen to join the international community supporting the Paris Agreement by setting their own emissions reduction commitments and progressing strategies to achieve these.

While clear and credible targets and commitments can help chart the course to a low emissions future, getting there depends in part on the policy choices made by governments, which will help determine whether they can realise emission target opportunities.

NATIONAL TARGET

43% REDUCTION ON 2005 LEVELS BY 2030 AND NET ZERO EMISSIONS BY 2050



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 several 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 is compensated or neutralised through investments in high-integrity, nature-based carbon offsets.

THIS REPORT WAS PRODUCED BY

PROJECT PARTNERS

Green Building Council Australia

PROPERTY COUNCIL of Australia

STEERING GROUP PARTNERS

asbec AUSTRALIAN SUSTAINABLE BUILT ENVIRONMENT COUNCIL

energy efficiency COUNCIL

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 at which we can apply each recommendation.


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 a long-term strategy for zero-carbon-ready buildings

THEME 1

2

Disallow new gas connections and 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, sustainable buildings with planning incentives

THEME 3

4

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

THEME 4

5

Embed the 'energy efficiency first' principle in 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

Empower owners, buyers and renters with a single national rating scheme for home energy performance

THEME 7

8

Adopt a credible framework for measuring embodied carbon

THEME 8

RECOMMENDATIONS SUMMARY

THEME 1
ZERO-CARBON-READY, RESILIENT BUILDING PLAN

1.1 Set a long-term strategy for zero-carbon-ready buildings

1.2 Set 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 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 Disallow new gas connections and require all new residential and commercial buildings to operate on high-quality electric equipment in National Construction Code 2025

2.2 Support a nationally harmonised approach to phase out fossil gas in existing buildings and appliances

2.3 Create a strategy and incentives for quality retrofits for existing commercial and residential buildings to support a just transition

2.4 Urgently grow skills and market readiness for electrification

2.5 Grow the market for strategic electric technologies by supporting local manufacturing

THEME 3
INCENTIVISE HIGH PERFORMANCE

3.1 Accelerate the shift to high-performance, sustainable buildings with planning incentives

3.2 Accelerate the shift to high-performance, sustainable buildings with targeted financial incentives

3.3 Introduce and support the harmonisation of energy efficiency and electrification obligation schemes

3.4 Support green loans and innovative finance products to drive high-performing homes and retrofits

3.5 Incentivise deep energy efficiency and electrification retrofits for existing homes

3.6 Shift the mid-tier commercial building market to better performance

3.7 Support the creation of industry leadership groups in priority sectors to champion best practice and collaboration

THEME 4
MINIMUM STANDARDS

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

4.2 Drive harmonised compliance, monitoring and enforcement of the National Construction Code

4.3 Support renters with minimum performance standards for rental homes

4.4 Investigate energy performance standards for existing buildings

4.5 Accelerate targeted retrofits for public and community housing stock

THIS IS AN INTERACTIVE PDF. CLICK THE RECOMMENDATION TO GO TO EACH PAGE.

RECOMMENDATIONS SUMMARY (CONTINUED)

THEME 5
ENERGY MARKET REFORM

5.1 Embed the 'energy efficiency first' principle in relevant legislation, statements and policies

5.2 Plan for future grid demand due to electrification with the optimal mix of demand and supply-side measures

5.3 Support a nationally harmonised energy efficiency target

5.4 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 assets and accommodation

6.3 Support low-income and vulnerable households and consumers with targeted and ongoing assistance and tools

6.4 Inform consumers on residential energy efficiency and electrification

6.5 Use consistent planning pathways that support innovation and reduce emissions

6.6 Use government procurement to grow and upskill the workforce for energy efficiency and electrification

THEME 7
ROBUST RATING TOOLS FOR ALL BUILDING TYPES

7.1 Empower owners, buyers and renters with a single national rating scheme for home energy performance

7.2 Support mandatory performance disclosure for homes at the point of sale or lease

7.3 Support the expansion of NABERS to all building types and extend the Commercial Building Disclosure Program

THEME 8
TOWARDS ZERO EMBODIED CARBON

8.1 Adopt a credible framework for measuring embodied carbon

8.2 Support the introduction of embodied carbon targets into the National Construction Code

8.3 Grow the availability of cost-effective low emissions building materials

8.4 Introduce embodied carbon reduction targets for government projects

8.5 Develop an embodied carbon skills and education agenda to grow and upskill the workforce

8.6 Incentivise the uptake of low embodied carbon materials and practices

THIS IS AN INTERACTIVE PDF. CLICK THE RECOMMENDATION TO GO TO EACH PAGE.

THEME 1
ZERO-CARBON-READY, RESILIENT BUILDING PLAN

ZERO-CARBON-READY, RESILIENT BUILDING PLAN

1.1 Set a long-term strategy for zero-carbon-ready buildings

1.2 Set 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 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 A LONG-TERM STRATEGY FOR ZERO-CARBON-READY BUILDINGS

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

All stages

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

Australia's support for the Paris Agreement[1] means we are committed to transitioning toward a low-carbon economy. To fulfil our obligation, Australia must reach net zero emissions by 2050.

Nationally, buildings account for 23 per cent of emissions and use half of our electricity.[2] We cannot reach net zero without decarbonising the built environment.

Buildings present some of the lowest-cost emissions reduction opportunities, and the technology to achieve zero-carbon-ready buildings already exists today. A state or territory-wide plan with a clear and steady trajectory for emissions reductions in vital economic sectors, and a suite of policies that provide industry certainty, would leverage opportunities for emissions reduction and build on the progress shown by market leaders in recent years.

SOLUTION

State and Territory Governments should establish nationally harmonised, long-term zero-carbon-ready building strategies with interim, science-based targets that support Australia's obligations under the Paris Agreement and State and Territory Government emissions targets. The *Trajectory for Low Energy Buildings* presents a ready-made framework that governments can leverage to deliver a long-term decarbonisation strategy for buildings. State and Territory Governments should collaborate with the Federal Government to extend the Trajectory to 2050. The Trajectory should be equipped with measurable interim targets and scheduled increases to performance standards.

RECOMMENDATION 1.2

SET 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 will stay locked in due to anthropogenic increases of greenhouse gases in the atmosphere. Australia is experiencing increased frequency and severity of extreme weather events. The built environment is not currently equipped to withstand future climate conditions, potentially leading to heightened risks for buildings and occupants. Buildings built today will be in use for decades. Their design should deliver increased resilience to more frequent and severe extreme weather and preserve the safety of occupants.

