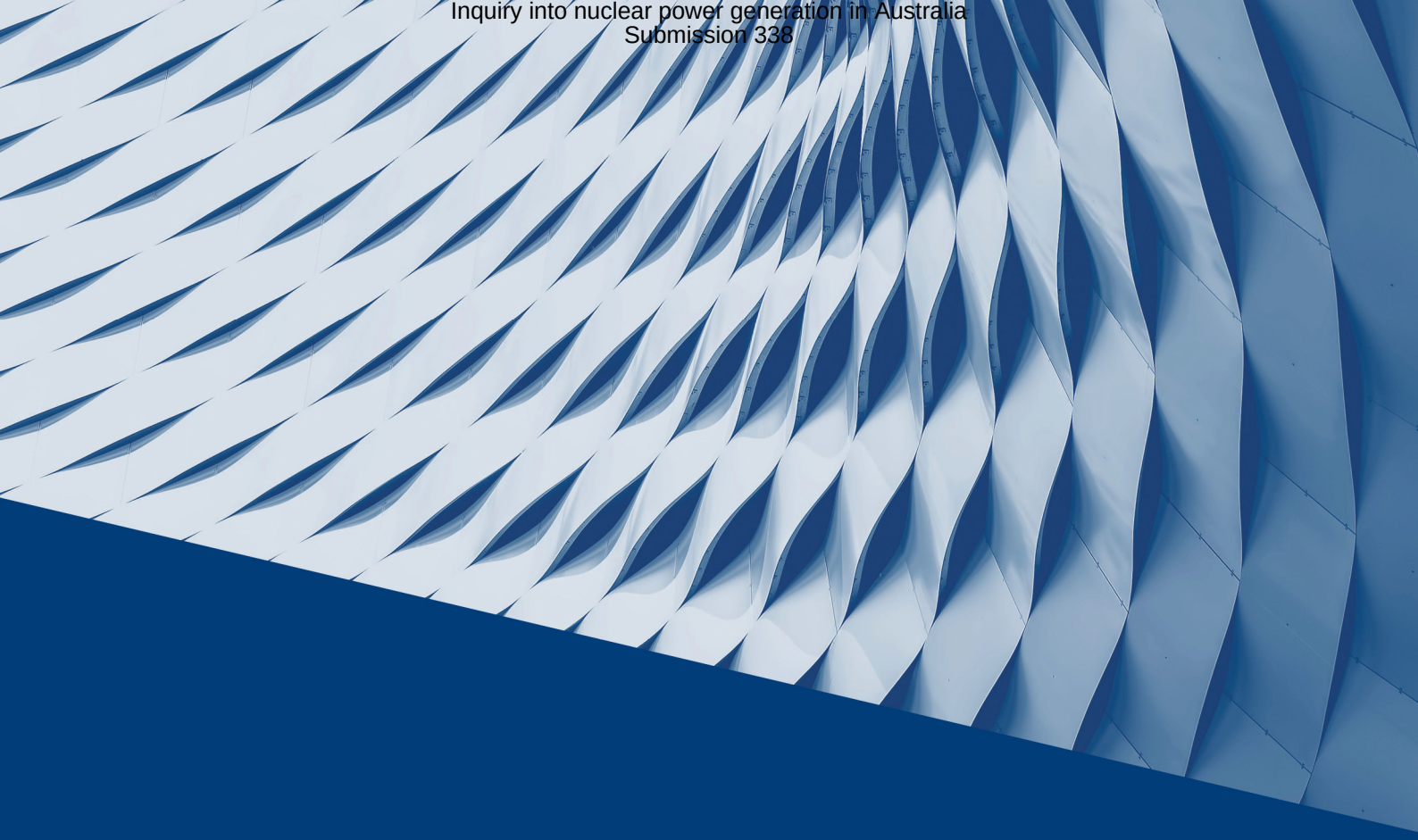

Nuclear Power Generation in Australia

Submission by the Australian Council of Trade Unions to the Inquiry into Nuclear Power Generation in Australia

ACTU Submission, 15 November, 2024
ACTU D. No 76/2024

ACTU
australian council of trade unions

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About the ACTU

Throughout our country's history, Australian Unions have always been at the forefront of winning a fair go. The Australian Council of Trade Unions (ACTU) is the peak body for Australian unions, made up of 36 affiliated unions who together represent over 1.7 million workers. We provide a single representative voice for working people. Since its creation in 1927, the ACTU has spearheaded some of the most fundamental workplace and social struggles in Australia's history. The workplace improvements are many: real wage increases, safer workplaces, greater equality for women, improvements in working hours, entitlements to paid holidays and better employment conditions, the establishment of a universal superannuation system, paid parental leave and paid family and domestic violence leave.

