Removing 'Nuclear Energy Prohibition' Submission

29/11/2022

Australia
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To
Environment and Communications Legislation Committee

Australia
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RePlanet Australia submission on inquiry into Environment and Other Legislation Amendment (Removing Nuclear Energy Prohibitions) Bill 2022

About Us

RePlanet Australia was founded in 2022 and is an eco humanist organisation that seeks to promote public policy which will help address a range of social and environmental issues including climate change, biodiversity loss and poverty.

Our organisation is the Australian chapter of RePlanet, a global network of citizen movements with the goal to liberate nature and elevate humanity.

Our Position

RePlanet Australia supports the proposed removal of legislative prohibitions on the use of nuclear energy and related nuclear fuel cycle infrastructure in Environment and Other Legislation Amendment (Removing Nuclear Energy Prohibitions) Bill 2022.

Our organisation firmly believes that the current prohibition on nuclear energy and related nuclear fuel cycle infrastructure is not in the Australian public's best interest as it serves as an unnecessary barrier to the potential deployment of a proven source of clean, safe and reliable energy both domestically and globally. In the context of the worsening global climate emergency such a barrier is morally and politically unjustifiable.

Recent polling [1,2], also suggests that the existing prohibition does not have a social licence with the majority of Australians supporting the use of nuclear energy and the number of people strongly opposed has dramatically declined.

Lifting the prohibition would bring Australia in line with other Western democracies which now consider nuclear energy as a form of green energy. This includes the recent vote by the EU parliament to include nuclear in its sustainability finance taxonomy[3] following advice from the European Commission's official science advisory, the Joint Research Centre, which found that nuclear energy met the EU requirement to 'do no significant harm'. "The analyses did not reveal any science-based evidence that nuclear energy does more harm to human health or to the environment than other electricity production technologies already included in the Taxonomy as activities supporting climate change mitigation"[4], Joint Research Centre report.

Globally even Green parties, historically opposed to nuclear energy, are realising the importance of the technology in addressing climate change. The Finnish Greens have become the first Green party to become actively pro nuclear[5].

Here in Australia, numerous government inquiries have also investigated nuclear energy and the nuclear fuel cycle, including the objections still maintained by our own Greens; they have recommended that the current prohibitions be removed.

The South Australian nuclear fuel cycle royal commission report, 2016 [6] states that "The Commission recommends that the South Australian Government remove at the state level, and pursue removal of at the federal level, existing prohibitions on the licensing of further processing activities, to enable commercial development of multilateral facilities as part of nuclear fuel leasing arrangements."

The committee for the "Uranium Mining and Nuclear Facilities (Prohibitions) Repeal Bill 2019"[7] issued a recommendation that "the NSW Government pursues the repeal of the Commonwealth prohibitions on nuclear facilities" on the basis that, amongst other reasons "The committee finds that Generation III/III+ and Generation IV are a significant advancement on older generation reactor designs" and that "On the balance of expert evidence gathered for this inquiry, the committee finds that emerging nuclear technologies, particularly Generation III/III+ and Generation IV: [..] are significantly lower risk than earlier nuclear technologies; and are considerably safer than other forms of electricity generation in the level of risk they pose to human health and the environment as a result of reducing airborne emissions."

Article highlighting the switch of the Finnish Greens

Lifting the ban on nuclear energy, with conditions, would also fulfil the recommendations of the inquiry into the prerequisites for nuclear energy in Australia 2019 [8], specifically recommendation 3: "The Committee recommends that the Australian Government [..] [lift] its moratorium on nuclear energy in relation to Generation III+ and Generation IV nuclear technology including small modular reactors [..]" and would allow for recommendation 1 (b): "Adopting a strategic approach to the possibility of entering the nuclear energy industry which considers: i. collaborating with, and learning from, international partners with expertise in nuclear energy; ii. developing Australia's own national sovereign capability in nuclear energy over time [..]"

