

Is Andrew Forrest's energy dream in peril? The future of green hydrogen in Australia explained



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Highlight: [Fortescue](#) announced 700 job cuts this week in a bid to remain 'lean'. So what does it mean for green hydrogen? Get our morning and afternoon news emails, free app or daily news podcast

Body

The iron ore billionaire Andrew Forrest has long vowed to transform Australia's energy landscape with green hydrogen made from renewable energy, even turning up to 2023's Cop28 [in a ship dubbed the "Green Pioneer"](#).

But pundits wondered whether the green dream had come crashing down to reality after [Fortescue announced this week](#) that it was cutting 700 jobs across its businesses globally as it seeks to remain "lean", with an unspecified number going in its energy unit.

Here we look at the emerging green hydrogen industry and the headwinds – and tailwinds – it faces.

What is green hydrogen?

Hydrogen, as fans of the periodic table recall, is the simplest element and most abundant in the universe. It makes up about 73% of the sun's mass and one-tenth of yours.

Refineries use hydrogen to crack heavy oil into petrol and diesel, and to make ammonia for fertiliser. It is also an important energy store that might one day displace gas or other fossil fuels, used for everything from power generation to metal production and heavy transport.

But hydrogen usually needs to be split from other elements and that takes energy. According to the International Energy Agency, hydrogen production and use was linked to 900m tonnes of CO2 emissions in 2022, or about twice that of Australia's total.

The source of the energy used to split hydrogen is categorised into up [to a dozen colours](#).

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[CSIRO highlights a few](#), with green hydrogen extracted without greenhouse gas emissions, usually via electrolyzers that are powered by wind, solar or hydro.

So-called blue hydrogen uses steam to separate hydrogen from natural gas, with resulting emissions sequestered. If they aren't, it's grey hydrogen. If coal is used (as [the Japanese have been eyeing in Victoria](#)), it's brown or black, depending on the type of coal. There's also "pink hydrogen" if nuclear power is the energy source.

Is **Fortescue** quitting the green hydrogen scene?

Fortescue said it "remains resolute in its commitment to be the world's leading green technology, energy and metals company with a laser focus on achieving Real Zero [[by cutting 90%](#) of emissions] by 2030".

The cost cuts relate to combining the metals and energy divisions into one "to simplify its structure, remove duplication and deliver cost efficiencies".

"We are by no means winding back on our commitment to green hydrogen," Forrest said in a statement provided to Guardian Australia. "In fact, we are doing all we can to back green hydrogen in Australia by investing in renewable energy and hydrogen technology every single day.

"The price of power remains a challenge in Australia, and this has been caused by fossil fuels and the subsidies provided for fossil fuels."

According to the investment bank UBS, **Fortescue's** [proposed green ammonia plant](#) at Queensland's Gibson Island needs electricity to cost \$20-\$30 per megawatt hour to be viable but recent long-term contracts for large wind and solar farms are offering \$70-\$90 per MWh power.

Those price gaps must close if hopes for "green steel" or other green metals that use hydrogen are to be realised.

AGL Energy, meanwhile, confirmed on Friday that **Fortescue** was ending plans to produce hydrogen at the site of its defunct Liddell coal-fired power station. "AGL remains committed to exploring options to produce green hydrogen and future fuels at the Hunter [Valley] site in the future if economically feasible," a spokesperson said.

UBS has a "sell" call on **Fortescue** shares, predicting they have at least another 10% to fall (building on the 25%-plus fall in 2024 so far). A big reason for the dip is falling iron ore prices as China's demand cools – unrelated to **Fortescue's** hydrogen hopes.

What are governments doing?

The government will offer a tax credit to subsidise green hydrogen as part of its [Future Made in Australia](#) scheme. Producers will receive a \$2/kg "incentive" for up to 10 years – between mid-2027 and mid-2040 – for projects reaching final investment signoff by 2030.

States, too, are chipping in. South Australia, for instance, has a [\\$500m hydrogen jobs plan](#) that includes \$100m state and federal support for [the Port Bonython Hydrogen Hub](#) that aims to produce green hydrogen-related exports from 2030.

New South Wales, meanwhile, will offer as much as \$3bn to lure similar ventures to that state, with a 2030 "stretch target" of 111,000 tonnes a year of green hydrogen output and 700 megawatts of electrolyser capacity.

But other nations are spending much more. The US's inflation reduction act may end up topping \$1USn (\$A1.5tn) for decarbonising programs, including hydrogen and electric vehicles among others.

Fortescue cuts were likely related to missing out on being [shortlisted for the first \\$2bn](#) of the \$4bn federal government's "hydrogen headstart" scheme, one source added.

What does the hydrogen industry think?

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Insiders say much climate action hinges on “cost-effective” renewable energy, not just the green hydrogen industry.

So-called blue hydrogen might be a near-term solution to make the product cheap enough to foster greater demand but “it's better for the planet if we went straight to green”, one source said.

Fiona Simon, chief executive of the Australian Hydrogen Council, said **Fortescue**'s move was “less about hydrogen than it is about one company and how it's sought to reassess its priorities”.

That said, “we've all known that hydrogen was difficult, and in the last two or three years [experience has shown] that is harder than we thought”, Simon said. “It certainly doesn't signal the death of hydrogen.”

Scaling up the production of electrolyzers that use electricity to split water into hydrogen and oxygen will help drive down costs, she said.

By some estimates, hydrogen costs would need to drop to about \$US2/kg (\$A3/kg) to be competitive. [One recent US government study](#) puts present costs at \$US12 to \$16/kg when delivery costs are included.

What next?

The International Energy Agency estimates global hydrogen demand reached 95m tonnes in 2022, rising about 3% that year. Low-emissions sources of the fuel accounted for just 0.7% of demand.

Minh Le, global head of hydrogen for analysts Rystad Energy, said that “as things stand at the moment it will be very challenging, if not almost impossible to reach \$2 [US] for green hydrogen”.

Still, “the momentum of hydrogen development remains strong”, with “many major auctions in key regions” coming through this year in Europe, Japan and elsewhere, he said.

Falling battery costs add to the competitive pressures in areas such as transport. At 14 times lighter than air, hydrogen is leaky – [with safety issues](#) – and [not yet barbecue ready](#).

Rystad Energy's Nigel Rambhujun said “a lot more work can be done on demand-side policies to incentivise potential end-users and reduce the green premium associated with clean hydrogen” with the next 6-12 months “critical” for the sector in Australia.

“Without significant government support, green hydrogen will continue to be the most expensive hydrogen colour.”

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