SOLUTION

State and Territory Governments should collaborate with the Federal Government to establish a comprehensive national plan towards a climate-resilient, healthy 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 scenarios data and a risk assessment would be required to determine structural and resilience requirements in new buildings. The use of this dataset should underpin a comprehensive framework of scheduled updates to regulations, 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

Vulnerable and low-income Australians are disproportionately affected by the impacts of a changing climate and will be reliant on the greatest government support. Scarce access to high-energy performance, fully electric, resilient housing means higher energy bills, negative health impacts and increased exposure to extreme weather events for vulnerable occupants. In particular, retrofitting existing homes to meet higher energy efficiency standards, electrification, and resilience will require an outlay of capital 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. Zero-carbon-ready homes should be affordable for all.

SOLUTION

State and Territory Governments should work with the Federal Government to develop a nationally harmonised plan for a just transition of the built environment. This plan should consider the right policy mix to support vulnerable and low-income Australians through this transition period adequately. State and Territory Governments should prioritise actions that balance grants, incentives, minimum standards, information & education campaigns and innovative financial mechanisms to deliver a more efficient, healthy 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

Australia can only achieve the transition to low-carbon, resilient buildings by improving the workforce's skills and capacity. 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 the industry to deliver higher building performance standards.

SOLUTION

State and Territory Governments should develop education and training agendas for creating healthy buildings that are energy efficient and resilient. They should prioritise ensuring uniform implementation of the National Construction Code, 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 governments should target to retrain in electric technologies.

Market transformation programs should be tailored for specific characteristics in each state and territory and delivered locally to suit different building techniques, industry contexts and capabilities, and climate zones. In addition to operational emissions, the agenda should support a nationally coordinated strategy to achieve net zero embodied carbon, including large-scale electrification of residential and commercial buildings.

THEME 2
ELECTRIFICATION

ELECTRIFICATION

2.1 **Disallow new gas connections and require all new residential and commercial buildings to operate on high-quality electric equipment in National Construction Code 2025**

2.2 **Support a nationally harmonised approach to phase out fossil gas in existing buildings and appliances**

2.3 Create a strategy and incentives for quality retrofits for existing commercial and residential buildings to support a just transition

2.4 Urgently grow skills and market readiness for electrification

2.5 Grow the market for strategic electric technologies by supporting local manufacturing

RECOMMENDATION 2.1

DISALLOW NEW GAS CONNECTIONS

and 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 already reap the benefits of being all-electric. However, others still operate on fossil gas equipment which is less efficient, has potential negative health impacts,[3] and generates additional network expenses. Recent estimates show that currently 2.9 million gas heating systems and 5.2 million gas hot water systems are installed in Australian homes.[4] Under business-as-usual settings, the number of gas hot water systems in homes is predicted to increase 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.[5] This is inconsistent with national goals for a net zero future and sustains unnecessary competition for limited renewable gas supplies.

SOLUTION

Every new building equipped with gas is one more building to retrofit at a significant cost in the future. State and Territory Governments should legislate against new gas connections and this should be supported by a requirement that all new buildings be fully electric in National Construction Code 2025. This change would align Australia with similarly developed economies and maintain our international competitiveness. Many jurisdictions in the US and Europe, as well as the ACT and Victoria in Australia, are already blocking new gas connections and equipment in buildings. The National Construction Code is one avenue for achieving this and disallowing new gas connections through planning instruments is another way that State and Territory Governments can deliver a fossil-fuel free built environment.

POWERING CANBERRA: OUR PATHWAY TO ELECTRIFICATION

The ACT Government plans to phase out fossil gas by 2045 by electrifying Canberra over the next two decades.[6] This decision will prioritise using 100 per cent renewable electricity and remove fossil gas from the city.

Initially, new greenfield developments will no longer be able to connect to gas mains, and from late 2023, infill projects will also be required to be fully electric. Several initiatives will support this policy:

- An information campaign and online resources portal to educate customers and encourage private electrification action.
- *Powering Canberra: Our Pathway to Electrification* outlines the Government's decision to transition away from fossil gas and models future energy use in the ACT.
- An Integrated Energy Plan for release by 2024 which sets the foundations for a managed transition over the next two decades.
- To help existing homes and businesses improve energy efficiency and electrify, the Home Energy Support Program provides up to $5,000 in rebates for eligible homeowners to help with the costs of installing energy-efficient products, and the Sustainable Household Scheme provides eligible homeowners zero-interest loans up to $15,000. Eligible businesses can access rebates up to $5000 under the Business Energy and Water Program.

RECOMMENDATION 2.2

SUPPORT A NATIONALLY HARMONISED APPROACH

to phase out fossil gas in existing buildings and appliances

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

All stages

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

Many buildings in operation today will still be in use in 2050, when we are due to achieve net zero as a nation. We can only achieve a net zero economy by decarbonising the built environment. ASBEC's Unlocking the Pathway report shows that 100 per cent 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 global market and to upskill local professionals. A nationally harmonised electrification plan will be required to establish new supply chains, provide certainty to businesses and phase out fossil gas equipment and appliances.

SOLUTION

State and Territory Governments should work with the Federal Government to develop a national plan for the electrification of buildings. This will provide the market with the signals appropriate to ensure a smooth transition of the existing building stock to all-electric and the economic rollback of gas delivery systems and gas appliances.
The electrification plan will require ambitious reach, but some parts are already well underway. Australian homeowners have been quick to embrace solar PV, and with system costs continuing to decline, the Australian Energy Market Operator predicts even higher penetration in future. A planned phasing out of gas to buildings will need to occur on a geographic basis as parts of the gas network lose connections, and a declining number of customers shoulders the maintenance cost.

This work should additionally consider phasing out high Global Warming Potential refrigerants and encouraging the transition to more sustainable alternatives.

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 retailers, supporting healthcare facilities through the change and developing solutions for different styles of apartment blocks.