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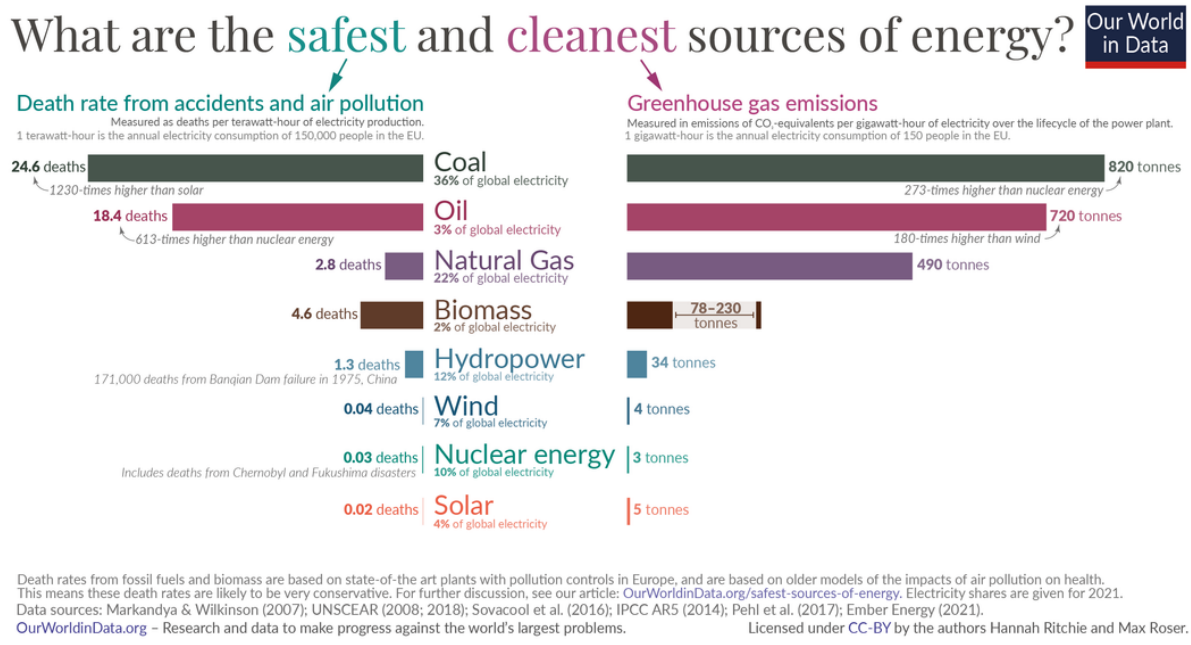
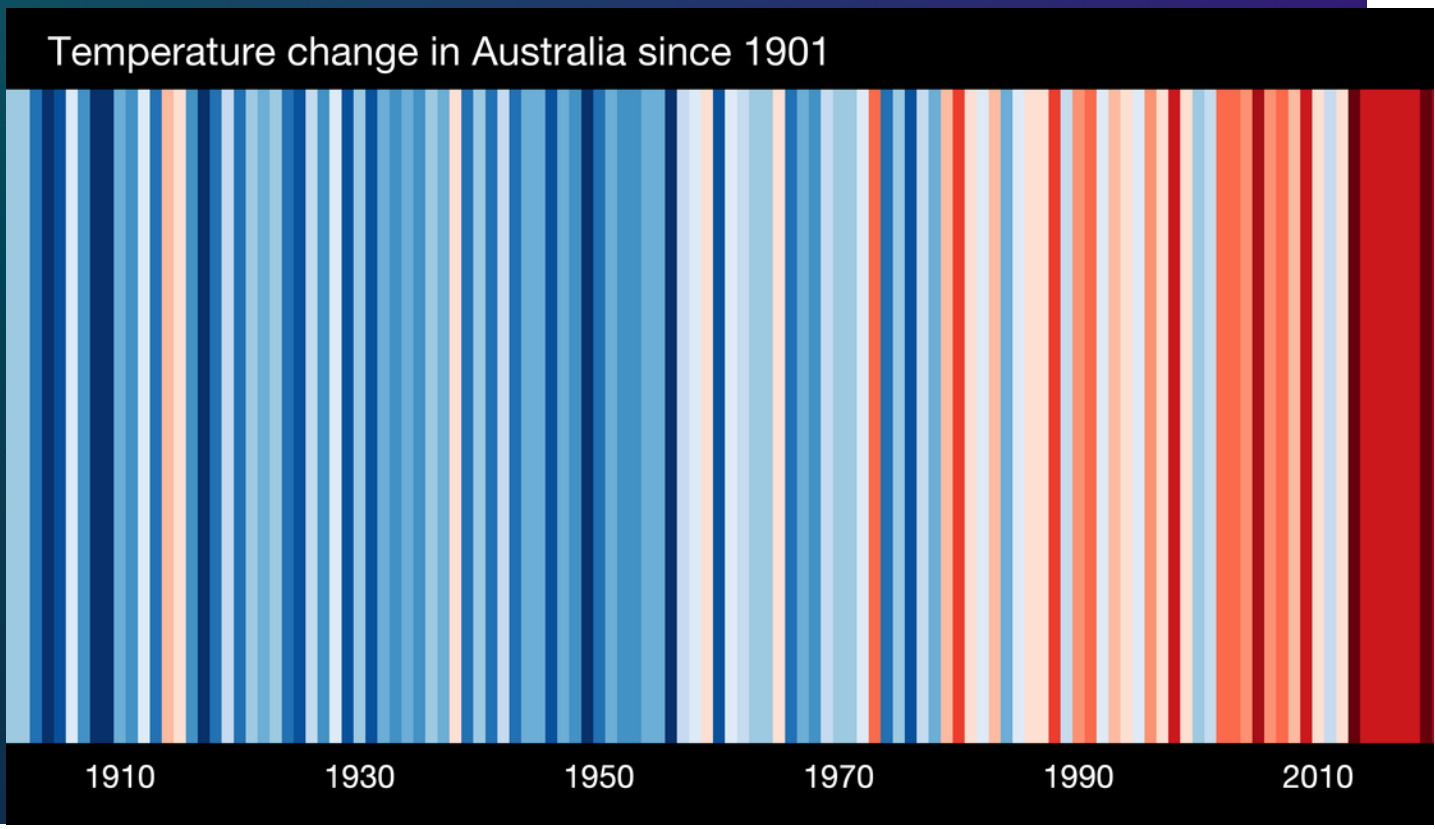


