# Removing 'Nuclear Energy Prohibition' Submission

06/12/2022

JDC ELECTRICAL & COMMUNICATIONS

To
Environment and Communications
Legislation Committee

# About Us

This organization seeks to promote a rethink on public policy which will help address a range of social and environmental issues.

Our organization is a private enterprise and our focus is presently on advancing and developing an Australian based international nuclear fusion energy industry. Whilst actively maintaining a prohibition on nuclear fission energy development. Relegating it only to research.

# Our Position

JJDC Electrical & Communications does not support the proposed removal of legislative prohibitions on the use of nuclear energy and the related nuclear fuel cycle infrastructure in the environment and other Legislation Amendment (Removing Nuclear Energy Prohibitions) Bill 2022.

Our organization firmly believes that the current prohibition on nuclear fission energy and the related nuclear fission fuel cycle infrastructure is in the Australian publics best interest it serves as a necessary barrier to the potential deployment in Australia of nuclear fission weapons, an increase in a proven source of unclean, unsafe, toxic, poisonous radioactive waste from power plants and medical facilities both domestically and globally.

In the context of the worsening current global climate emergency, such a barrier is morally and politically justifiable.

Our organization believes that the legislations should be amended to note that there is more than one type of nuclear energy production, specifically Fission and Fusion, and that nuclear fusion energy be inserted and that the legislation allow its development into power plants whilst still retaining a prohibition on nuclear fission energy and the nuclear fission fuel cycle. A recent tainted weighted polling, suggests that the existing prohibition does not still have a social license with the majority of Australians, it falsely shows a support in the use of nuclear energy and this polling did not define nuclear as either fission or fusion or to inform the people of the differences between the two or to define fusion that is being promoted as nuclear energy and as such falsely skews the number of people in favor.

Lifting the prohibition would not bring Australia in line with other western democracies which are now considering nuclear fission energy and are still developing Nuclear Fusion to replace it once developed to help with their energy needs as they lack the land or solar, wind, hydro, geothermal, wave or hydrogen energy resources which Australia can muster. Australia needs to take into consideration what damage and future problems more fission plants in all their forms will cause to the Australian and the Asian Pacific environment and its non proliferation standing. This includes the recent vote by the EU parliament to include nuclear in its sustainability finance taxonomy and] following advice from the Eu's Commissions official science advisory, the Joint Research Centre, which found that nuclear energy (not mentioning whether they considered Fission on its own or took fusion into consideration) met the requirement to do no significant harm'. The analyses did not reveal any science-based evidence that nuclear fission 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,"though did not include current increase of nuclear fusion development, JJoint Research Centre report.

Internationally green parties, historically opposed to nuclear fission energy, are realizing the importance of the technology in addressing climate change. With the Finnish Greens become the first Green party to become actively pro fission nuclear[again they have taken this step of now considering nuclear fission energy as they lack the land or solar, wind, hydro, geothermal, wave or hydrogen energy resources which Australia can muster to help with their energy needs

Here in Australia, numerous government inquiries have also investigated nuclear fission energy and the nuclear fission fuel cycle, with little consideration to nuclear fusion, this also goes with a prominent portion of well placed Australian self promoting scientific community in its biased way has formed the view nuclear fusion is too far away to get heavily involved in as yet, including the objections still maintained by our own greens who have recommended that the current prohibitions be removed. The South Australian nuclear (fission) fuel cycle royal commission report, 2016 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."

