

Australia has no need for nuclear on the way to net zero

Climateworks modelling shows Australia can reach net zero emissions before 2040 with technology available today – nuclear is not part of that picture.

Discussion on nuclear’s role in Australia’s energy mix has increased, despite the associated costs and time limitations.

Too expensive

Costs associated with building and generating electricity from nuclear power are high, both now and in the future.

The capital costs (total cost of bringing a project online) and operating costs of large-scale nuclear in Australia are:

- + In 2024: **67 per cent** more expensive than large-scale solar and wind, backed by storage
- + In 2030: **72 per cent** more expensive than large-scale solar and wind, backed by storage

The projected costs for small-scale modular reactors (SMRs) are higher.

For the last five years, [CSIRO's GenCost report](#) has found that renewables are the cheapest form of energy in Australia.

Despite needing additional transmission to support increased renewable energy rollout, solar and wind remain the more affordable options. The [Australian Energy Market Operators \(AEMOs\) 2024 Integrated System Plan](#) found that transmission projects are expected to recoup their \$16 billion investment and save [Australian consumers \\$18.5 billion](#) in avoided energy costs, whilst also delivering emissions reductions valued at a further \$3.3 billion.

Renewables are projected to become more affordable as global investment in solar and wind accelerates.

Large-scale nuclear is a mature technology globally but has not experienced any significant cost reductions. This can be attributed to the requirement for many years of expensive, localised construction and ongoing labour expenses.

Too late

Analysis by Climateworks and AEMO finds that nuclear power is not cost-viable, and does not align with the speed or rate of emissions reductions required for Australia to meet its global commitments.

Both Climateworks' 1.5 degree Celsius aligned scenarios and AEMO's Integrated System Plan show Australia requires approximately 300 gigawatts (GW) of grid capacity by 2050.

Today, Australia's grid sits at 55 GW. On average, that means an additional 10 GW per year will be required.

The seven proposed nuclear reactors would provide a combined 6–11 GW of grid capacity and take at least 15 years to complete.

Renewables are cost-effective and ready to be deployed now, with shorter timelines.

A 2024 analysis found that Australian renewable projects are being built significantly faster: onshore wind takes approximately four and a half years to develop, while solar takes three and a half – construction times have halved since 2011.

Solar is now being installed faster than any technology in history.

You only need to look to China to see what is possible – the country is installing at least 10 GW of solar and wind capacity every fortnight.

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What does our modelling tell us?

