Environment and Other Legislation Amendment

(Removing Nuclear Energy Prohibitions) Bill 2022

Submission by Barrie Hill November 2022

I respectfully submit that all nuclear energy prohibitions or bans be removed from all Australian legislation, commencing at the federal level, for sound reason.

At the recent Submarine Institute of Australia conference in Canberra, in his opening address the Minister for Defence, the Honourable Richard Marles noted that within Australia's embrace of nuclear technology for submarines we must "evangelically pursue the truth".

This truthful nuclear mindset imperative has been the guiding principle from the development of the first operational nuclear submarine by Admiral Rickover and his subsequent development of commercial nuclear energy in the United States. It has been the overarching concept for the management of nuclear sector safety and risk and all progressive development around the world supported by the International Atomic Energy Agency (IAEA). A majority of the issues faced in some jurisdictions with the introduction of nuclear power can be traced back to failure to adhere to the clear management principles laid down by Admiral Rickover.

The conduct of this inquiry and due consideration of all submissions will hopefully follow this criteria and result in good news for Australia.

The *Australian Radiation Protection and Nuclear Safety Act 1998* and the *Environmental Protection and Biodiversity Conservation Act 1999* prohibit the approval, licensing, construction or operation of a nuclear fuel fabrication plant, nuclear power plant or enrichment. These Acts should be amended to enable nuclear energy to develop in Australia. The removal of all nuclear energy prohibitions in all Australian legislation can in no way automatically authorise the construction of nuclear power stations but will clear the path for more rational and thorough investigation of the options for renewal of our ageing electricity sector plant. Lifting the bans is the first step. The next step is testing the market to find out what private investment capacity there is for this type of power generation in Australia. With no first step there will be no second, third or fourth step and there will be no continuity of dispatchable low cost base-load power in Australia.

The United Nations COP27 climate change conference, which took place in Egypt this month, featured a nuclear themed pavilion and concluded with a final statement supporting a technology inclusive approach to decarbonising energy systems. An increasing number of climate scientists understand that

there is no credible path to reducing global carbon emissions without the expansion of nuclear power. It is the only low carbon technology available today that demonstrates the capability to generate large quantities of centrally generated emission free electric power at acceptable cost and reliability. There are no other credible options that come close to this reality. There is much wishful thinking not based on science or engineering reality.

Beyond any obvious failure of scientific or engineering reality, or cost considerations a recent study by the Geological Survey of Finland indicates that there is insufficient metal reserves on this planet to provide for even the first round of renewable energy installations if this option was pursued. With this understanding it is clear that metal reserves should only be allocated to those electricity supply options which provide the highest energy density and longest life before disposal such as nuclear power. There are already signs that this is happening through significant cost increases in strategic metal markets, which will force low energy density and low life options such as wind turbines and batteries to unsustainable cost levels. It is timely and appropriate for Australia to follow the lead of the United Nations COP27 concluding statement by removing Australia's legislated bans on the introduction of nuclear power, and acting to commence serious consideration of this option.

From the beginning of all nuclear related activities in Australia this country has maintained an exemplary record of management and technological practice based on an unwavering pursuit of excellence, all underpinned by factual information. This high level performance was acknowledged by IAEA Director General Rafael Grossi in a recent visit to Australia when he indicated that Australia has the international social license to manage the construction and operation of nuclear submarines for defence purposes. This international level of recognition in some ways goes beyond any social license recognition required for the potential introduction of commercial nuclear energy. The safety risk and nuclear material proliferation elements involved could be considered marginally lower, albeit no less important.

The Australian nuclear energy prohibitions exist for a range of ideological and competing commercial interests. Sir Roger Scruton described ideologies thus: the facts no longer make contact with the theory which rises above them on a cloud of nonsense. Anti-nuclear power ideologies can be traced back to past cold war international propaganda surrounding nuclear weapons and the threat that advanced nuclear energy poses to the ongoing use of fossil fuels and associated international profits. Many early reactors built around the world were designed to produce material for nuclear weapons so past concerns in Australia were not totally without foundation. That phase of technology level has long passed and modern designs are not suited to the production of weapons grade material.

It is clear from the history of the introduction of the Australian nuclear energy prohibitions that the outcome was the result of neither careful thought, nor inquiry,

nor analysis, nor mindful debate. It was a necessary political tradeoff assuaging the influences previously noted and thought to be relatively unimportant at the time, given abundant fossil fuel resources. Renewable energy proponents have also contributed to much recent misinformation in attempts to justify continuing all nuclear energy prohibition.

