

Nuclear energy risks an industrial meltdown for local manufacturing jobs

A nuclear policy, if enacted, risks Australia's aluminium manufacturing industry and jobs due to:

- A 50% collapse in industrial electricity usage by 2035
- Permanently higher electricity prices, and more reliance on ageing and increasingly unreliable coal and expensive gas generation
- Development & decarbonisation timelines that don't meet industry requirements or align with climate science

The closure of Australia's aluminium smelters would result in the loss of up to 13,500 jobs

The Federal Opposition's proposal for nuclear energy would result in widespread manufacturing and industry job losses if enacted, including the almost certain closure of Australia's mainland aluminium smelters by 2030.

Energy modelling conducted by the Federal Opposition to inform their nuclear policy shows that under the proposal, industrial electricity use would collapse from the current level of 45.4 TWh per year down to 22.8 TWh by as early as 2035 – a 50% drop¹. A collapse in energy usage of this magnitude is equivalent to the closure of Australia's four aluminium smelters, which currently use 23.5 TWh of electricity per year.

Nuclear's higher prices and slow development timeline also place our smelters at risk. Australia's aluminium smelters in Tomago in NSW's Hunter region, Gladstone in Central Queensland, Portland in Victoria and Bell Bay in Tasmania rely on low-cost energy in order to be economically viable. Nuclear, however, will drive up the cost of electricity and divert resources away from the development of the lowest-cost energy pathway as identified by the Australian Energy Market Operator (AEMO), which is predominantly renewable power backed by storage and firming.

¹ See Chart 2 for modelled impacts

These risks would be further compounded if the Federal Opposition were to maintain its position to cut all Future Made in Australia initiatives², including the \$2bn Green Aluminium Production Credit³. The creation of the credit recognises that modernisation investments in our manufacturing base are needed in order to ensure it remains competitive in a global market that is increasingly seeking out green products, as countries and companies pursue emission reduction goals. The credits will provide an incentive for every tonne of green aluminium smelters produced from 2026 to 2036. This investment will lower the cost of producing the metal with clean energy and support the modernisation and repowering of Australia's aluminium industry.

The Federal Opposition's commitment to nuclear and its opposition to the industrial support measures within Future Made in Australia fails to recognise the reality of what is required for manufacturing locally or globally. It would – if enacted – place our mainland aluminium smelters at severe risk of closure.

In fact, the combined policy proposals represent the greatest single threat to Australia's industrial future and the competitiveness of our domestic manufacturing sector, since the withdrawal of support for the local car-making industry and its subsequent closure.

The collapse of Australia's car-making industry was also precipitated by government decisions. In 2013, the Abbott Government moved to cut support for local car manufacturing by slashing \$500m from the Automotive Transformation Scheme⁴. Within eight months, each of the three major car makers announced plans to close their manufacturing operations.⁵ The closures had a major impact on the manufacturing sector in Victoria and South Australia and resulted in tens of thousands of job losses, with many former workers becoming trapped in long-term unemployment or forced to take up lower-paid, less secure new jobs.⁶

Australia's aluminium industry currently supports 7,594 direct jobs and 5,886 jobs indirectly. Ensuring the sector's viability is vital for those 13,500 people who rely on its sustainability for employment.

It also has significant national strategic importance. Maintaining a domestic supply chain is crucial to reducing Australia's vulnerability to disruptions in global trade and building self-sufficiency in key resources, materials and capabilities.

Nuclear reactors are too costly and slow to build for the aluminium industry

Nuclear reactors present a risk for Australian industry for two main reasons:

- 1) They represent an extremely expensive form of power generation, and given the high energy needs of aluminium production, this will result in uncompetitive end products

² <https://peterdutton.com.au/leader-of-the-opposition-transcript-budget-in-reply/>

³ <https://www.industry.gov.au/news/new-green-aluminium-production-credit-will-support-transition-green-metals>

⁴ <https://theconversation.com/walking-away-from-holden-abbott-finishes-what-hewson-started-21376>

⁵ <https://www.industry.gov.au/sites/default/files/2022-08/australian-automotive-industry-transition-following-the-end-of-australian-motor-vehicle-production.pdf>

⁶ Irving, J., Beer, A., Weller, S., & Barnes, T. (2022). Plant closures in Australia's automotive industry: continuity and change. *Regional Studies, Regional Science*, 9(1), 5–22. <https://doi.org/10.1080/21681376.2021.2016071>

- 2) Construction timelines cannot meet the repowering and decarbonisation requirements smelter operators have outlined to maintain their commercial viability.