Summary

An attempt to establish a domestic nuclear power industry would do significant, long-term harm to Australian workers and their families:

- Nuclear power would drive up household electricity bills an average of $665 per year, while forcing millions of Australians to turn off their cheap rooftop solar, a double blow during a cost-of-living crisis.
- The uncertainty introduced through a nonsensical pivot to nuclear would depress energy investment across the board, compromising supply and reliability.
- Nuclear power is unlikely ever to create a single job. It is forecast to remain the second most expensive source of energy in Australia and is at least twice and up to six times more expensive than the cheapest sources, wind and solar. It has not and will not be able to attract the investment necessary to get off the ground, let alone grow to scale.
- If Australian taxpayers were forced to foot the bill for this uncompetitive industry, the jobs created would not appear for two decades, would represent only a fraction of the jobs that would have been created through equivalent investment in renewables, and would pose dangerous, long-term health risks for workers.
- By artificially stalling the rapid progress of renewable energy, nuclear power would drive up climate pollution, worsening the already growing threat to workers in all sectors from extreme heatwaves, bushfires, floods, storms, and vector-borne illnesses.

Introduction

An attempt to develop a nuclear power industry in Australia would hurt Australian workers in multiple, compounding ways. It would hurt their hip pockets, by driving up energy costs. It would hurt their communities, by promising jobs highly unlikely to materialise. And it would hurt their health and safety, by exacerbating climate change, which is already making work more dangerous, precarious, and gruelling for workers in every sector of the Australian economy. The ACTU therefore strongly opposes the development of nuclear power generation in Australia and urges current and future Governments to reject this misguided policy, which numerous expert analyses have shown would undermine both our economy and our climate.

Australian workers deserve well-paid, safe, and secure jobs, an affordable cost of living, and a liveable climate. The net zero transformation is already beginning to deliver on these priorities. Renewable energy generation is already generating 40% of our nation's energy and delivering the cheapest electricity in history while cutting domestic climate pollution, and clean industries like green hydrogen, critical minerals, and renewable manufacturing are already delivering tens of thousands of jobs—and are slated to deliver hundreds of thousands in the years to come. Nuclear would deliver on none of these priorities, leaving workers to face the greatest economic and environmental challenge of the century with little more than false promises and discredited ideas. Australian workers deserve better.

The following submission outlines in brief three means by which nuclear power would do significant harm to Australian workers.

Nuclear energy would drive up Australians' power bills

Multiple analyses have demonstrated that developing a nuclear power industry in Australia would significantly increase median household energy bills. Drawing on energy market analysis and evidence from recent nuclear projects in economies comparable to Australia's, modelling from the Institute for Energy Economics and Financial Analysis (IEEFA) forecasts that adding nuclear power to the energy grid would raise median electricity bills an average of $665 per year, with a range of between $260

and $1,200 annually. Larger household would be penalized the most—for example, a four-person household would see their bills rise $972 on average.[1]
This finding aligns with independent estimates from energy experts at the Monash University Energy Institute and the University of New South Wales.[2]

The above analyses assume that the costs of nuclear power would be passed through to consumer energy bills. Some proponents have suggested that instead, the cost of establishing nuclear would be entirely borne by the Government and therefore taxpayers. This would do similar harm to workers and working families: by significantly increasing their tax burden to pay for an uneconomic, unnecessary energy technology, and/or requiring significant funding cuts to essential public services like schools and hospitals. Saddling Australian taxpayers with the cost of an industry bound otherwise to fail would exact enormous opportunity costs, exacerbating the cost of living crisis and lowering the median quality of life for Australian workers and their families.