RECOMMENDATION 2.3

CREATE A STRATEGY AND INCENTIVES FOR QUALITY RETROFITS

for existing commercial and residential buildings to support a just transition

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

State and Territory Governments should develop retrofit programs to ensure that cleaner, healthier, more efficient and more comfortable buildings are available to all. These programs should incorporate financial incentives and focus on the technologies integrating with renewable electricity. Millions of heat pumps, batteries and 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 this clean, 100 per cent renewable future is affordable for all, including renters and social and community housing occupants.

HOME HEATING AND COOLING UPGRADES PROGRAM

Victoria's Home Heating and Cooling Upgrades Program[7] aims to help low-income and vulnerable households improve thermal comfort by offering rebates to upgrade gas heaters, fixed electric heaters, wood heaters and homes with no heating with energy-efficient reverse-cycle air conditioners.

These upgrades will improve the quality of life for eligible householders and pave the way for the electrification of Victorian households as the state transitions to a renewable energy future.

Under the program, eligible households can receive:

- $1,000 towards the cost of an energy-efficient reverse-cycle air conditioner
- $200 towards the cost of decommissioning an outdated gas heater (if an existing gas heater is being replaced)
- $500 towards the cost of upgrading a switchboard (if an upgrade is required to install the rebated reverse-cycle air conditioner).

This type of program can deliver exceptional health-related financial co-benefits. A recent study by the Victorian Government showed that for every dollar saved in energy costs, more than $10 was saved in healthcare.[8]

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. Transitioning 85 per cent of homes off gas by 2040[9] requires retrofitting hot water systems in 5,000 homes every week until 2040, starting in 2023. The challenge is significant, and governments will be required to build skills and market readiness to deliver electrification at scale.

SOLUTION

Training and information packages are essential across the professions and trades that support the electrification of the built environment so that all parties understand 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 solar installation, connecting heat pump hot water systems, changing out gas heating systems, rewiring to meet improved standards, and insulating for higher resilience to weather extremes. States and territories should work to identify the skills gaps and develop the resources necessary for this momentous renovation project.

RECOMMENDATION 2.5

GROW THE MARKET FOR STRATEGIC ELECTRIC TECHNOLOGIES

by supporting local manufacturing

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

Design | Construction | Commissioning | Retrofit | Occupation

IMPACT: ☑ ☑ ☑

EASE: ☑ ☑ ☐

COST EFFECTIVENESS: ☑ ☑ ☐

ISSUE

Zero-carbon-ready homes and buildings can primarily be delivered using today's technology. However, 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 worldwide are already seeking access to the best technology, and Australia should not miss out by delaying our search for adequate supplies.

SOLUTION

State and Territory Governments should develop technology roadmaps that prioritise local manufacturing and focus on R&D, deployment, and training for key electric technologies such as heat pumps, integrated energy storage, and EV chargers. These state-based roadmaps will be crucial in identifying areas to effectively utilise resources to establish thriving new industries while ensuring local trades have the necessary skills to deliver these technologies to our homes and buildings.

These roadmaps will also serve as guides for allocating funding, emphasising making electrification technology accessible and affordable to all.

By overcoming the initial higher capital costs, the entire community can enjoy operational savings and benefits. To facilitate this, governments can implement incentives and funding programs to stimulate the market and provide valuable "learning by doing" opportunities.

THEME 3
INCENTIVISE HIGH PERFORMANCE

INCENTIVISE HIGH PERFORMANCE

3.1 **Accelerate the shift to high-performance, sustainable buildings with planning incentives**

3.2 **Accelerate the shift to high-performance, sustainable buildings with targeted financial incentives**

3.3 Introduce and support the harmonisation of energy efficiency and electrification obligation schemes

3.4 Support green loans and innovative finance products to drive high-performing homes and retrofits

3.5 Incentivise deep energy efficiency and electrification retrofits for existing homes

3.6 Shift the mid-tier commercial building market to better performance

3.7 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 SUSTAINABLE BUILDINGS

with planning incentives

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

Design | Construction | Retrofit

IMPACT: ☑ ☑ ☑

EASE: ☑ ☑ ☑

COST EFFECTIVENESS: ☑ ☑ ☑

ISSUE

The provision of planning incentives to homebuyers and builders that commit to best practice energy efficiency and electrification is an important mechanism that has largely been overlooked in the national policy mix. Planning incentives such as density bonuses and green door policies would support the accelerated deployment of high-performing new buildings by targeting one of the highest priorities for building developers – the cost and time invested and the uncertainty of planning processes. This approach would also come at a low cost of implementation to governments.

SOLUTION

State and Territory Governments should work with local governments to deliver planning incentives encouraging the built environment towards above-minimum standard sustainability practice and reduced emissions. Priority should be placed on:

- Green door policies, which would provide expedited or prioritised review and approval of development applications associated with more sustainable and higher-performing buildings.
- Density bonuses, which offer developers an increase in the permitted density of residential projects in exchange for more sustainable and higher-performing buildings.
- Height bonuses, which would allow increases in net lettable area for commercial buildings that meet high sustainability requirements.

RECOMMENDATION 3.2

ACCELERATE THE SHIFT TO HIGH-PERFORMANCE, SUSTAINABLE BUILDINGS

with targeted financial incentives

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

All stages

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

Notwithstanding the progress made by market leaders, energy efficiency investment for most stakeholders in the built environment remains a low priority. This is due to barriers such as the perceived difficulty of energy upgrades, high upfront costs and long payback periods. Financial incentives can drive accelerated uptake of energy efficiency and distributed 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.

SOLUTION

State and Territory Governments should work with the Federal and local governments to deliver financial incentives encouraging the built environment towards better sustainability practices and reduced emissions. Priority should be placed on rates and charges relief for buildings that satisfy a verifiable performance standard for instance, stamp duty and land tax concessions for high-performing buildings. Incentives like these could impact green depreciation by targeting the point at which owners consider investing in their homes before sales.

RETAILER ENERGY PRODUCTIVITY SCHEME

The Retailer Energy Productivity Scheme[10] a South Australian Government energy productivity scheme, incentivises households and businesses to save energy. The scheme aims to make sustainability practices and technology more affordable and accessible including incentives such as cashback for residents, businesses, and community groups.

These can include:

- residential, business and commercial solar PV
- energy monitoring technology
- electric vehicle charging stations
- water saving devices
- home energy assessments
- resource recovery and more.

The incentives and rebates aim to reduce costs, increase property value, and support carbon reduction and circular economy objectives.