History

The existing prohibition on the use of nuclear energy in Australia was introduced in 1999, with the support of the Coalition, Labor, Greens and Democrats, four years after the first Conference of Parties (COP) under the UN Framework Convention on Climate Change (UNFCCC) in 1995 and eleven years after the first Intergovernmental Panel on Climate Change (IPCC) report in 1988. It was clear as this prohibition was being implemented that climate change was a growing issue and driven by human activity, primarily the release of greenhouse gases from burning fossil fuels, and yet it was decided to block the use of nuclear energy which was known to not produce greenhouse gas emissions during operation, and thus continue to use fossil fuels.

In the twenty-three years since the prohibition was introduced the seriousness of climate change has become clearer and the urgent need to transition away from fossil fuels has only increased. The fact that the prohibition has remained in place during this time is a serious failing of our political system and must now be immediately rectified.



The case for nuclear

Climate, environment and public health benefits

On October 17, 1956 the first full scale nuclear power station opened in the UK. Today nuclear energy is used in thirty-two countries with over four hundred operational reactors producing approximately ten percent of global electricity. Nuclear is the second largest source of clean electricity after hydroelectricity.

For almost seventy years nuclear energy has demonstrated it can provide affordable, reliable energy without producing the dangerous air pollution or greenhouse gases associated with the burning of fossil fuels. Despite a small number of notable accidents, nuclear remains one of the safest forms of energy available to humanity.[9]

Research published in 2013 found "that global nuclear power has prevented an average of 1.84 million air pollution-related deaths and 64 gigatonnes of CO2-equivalent (GtCO2-eq) greenhouse gas (GHG) emissions that would have resulted from fossil fuel burning."[10]

The Intergovernmental Panel on Climate Change (IPCC) acknowledges that land use plays a vital role in protecting the environment and addressing climate change, "Sustainable land management can contribute to reducing the negative impacts of multiple stressors, including climate change, on ecosystems and societies (high confidence)"[11]. Nuclear energy has the lowest lifecycle land use requirement of all energy sources[12].

A report produced for the United Nations Economic Commission for Europe (UNECE) found that nuclear energy has the lowest lifecycle environmental impact[13]. Note that this is for the full lifecycle and fuel cycle, not merely plant construction and operation. This further highlights that there is no scientific basis for including the prohibition of nuclear energy in an act specifically written to protect the environment and biodiversity.

The case for nuclear

Water Security

Desalination is already part of Australia's water mix[14], with six major desalination plants including Sydney, Melbourne, Adelaide and the Gold Coast. These plants help to secure Australia's water supply against climate change induced water disruptions and are likely to become progressively more valuable in the future. However as they are Reverse Osmosis plants, they are limited by the cost of the technology, the cost of electricity and the carbon footprint of that electricity, which can be substantial as Australia's electricity is often primarily produced from fossil fuels.

In comparison, nuclear power opens the door to thermal Multi Effect Distillation (MED) units, powered from reactor waste heat or process heat. Nuclear powered desalination, as used in Pakistan, India or Japan, is prohibited under current legislation, but offers a sustainable, secure, low carbon water source . According to an IAEA report[15], "only nuclear reactors are capable of delivering the copious quantities of energy required for large-scale desalination projects" anticipated to be required by 2025.