Even the example most often cited by proponents of nuclear—that of Ontario, Canada—reinforces the conclusions above. When accounting for wholesale, distribution, and transmission costs, Australians currently pay anywhere between 1% and 19% less for energy than residents of Ontario, which derives the majority of its energy from nuclear. And this contemporary comparison doesn't account for the 35 years that Ontarians spent paying off the enormous commercial debts incurred to fund the construction of the plants in the first place, beginning in the 1970's. For 35 years, these costs were passed through to Ontarians in their power bills, and even now that the commercial debt is repaid, they have been left with an energy system that charges significantly more on average than Australia's current electricity market.[3]

According to analysis from the McKell Institute, nuclear would further push up Australian retail electricity costs through another mechanism: severely dampening energy investment writ large over the next two decades. Even in the most optimistic forecasts, the first nuclear power stations could not be built until the late 2030s. In the intervening years, few if any investors would be willing to risk major energy investments in the Australian economy, knowing the Commonwealth had already chosen an

[1] Bowyer, Johanna and Tristen Edis. "Nuclear in Australia would increase household power bills." Institute for Energy Economics and Financial Analysis. September 2024.
[2] Morton, Adam and Paul Karp. "Power bills could rise by $1,000 a year under Colaition plan to boost gas until nuclear is ready, analysts say." The Guardian. June 21, 2024.
[3] Edis, Tristan. "Ontario's huge nuclear debt and other things Dutton doesn't understand about cost of electricity." Renew Economy. October 30, 2024.

energy market "winner" to be underwritten by taxpayers. This lack of investment would decrease supply and reliability, putting upward pressure on household and commercial power bills.[4] Investor appetite would also be undermined by the inherent uncertainty attached to a policy of nuclear expansion. Given that both Commonwealth and state legislative bans and restrictions would first need to be overturned to allow the industry to move forward, investors would lack the certainty necessary to make long-term bets on the future of Australian energy market.[5]

Nuclear power could also drive up power bills through a third mechanism: by pushing rooftop solar out of the energy grid. By reverting unnecessarily to an outdated baseload power model reliant on a nuclear energy source than cannot be turned off—regardless of its relative cost or whether it's needed to meet demand–nuclear would force consumers with distributed energy resources like rooftop solar to turn off their systems. Analysis conducted by the Queensland Conservation Council shows that foisting nuclear onto the grid would force the equivalent of 45,000 rooftop solar arrays to be shut off every day in Queensland.[6] Analysis from the Smart Energy Council concludes that nuclear could force the switching off of rooftop solar at between 1.8 and 2.9 millions homes nationally.[7]

The International Energy Agency (IEA) has confirmed that solar now produces the cheapest energy in history[8], and Australian rooftop solar specifically produces some of the cheapest electricity anywhere in the world. That's why 3.6 million Australian households have already installed solar on their homes, saving $1500 per year on average[9], with total capacity forecast to more than triple by 2054, exceeding that of coal, gas, and hydro power generation combined.[10] A nuclear policy for Australia could halt this progress in its tracks, and eliminate the nearly $3 billion Australians are collectively saving every year through rooftop solar, effectively clawing back from consumers one of the most effective and popular household cost-of-living solutions. This will further force up energy costs for many households, and slow the uptake of rooftop solar across the board.

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[4] Douglas, Max. "Explainer: Why the evidence suggests nuclear won't work for Australia." The McKell Institute. June 2024.
[5] Chau, David and Clint Jasper. "Barriers, hurdles and roadblocks litter the long road to the Coalition's nuclear future." ABC News. June 24, 2024.
[6] Silcock, Clare. "Delayed Reaction: Why Queensland Will Never Need Nuclear Energy." Queensland Conservation Council. July 2024.
[7] "Coalition's Nuclear Plan to Switch Off Solar for up to 3 Million Homes." Smart Energy Council. September 16, 2024.
[8] World Energy Outlook 2023. International Energy Agency. October 2023.
[9] Zou, Annette; Mcleod, Ben; Rayner, Jennifer; Tidswell, Kirsten. "Seize the Sun: How to Supercharge Australia's Rooftop Solar. Climate Council. September 19, 2024.
[10] "Projections for distributed energy resources—solar PV and stationary energy battery systems." Report for AEMO. Green Energy Markets. December 2023.

Workers are already facing significant burdens from a cost-of-living crisis driven by corporate price gouging and supply chain disruptions. A quixotic attempt to build a nuclear power industry from scratch in Australia would only add to that burden, driving up energy bills at precisely the moment workers most need them to decline. Conversely, household clean energy technologies like solar, batteries, and electric appliances are the fastest way to cut household power bills, are available now, and help combat, rather than accelerate, climate change.