RECOMMENDATION 3.3

INTRODUCE AND SUPPORT THE HARMONISATION OF ENERGY EFFICIENCY

and electrification obligation schemes

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

Design | Construction | Retrofit | Occupation

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

To achieve maximum emissions reductions at the least cost, actions across all sectors and jurisdictions should be compared 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 differs and requires bespoke applications to access incentives. These schemes should be harmonised and integrated to improve program design and administration and reduce costs for delivering energy efficiency and electrification upgrades.

SOLUTION

State and Territory Governments should support the objective of nationally harmonised EEO schemes while taking action to introduce schemes in states where they do not currently exist. A key focus should be ensuring existing schemes are aligned as much as possible with other jurisdictions. Best practice elements of harmonised EEOs will include consistent application and rules and comprehensive coverage of sectors. Further investigation should be undertaken to expand the mandate of EEO schemes to include electrifying building equipment, aligning demand with renewable generation, and energy efficiency upgrades.

RECOMMENDATION 3.4

SUPPORT GREEN LOANS AND INNOVATIVE FINANCE PRODUCTS

to drive high-performing homes and retrofits

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

Design

Construction

Retrofit

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

Cost is one of the biggest barriers to building or renovating sustainably. For instance, the perception that the value of retrofit is less than its cost can make it extremely difficult to induce a homeowner to take action. Green finance mechanisms, such as green mortgages, offer a way to overcome these cost barriers by providing an incentive in the form of a lower interest rate or increased loan amount whilst elevating the consideration of sustainability in consumer decision-making. Whilst green finance mechanisms are currently available in Australia, there is scope to drive broader interest through the right policy settings.

SOLUTION

State and Territory Governments should work with the Federal Government, property and finance sectors to accelerate the expansion of preferential financing mechanisms that incentivise sustainable buildings and upgrades. This is particularly significant in the current state of high interest rates and inflation.

Measures could involve funding the development of green home finance products, like green mortgages, equity loans and home improvement loans for residential buildings, or green bonds and bespoke financial solutions for commercial buildings.

HOUSEHOLD ENERGY UPGRADE FUND

In May 2023, the Federal Government allocated $1 billion to the Clean Energy Finance Corporation (CEFC) to drive energy upgrades in homes.[11] The fund's primary objective is to promote sustainability in the housing sector by offering consumer finance at discounted rates. This financing will support various initiatives, including investments in energy efficiency upgrades, high-performance appliances, and solar PV systems integrated with battery technology.

To ensure widespread accessibility, the CEFC will collaborate with reputable lenders in the housing sector, including banks, to implement the program for consumers. This approach will mirror the successful CEFC asset finance programs that have already been established.

RECOMMENDATION 3.5

INCENTIVISE DEEP ENERGY EFFICIENCY AND ELECTRIFICATION RETROFITS FOR EXISTING HOMES

BUILDING TYPE: Residential

LIFECYCLE STAGE: Retrofit

IMPACT: ☑ ☑ ☑

EASE: ☑ ☐ ☐

COST EFFECTIVENESS: ☑ ☑ ☐

ISSUE

Recent reforms to the National Construction Code have set minimum standards at 7 Star NatHERS for the energy performance of new homes. However, a challenge remains to improve the energy efficiency of our existing housing stock, which includes a significant portion of homes built before the introduction of minimum energy efficiency standards for residential buildings in 2005. Several State and Territory Governments offer programs encouraging consumers to adopt high-efficiency appliances and fixtures, such as energy efficiency obligation schemes.

While these schemes have been effective at driving the uptake of cost-effective upgrade measures, they have not been as effective at incentivising 'deep' retrofits or electrification of fossil gas uses that are required in the existing housing stock. However, there is scope for these schemes to be combined with other policy instruments to drive broader action.

SOLUTION

State and Territory Governments should research and trial programs to complement energy efficiency obligation schemes that provide deep retrofits and major electrification work to existing homes at scale. Priority should be given to low-performing assets in the social and community housing sector, which could act as the launching market for these solutions with a view to later scale to the private homeowner market.

RECOMMENDATION 3.6

SHIFT THE MID-TIER COMMERCIAL BUILDING MARKET TO BETTER PERFORMANCE

BUILDING TYPE:

Commercial

LIFECYCLE STAGE:

Retrofit

IMPACT: ☑ ☑ ☑

EASE: ☑ ☑ ☑

COST EFFECTIVENESS: ☑ ☑ ☑

ISSUE

Mid-tier buildings lag significantly behind those leading the market in implementing energy efficiency upgrades and retrofits. The reasons for this include lack of awareness or motivation, difficulty accessing capital and information, lack of networking among owners and tenants, split incentives, and lack of skills and expertise among industry professionals. Given the sector's size, mid-tier buildings present one of the largest untapped policy opportunities for governments. For example, mid-tier office buildings – those classed as non-Premium Grade or non-A Grade – account for around 80 per cent of Australia's office buildings and 50 per cent of floor space. Research has shown that the savings potential in mid-tier office buildings is significant and feasible.

SOLUTION

State and Territory Governments should accelerate energy efficiency and fuel-switching to electric equipment for mid-tier buildings, focusing on information, incentives and research. These include establishing targeted tax incentives to encourage building upgrades, setting targets for the performance of government tenancies, and investing in research to quantify further and understand the mid-tier sector.

RECOMMENDATION 3.7

SUPPORT THE CREATION OF INDUSTRY LEADERSHIP GROUPS

in priority sectors to champion best practice and collaboration

BUILDING TYPE:

All buildings

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 State and Territory Governments 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. State and Territory Governments can lead or support industry-led groups to accelerate action in these sectors.

SOLUTION

State and Territory Governments should support creating leadership groups in priority sectors, such as industrial, education, student accommodation, retirement living & aged care, and health and retail sectors. The groups can support innovation, demonstrate opportunities, connect stakeholders, proliferate learnings about best practice and develop industry skills and capability.

BETTER BUILDINGS PARTNERSHIP

The Better Buildings Partnership[12] 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 64 per cent of the office floor space across Sydney's CBD in FY2022, these commercial landlords have a vital role in improving Sydney's existing buildings' energy, water and waste efficiency. 75 per cent of BBP members are committed to achieving net zero emissions across scopes 1 and 2 by 2030, and five members are certified carbon neutral.