The most recent GenCost report produced by the CSIRO in December 2024 highlights that given the exceptionally high build cost of nuclear, this would double the price of the current pathway Australia is on, which is the development of a mix of 90% renewable energy: wind, solar, backed by batteries, hydro power and demand response management.

The CSIRO report underscores the reality that nuclear energy is a high-cost source of electricity (outside of China). Furthermore, this likely underestimates the true cost as it uses optimistic assumptions that Australia could construct plants as cheaply as South Korea. If, however, examples from comparable nations like the UK and the USA are used, the cost comparison becomes even starker at \$250 - \$346 MWh levelised cost of energy (LCOE)^{7, 8}

Chart 1 shows that nuclear, especially the hypothetical small modular reactor (SMR) proposal, is among the most expensive in terms of LCOE. The Federal Opposition plans for large-scale units plans and 2 SMR's.⁹ This would be disastrous for aluminium smelters, which rely on low-cost electricity to remain financially viable.

Chart 1: Nuclear energy will drive electricity costs higher

Levelised cost of energy (\$/MWh)

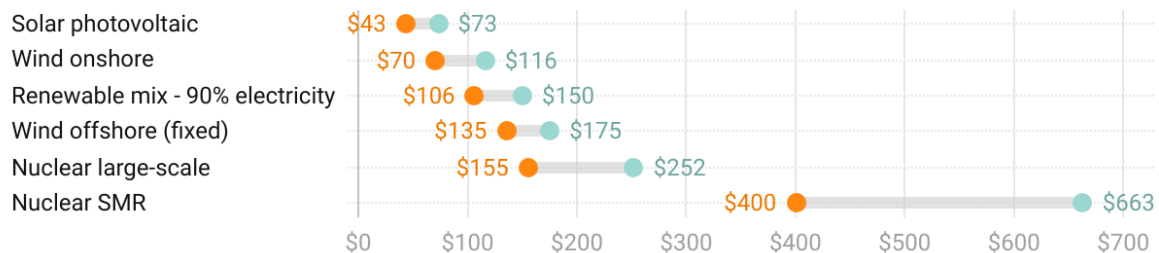


Chart: Springmount Advisory • Source: CSIRO GenCost 2024-25 - Table B.10 • Created with Datawrapper

Additionally, the timeline for the construction of nuclear power plants does not match the replacement energy requirements industry has outlined. The three mainland aluminium smelters currently rely on power from coal power stations that are all at the end of their working life. Contracts for the current supply of electricity to Queensland's Boyne smelter expire in 2029, and for Tomago in the NSW Hunter by end of 2028¹⁰. The smelters must develop low-cost renewable energy solutions to maintain their long-term viability. The timeline for nuclear, meanwhile, is at least 15 years.

The Australian Aluminium Council has flagged these concerns, saying in a submission to the Select Committee on Nuclear Energy that:

⁷ <https://ieefa.org/resources/nuclear-australia-would-increase-household-power-bills>

⁸ LCOE is the average cost to produce one unit of electricity (like 1 megawatt-hour) over the lifetime of a power plant. It adds up all the costs, including building, operating, and maintaining the plant, and spreads them out evenly over all the electricity the plant is expected to generate. Then it tells you, on average, how much it costs to make each unit of power.

⁹ <https://www.theguardian.com/australia-news/2025/feb/04/nuclear-power-liberal-coalition-energy-power-plan-details>

¹⁰ <https://www.riotinto.com/en/sustainability/climate-change>

“There are substantial technical, regulatory and cost challenges to be overcome in Australia developing a nuclear industry, and there is a large body of research suggesting that nuclear power plants are the class of infrastructure investment which is more prone to cost and schedule blowouts because of these challenges. The most recent Western nuclear builds on already permitted sites (US, UK, France, Finland) have taken between 17-23 years from design commencement to first power. The time required to develop any potential nuclear energy industry in Australia will already have needed substantial investment in alternatives to continue to maintain Australia’s aluminium industry and any duplication of resources is unlikely to result in a least cost outcome for consumers.”¹¹

The Australian Industry Group (Ai Group) has likewise indicated the cost impacts of nuclear energy to the Committee:¹²

“Ai Group’s position is that we have no in-principle objection to nuclear energy; We see no evidence that its (nuclear’s) economics will be attractive in Australia ... It would not make sense to halt the deployment of the transmission lines, renewable generation, energy storage, demand flexibility and gas peaker backup that the best available analysis indicates are Australia’s least cost electricity development path.”