Perth reverse osmosis desalination plant

The case for nuclear

A 'Just Transition'

The politics of transitioning away from fossil fuels has been challenging as workers and communities are justifiably concerned about their future as the existing industry is phased out. Governments need to find an acceptable solution to ensure these workers and communities are not left behind by the transition, this is known as a 'Just Transition'.

RePlanet Australia firmly believes that nuclear energy provides a 'Just Transition' pathway for workers and communities currently benefiting from the fossil fuel industry via thermal electricity generation and mining, along with supporting industry.

The nuclear fuel cycle, including nuclear energy generation, offers a range of employment opportunities with many being transferable from the existing fossil fuel industry. For example, workers at thermal coal and gas power stations already have skills and experience operating much of the same machinery used at a nuclear power station.

As nuclear energy generation is comparable to existing thermal generation, unlike wind and solar, the sites best suited for nuclear generation in Australia are at the sites of existing thermal coal and gas power stations. A recent US Department of Energy report provides a clear reference for the benefits of a coal to nuclear transition[16].

Analysis of clean energy technologies shows that nuclear energy offers 25% more employment per unit of energy and pays wages that are 25-30% higher than other forms of clean energy[17].

This all makes nuclear energy a politically attractive option and eases Australia's energy transition by securing a 'Just Transition' for workers and communities currently enjoying the economic benefits of local fossil fuel generation.

Canadian Nuclear Power Workers

The case for nuclear

Decarbonising industrial sectors

Overseas, major corporations such as Dow chemical are partnering with next generation nuclear to replace fossil gas for their process heat requirements with zero carbon nuclear[18]. The Australian industrial sector only consumes approximately 20% of its energy in the form of electricity, with the remainder coming from significantly lower cost (per gigajoule) and reliable fossil gas. This is a major source of greenhouse gas emissions, and we should leave all options on the table to remove them and meet our emissions targets.

Nuclear power doesn't have to be on grid - one major component of the Canadian SMR action plan is the development of SMR's, small modular nuclear reactors, for use in the mining sector to help decarbonise that industry. That is through both producing electricity in remote areas, but also providing process heat for local industry as well as potentially heat for desalination, or district heating, and energy for the local production of hydrogen for hydrogen powered mining equipment[19].

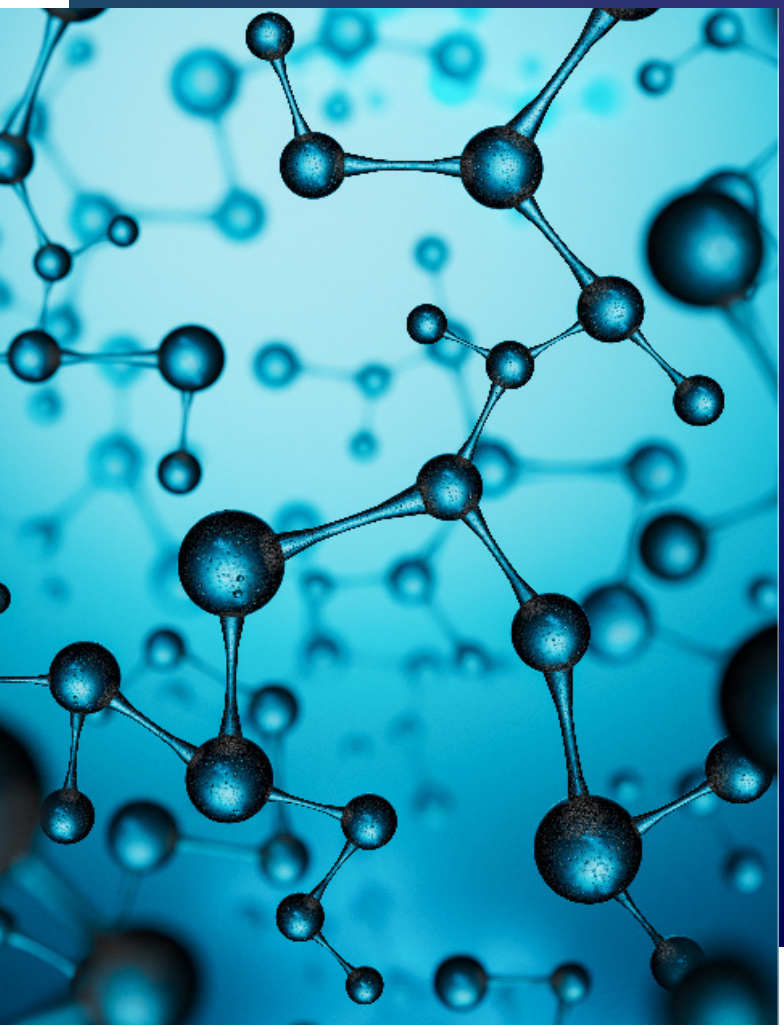
Pictured: Chemical plant

The case for nuclear

Hydrogen production

The Australian government sees the value of hydrogen for decarbonisation[20], but it is currently stymied as a major potential source of low emission hydrogen, nuclear power, is currently prohibited.

