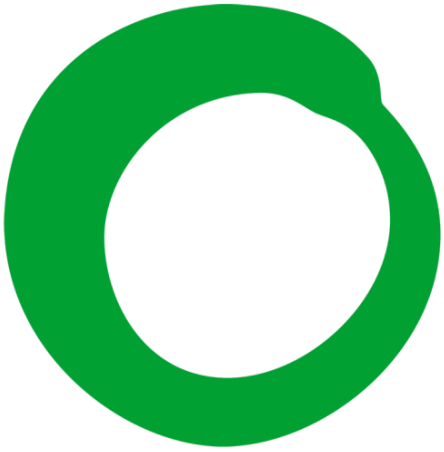

Friends of the Earth Adelaide

Submission to the Senate's Environment and Communications Legislation Committee

We are responding to the Environment and Communications Legislation Committee's inquiry into the "Environment and Other Legislation Amendment (Removing Nuclear Energy Prohibitions) Bill 2022".

The purpose of the Bill is to remove Australia's ban on nuclear power. Although superficially such an amendment might seem innocuous, because it would not in itself lead automatically or inevitably to the construction of nuclear power plants, in fact it would be pernicious for the following reasons:

1) It would divert attention from the immediate need for an urgent response to climate change. Even if a decision was made today to introduce nuclear energy to Australia, not a single kilowatt-hour of electricity would be generated from nuclear reactors for over a decade. But the climate cannot wait that long. Fortunately, there are proven and realistic alternatives that can be acquired much sooner and much more cheaply, especially in a country as rich in renewable energy potential as Australia.

2) It would mislead the public into thinking that nuclear energy might be a realistic alternative for Australia. Viewed objectively, both the historical record and the current status of nuclear power demonstrate that nuclear energy is neither reliable, cost effective, nor fit for purpose in the Australian context. If there is any argument for the use of nuclear power, it only applies to countries which already have nuclear power plants and which need to make a decision about whether or not to continue operating existing plants. In that case, given that the upfront cost of existing plants has already been sunk, there may be an argument for continuing their operation while shifting to a 100% renewables-based zero emissions energy system. However, constructing new plants just diverts investment from cleaner and more cost-effective alternatives.

Some people who promote nuclear power are sincere, but misinformed or deluded. Others are quite cynical. There are those who recognise that by promoting nuclear power they can serve their own interests by delaying the energy transformation and prolonging an energy system which is based on large-scale centralised generation and the use of fossil fuels. Then there are those who promote nuclear energy to give them a point of strategic difference with their political opponents. They are looking for another angle on the climate wars that have blighted the energy policy landscape for over a decade.

Australia cannot afford to give credence to naïve or cynical arguments in favour of nuclear power. We must rapidly shift from an energy system based on fossil fuels to a system based on renewable energy backed by various forms of storage (e.g. batteries and pumped hydro). This requires governments, industry and the general public to be highly focused on real solutions. The last thing we need is for vested interests and nuclear true believers to muddy the waters with fanciful talk of nuclear power.

The best way to send a clear message to industry and the community that Australia's future lies in renewable not nuclear energy is to maintain the ban on nuclear power.

See the notes and references listed below for background and supporting argument.

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Notes and References

1. Nuclear energy is too expensive and will come too late

CSIRO et al, 2015, *The Australian Power Generation Technology Report*
The following article presents commentary on the above report.

Sophie Vorrath & Giles Parkinson, 'Nuclear priced out of Australia's future energy equation in new report', *Renew Economy*, 26 November 2015
http://reneweconomy.com.au/2015/nuclear-priced-out-of-australias-future-energy-equation-in-new-report-67465
'Australia's official economic forecaster has finally admitted that the cost of nuclear energy is more than double other clean energy alternatives, suggesting it would likely play no role in a decarbonised grid based around lowest costs.'

The following two articles report a dramatic recent increase in the estimated costs for the NuScale reactor, which is considered by many to be first cab off the rank among the small modular reactors among western countries. It is noteworthy that the price has increased so much even before a single reactor has been built. And it is well known that the large-scale reactors currently under construction in western countries are all well over budget and many years behind schedule.

Jeff Beattie, 'NuScale says costs of SMR plant in Idaho have climbed due to inflation', *Nucleonics Week*, Volume 63, Issue 47, November 23, 2022
'Cost of power soars from $58/MWh to somewhere under $90/MWh'

Beyond Nuclear, 'NuScale SMR cost headed off-scale?' December 1, 2022
https://beyondnuclear.org/nuscale-smr-cost-headed-off-scale/

The following report emphasises the need for urgency in our climate response. Given that, even if a decision was made today, nuclear power plants would not generate energy any energy for at least 10 years, nuclear power is too slow to be a useful response to climate change.

Will Steffen et al, 2021, *Aim High, Go Fast: Why emissions need to plummet this decade*, Climate Council of Australia Limited

'The lion's share of the effort to get to net zero emissions needs to happen *this decade.*'

2. Nuclear energy is a barrier to renewable energy

Prime Minister Anthony Albanese quoted in *The Advertiser*, 6 December 2022
'I think it's [nuclear energy] a distraction from what we need to do.'