The existing nuclear energy prohibitions have been a pseudo comfort blanket for many at all levels of the Australian community. The prohibitions have provided the convenient excuse to avoid all thought and complex or difficult work associated with factual assessment of options for renewal of our electricity sector, particularly within the federal and state bureaucracies. The apparent simplicity of renewable energy has also been a factor. This has been acknowledged in previous inquiry hearings. It is partly the result of a change from the Australian public service provision of frank and fearless information to greater acceptance of ministerial direction. In a few significant cases there has been distortion of information to justify or excuse this attitude, and great reluctance to accept honest feedback. This a common characteristic of many individuals defending outdated or simplistic views challenged by new information and well documented in academic literature.

Analytical work for policy development for the Australian electricity sector is complex and requires a sound engineering understanding of all possible options prior to any economic or strategic assessment. Ongoing promotion of renewable energy as cheaper than the use of nuclear energy is completely opposite to real experience and evidence from around the world. It is clearly not true in practice and not difficult to demonstrate in theory by sound engineering and economic analysis.

All peer reviewed economic analysis shows that the whole of system cost of renewable energy climbs exponentially with increasing installation levels to between three to four times that of nuclear energy installations. High costs are bought on by under utilisation of the massive firming and transmission investments essential for renewable system installations. This is well understood by more than 50 countries now moving to introduce nuclear power and in some cases removing all legislation and subsidies favouring renewable energy outcomes. The Canadian state of Ontario provides an excellent world-class example of quality thinking and policy development for the supply of electrical energy. I recommend that inquiry members visit Ontario for a first hand understanding of what a forward-thinking country can achieve and why.

For the more trusting and less analytically minded in the Australian community the existence of the nuclear power prohibitions implies that something must be wrong with nuclear energy. There is no negative scientific or engineering truth justifying the current legal nuclear energy implementation prohibitions embodied in federal and state legislation throughout Australia. If there were such issues impacting the safety or any other interests of the Australian public with the potential adoption of nuclear

energy, such as we find with most prohibited drugs and gun ownership, the issues could be easily and truthfully explained.

There never has been any such explanation. In fact it can be easily demonstrated that the opposite proposition is true. The introduction of nuclear energy in many countries around the world has resulted in positive contributions to community benefit through enhanced safety, lower energy costs, huge particulate pollution reduction, and advanced manufacturing capability, compared with other reliable energy supply alternatives such as coal. All of this was evident particularly with nuclear energy programs in Asian countries decades before any consideration of nuclear energy applications to lessen possible climate change concerns.

One of the more important aspects of nuclear plant safety consideration is exposure to radiation by the operational workforce and surrounding community. Nuclear power station workforce exposure to radiation is very tightly controlled and monitored. The routine and stable nature of power station operations makes radiation safety management relatively straightforward compared with some other nuclear sector activities such as research.

Contrary to a poor understanding of radiation science by the public, low levels of nuclear (or ionising) radiation are not harmful to animals or humans but are actually beneficial to health. There is a very large number of studies that support this characteristic of low-level radiation and its positive effects on humans. The Romans may not have understood nuclear science but they did understand the health benefits of their many public spa installations which are now shown to contain small amounts of radioactive minerals.

The most significant studies that show the hormetic effect of low levels of radiation, indicate that the optimum for good health is nominally fifty times the average background radiation on earth. Hormesis is the understanding gained over many centuries, that large doses of a substance may be detrimental to health, but small doses are beneficial. The hormetic effect, is a characteristic of most pharmaceuticals and even of many foods - it is all a matter of dosage. An understanding of the benefits of low level radiation is crucial to the Australian community having a more knowledgeable attitude toward this aspect of nuclear energy utilisation.

Concern over waste issues remains an ideological concept causing significant political road blocks and delay to appropriate disposal installations as already demonstrated in Australia. The nuclear power sector is the only industrial sector around the world that now manages all waste materials through appropriate engineering and technology. The Australian continent geological characteristics together with a world class mining community has the potential to provide safe storage or disposal of all nuclear materials from Southeast Asia. This would provide a considerable financial benefit to Australia.

The existing electricity market design failure, subsidised renewable energy, and the nuclear energy prohibitions have bought Australia to the brink of electricity sector disaster and consequently national security disaster. An ever increasing range and complexity of rules introduced by the market operator have in no way resolved or slowed the situation. A market distorted by technology preferences and subsidies, relying on more and more complex rules is clearly not working. In many cases increasing rule driven interventions are the portents of imminent collapse. The prohibitions have been major contributor, a major excuse, for the situation we now face. If we continue with the current renewable energy ideology and continue to prohibit the introduction of nuclear energy, electrical energy prices will rise to between three to four times the current levels with increasing potential for blackouts. This potential outcome path is already evident and must be halted. Failure to remove the existing nuclear energy prohibitions and continue on this path will be an economic disaster for Australian manufacturing and processing industries and a huge cost burden for the population.