The US DOE recently issued grants for nuclear hydrogen, deputy Secretary of Energy David M. Turk stated that "Using nuclear power to create hydrogen energy is an illustration of DOE's commitment to [...] meet DOE's Hydrogen Shot goal, and to advance our transition to a carbon-free future."



The Canadian national resources council similarly released their "hydrogen strategy for canada" which repeatedly highlighted the synergies between nuclear power and clean hydrogen production[21]. The nuclear hydrogen initiative, a nonpartisan, global collaboration of more than 50 companies, academic institutions, government agencies, and non-profit organisations[22], released a report[23] giving key recommendations for governments. These are:

- Nuclear hydrogen production should be expressly included as a key zero-carbon hydrogen pathway in hydrogen plans and roadmaps, as well as in the "guarantee of origin" schemes.
- Explicit goals and metrics for nuclear hydrogen production (e g , x by year y) should be set and described in the policies and plans.
- Hydrogen hubs should include nuclear hydrogen production facilities.

A global player

The Russian invasion of Ukraine in February, 2022 and the subsequent international condemnation and sanctions, including from Australia, has resulted in a global energy crisis. This crisis has been decades in the making as many developed countries, including Australia, have both failed to adequately invest in the transition away from fossil fuels and offshored production and supply chains to countries such as Russia.

Russia's invasion has renewed focus on the importance of energy security and supply chain integrity. Both the United States and European Union have recognised that allowing authoritarian or unfriendly regimes to dominate supply chains leaves countries vulnerable and has a detrimental effect on labour and environmental conditions. For example, solar panel supply chains have been impacted by efforts to curb forced labour practices[24].

RePlanet's SwitchOffPutin Campaign

Environment and Other Legislation Amendment (Removing Nuclear Energy Prohibitions) Bill 2022 would remove the Federal prohibition on enrichment, fuel fabrication, and reprocessing. This would open the door to Australia increasing its role in the global nuclear fuel cycle providing both economic benefits domestically and increased energy security globally.

If Australia were to not utilise nuclear energy domestically, Australia could still join Canada, the US, South Korea, Japan, etc. to provide a western backed nuclear supply chain providing an alternative to the export reactor and nuclear fuel programs of Russia and China. Countries such as Pakistan and Argentina are currently building Chinese export reactors, while Egypt and Turkey are both currently building Russian export reactors.

From the Netherlands, to Poland, to Indonesia, and Nigeria, the world is moving towards either starting or growing their nuclear power generation in order to meet emission reduction targets. These countries will need a reliable source of nuclear fuel and Australia has the potential to be a major supplier.

A global player

As mentioned above, the world has seen the weaponisation of energy dependence during the invasion of Ukraine, reinforcing the importance of the world's nuclear supply chain being maintained by democratic and co-operative regimes.

The current prohibition prevents Australia from moving up the nuclear fuel cycle. We currently dig uranium ore out of the ground, but are forced to sell it overseas for approximately $100/kg[25], where other entities convert that into nuclear fuel sold at approximately $1600/kg (fuel) [26]. In 2018/19 Australia exported 7,571 tonnes of uranium ore[27] at an average price of $96.95/kg or $734 million, making it a reasonably minor export economically.

If instead we had processed it within Australia and exported it as nuclear fuel, that same uranium would instead be worth $112 billion, making it one of Australia's largest exports. (by calculation using data from world nuclear association[28]).

This advanced manufacturing capability fits with Australian government initiatives[29] to build up domestic manufacturing, and is supported by Australian unions such as the AWU[30] which believe that Australians deserve the high paying advanced jobs that come with the nuclear technology industry, and we agree with them.

Further, this uranium equates to 253 TWh of electricity produced, equivalent to 97% of Australia's electricity generation in 2019. As nuclear power has the lowest life cycle carbon of all electricity generating technologies (UNECE[31]), and nuclear power primarily replaces high carbon gas or coal plants, this makes Australia's uranium exports one of its greatest contributions towards addressing climate change. Australia should be proud of this contribution and seek to maximise the potential benefits of this industry.

Conclusion

RePlanet Australia calls on the Australian parliament to pass the Environment and Other Legislation Amendment (Removing Nuclear Energy Prohibitions) Bill 2022 or work to immediately lift the prohibitions outlined by the bill via other means.

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