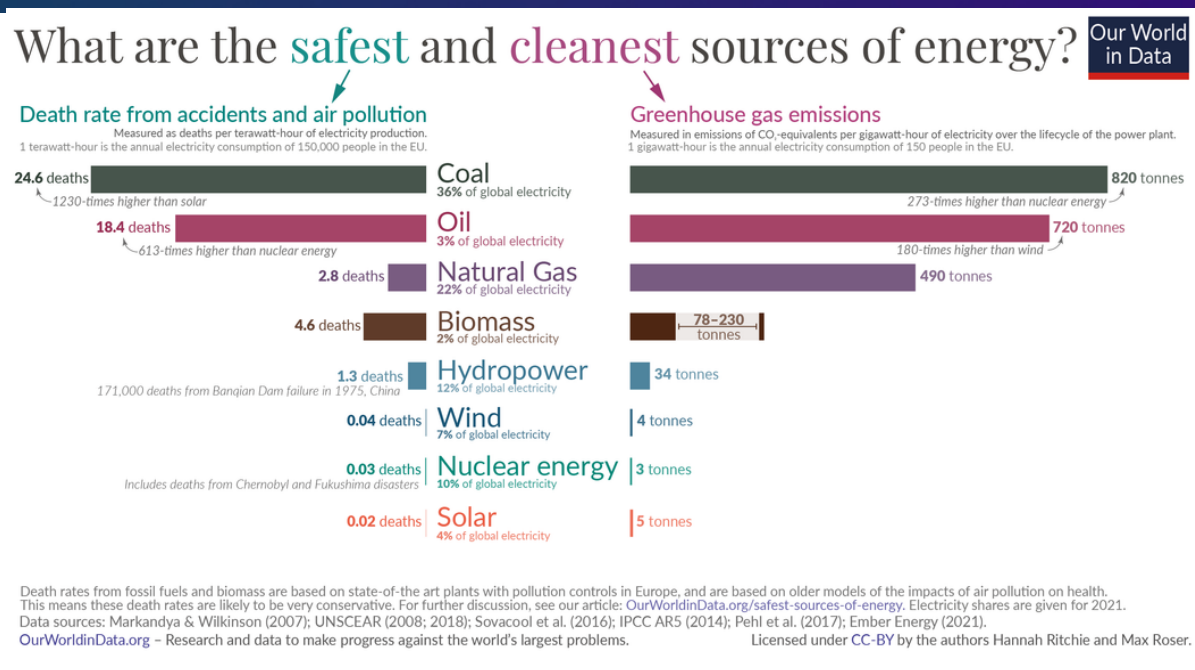
The committee for the "Uranium Mining and Nuclear Facilities (Prohibitions) Repeal Bill 2019" issued a recommendation that "the NSW Government pursues the repeal of the Commonwealth prohibitions on nuclear facilities on the basis that, amongst other reasons the committee finds that untested and proven generation III/III and Generation I are a significant advancement on older generation reactor designs and that the balance of expert evidence gathered for this inquiry, the committee finds that emerging nuclear technologies, particularly Generation III/III and Generation I : [..] 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." All this does not take any account of the rise of nuclear fusion and its development and its advantageous timeing developing an industry on Nuclear Fusion would be in Australia in allowing Australia to produce products from its own resources to export.

A graphic from an outreach website recently launched to build public support for fusion energy. (Image credit – Ana Kova / U.S. Fusion Outreach)

Lifting the ban on nuclear energy, and not considering Nuclear Fusion and the prohibition of Nuclear Fission would be to waste taxpayers money, as investing in Nuclear Fission would be investing Australian into an unnecessary interim technology and missing an opportunity of the EU, UK and US lack of solar, wind, hydro, geothermal, wave or hydrogen energy resources which Australia can muster, and therefore could place Australia ahead of the rest of the western world in a future Nuclear Fusion energy production and its manufacturing industry and the resulting conditions.

If Nuclear Fusion had been considered in the recommendations of the inquiry it would immediately have satisfy its 1b recommendation into the prerequisites for nuclear energy in Australia 2019, specifically the recommendation, "The Committee recommends that the Australian Government[lift its moratorium on nuclear energy in relation to Generation III and Generation I 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 [..]”This would of cause have been achieved without the need for the Nuclear Fission plants, Generation I/II/III

