Submission No 39

INQUIRY INTO URANIUM MINING AND NUCLEAR FACILITIES (PROHIBITIONS) REPEAL BILL 2019

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Nuclear power is beneficial, but we need more prudent considerations on long-term existence and following impacts of atomic energy plants

Submission to Inquiry into the Uranium Mining and Nuclear Facilities (Prohibitions) Repeal Bill 2019

Submission from

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Who and Why

I, as a third-year (Chinese) student in major of government and international relations, especially in the unit of parliament and democracy, would like to contribute this inquiry by introducing some recommendations for the long-term nuclear energy sector in New South Wales (NSW). Based on previous submissions and the second reading speech, I believe that this time is a precious opportunity to develop nuclear power in this state and the achievement found on this inquiry will affect the expansion of nuclear energy industry in Australia in the future. However, it is also necessary to ponder the continuous effect associated with subsequent planning and adjusting in the industrial field. In other words, we should minimise potential costs and obstacles in further reform and progress of the energy industry. Therefore, I list one fundamental recommendation with two derived recommendations for preparing the cancellation of bans step by step. In general, to enhance the benefits of nuclear power while reducing harms, we should clarify the listed problems to avoid regretting in the future.

* I mainly use cases of Finland as evidence of my recommendations because The Hon. MARK LATHAM used Finnish decision-making as a reason for persuasion during the second reading.

Summary

Fundamental Recommendation – Based on terms of reference 2(b)[1]:

We should ensure that we aim to develop nuclear power for a long-term plan because this energy sector, including companies and facilities, will exist a long period in NSW with their requirements once it has been established.

The long life cycle of nuclear plants causes two problems and we need to choose a determinate direction of developing plan in order to prevent waste of money: we may pay for the expensive decommissioning process of nuclear power plants for further change of energy structure, *or* we may face the issue of the long-term maintenance of nuclear power plants in the future. Hence, here are two derived recommendations:

Derived Recommendation 1 – Based on terms of reference 2(b):

Due to the costly decommissioning process, **we should maintain the nuclear facilities and allow them to occupy a part of our energy market in a long time**, which means that the rooted nuclear sector perhaps impedes future energy structure reform and adjustment.

[1] The committee commission the newDemocracy Foundation to facilitate community input into the bill, such as a citizens panel or jury, to complement the traditional forms of evidence gathering by committees, such as seeking submissions and taking oral evidence.

Derived Recommendation 2 – Based on terms of reference 2(b):

If we allow the nuclear industry to root in our energy field, we should consider how to keep the balance between nuclear energy and renewable energy while new technologies of renewable energy challenging the energy structure. It is to say that **we may have to sacrifice the speed of our further energy progress for avoiding significant loss of rapid denuclearisation after a short period of nuclear development.**

Nuclear power is beneficial, but we need more prudent considerations on long-term existence and following impacts of atomic energy plants

According to the results of the second reading, lifting of bans on nuclear power is reasonable to be a way for solving the shortage of stable energy supply and filling the energy market during the new technological transition period. Nonetheless, the second reading gave a fuzzy expectation of the change of the state energy industry (also the national energy industry in the future) after we open nuclear power application in NSW. By focusing on the atomic facilities establishment, it is evident that the nuclear industry requires an extended life cycle and continuous maintenance[2]. For instance, the Loviisa plant in Finland has more than fifty years of predicted operating life (originally designed life is 30-year)[3]. Another example of the Olkiluoto plant in Finland shows the huge cost in the establishment stage (over 8.5 billion euros)[4]. We probably will face similar situations in the future since nuclear companies will seek to stay a long time in NSW for earning more money and expanding their share of electricity if they construct large nuclear plants[5].

[2] The life cycle of a nuclear plant is not a fixed period because we often extend its operating life in practice. The investment factors are the main reason for the extension: we often want to maximise the benefits of the old plants. See (World Nuclear Association 2018), https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-power-reactors/nuclear-power-reactors.aspx

[3] See (World Nuclear Association 2007), http://www.world-nuclear-news.org/regulationSafety/Twenty_more_years_for_Loviisa_plant_270707.shtml

[4] See (World Nuclear Association 2015), https://theecologist.org/2015/may/15/finland-cancels-olkiluoto-4-nuclear-reactor-epr-finished

[5] As The Hon. MARK LATHAM said in the second reading, our current inquiry is just the first step in the process of lifting the entire prohibition of the nuclear industry in Australia.