Between 2006 and 2022, BBP members have also displayed:

- An 82 per cent reduction in stationary emissions intensity
- A 65 per cent reduction in potable water consumption.

THEME 4
MINIMUM STANDARDS

MINIMUM STANDARDS

4.1 **Support an accelerated trajectory for resilient, all-electric, zero-carbon-ready, healthy buildings in the National Construction Code**

4.2 Drive harmonised compliance, monitoring and enforcement of the National Construction Code

4.3 Support renters with minimum performance standards for rental homes

4.4 Investigate energy performance standards for existing buildings

4.5 Accelerate targeted retrofits for public and community housing stock

RECOMMENDATION 4.1

SUPPORT AN ACCELERATED TRAJECTORY FOR RESILIENT ALL-ELECTRIC, ZERO-CARBON-READY, HEALTHY 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 per cent 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, healthy 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 the Federal Government through the Building Ministers' Meeting and the Energy and Climate Change Ministerial Council, State and Territory Governments should support 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 as well as requiring all new buildings to be designed and delivered as all-electric buildings. 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 (NCC) is ongoing. It is unlawful and 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 several 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

States and territories, together with the Federal Government, should support a coordinated approach to address issues relating to compliance and enforcement highlighted through the Building Confidence Report.[13] 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 consistently implementing Building Confidence Report recommendations for states and territories to adopt.

The Building Ministers' Meeting should seek 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

SUPPORT RENTERS WITH MINIMUM PERFORMANCE STANDARDS

for rental homes

BUILDING TYPE:

Residential

LIFECYCLE STAGE:

Sale/lease

Retrofit

Occupation

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

Australia does not have minimum energy efficiency standards for rental properties, typically less energy efficient than owner-occupied premises.[14] This places renters in a difficult position as they have limited ability to make changes to the properties they live in and landlords have little incentive to invest in upgrades that do not benefit themselves. Introducing minimum energy performance standards for rental properties would help overcome the landlord-tenant split incentive, ensure that all households have an acceptable level of energy efficiency, and accelerate switching to all-electric appliances. This would also benefit low-income and disadvantaged households, who are more likely to live in inefficient homes and have less efficient appliances.

SOLUTION

State and Territory Governments should work to develop and implement a nationally consistent approach to deploying minimum energy efficiency standards for existing rental properties. These standards could include requirements for basic, cost-effective measures, such as insulation, draught sealing and low-flow shower heads, while ensuring healthy indoor environments.

Alongside these standards, governments should review mechanisms for tenants to initiate upgrades to rental properties, investigate incentives that encourage landlords to upgrade rental properties and safeguard to avoid any unintended consequences around housing affordability, such as significant rent increases.

LOI CLIMAT ET RÉSILIENCE

France's *Loi Climat et Résilience* presents a legislated schedule of increases to minimum rental standards over time.[15] Underpinned by a comprehensive energy rating scheme for the energy performance of homes, the Diagnostic de Performance Energétique (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 renting 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 addressed split incentives and power imbalances between owners and renters. In France, as in Australia, renters tend to have less efficient housing[16] which leads to higher bills and poorer health outcomes.

RECOMMENDATION 4.4

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 implementing or bolstering energy efficiency standards for existing buildings.[17] While Australia's National Construction Code (NCC) ensures 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[18] stated that energy efficiency in existing buildings should be a greater focus at national and state levels because of the long lifetime of buildings. In addition, the triggers for adopting the NCC energy efficiency requirements in renovations vary significantly across jurisdictions.

SOLUTION

Many buildings standing today will still be in operation in 2050. State and Territory Governments 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 4.3). If the application of minimum standards goes beyond renovations and rental properties, it should underpin the extended lead times and a strong incentives program.

RECOMMENDATION 4.5

ACCELERATE TARGETED RETROFITS

for public and community housing stock

BUILDING TYPE:

Residential

LIFECYCLE STAGE:

Retrofit

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

Poor energy-performing homes affect not only Australians' health and comfort, but the economy overall through increases in public health spending. Low-income and disadvantaged households are more likely to live in inefficient homes and have less efficient appliances, putting them at risk of higher energy bills and increased allergies, respiratory diseases and mortality.[19] A high priority should be given to upgrading the worst-performing public and community housing stock, which is essential to improve health, well-being and energy costs for those most disadvantaged in the community.

SOLUTION

State and Territory Governments should accelerate performance upgrades to Australia's worst-performing public and community housing stock. Upgrades should target areas with the highest temperature variation and dwellings requiring large amounts of heating and cooling energy. Upgrades could include insulation, shading, draught-proofing, ventilation and a shift to efficient all-electric appliances.

HEALTHY HOMES PROGRAM

The Healthy Homes program[20] in Victoria deployed energy upgrades to one thousand homes in Melbourne's western suburbs and the Goulburn Valley. The program set out to improve indoor temperature and comfort, as well as reduce energy bills.

During a four-year interval, the Healthy Homes program delivered upgrades like draught-proofing, ceiling or sub-floor insulation, high-efficiency heating and cooling appliances and window coverings.

The results of the program were significant. Program outcomes showed that the upgrades increased indoor temperatures over winter, reducing time spent exposed to cold by 43 minutes a day. There was also an average cost saving of $972 over winter, mainly due to health benefits. For every $1 saved in energy costs, more than $10 was saved in healthcare costs.

This type of program should be delivered at scale by State and Territory Governments to unlock consumer benefits and cost savings for governments.

THEME 5
ENERGY MARKET REFORM

ENERGY MARKET REFORM

5.1 **Embed the 'energy efficiency first' principle in relevant legislation, statements and policies**

5.2 **Plan for future grid demand due to electrification with the optimal mix of demand and supply-side measures**

5.3 Support a nationally harmonised energy efficiency target

5.4 Reduce barriers and support innovation in distributed energy resources

RECOMMENDATION 5.1

EMBED THE 'ENERGY EFFICIENCY FIRST' PRINCIPLE

in relevant legislation, statements and policies

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

All stages

IMPACT: ☑ ☑ ☑

EASE: ☑ ☑ ☑

COST EFFECTIVENESS: ☑ ☑ ☑

ISSUE

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

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 vital 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 when considering network and retail pricing proposals.