“It would not be sensible to scale back delivery of the Integrated Systems Plan, including transmission and large scale renewable generation, in the hope that nuclear’s relative attractiveness sharply improves.”

Nuclear proposal shows an industrial electricity use collapse

The Federal Opposition’s modelling, commissioned in support of its nuclear proposal, accepts a future in which there is slower economic growth and industrial energy demands are at greater risk. It also accepts a future in which we cannot meet our commitments to take action on climate pollution.^{13 14}

The Frontier Economics modelling uses scenarios developed by the Australian Energy Market Operator (AEMO)¹⁵ in its 2024 Integrated Systems Plan to illustrate expected energy usage.

- 1) **Progressive Change (used by Frontier Economics for the Nuclear Energy Plan)**
- this scenario reflects slower economic growth and energy investment with economic and international factors placing industrial demands at greater risk and slower decarbonisation action beyond current commitments.
- 2) **Step Change (used by Frontier Economics to illustrate the Federal ALP’s energy policy)**, in this scenario, Australia fulfils emission reduction commitments in a growing economy.
- 3) **Green Energy Exports** sees very strong industrial decarbonisation and low-emission energy exports.

¹¹ <https://aluminium.org.au/wp-content/uploads/2024/11/241113-Aluminium-Select-Committee-on-Nuclear-Energy.pdf>

¹² https://www.aph.gov.au/Parliamentary_Business/Committees/House/Select_Committee_on_Nuclear_Energy/Nuclearpower/Submissions

¹³ https://www.frontier-economics.com.au/wp-content/uploads/2024/11/Report-1-Base-case-report-Nov-14-2024_v2.pdf

¹⁴ <https://www.frontier-economics.com.au/wp-content/uploads/2024/12/Report-2-Nuclear-power-analysis-Final-STC.pdf>

¹⁵

<https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2024-integrated-system-plan-isp/current-inputs-assumptions-and-scenarios>

Australia is currently on a trajectory aligned with the Step Change scenario, which is the pathway backed by AEMO following consultation with its expert panellists representing industry, government, network service providers, researchers, academics, and consumers.

The more ambitious *Green energy exports* scenario is what the Future Made in Australia package brings closer to reality.

Under the Step Change scenario, industrial electricity use will grow slightly above current levels, rising to 48 TWh in 2035. While the Green Energy Export scenario, which the Future Made in Australia initiative will help unlock, will see industrial electricity consumption grow 18%, to 54 TWh by 2035.

The Federal Opposition’s nuclear plan, in contrast, is mapped to the *Progressive Change* scenario, which sees Australian industrial energy use collapse.

The chart below shows the implications for Australian industry if this country pursues a nuclear-powered Progressive Change scenario. It highlights how industry energy use will collapse within a decade, falling 15% by the late 2020s before dropping to 50% by the early 2030s. Total industrial electricity usage will fall from 45.4 TWh today to 22.8 TWh in 2035.

