



Building sector

Most building emissions in Australia come from the energy used to live and work in them and inefficient building standards. We tend to use excessive energy because commercial and residential buildings in Australia are generally poorly built for local conditions.

Already, we're changing the way we consume energy as we switch from gas, power supply increasingly comes from renewables, and we put more solar panels on our rooftops.

The share of electricity in the energy use of buildings will rise from 58% of energy consumption by buildings in 2020 to more than 85% by 2050 and that will be from renewable electricity.

How else will we make sure that our buildings are fit for the transition to net zero?

Almost all new buildings from now to 2050 will need to meet a seven-star rating under the Nationwide House Energy Rating Scheme (NatHERS).

Installation of rooftop solar will continue to increase. Approximately 30% of detached homes currently have rooftop solar (AEMO, 2022). Under the CSIRO's *Rapid Decarbonisation* scenario this would need to increase to 47% by 2030 – equivalent to almost 3000 additional homes fitted with rooftop solar per week.

Shifts in the construction and design of new buildings will improve thermal (space heating and cooling) energy efficiency which will need to increase by 15% on average by 2050.

Many of the retrofit opportunities – heat pumps, solar water heating, and electric or induction stoves – are already commercially available. Improvements in heating and cooling efficiency achieved through new and rebuilt stock as well as some retrofitting account for around 25% of residential and 40% of commercial building improvements respectively.

Building codes may need to be strengthened to mandate uptake, and failure to do so could limit the pace of decarbonisation.

Decarbonisation of the electricity sector along with efficiency improvements and switching fuels is projected to reduce building emissions to well below 5% of 2020 levels by 2050.

For more information, see infographic below and section 3.2 of the report *Pathways to Net Zero Emissions – An Australian Perspective on Rapid Decarbonisation*.

[csiro.au/rapiddecarbonisation](https://www.csiro.au/rapiddecarbonisation)

For further information

CSIRO media liaison
1300 555 005
media@csiro.au

Building sector

2030

Emissions from commercial buildings at 20% of 2020 levels

Half of detached homes have rooftop solar – 3000 more homes fitted each week from 2022–2030

Emissions from households at 18% of 2020 levels

Electricity makes up 58% of household energy, as gas etc decrease

2050

Emissions from commercial buildings down more than 95% from 2020 levels

Almost half of commercial floorspace now built to higher energy efficiency standards

Emissions from residential buildings down more than 98% from 2020 levels

Almost two thirds of residential buildings built to 7-star efficiency standards

Water heating and cooking are 100% electrified for residential buildings

Electricity makes up 62% of household energy use, as gas etc decrease

2020

Building operation makes up about 18% of total emissions

Existing building stock is not energy efficient

One third of detached homes have rooftop solar

Half of water heating and cooking are electrified

Electricity makes up half (49%) of household energy

Space heating is still about one third electrified

- Commercial
- Residential