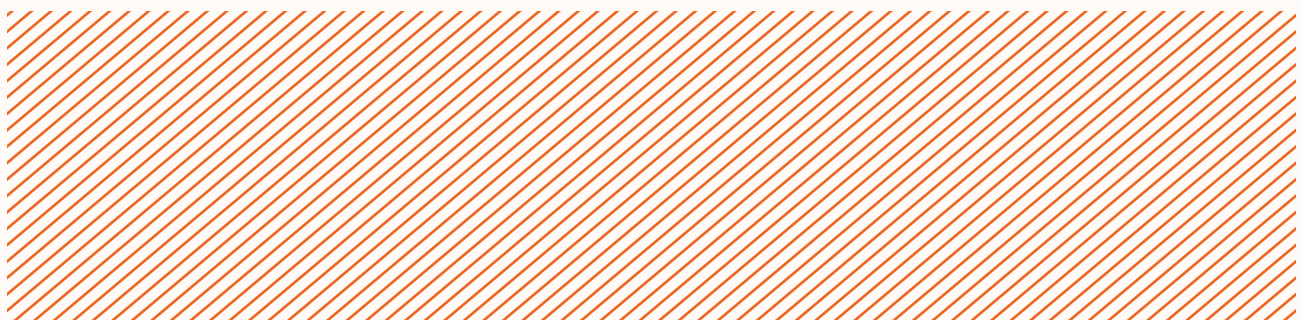
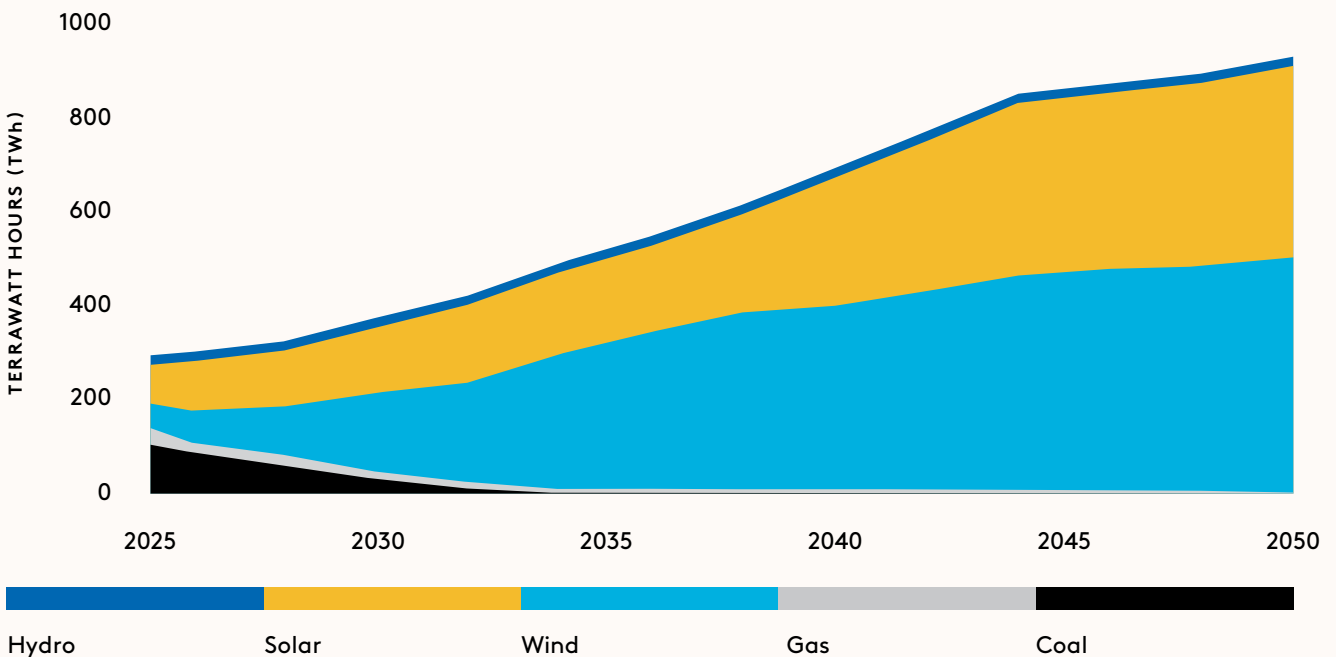
Climateworks has a decade-long history of using technology-neutral scenario modelling utilising AusTIMES – a tool developed over several years in partnership with CSIRO – to provide a view of how the entire Australian economy could decarbonise at the lowest cost over time.

In the modelling that underpinned our latest decarbonisation scenarios, nuclear is not taken up by the model.

- + Small nuclear power reactors were included, but they were not deployed in the model because they are too expensive and would take too long to build
- + Large-scale nuclear reactors were not included in the modelling because they were made illegal in the late 1990s

Decarbonising the electricity grid in the short to medium term enables emissions reductions across the whole economy. In our scenarios, renewable energy, which can be rolled out in the next few years at a relatively low cost, is the best option to decarbonise Australia’s grid.

Electricity generation mix for 1.5°C scenario



The solutions are here already

Wind and solar are currently powering over a quarter of the country. Australia also has globally significant advantages, an enviable capacity for renewable resources, critical minerals and a skilled workforce.

The electricity sector will need to move quickly to build the solar and wind capacity required to take advantage of the enormous opportunity presented by Australia's green export and renewable energy potential. When it comes to renewable energy, the benefits outweigh the costs. Australia's green hydrogen and green iron exports alone could generate up to 3.25 million jobs by 2050, primarily in regional areas, and establish the nation as a renewable energy superpower.

We know that every degree of warming and every bit of emissions reduction matters. A 1.5°C-aligned least-cost pathway for Australia can be achieved with renewable energy, backed up by storage.

Now is the time for Australia to raise its renewable energy ambition and unlock the big economic opportunities from the emerging global net zero economy.



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