Chart 2: Industrial electricity usage collapses with nuclear

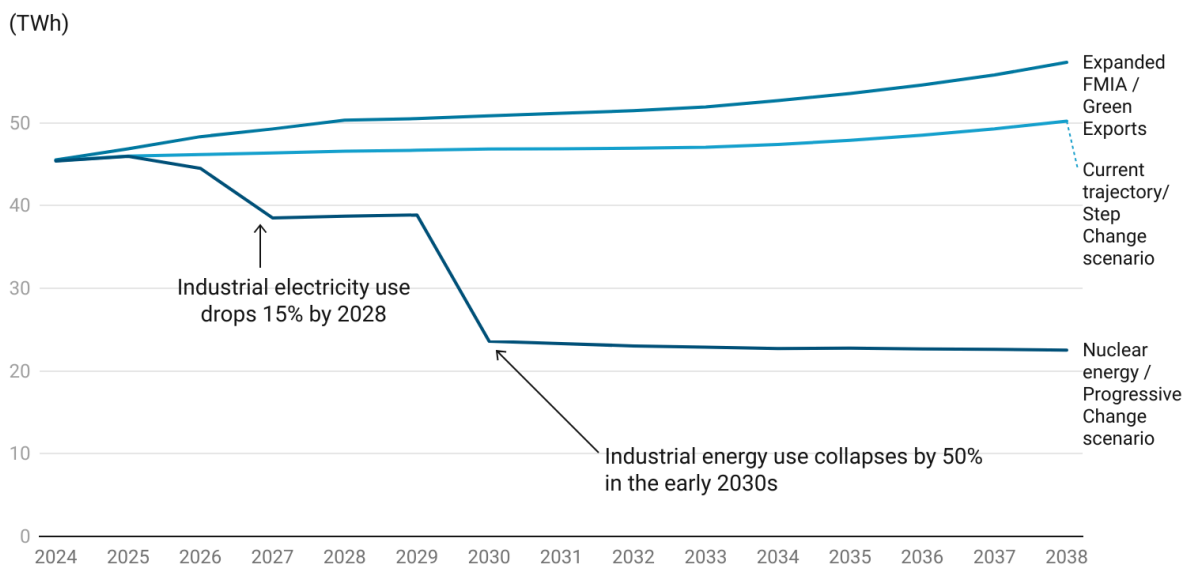


Chart: Springmount Advisory • Source: AEMO ISP 2024; Frontier Economics • Created with Datawrapper

Pursuing such a path will likely result in wide-scale industrial closures. It will also leave Australia more vulnerable to growing energy security and climate risks, as the country remains reliant on \$60bn annual oil imports from the Middle East (rather than progressively electrifying our transport sector) and fails to deliver on action on emission reduction. In contrast, building a green exports-focused economy will help deliver on our climate commitments, while promoting industrial expansion and support for regional workers, jobs and communities over the next decade and beyond.

Aluminium plants are particularly vulnerable to nuclear





Australia is the world's sixth largest aluminium producer and the sector is highly sensitive to electricity prices due to the large volumes required by the industry.

Australia's four aluminium smelters consume approximately 23.5 TWh of electricity each year, equivalent to 52% of industrial electricity consumption.

Pursuing nuclear energy in Australia will drive up electricity prices in Australia to uncompetitive levels for many industries. The three aluminium smelters on the mainland are particularly exposed due to a reliance on end-of-life coal power plants, while the Bell Bay smelter in Tasmania, powered by hydroelectric sources, is more secure from both an energy and decarbonisation perspective but will likely be exposed if the other smelters are forced to close down due to reduction in economies of scale for trade and maintenance.

Together, the four smelters support more than 7,500 jobs directly and almost 6,000 indirect jobs in the regions¹⁶.

Table 1: Aluminium smelter energy use and employment

	Smelter	Electricity use per year (TWh) ¹⁷	Direct jobs ¹⁸
	Boyne QLD	7	2,464
	Tomago NSW	8.3	2,796
	Portland VIC	5.2	1,383
	Bell Bay TAS	3	951
<i>Indirect jobs</i>			5,886
Total		23.5 TWh	13,480 Jobs

¹⁶ https://ieefa.org/wp-content/uploads/2020/09/Aluminium-Led-Energy-Renewal-for-Central-Queensland_September-2020-.pdf

¹⁷ Table 1, https://ieefa.org/wp-content/uploads/2020/09/Aluminium-Led-Energy-Renewal-for-Central-Queensland_September-2020-.pdf

¹⁸ <https://www.industry.gov.au/news/new-green-aluminium-production-credit-will-support-transition-green-metals>

The \$2 billion Green Aluminium Production Credit announced by the Government¹⁹ will support the sector to transition to renewable energy. The initiative will harness Australia's unique comparative advantage by combining our exceptional renewable and mineral resources to produce green metals for the global economy.

A nuclear policy will derail this potential entirely, especially when coupled with the Federal Opposition's stated plan to withdraw support for the Future Made in Australia package including the aluminium production credits.

This will place not just the transition to clean energy at risk, but the continued survival of aluminium production in Australia.