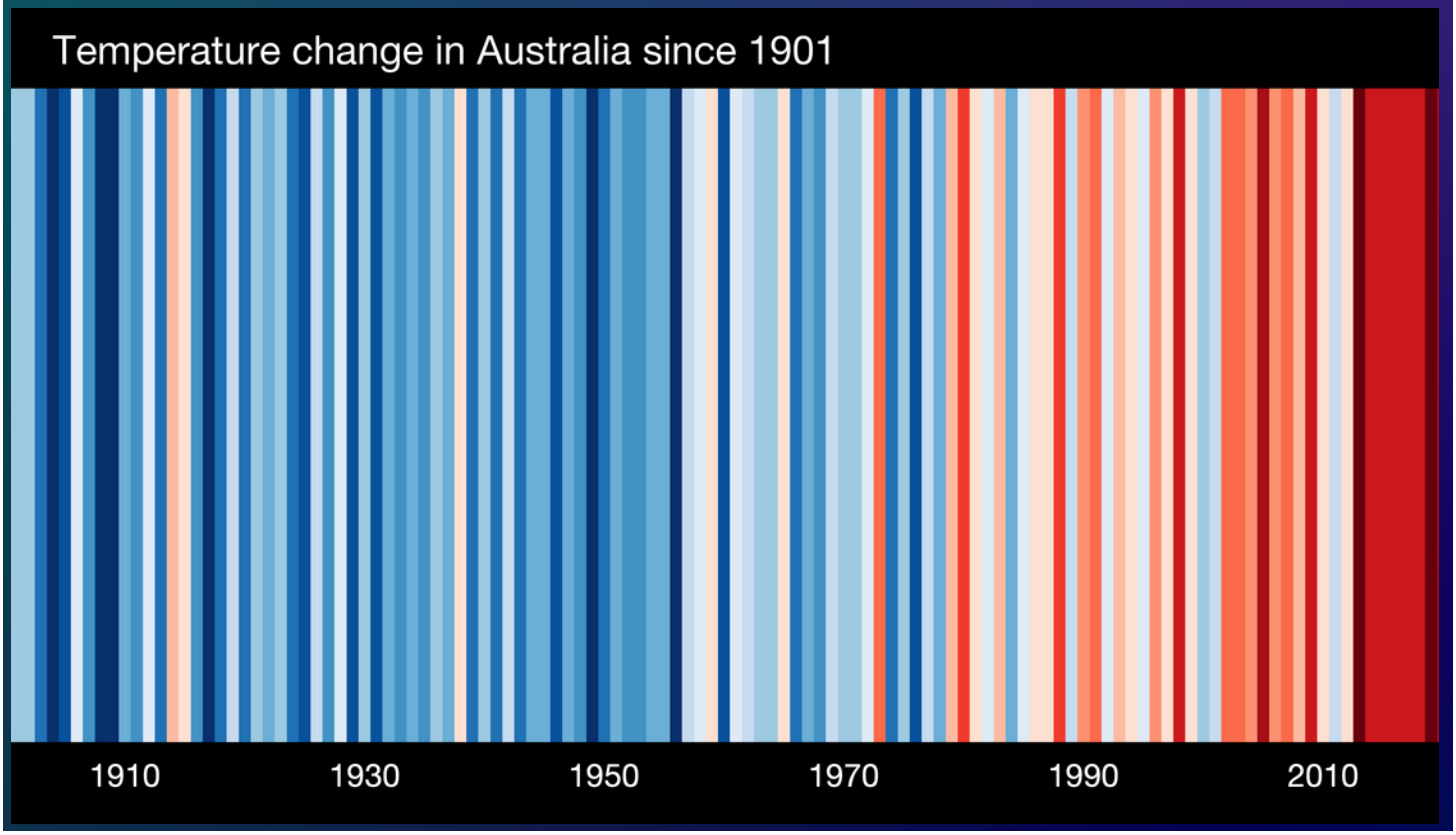
Its also notable that proponents of Nuclear Fission Energy point out in their submission without referencing any Nuclear Fusion that The committee for the Uranium Mining and Nuclear Facilities (Prohibitions) Repeal Bill 2019 issued a recommendation that the NSW Government pursues the repeal of the Commonwealth prohibitions on nuclear facilities on the basis that, amongst other reasons the committee finds that Generation II/III and Generation I are a significant advancement on older generation reactor designs and that in the balance of expert( now limited expert evidence as these technologies are or were unto now are not tested and proven and awaiting US, EU and UK approval) evidence gathered for this inquiry, the committee finds that emerging nuclear technologies, ( Without mention of Nuclear Fusion) particularly Generation II/III and Generation I : [..] are significantly lower risk ( They still have the ability to provide highley toxic waste) than earlier nuclear technologies and are considerably safer than other forms of electricity generation in the level of risk ( The statistics are flawed as there are more other types of power generation and all have had accidents, hence as there are few nuclear power plants in the comparison the graph is skewed in their favor) they pose to human health and the environment as a result of reducing airborne emissions.”(No consideration to waste.) Again all these reports do not take into consideration the new developments in Nuclear fusion which needs to be done before the committee decides on any ratification of the future bill.