Nuclear is unlikely to create any jobs

Proponents of nuclear have often held it out as a source of jobs for communities where coal-fired power plants are phasing down. It is not—for the simple reason that nuclear is unlikely ever to be economically competitive in Australia. This year's independent CSIRO Gencost update report confirmed that nuclear would cost at minimum 50% more than solar and wind power backed by batteries. In fact, of all the energy sources modelled by the Gencost report, nuclear energy—both large-scale plants and small modular reactors (SMRs)—is forecast to be the second most expensive energy source all the way out to 2050, behind only reciprocating hydrogen compressors. The levelized cost of energy for nuclear is higher than that of coal, combined cycle gas, onshore wind, and solar.[11] The latter two are already the cheapest sources of energy in Australia, and are forecast to grow cheaper still, meaning nuclear will grow even more uncompetitive on cost.[12]

The CSIRO's analysis has been corroborated by multiple independent analyses, which combined suggest that the Gencost update may be conservative in its estimates of nuclear's relative cost. In the 17th edition of its Levelised Cost of Energy+ (LCOE+) Analysis, the investment bank Lazard found nuclear to be three times the cost of wind and solar.[13] And analysis from construction and engineering firm Egis found that nuclear could prove up to six times more expensive than renewables in Australia.[14] The executive director of the International Energy Agency (IEA), Fatih Birol, one of the world's leading experts on energy systems, has confirmed that Australia should prioritise wind and solar, and has no need for nuclear energy, given its world-leading abundance of sun and wind. The IEA is not anti-nuclear by default: tellingly, Birol *has* supported the renewed build-out of nuclear in France, Britain,

[11] Graham, Paul; Hayward, Jenny; Foster, James. 2023-24 GenCost Report. CSIRO. May 2024.
[12] Bond, Kingsmill; Bulter-Sloos, Sam; Lovins, Amory; Speelman, Laurens; Topping, Nigel. "X-Change: Electricity." Rocky Mountain Institute. July 2023. 9
[13] "Levelized Cost of Energy +". Lazard. June 2024. /
[14] "Levelised Cost of Electricity." Egis. Report for Clean Energy Council. May 18, 2024.

and Japan—countries that were not starting from scratch and where industry has the potential to be economically competitive.

Australia, by contrast, is the sunniest country in the world, and among the windiest, with enough renewable energy potential to power our own domestic economy hundreds of times over.[15] An attempt to develop a domestic nuclear power industry instead would sacrifice this enormous natural advantage, in favour of an energy source for which we have a distinct competitive disadvantage—a pointless and expensive strategic blunder.

Examples from other countries further demonstrate that nuclear power is uniquely subject to cost blow-outs and delays. Analysis from IEEFA found that every single nuclear project that commenced construction over the past 20 years in economies comparable to Australia's experienced major cost blowouts up to 350% over-budget, and delays of many years. In the United Kingdom, for example, the proposed Hinkley Point C nuclear reactor has blown-out from $18 billion to $93 billion AUD, with start-up date not projected to 2031—a full 15 years behind schedule.[16] For the same cost, Australia could build around 73GW of solar, more than our whole electricity system generates today. Finland's new nuclear plant, Olkiluoto, cost $18 billion to produce 1.6GW of electricity. For that price tag, Australia could get around 15.5GW of grid-scale solar.[17]

The only Small Modular Reactor project in the United States, Idaho's NuScale Power, was terminated completely due to exploding costs, with the project running almost 300% over-budget even with generous federal subsidies.[18] And the most recent large nuclear reactor to be built in the United States, Vogtle Unit 4 in Georgia, arrived seven years late and $17 billion USD over-budget.[19] These examples come from countries with historic experience in nuclear. The United Kingdom has nine nuclear reactors, and the United States derives 18% of its energy from its nuclear fleet, the large majority of which was built decades ago. It is reasonable to assume that in Australia, a geographically isolated country with no engineering or technical experience building nuclear power plants, the cost overruns would be even larger, and the delays longer.