RECOMMENDATION 5.2

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

Australian energy markets, including the National Energy Market (NEM), Western Power and the Northern Territory grid, are undergoing a once-in-a-century transformational change. Low-cost renewables are replacing carbon-intensive electricity generation infrastructure supported by firming capacity, and their capacity must increase 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. Still, demand could potentially double to 320 TWh per year by 2050.[21] Demand-side measures, such as energy efficiency, load-shifting, and demand response, can lower total energy demand and demand at key times,[22] reducing the need for expenditure on generation, storage and networks and lowering the cost of transforming energy markets.

SOLUTION

State and Territory Governments and the Federal Government 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 resourcing 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 the optimal mix of demand and supply-side measures to meet consumers' energy needs.

RECOMMENDATION 5.3

SUPPORT A NATIONALLY HARMONISED ENERGY EFFICIENCY TARGET

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

All stages

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

Buildings can deliver services such as heating, cooling, lighting and producing hot water using varying amounts of energy. The difference in energy consumption between efficient and inefficient buildings is stark. For example, a one-star NABERS-rated hotel would use over six times the energy of a market-leading six-star NABERS-rated hotel for a similar level of service.[23] Establishing a nationally harmonised energy efficiency target would assist buildings to continue to deliver these vital services while reducing the energy they consume and improving outcomes for occupants.

SOLUTION

State and Territory Governments should collaborate with the Federal Government to set a national energy efficiency target. While still in development at the time of this document's release, the national target will likely be derived from the National Energy Performance Strategy. States and territories should ensure they import an ambitious national energy efficiency target into their policies and regulations. Consistent, nationally aligned efforts across all states and territories will give policy certainty and encourage investment in efficiency upgrades by the private sector.

RECOMMENDATION 5.4

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

Adopting reforms that address barriers to the connection of distributed energy, embedded networks and demand response is recommended, including a nationwide, consistent approach to how standards for connection are set, governed and applied. State and Territory Governments should work with the Federal Government to implement recommendations from the 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 Support low-income and vulnerable households and consumers with targeted and ongoing assistance and tools

6.4 Inform consumers on residential energy efficiency and electrification

6.5 Use consistent planning pathways that support innovation and reduce emissions

6.6 Use government procurement to grow and upskill the workforce for energy efficiency and electrification

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

State and Territory Governments have a significant market presence in Australia's property sector and can leverage it to improve building energy performance. This would not only deliver substantial financial savings for the public sector and taxpayers but also contribute to emissions reduction and develop skills and capability in the market. Many State and Territory Governments already have ambitious net zero targets and should reinforce this objective with a built environment-specific target. This would place State and Territory Governments in a leadership position and, in doing so, encourage similar commitments from local governments and Australian property companies.

SOLUTION

State and Territory Governments should commit to a trajectory of performance improvements for all government-owned and leased properties over time, aiming to achieve zero-carbon-ready new and existing buildings by 2030. This should cover all asset types, including social housing, office buildings, schools, hospitals and industrial facilities. Measures could include strong minimum standards for new buildings and fit-outs, targets for 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.

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

The private sector has long embraced voluntary rating and benchmarking systems such as Green Star and NABERS to establish the design parameters and verify the performance of high-quality buildings. However, these rating systems have yet to see the same level of adoption in the public sector in all jurisdictions. By leveraging these tools through procurement processes, governments can integrate requirements to help lower emissions in public projects, increase the market for sustainable building products and improve community facilities.

SOLUTION

State and Territory Governments should require the adoption of building sustainability rating systems such as Green Star and NABERS to drive sustainable outcomes in public projects. Governments should adopt these rating systems for owned and leased buildings including commercial offices, schools, hospitals, industrial facilities, and social housing. Governments should also support industry adoption of these rating systems and make their use a requirement when contributing funding to built environment projects.

RECOMMENDATION 6.3

SUPPORT LOW-INCOME AND VULNERABLE HOUSEHOLDS

and consumers with targeted and ongoing assistance and tools

BUILDING TYPE: Residential

LIFECYCLE STAGE: Sale/lease, Retrofit, Occupation

IMPACT: ☑ ☑ ☑

EASE: ☑ ☑ ☑

COST EFFECTIVENESS: ☑ ☑ ☑

ISSUE

Increasingly, consumers must engage with the energy retail market to reduce their energy bills. While many benefits can flow to informed consumers, those at risk of energy stress, such as low-income or disadvantaged consumers, need tailored, ongoing support to engage with their energy use. This is due to barriers that may be related to a lack of capital, language and literacy challenges, split incentives or geography. Better informing and educating consumers about their bills, energy usage and the energy market can help to overcome these barriers.

SOLUTION

State and Territory Governments should provide user-friendly information and tools to educate consumers of the long-term benefits of energy efficiency and to encourage improved energy choices. By working with local governments, states should also offer ongoing assistance programs to inform and enable disadvantaged households to engage with the energy market. These programs should strengthen relationships between disadvantaged households, support services, advocates and energy retailers where possible.

RECOMMENDATION 6.4

INFORM CONSUMERS ON RESIDENTIAL ENERGY EFFICIENCY AND ELECTRIFICATION

BUILDING TYPE:

Residential

LIFECYCLE STAGE:

Design | Construction | Sale/lease | Occupation

IMPACT: ☑ ☑ ☑

EASE: ☑ ☑ ☑

COST EFFECTIVENESS: ☑ ☑ ☑

ISSUE

Knowledge limitations can lead to market failures when consumers are not able to make informed choices about the energy efficiency or technology within their homes, and there is growing research showing that consumers are confused by the plethora of sustainability jargon in the residential sector. Consumers also find it difficult to choose from the diversity and complexity of technology options and recommended behaviours. They tend to seek decision-making shortcuts, including withdrawal or deferring to the government to 'solve the problem'.

SOLUTION

Working with other levels of government, industry and academia, State and Territory Governments should drive awareness and behaviour change around sustainable all-electric housing by providing information and social support to homebuyers and renovators at key decision-making moments. This information, which could include details of available financial incentives and mechanisms (see Recommendations 3.2 and 3.4), must consider timing and context to ensure effectiveness. Governments should consider programming in mainstream broadcast media, social media and commercial product placement to accelerate the adoption of high-performance homes and support early adopters to enter the market at scale.

MAKE YOUR NEXT CHOICE ELECTRIC

The ACT Government and CHOICE have developed a campaign, *Make your next choice electric*,[24] that includes information for consumers to support the ACT's all-electric future.