The long life cycle of nuclear plants is due to the problem that it is expensive to decommission nuclear power plants in the future (see details in the derived recommendation 1 part). However, if we do not want to waste our money to remove nuclear facilities too early, we may lead to a rooted nuclear industry in NSW in the future, which means we have to face the issue of the long-term maintenance of nuclear industry (see details in the derived recommendation 2 part). Therefore, here is my fundamental advice of the inquiry:

Fundamental Recommendation – Based on terms of reference 2(b):

We should ensure that we aim to develop nuclear power for a long-term plan because this energy sector, including companies and facilities, will exist a long period in NSW with their requirements once it has been established.

It is questionable that if we have conditions to no longer rely on nuclear energy in the future, how do we deal with nuclear facilities that need to be abandoned? It is unclear to assert that the development of new energy will take a long time that is enough to earn back the cost of nuclear establishment and elimination due to the obvious demands in the international community[6]. Some other new energy industries' facilities, such as wind and solar, are easy to

[6] See (IRENA 2018), https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Apr/IRENA_Report_GET_2018.pdf

be dismantled[7], but the remove of a nuclear plant will be an arduous task. For example, the complex and costly dismantling process of the Otaniemi research reactor (the first nuclear reactor in Finland), which has required 13.5 million euros special grant, reflects the limitations of current technology[8]. According to NEI and IAEA[9], although we already have many successful examples of the decommissioning plan, the advanced and high-price technology for supporting the decommissioning process will be a significant issue. We could say that the expensive dismantling process of nuclear facilities will question the necessity to establish nuclear energy if we want to adjust our energy structure in the future when more stably renewable energy come out. Therefore, if we develop atomic plants, we should confirm the fundamental recommendation at first, and then:

Derived Recommendation 1 – Based on terms of reference 2(b):

Due to the costly decommissioning process, **we should maintain the nuclear facilities and allow them to occupy a part of our energy market in a long time**, which means that the rooted nuclear sector perhaps impedes future energy structure reform and adjustment.

7 See (wind energy),
https://www.awea.org/policy-and-issues/project-development/state-and-local-permitting/decommissioning
also see (solar energy),
https://www.greenmatch.co.uk/blog/2017/10/the-opportunities-of-solar-panel-recycling

8 See (Finland government 2018),
https://vm.fi/documents/10623/307577/Julkisen+talouden+suunnitelma+vuosille+2019-2022

9 See (NEI 2016),
https://www.nei.org/resources/fact-sheets/decommissioning-nuclear-power-plants
also see (IAEA 2019),
https://www.iaea.org/topics/decommissioning

If we decide to develop nuclear power as the long-term energy industry, and we also decide to operate the nuclear facilities in a sufficient scale to supply a part of our energy demand, we have to face at least two problems. Firstly, the long-term maintenance of nuclear plants will spend our resource and occupy a significant share of the state energy industry, which is costly and hard to be changed in a short time. Secondly, some negative effects on energy structure reform may be caused by the powerful nuclear industry because it may play a vital role in not only our energy mix but also our political agenda by using their capitals[10]. Therefore, it is possible to face the resistance of nuclear power in subsequent energy development and environmental protection in the future. For example, the waste generated by nuclear plants will need a certain amount of lands, money, human resources and technologies to avoid serious pollution[11]. For another example, the old or abandoned sites of nuclear plants require a long-term process to clean the lands, which means we cannot to eliminate the established nuclear facilities prematurely[12]. Therefore:

[10] See (World Nuclear Association 2019),
https://www.world-nuclear.org/nuclear-basics/the-nuclear-industry.aspx
also see (World Nuclear Association 2019),
https://www.world-nuclear.org/information-library/current-and-future-generation/nuclear-power-in-the-world-today.aspx
also see OECD's *Market Competition in the Nuclear Industry* 2008
also see Barry C Pemberton's *Corporate Governance and the Nuclear Industry* 2016

[11] See
https://theconversation.com/nuclear-waste-is-safe-to-store-in-our-suburbs-not-just-the-bush-28206

[12] See
https://www.theatlantic.com/science/archive/2018/05/the-60-year-downfall-of-nuclear-power-in-the-us-has-left-a-huge-mess/560945/
also see
https://www.nature.com/news/nuclear-power-plants-prepare-for-old-age-1.20499

Derived Recommendation 2 – Based on terms of reference 2(b):

If we allow the nuclear industry to root in our energy field, we should consider how to keep the balance between nuclear energy and renewable energy while new technologies of renewable energy challenging the energy structure. It is to say that **we may have to sacrifice the speed of our further energy progress for avoiding significant loss of rapid denuclearisation after a short period of nuclear development.**

also see

https://www.powermag.com/interactive-map-abandoned-nuclear-power-projects/