# History

The existing prohibition on the use of nuclear (Fission) 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 fission 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 healthy sign that there would be a future that did not need nuclear fission in Australia. It is a discussion of a now need by some that Australia should enter the Nuclear Fission Energy Industry at the expense of the nation and an opportunity of national significance. This being the growth and investment overseas of the Nuclear Fusion Industry, Australia has the opportunity to put more funds into Nuclear Fusion development and not waste funds on Nuclear Fission as we have ample investment in Australian interim technology and an opportunity over the EU, UK and US's lack of solar, wind, hydro, geothermal, wave or hydrogen energy resources which Australia can muster, and therefore could place Australia ahead of the rest of the western world in a future Nuclear Fusion energy market.



# *The case for nuclear fusion*

## Climate, environment and public health benefits

On October 17, 1956 the first full scale nuclear fission 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 fission is the second largest source of clean electricity after hydroelectricity.

For almost seventy years nuclear fission energy has demonstrated it cannot provide affordable, reliable energy without producing the dangerous radiation waste and associated gases associated. Despite a small number of notable accidents, nuclear fission remains one form of nuclear energy available to humanity.[

Research published in 2013 found "that global nuclear fission power has prevented an average of 1.84 million air pollution-related deaths and 64 giganticness of CO2-equivalent (GtCO2-eq) greenhouse gas (GHG) emissions that would have resulted from fossil fuel burning. Nuclear Fusion can improve on this.

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)". Nuclear energy has the lowest life-cycle land use requirement of all energy sources.

A report produced for the United Nations Economic Commission for Europe (UNECE) found that nuclear energy has the lowest life-cycle environmental impact. Note that this is for the full life-cycle and fuel cycle, not merely plant construction and operation. This 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 act doe not compare nuclear fission and nuclear fusion nor take in account that with more nuclear fission plants there would also be a rise in spent fission fuel and other radioactive waste into limited storage and increase with chance of catastrophic accidents. The report also does not take in whole of life of plants and mines, radiated equipment and upgrades and maintenance of said plants nor doe it take in reparations of site at end of life of plants and mines in there costings which all in turn will increase cost per Kwh. to customers.

# *The case for nuclear fusion*

## Water Security

Desalination is already part of Australia's water mix, 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 and would be more expensive if nuclear fission were used.

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

Perth reverse-osmosis desalination plant

# The case for nuclear fusion

## A 'Just and better future 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'.

There is a CASE STUDY: Plant closure, social dialogue and the just transition - the closure plan for the Diablo Canyon nuclear power facility.

JJDC Electrical & Communications firmly believes that nuclear fusion energy provides a "just transition"' pathway for workers and their communities currently benefiting from the industry via thermal electricity generation and mining, along with their supporting industry.

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

As nuclear fusion energy generation is comparable to existing thermal generation unlike wind and solar, the best sites suited to nuclear generation in Australian 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 benefit of a coal to nuclear transition.

Analysis of clean energy technology shows that nuclear energy offers 25%more employment per unit of energy and pay and wages that are 25-30% higher than other forms of clean energy.

This all makes nuclear fusion energy a more politically attractive option than fission and eases Australia energy transition by securing a 'just transitional phase for workers and communities enjoying the economic benefit of fossil fuel generation.

# *The case for nuclear fusion*

## 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.

Again they do not specify fission or fusion .

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 fission or fusion 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 fission Reactors), for use in the mining sector to help de-carbonise the industry. A fusion plant would be more suitable than a fission plant which would bring an element of extra risk being remote, can suffer radiation salt spills and accident radiation gas venting and a need to implement higher safety controls and hence costs. Though both would be 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 or electric powered mining equipment and vehicles

# *The case for nuclear fusion*

## Hydrogen production

The Australian government sees the value of hydrogen for de-carbonisation, but it is currently stymied as a major potential source of green low emission hydrogen, nuclear fusion power, could be its growth power provider.