A nuclear pathway is a pathway to greater carbon pollution

A nuclear pathway will lead to greater emissions and environmental impacts. The Progressive Change scenario, outlined in AEMO's ISP and used as the basis for the nuclear modelling, is aligned with 2.6 degrees of warming (compared to the Step Change scenario at 1.8 degrees and the Green Energy Export scenario at 1.5 degrees²⁰). Every fraction of a degree matters. As the Intergovernmental Panel on Climate Change (IPCC) states *"every additional 0.1°C of global warming causes clearly discernible increases in the intensity and frequency of temperature and precipitation extremes, as well as agricultural and ecological droughts in some regions"*.²¹

A nuclear pathway would slow the rate of renewable deployment, leading to more coal and gas use in the time taken for nuclear plants to be built. The Climate Change Authority have shown that by 2050 the nuclear pathway would release an additional²²:

- 1 billion tonnes of emissions from the electricity sector
- 1 billion tonnes from economy-wide emissions.

For context, Australia's emissions are lowering each year, currently producing ~440 million tonnes a year²³ – meaning that the nuclear pathway will release the equivalent of 4.5 years of extra emissions.

If Australia's aluminium industry is off-shored, that aluminium will still be produced but without Australia's better-than-most aluminium production standards. Australia already has lower than average carbon per tonne of aluminium production²⁴, and existing commitments from smelter owners to repower with renewable energy will reduce these emissions significantly. Aluminum produced off shore is therefore likely to have much higher emission intensity, again increasing global carbon emissions.

¹⁹ <https://www.industry.gov.au/news/new-green-aluminium-production-credit-will-support-transition-green-metals>

²⁰ <https://www.climatechangeauthority.gov.au/assessing-impact-nuclear-pathway-australias-emissions>

²¹ https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf

²² <https://www.climatechangeauthority.gov.au/assessing-impact-nuclear-pathway-australias-emissions>

²³ <https://www.dcceew.gov.au/climate-change/publications/australias-emissions-projections-2024>

²⁴ <https://treasury.gov.au/sites/default/files/2023-04/c2022-314397-australian-aluminium-council.pdf>

The future for industrial electricity supply is renewable

Australia's industrial future will be underpinned by low-cost renewables and long-duration storage. This view is supported by industry, including major aluminium producers like Rio Tinto²⁵ which owns three of the four smelters in Australia.

Rio Tinto's Chief Executive Jérôme Pécresse stated in February 2025, that *"there is no reason why Australian aluminium smelters can't be powered by a mix of intermittent renewables, provided that mix is "firmed" via batteries"*.²⁶ Pécresse continues: *"Reducing carbon emissions from aluminium production is no small feat, but it's a challenge we must tackle to achieve our carbon emissions objectives and secure aluminium's role as a sustainable material for the future."*

Industry is clear that the future of aluminium production will be powered by renewable energy, not nuclear.

The Federal Opposition's nuclear plan will require as much as \$600bn in taxpayer funding to construct seven plants that will produce just 3.7%²⁷ of Australia's electricity capacity²⁸. Their own modelling assumes a 50% collapse in industrial electricity usage, which would come at the cost of thousands of jobs.

Renewables firmed by demand response management plus hydro and battery storage are the only viable energy resources for the continued operation of aluminium smelting in Australia. We need to accelerate investment in new renewable and storage projects in order to support our existing industry and capitalise on the expected 50% increase in aluminium demand between now and 2050²⁹.

The real-world impact of the opposition's nuclear policy will be to create investor uncertainty and crowd out private investors who will invariably deter a significant part of the 260GW, \$300-400bn in renewable energy investment proposals already in the grid connection queue across Australia and force industry to consume high-cost, high-polluting electricity generated from fossil fuels for decades longer, before even higher cost, slow-to-build nuclear plants are eventually constructed.

Nuclear Modelling conducted for the Federal Opposition by Frontier Economics:

- [Report 1 14 November 2024](#)
- [Report 2 13 December 2024](#)

²⁵ https://www.linkedin.com/posts/jeromepecresse_i-spent-the-last-week-in-our-pacific-aluminium-activity-7292555941789458433-U9Wg

²⁶ <https://reneweconomy.com.au/rio-tinto-turns-to-big-batteries-to-underpin-green-smelters-as-firmed-renewables-eclipse-gas-and-coal/>

²⁷ <https://datawrapper.dwcdn.net/Arvx7/full.png>

²⁸ <https://smartenergy.org.au/nuclear-fallout-116-600-billion-to-build-7-nuclear-reactors/>

²⁹ <https://www.climateworkscentre.org/news/will-tax-incentives-help-australian-smelters-go-green/>