[15] "Factsheet: Climate Ambition Summit." Climate Council. December 10, 2020.
[16] McIllroy, Tom. "UK's nuclear plant will cost nearly three times what was estimated." Australian Financial Review. June 20, 2024.
[17] "Watch this space: Ultra Low Cost Solar." Australian Renewable Energy Agency (ARENA). October 27, 2022.
[18] Morton, Adam. "Small modular nuclear reactor that was hailedby Coalition as future cancelled due to rising costs." The Guardian. November 9, 2023. s
[19] Amy, Jeff. "Georgia nuclear rebirth arrives 7 years late, $17B over cost." Associated Press. May 26, 2023.

Globally, investment flows into nuclear are stagnant at about 5% of total global energy investment, while investment in renewables is surging, reaching $208 billion per year, compared to $26 billion annually for nuclear. And in other advanced economies, generation is moving decisively away from nuclear, with nuclear capacity across advanced economies having fallen markedly between 2011-2020, and expected to fall further through 2030. Trying to build a nuclear industry from scratch would put Australia out of step with other advanced economies and with global investment flows.

The evidence above makes clear why the nuclear power industry is unlikely to ever create a single job in Australia: the economics simply don't stack up. Because it is and will likely remain highly uncompetitive compared to other energy sources, the industry cannot attract the investment it would need to get off the ground and deliver any jobs. The only alternative would require the industry be almost entirely underwritten by government, with massive unnecessary costs passed on to Australian taxpayers. Given the unlikeliness of both scenarios, the chances of a nuclear industry ever materialising in Australia are slim. The promise of nuclear jobs turns out to be a false one—an extreme long-shot bet on an industry that cannot compete.

But even in the highly unlikely, best-case scenario where nuclear were eventually to become competitive, the jobs it creates would come far too late to help the communities experiencing the phase down of coal-fired power plants right now. Proponents of nuclear have proposed citing nuclear power plants in seven coal communities across Australia, from the Morwell, VIC to Musswellbrook, NSW. As coal-fired power phases down in line with Australia's legislated net zero goals, these communities are already undergoing major structural adjustments and in need of new jobs and economic diversification.

The proponents of nuclear energy admit the first plants couldn't be operational before 2035-2037. Experts from the CSIRO to former Chief Scientist Alan Finkel have concluded that even this timeline is impossible, and that the earliest a nuclear plant could become operational is by the early 2040s—without accounting for the multi-year delays that have been the rule, rather than the exception, for nuclear plant construction in advanced economies over the past two decades. An industry that won't create a single job for twenty years is of no use to workers experiencing structural adjustment now.

Luckily, renewable energy generation has already created over 26,000 jobs in Australia, with significant increases expected as renewable generation expands rapidly.[20] Other net zero industries like solar and battery manufacture, green hydrogen, critical minerals mining and processing, and green metals are forecast to supply tens of thousands of new jobs by the end of the 2020s—not the beginning of the 2040s. According to analysis by Accenture, by the year 2040, when even in the best-case scenario construction would only just be starting on Australia's first nuclear reactor, these net zero export industries could already have generated over 400,000 new jobs, many of them in the regions.[21] The Government's proposed Future Made in Australia plan would supercharge this green industrial growth.

By contrast, according to analysis from the Electrical Trades Union, even a 2 GW nuclear reactor—well above average size—would employ only about 400 direct jobs, with only a quarter of these being on-site blue-collar jobs. The remaining three quarters are engaged principally in administration, regulatory compliance, energy, marketing, sales, science and emergency personnel, with the majority of these jobs normally offsite away from the nuclear facility itself—in the nearest capital city or even offshored.[22]

When it comes to job growth, nuclear is a bad bet—and an unnecessary one. The renewable transformation is already driving significant job growth in Australia and has the potential to create more jobs than currently exist in Australia's legacy fossil fuel export industries. By generating investor uncertainty and delaying the transition to renewables, an attempt to build a nuclear power industry would significantly decrease net energy job growth in the near-term, and likely deliver zero jobs in the long-term.