Sophie Vorrath & Giles Parkinson, 'Nuclear priced out of Australia's future energy equation in new report', *Renew Economy*, 26 November 2015
http://reneweconomy.com.au/2015/nuclear-priced-out-of-australias-future-energy-equation-in-new-report-67465
'Both the nuclear and the coal industry lobbies have a shared advantage in slowing down the deployment of wind and solar, because it narrows and ultimately removes the need for large-scale centralised generation.'

Benjamin K. Sovacool, Patrick Schmid, Andy Stirling, Goetz Walter & Gordon MacKerron, 2020, 'Differences in carbon emissions reduction between countries pursuing renewable electricity versus nuclear power', *Nature Energy*
https://www.nature.com/articles/s41560-020-00696-3
'We find that larger-scale national nuclear attachments do not tend to associate with significantly lower carbon emissions while renewables do. We also find a negative association between the scales of national nuclear and renewables attachments. This suggests nuclear and renewables attachments tend to crowd each other out.'

Yoshihiro Takahashi, '4 nuclear reactors' worth of renewable electricity wasted in southwest Japan', *Mainichi Japan*, June 13, 2021
https://mainichi.jp/english/articles/20210611/p2a/00m/0bu/007000c
'[T]he first "barrier" to the utilization of renewable energy was nuclear power plants.'

3. There are realistic alternatives

Mark Diesendorf, *Renewable electricity policy for Australia*, The Australia Institute, November 16, 2018
http://www.tai.org.au/content/renewable-electricity-policy-australia
'[G]iven the political will, Australia could and should transition quite rapidly to a reliable 100% renewable electricity system and hence a predominantly renewable energy future. Indeed, climate science demands a rapid transition ... Although barriers exist, they are not primarily technological or economic, but rather are political and institutional.'

AEMO, *Renewable Integration Study: Stage 1 report*, April 2020
'If the recommended actions are taken to address the regional and NEM-wide challenges identified, the NEM could be operated securely with up to 75% instantaneous penetration of wind and solar…Beyond 2025, AEMO has not identified any insurmountable reasons why the NEM cannot operate securely at even higher levels of instantaneous wind and solar penetration, especially with ongoing technological advancement worldwide.'

4. A few persistent myths

4.1 Baseload Power
'Baseload power' is an outdated notion promulgated by nuclear and fossil fuel apologists in order to mislead policy makers and the general public.

Andrew Stock and Petra Stock, 2017, *Powering a 21st Century Economy: Secure, clean, affordable electricity*, Climate Council of Australia Limited
'"Baseload" power refers to large, inflexible coal and nuclear plants which generate power continuously at full output. Such baseload power stations cannot easily or quickly adjust their power output up or down when needed.
'On the other hand, demand for electricity has always been variable with changing electricity needs throughout the day, week and year.
'Ageing coal fired power plants are unreliable and inflexible.
'Increasingly, power grids around the world are moving away from inflexible, baseload power to modern, flexible systems which are able to respond quickly to both changes in demand and in generation (REN21 2017). As the amount of low cost, wind and solar generation increases in the grid, the need for baseload power decreases. For example, in California, which reached 36% renewable power in 2016 (California Energy Commission 2017), the need for baseload resources like coal and nuclear is waning, and the need for system flexibility is increasing (California Public Utilities Commission 2015; AEMO 2017d).'

4.2 Lessons of the war in Ukraine
The lesson of the war in Ukraine that nuclear propagandists would like us to learn is that nuclear energy is essential for energy security.
It might seem too obvious to require stating, but, due to the uncritical repetition of the nuclear propaganda by many media outlets, allow us to point out that the real lesson to be learnt is that nuclear power plants are extremely vulnerable to attack by an aggressor. Far from providing energy security, they act as pre-placed nuclear weapons for any enemy with the capacity to accurately target them or their support infrastructure.

4.3 All the other problems with nuclear energy still apply
Nuclear energy generates waste that must be isolated for millennia. It also comes with the risk of catastrophic accidents and nuclear proliferation. These problems have not been solved, not even by the much hyped 'small modular reactors'. Refer, for example, the following articles.

Arjun Makhijani & M. V. Ramana, 2021, 'Can small modular reactors help mitigate climate change?', *Bulletin of the Atomic Scientists*, 77:4, 207-214
https://doi.org/10.1080/00963402.2021.1941600

Edwin Lyman, *Small Isn't Always Beautiful: Safety, Security, and Cost Concerns about Small Modular Reactors*, Union of Concerned Scientists, September 2013
http://www.ucsusa.org/nuclear_power/nuclear_power_technology/small-modular-reactors.html#.VXQwKOtQlG4

Steve Thomas et al, *Prospects for Small Modular Reactors in the UK & Worldwide*, Nuclear Consulting Group, Nuclear Free Local Authorities, July 2019
https://sppga.ubc.ca/wp-content/uploads/sites/5/2018/09/sub277-Attachment-2.pdf