TThe US DOE recently issued grants for but did not identify whether it be fission or fusion 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 Short-term 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 though not defining it be either fission or fusion and clean hydrogen production. The nuclear hydrogen initiative, a nonpartisan, global collaboration of more than 50 companies, academic institutions, government agencies, and non-profit organizations, released a report[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 road-maps, 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.

In all there recommendations they failed to include or consider nuclear fusion as it is not a now source of energy. The US, UK, EU and others have taken this step of NOW consideration of nuclear fission energy as an interim stratage as they lack the land or solar, wind, hydro, geothermal, wave or hydrogen energy resources which Australia can muster to help with their energy needs.

# Australia Nuclear Fusion Energy 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 off-shored 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 and the dangers of a fission plant destruction, Both the United States and the European Union have recognized that allowing authoritarian or unfriendly regimes to dominate supply chains  or that when attacked countries energy supplies, sources and producers are vulnerable and have a detrimental effect on labour and environmental conditions. For example, solar panel supply chains have been impacted by efforts to curb forced labour practices. A move to nuclear fusion would alleviate some of this and the problems of a nuclear fission power plant destruction and its horrendous desemation and world wide effect as seen with the Chernobyl disaster.

The Environment and Legislation Amendment (Removing Nuclear Energy Prohibitions) Bill 2022 would if applied would remove the Federal prohibition on nuclear fission enrichment, fuel fabrication, and reprocessing. This would open the door to Australia increasing its role in the global nuclear fuel cycle domestically and increased future radioactive waste globally and endanger the Australian and Asian Pacific nuclear balance.

This would also in the eyes of our Indo-Asian-Pacific international neighbors  be seen as provocative.

If Australia were to not utilize nuclear fission energy domestically, Australia could still join Canada, the US, South Korea, Japan, etc. to provide a western backed nuclear fusion supply chain providing an alternative to the export fission reactor and nuclear fuel programs of Russia, US, Canada,India, Pakistan and China.

From the Netherlands, to Poland, to Indonesia, and Nigeria, the world is moving towards either starting or growing their nuclear fission power generation in order to meet emission reduction targets. they have taken this interim "now step" of now considering nuclear fission energy as they lack the land or solar, wind, hydro, geothermal, wave or hydrogen energy resources which Australia can muster to help with their energy needs. These countries will need a reliable source of nuclear fuel and Australia still has the potential to be a major supplier without adding nuclear fission fuel processing or nuclear fission reactors, Whilst advancing Nuclear Fusion Energy to the world.

# Australia Nuclear Fusion Energy Global Player

## *Conclusion*

The requirements of advanced materials, Robotics, Ai, other study, remote maintenance and the development of design and operation simulation systems throughout the Nuclear Fusion Industry manufacturing supply chain all of which capabilities fits within Australian government initiatives and private and overseas investments to build up domestic manufacturing, and is supported by Australian unions such as the AWU though they probable have a blinked eye as they talk about nuclear instead of fission and fusion which believe that Australians deserve the high paying advanced jobs that come with the nuclear industry technology industry, and my organization agrees with them. Further, as nuclear power has the lowest life cycle carbon of all electricity generating technologies (UNECE), and nuclear fission 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 maximize the potential benefits of this industry.

With the profits and revenue that will be made from the interim need for uranium or Thorium Australia could increase its funding to Nuclear Fusion development. There is also a further plus in doing this as new technologies and materials will be developed as it progresses adding more value to developing a Nuclear Fusion Industry in Australia.

JJDC Electrical & Communication requests that the Australian parliament not pass the Environment and other Legislation Amendment (Removing Nuclear Energy Prohibitions) Bill 2022 or work to immediately as outlined by the bill via other means similar to the US, UK, EU, CAN and namely develop nuclear fusion whilst still developing nuclear fission systems ,but to maintain a prohibition on nuclear fission as is being presently being.

Fusion is being developed quickly and Australia with the help of HB11 is a front runner This organization has hopefully explain why nuclear fusion should be considered in this submission and the Nuclear legislation should be separated into Nuclear Fusion and Nuclear Fission and a prohibition be maintained on Nuclear Fission for the growth of the fusion industry in Australia and Indo, Asia , Pacific which is proving to be a best of technology and Australian choice.

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# Acknowledgements

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We thank you for the opportunity to provide a submission on this important issue

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