All of the factual details supporting this truth have been provided to the federal parliament through submissions to a recent inquiry namely
'Inquiry into the current circumstances, and the future need and potential for dispatchable energy generation and storage capability in Australia.' Similar submissions to state government inquiries have resulted in no action or improvement, and in some cases in ideological evasion. Many of the more detailed submissions outline the issues and provide well-thought-out proposals to rectify a situation now firmly in the general category of a slow train wreck.

The existence of the prohibitions also presupposes or implies that the Australian community is totally incapable of managing the introduction of nuclear energy for the electricity sector. This assumption is completely at odds with our recent decision to move to nuclear powered submarines with no concerns raised by the IAEA. It is completely at odds with our more than 50 years of experience managing nuclear materials export, nuclear scientific research, the production of radiopharmaceuticals, and the construction and operation of three nuclear reactors, the latest of which, OPAL, is technically more complex than most nuclear power reactors. All of this while meeting all relevant international conventions and best engineering and management practice. It is completely at odds with the education levels and commercial nuclear energy experience of Australian engineers and technologists gained overseas. It is completely at odds with the support available from Australian university engineering, science, and business faculties. The world nuclear community finds the whole prohibition concept in Australia both odd and incomprehensible to say the least.

The Australian nuclear power prohibitions reflect thinking levels similar to that seen in the early days of automobile introduction around the world and

legislation requiring “red flag” warning. The establishment of the International Atomic Energy Agency and other appropriate international agreements has progressively removed the red flag concept and need from all civil nuclear sector activities with the exception of Australia and a few other countries. It is time for Australian legislators to accept this and move on.

Many commentators have highlighted the obvious hypocrisy that Australia exports uranium for use in many nuclear power stations around the world but has acted to prohibit nuclear power stations in Australia. Australia is currently completely out of step with the 32 countries operating nuclear power stations and another 50 currently embarking on nuclear power programs. Definitions of hypocrisy include; insincerity, two faced, duplicity, falseness, phoniness, sanctimoniousness, etc. Sadly such hypocrisy is seen within Australia and internationally as some sort of sad joke. Such hypocrisy reflects adversely on those working in the nuclear engineering sector, causes some difficulties or reluctance with an open exchange of information, and hugely diminishes Australia's reputation worldwide.

The world nuclear energy supply industry has expanded considerably, with many new privately funded companies seeing the huge opportunities, and moving to gain regulatory acceptance for the next generation of plant. This is particularly so for smaller reactor systems now gaining regulatory acceptance overseas for direct replacement of existing coal fired plant. Australia's nuclear energy prohibitions are a serious disincentive for all overseas nuclear plant supply organisations to engage with potential customers and equipment manufacturing companies in Australia. Australia has the potential to become a secure manufacturing hub for nuclear plant throughout Southeast Asia but this will not happen while the nuclear energy prohibitions remain in place.

There is some evidence that even removing the prohibitions and acting quickly to introduce nuclear power may already be too late for Australia. Many countries are scrambling to introduce nuclear power, mindful of climbing energy costs, conventional resource supply insecurity, and climate change imperatives. However the international nuclear plant supply chain is limited. There are few options for Australia to overcome this issue. In the short term one clear imperative is to ensure that no existing Australian power stations are decommissioned and demolished until an equivalent reliable 24/7 power generation supply is available. To act otherwise will ensure the national disaster already on the horizon and will amount to an act of sabotage, as already evident in South Australia.

The Honourable Richard Marles has reinforced the need to maintain an evangelical pursuit of the truth: factual honesty in all matters associated with the consideration, introduction, and ongoing operation of all nuclear applications in Australia. The Australian public is not immune to the truth. The

AUKUS agreement has been received with overwhelming support after clear communication of the defence realities we currently face. The conduct of this inquiry and due consideration of all submissions will hopefully follow this criteria of energy sector reality and result in good news for Australia.

I respectfully submit that all nuclear energy prohibitions or bans be removed from all Australian legislation, commencing at the federal level.

Barrie Hill November 2022

Quote
Everything new endangers something old. A new machine replaces human hands; a new source of power threatens old businesses; a new trade route wipes out the supremacy of old ports and brings prosperity to new ones. This is the price which must be paid for progress and it is worth it.
Admiral H G Rickover

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Submission Author

Barrie Hill has fifty years experience in mining and power sector investment, construction, and operations in New Zealand, United Kingdom, and Australia.

This has included the design, commission, and operation of nuclear power stations and the construction of the OPAL research reactor
He was a founding director of the Queensland Mining Council, the Hargraves Institute for Innovation, and is a member of Engineers Australia Nuclear Engineering Panel.

Currently
Managing Director SMR Nuclear Technology Pty Ltd
Previously
Head of Construction and Principal Consultant Mining and Energy, Jacobs Australia,
Director Engineering and Special Advisor Reactor Safety, Australian Nuclear Science and Technology Organisation
General Manager, Queensland Magnesia
General Manager, Electrometals Mining
Engineering Manager, Comalco