Finally, in the highly unlikely scenario that a nuclear industry did get off the ground, without significant delays or cost overruns, and deliver a modest number of jobs in the 2040s, those jobs would put workers at serious health risk. A 2024 academic meta-analysis of epidemiological studies of the health impacts of nuclear power plant on workers and residents living near the plants synthesized the results of 47 studies covering 175 nuclear power plants across 17 countries, encompassing samples of 480,623 workers and 7,530,886 residents. The study found that workers had a significantly higher risk

[20] "Employment in Renewable Energy Activities, Australia." Australian Bureau of Statistics. Reference period 2018-2019 financial year. Released April 6, 2020.
[21] "Sunshot: Achieving Global Leadership in Clean Exports." Accenture. October 31, 2023.
[22] Proof Committee Hansard. Senate Environment and Communications Legislation Committee. Environment and Other Legislation Amendment (Removing Nuclear Energy Prohibitions) Bill 2022. May 15, 2023.

for mesothelioma and circulatory disease, while residents had significantly higher risks of thyroid cancer and leukemia. Risks were highest for children under five. The study's meta-regression analysis showed causal relationships between these health outcomes and exposure to levels of radiation that met regulatory dose limits.[23]

Compounding the long-term health impacts are the risks of sudden plant failure. At least two of the locations proponents have put forward for nuclear power plants in Australia are located on active geologic fault lines, increasing the risk of meltdowns for the workers in those plants, and the communities surrounding them. Though technologies exist to increase nuclear reactors' resilience to earthquakes, but these engineering solutions would add further significant cost to the plants, rendering them even less economically competitive.[24]

The pursuit of nuclear in Australia would make climate change worse

An attempt to foist uncompetitive nuclear onto the Australian energy grid would draw effort and resources away from the transition to renewable energy, significantly slow down renewable investment by introducing high levels of investor uncertainty, hog grid and market space that cheaper renewables would be barred from contesting, and decrease the reliability and efficiency of modern grid operations with its inflexible, demand-agnostic supply. According to the Rocky Mountain Institute, one of the world's foremost energy expert think tanks, "new nuclear plants would save manyfold *less* carbon per dollar and per year than cheaper, faster [energy] efficiency or modern renewables."[25]

[23] Lin, Ro-Ting; Boonhat Hathaichon; Lin Yu-Yu; Klebe, Sonja; and Ken Takahashi. "Healths Effects of Occupational and Environmental Exposures to Nuclear Power Plants: a Meta-Analysis and Meta-Regression." Current Environmental Health Reports. Volume 11, pages 329-339, June 2024.
[24] Evans, Jake. "Some of the Coalition's proposed nuclear locations are near fault lines—is that a problem?" ABC News. June 21, 2024.
[25] Parkinson, Giles. "Picking losers: Choosing nuclear over renewables and efficiency will make climate crisis worse." Renew Economy. May 15, 2024.

By halting the meteoric rise of renewables, and not delivering any power until at least the 2040s, nuclear would instead necessitate keeping coal and gas-fired power plants online decades longer than necessary, resulting in significant increases in the greenhouse gas emissions driving climate change.[26]

According to former Chief Scientist Alan Finkel, "the reality is there is no substitute for solar and wind power this decade and next, supported by batteries, transmission lines and peaking gas generation. Any call to go directly from coal to nuclear is effectively a call to delay decarbonisation of our electricity system by 20 years."[27]

Workers cannot afford such a delay. Climate change is already impacting all workers in all sectors. Through increases in extreme heat, inclement weather, vector borne illnesses, and deteriorating air quality, it is making work more precarious, more gruelling, and more dangerous—whether you're a firefighter[28], a nurse[29], or a coal miner[30]. A decision to halt the renewables transition in order to pursue an unworkable nuclear chimera would exacerbate all of these trends, condemning Australian workers to a future of steadily worsening heat waves, floods, droughts, storms, and bushfires.

The ACTU supports phasing out all unabated fossil fuels by 2050, with accelerating action in this critical decade, and abatement used only as a backstop. The pursuit of nuclear would work against this critical goal, prevent Australia from achieving its Paris Agreement goals, and undermine worker health and safety for decades to come.

[26] Douglas, Max. "Explainer: Why the evidence suggests nuclear won't work for Australia." The McKell Institute. June 2024.
[27] Dr. Alan Finkel. "Here's why there is no nuclear option for Australia to reach net zero." The Guardian. March 22, 2024.
[28] "This is Not Normal: Climate Change and Escalating Bushfire Risk." Climate Council. November 12, 2019.
[29] "Health, Environment, and Climate Change Position Statement" Australian Nursing and Midwifery Federation. Endorsed November 2023.
[30] De Mello, Lurion. "Rain makes coal heavy, slippery and harder to dig up. So what does La Nina mean for this already disrupted industry." The Conversation. November 16, 2023.

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