The website provides information for consumers on the energy bills savings offered by electric equipment, how to reduce their carbon footprints and independent product recommendations from CHOICE. The campaign includes a user-friendly, step-by-step guide to support and educate customers looking to take voluntary action to electrify their homes.

RECOMMENDATION 6.5

USE CONSISTENT PLANNING PATHWAYS

that support innovation and reduce emissions

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

Design

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

Land use planning policy and regulation are critical to delivering low emissions buildings, infrastructure and precincts in our cities and communities. However, a significant opportunity remains to provide emissions reduction through state planning instruments that align with a national trajectory towards zero-carbon-ready buildings.

While policies around sustainability and the built environment are broadly present in state, territory and regional strategic planning documents, local governments need to implement them consistently.

SOLUTION

Planning tools need to be streamlined with consistent and transparent outcomes across state, territory and local boundaries to support industry buy-in. Energy performance targets must align with a national plan for zero-carbon-ready buildings, supported by adequate post-development monitoring and enforcement.

State and Territory Governments, and local governments should lead the development and implementation of consistent planning policies that facilitate and incentivise the delivery of zero-carbon-ready buildings in alignment with the *Trajectory for Low Energy Buildings*.

Government bodies should focus on developing accelerated pathways to recognise and reward innovative projects that lead by example. Working collaboratively across government boundaries with industry and the community will support the delivery of this objective.

RECOMMENDATION 6.6

USE GOVERNMENT PROCUREMENT TO GROW AND UPSKILL

the workforce for energy efficiency and electrification

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

Design | Construction | Retrofit

IMPACT: ☑ ☑ ☑

EASE: ☑ ☐ ☐

COST EFFECTIVENESS: ☑ ☑ ☐

ISSUE

Australia needs a trained and experienced workforce with the right skills to transition to net zero emissions. State and Territory Governments have significant market presence and procurement power. By directing their procurement towards delivering highly efficient, all-electric buildings, State and Territory Governments can grow the workforce and skills needed for our energy transition. There is a lack of skilled professionals to deliver energy efficiency upgrades and replace fossil gas equipment with cleaner, more efficient electric equipment.

SOLUTION

State and Territory Governments should leverage their significant procurement power to grow and upskill the workforce for energy efficiency and electrification work. By committing to achieve zero-carbon-ready buildings for their own leased and owned assets (Recommendation 6.1), applying robust rating schemes to their projects (Recommendation 6.2) and ensuring that all projects they contribute to financially have ambitious sustainability objectives, governments can help grow the workforce for energy upgrades. Many highly-skilled energy professionals will be needed to transition the built environment to a more sustainable future.

THEME 7
ROBUST RATING TOOLS FOR ALL BUILDING TYPES

ROBUST RATING TOOLS FOR ALL BUILDING TYPES

7.1 **Empower owners, buyers and renters with a single national rating scheme for home energy performance**

7.2 Support mandatory performance disclosure for homes at the point of sale or lease

7.3 Support the expansion of NABERS to all building types and extend the Commercial Building Disclosure Program

RECOMMENDATION 7.1

EMPOWER OWNERS, BUYERS AND RENTERS

with a single national rating scheme 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 assess the energy performance of homes easily. A single, robust rating scheme consistently applied across the country would make it easier to compare the efficiency of homes and create a market for better-performing homes whilst providing added consumer protection for buyers and tenants. Work has been underway for several years on developing a rating tool for homes, but it has yet to be released for public use.

SOLUTION

State and Territory Governments should contribute to developing and implementing a single national rating scheme to facilitate the disclosure of performance in residential buildings. Through fora like the Building Ministers Meeting and the Energy and Climate Change Ministerial Council, State and Territory Governments should elevate as a political priority a rating scheme that includes:

- Benchmarks for market comparison of best practice sustainability performance
- Disclosure of the status of solar PV provision, energy storage, EV charging, and electrification of heating and hot water systems
- A single input tool for calculating the rating and a single, public-facing communication of results to avoid disparities and confusion
- A best practice governance model based on NABERS that brings the Federal, State and Territory Governments and industry together to manage benchmarks for new homes collectively.

RECOMMENDATION 7.2

SUPPORT MANDATORY PERFORMANCE DISCLOSURE

for homes at the point of sale or lease

BUILDING TYPE:

Residential

LIFECYCLE STAGE:

Sale/lease

IMPACT: ☑ ☑ ☑

EASE: ☑ ☑ ☑

COST EFFECTIVENESS: ☑ ☑ ☑

ISSUE

A home's energy performance positively impacts running costs, occupants' health, and emissions intensity.[25] Occupants value these attributes but currently lack the information to make an educated decision. When consumers purchase a fridge or television, they can see its energy performance, but when they purchase a house - a far greater user of energy - there is no information available. This information gap leads to suboptimal outcomes for occupants and an Australian housing market trailing similarly developed economies on energy performance.

SOLUTION

In the first instance, states and territories, together with the Federal Government, should prioritise the delivery of a single national rating scheme for the energy performance of homes (Recommendation 7.1). Once this is available and proven reliable, governments should implement a mandatory disclosure scheme. Options could include disclosure at the point of sale, leasing, or at set intervals. Mandatory disclosure has delivered world-leading outcomes in the commercial building sector, and residential buildings can replicate this success. It will also unlock a host of initiatives, such as green loans by banks and green door approvals from local councils.

RECOMMENDATION 7.3

SUPPORT THE EXPANSION 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 (CBD) Program. The commercial office sector has seen approximately a 60 per cent reduction in carbon intensity since 2011.[26] 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

State and Territory Governments should support the expansion of NABERS to other building types and the regular review and growth of the CBD Program to cover more asset 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. Nationally aligned programs can further leverage NABERS to drive emissions reductions in buildings. All states and territories should fund emissions reduction in buildings by establishing a comprehensive program that targets annual improvements in certified NABERS energy ratings, modelled on the NABERS method in the NSW Energy Savings Scheme.

