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Senate Standing Committee on Environment and Communications  
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### Removing Nuclear Energy Prohibitions Bill 2022

In making a submission to this enquiry I would first state that my background was over 27 years as a mechanical engineer in the SECV Power Department where I was involved directly in the development and design and commissioning of new Power Stations. This included all the current operating brown coal stations as well as the recently demolished Hazelwood units.

My experience and knowledge leaves me very concerned with the way we are shutting down all fossil fired power stations (need replacing anyway) and substituting them with renewable energy sources (mainly wind turbines and solar farms). My concern is based on an apparent lack of overall planning and also the fact that the above renewable energy sources do not have, and never will have, the reliability of the base load coal fired stations they are replacing. You can improve their reliability to some extent by backup storage batteries, but here again there is a lack of planning in that area (almost an afterthought) as to how much battery capacity would be required. I would refer you to a report titled "Compendium for a sensible energy policy", Nov. 2017, prepared by a number well credentialed people in response to the German Federal Ministry of Economics and Energy brochure stating that the Energiewende renewable energy revolution was a success story. Their report showed this not to be the case. In their assessment they estimated battery backup for a 10 day lull in the wind in winter, when light levels are low, (a situation that has occurred), would require battery storage of 16TWh. The estimated cost of such storage would be around 16 Trillion euros. Keep in mind that this is one small country, so the ability of the world resources for batteries as well as their production over the next 10 to 30 years will create a huge problem.

The problems we are faced with in replacing coal fired power stations in Australia by using only wind and solar with back-up of batteries, gas turbines (Open cycle GT's are 26% efficient), and some hydro, will make it very difficult or even impossible to retain the necessary reliability in the electricity grid for commercial and industrial purposes. I would point out that a necessary criterion to have a reliable grid requires that load can be provided immediately on demand. Additionally you need to have reserve capacity over and above peak demand for events such as maintenance shutdowns and sudden disturbances that bring safety protection trips of generators into play.

Having decided that coal is not to be used as an energy source this should have led immediately to nuclear reactors as the replacement technology. I can see now that due to legislation in the Australian parliament we are prevented from such action going forward. Therefore your committee must come to the conclusion that this is folly of the greatest sort. We use nuclear reactors for medical purposes, we have an intention to be involved with nuclear powered submarines and we don't have any qualms about aligning with countries that are currently threatening nuclear war. So why not use nuclear technology for peaceful purposes.

My experience tells me that if you want a reliable electricity grid you must have base load generators (probably 80%), controlled by human action, and not at the whim of the climate, as the basis for your generation. Therefore it becomes obvious nuclear reactor powered energy sourced technology needs to be adopted such as in nuclear power stations.

The current government claims nuclear units are too expensive. Of course the initial capital cost is high. I don't know the exact costing but unless you take the whole of life costs, which is the correct way of costing, (and that means over 80 years for nuclear) with whatever you are comparing, I'm sure nuclear would be the cheapest and most sensible way to go. Nuclear power station upfront costs are high but with a payback life time of 80 years you will recoup this cost many times over. Note that the life of wind and solar installations is 20 years or less so by comparison to Nuclear you need to replace them four times over the life of a nuclear installation. Also imagine the environmental waste that would produce.

In conclusion I support the removal of the current legislation regarding the use of nuclear technology. I would hope that the Senate Committee recommend an immediate program to build nuclear power stations in Australia. It is already late in the day to have such installations in place to replace the planned shutdown of our coal fired power stations. Without such a plan we will have replaced a reliable electricity grid with an unreliable one. That is economic madness! Note that events have occurred already in Texas, California, England, Germany and Australia that demonstrate the unreliability of renewables in the electricity grid. This has occurred while fossil fuelled power stations were still supporting the grids in each of those countries.

Yours faithfully,

Alex Walsh