THEME 8
TOWARDS ZERO EMBODIED CARBON

TOWARDS ZERO EMBODIED CARBON

8.1 **Adopt a credible framework for measuring embodied carbon**

8.2 **Support the introduction of embodied carbon targets into the National Construction Code**

8.3 Grow the availability of cost-effective low emissions building materials

8.4 Introduce embodied carbon reduction targets for government projects

8.5 Develop an embodied carbon skills and education agenda to grow and upskill the workforce

8.6 Incentivise the uptake of low embodied carbon materials and practices

RECOMMENDATION 8.1

ADOPT A CREDIBLE NATIONAL FRAMEWORK

for measuring embodied carbon

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

Design

Construction

Retrofit

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

The World Green Building Council defines embodied carbon as "carbon emissions associated with materials and construction processes throughout the whole lifecycle of a building or infrastructure".[27] In 2019, it comprised 16 per cent of Australia's built environment emissions. Without intervention, this share will balloon to 85 per cent in 2050[28], 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 developing an embodied carbon tool through the NABERS program. Once it is complete, all states and territories should adopt it nationally, integrate it into construction regulation and apply it to government projects.

SUSTAINABLE BUILDINGS SEPP

State Environmental Planning Policies (SEPPs) apply across NSW and set the rules to guide and control development. State Environmental Planning Policy (Sustainable Buildings) 2022[29] encourages designing and delivering more sustainable buildings in NSW. It sets sustainability standards for residential and non-residential development and, for the first time, starts measuring and reporting on the embodied emissions of construction materials.

This means that from October 2023, all non-residential developments will need to disclose the quantities of key materials (for the super-structure, substructure and facade) and associated embodied emissions and describe how embodied emissions were minimised (by re-used or recycled content). Initially, reporting will be via a simple template, and then projects will use the NABERS embodied carbon tool once it is released.

RECOMMENDATION 8.2

SUPPORT THE INTRODUCTION OF EMBODIED CARBON TARGETS

into the National Construction Code

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

Design Construction Retrofit

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 greenhouse gases. Without intervention, embodied emissions will go from 16 to 85 per cent of the built environment's total carbon footprint by 2050.[30] Industry leaders are already taking voluntary action to reduce these emissions. Still, 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. States and territories and 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 of upcoming changes to requirements and allow them to adjust their designs and supply chains accordingly.

RECOMMENDATION 8.3

GROW THE AVAILABILITY OF COST-EFFECTIVE LOW EMISSIONS BUILDING MATERIALS

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

Design | Construction | Retrofit

IMPACT: ☑ ☑ ☑

EASE: ☑ ☑ ☑

COST EFFECTIVENESS: ☑ ☑ ☑

ISSUE

The need for more low embodied carbon materials in the construction sector is crucial to action on climate change. Traditional high-carbon materials contribute significantly to greenhouse gas emissions. Failing to embrace sustainable alternatives will lead to increasing emissions at a time when all efforts should be directed to mitigation. Transitioning to low embodied carbon materials is essential to achieve climate targets and build a resilient future. Prioritising the availability and affordability of these materials will encourage their uptake by the built environment.

SOLUTION

Governments can play a crucial role in fostering the market's growth for low embodied carbon materials. Governments can encourage the adoption of sustainable practices by implementing supportive policies, such as incentivising the use of these materials in construction projects and providing financial assistance or tax offsets to manufacturers. They can also promote research and development initiatives to advance the availability and affordability of these materials. Through these measures, governments can drive the transition towards a lower embodied carbon built environment.

RECOMMENDATION 8.4

INTRODUCE EMBODIED CARBON REDUCTION TARGETS FOR GOVERNMENT PROJECTS

BUILDING TYPE: Government, Commercial

LIFECYCLE STAGE: Design, Construction, Retrofit

IMPACT: ☑ ☑ ☑

EASE: ☑ ☑ ☑

COST EFFECTIVENESS: ☑ ☑ ☐

ISSUE

State and Territory Governments can use their 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 State and Territory Governments in a position of leadership and, in doing so, encourage similar commitments from local governments and Australian property companies.

SOLUTION

State and Territory Governments should commit to reducing their own embodied carbon footprint over time to achieve 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 developing skills and expertise in the market and reduce the cost of low-carbon materials through economies of scale. There are also many shared benefits to be unlocked by pooling resources and research and sharing information between the property and infrastructure sectors.

RECOMMENDATION 8.5

DEVELOP AN EMBODIED CARBON SKILLS

and education agenda to grow and upskill the workforce

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

All stages

IMPACT:

EASE:

COST EFFECTIVENESS:

ISSUE

Embodied carbon is an emerging area with a relatively low level of skill maturity. The skills and knowledge requirements to reduce embodied carbon footprint in the built environment drastically differ from those for operational emissions. As the grid decarbonises and the share of carbon emissions from embodied carbon becomes the primary source of built environment emissions, it will be essential to have a large and well-qualified workforce to address market needs.

Reducing embodied carbon in the built environment requires a multidisciplinary approach and a combination of skills. Key skills required are lifecycle analysis consultants, sustainable designers and architects, material science experts and engineers. State and Territory Governments can play a key role in preparing industry for the coming demand for embodied carbon reduction skills.

SOLUTION

State and Territory Governments should collaborate to develop a skills and education agenda to grow and upskill the embodied carbon workforce. To that end, they should pool resources to develop and deploy training materials through a number of available pathways. These include educational institutions, industry collaboration and research partnerships, online platforms and resources, pilot programs and demonstrations. Taking this approach will ensure that the market is ready to deliver essential improvements to embodied carbon in the built environment.

RECOMMENDATION 8.6

INCENTIVISE THE UPTAKE OF LOW EMBODIED CARBON MATERIALS AND PRACTICES

BUILDING TYPE:

All buildings

LIFECYCLE STAGE:

Design | Construction | Retrofit

IMPACT: ☑ ☑ ☑

EASE: ☑ ☑ ☐

COST EFFECTIVENESS: ☑ ☑ ☐

ISSUE

Property organisations, professionals, materials manufacturers, and importers can take many actions to reduce projects' embodied carbon. These include procuring low embodied carbon products, using carbon-intensive products more efficiently, seeking local suppliers, and reducing emissions during construction. Many of these actions are already included in certification frameworks such as Green Star and can be carried out voluntarily by participants.

SOLUTION

State and Territory Governments can take action to improve embodied carbon outcomes through incentives. These could include direct financial incentives, tax reductions or planning incentives for property organisations undertaking embodied carbon reduction on their projects. This will help develop skills and a market for low embodied carbon products while reducing the built environment's carbon footprint.

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