

SUBMISSION TO ENERGY WHITE PAPER

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Summary: Arguments are presented that the nuclear option must be considered as a part of Australia's future energy mix.

The issues: Energy Policy is a vital part of Australia's future prosperity and all governments must make important decisions. The current review is timely. The way forward depends very much on whether the Australian people, including politicians, are willing to heed the warnings of the scientific community that global warming is real and is likely to be a serious problem in the near future or whether they take the easy and less controversial course of ignoring it and hoping the predictions are wrong.

We need to generate large amounts of additional electricity, on the order of 10% a year, and coal is the cheapest way to provide it, the dirtier the brown coal the cheaper it is. Australia is blessed with enormous coal reserves. Many ignorant people see no harm in burning unlimited amounts of it, unaware of the consequences.

There will always be skeptics, but the majority opinion in the scientific community, including major bodies such as the National Academy of Science in the US, and the Australian Academy of Science is clear: we must reduce our greenhouse gas emissions significantly in the short term. We cannot continue to burn the quantities of coal that we are doing now.

In the US and also Australia coal seam gas has provided a short term respite which has had a large impact on the US economy, particularly in recent years. The advantage of gas, or methane, is that it produces only ~30% of the greenhouse gas (CO₂) that the same energy equivalent of coal does and it is less polluting, so it is a definite improvement. However, there needs to be only ~3% leakage into the atmosphere from the production to invalidate this advantage, because escaping methane is unburnt, that is, not converted to CO₂. In the atmosphere it has 30 times the effect.

We need a sustainable and long term energy policy. Current policy is to replace much of the fossil fuels by renewables, principally wind and solar power. However, these are inadequate because there can be long periods when the wind does not blow or when the sun does not shine – night time, cloudy and rainy periods. Hence they require backup by conventional power stations, because no adequate or economic energy storage process has been developed. There are problems with popular acceptance of these energy sources because of their impact on the lives and health of people whose lands are used. And the economics of renewables are not attractive. They must be subsidised.

The purpose of this submission is to urge consideration of the nuclear option as part of our future energy mix. The way to proceed is to have an open debate on the merits and disadvantages of nuclear. This has been called for by many in the science and engineering community including Professor Alan Finkel Vice Chancellor of Monash University and Chair of the Academy of Technological Sciences and Engineering.

In the lead-up to the S A election, Business SA has called on political leaders for a debate and to act on developing one of the State's global economic advantages by beginning a pilot program for nuclear power. With the impending closure of General Motors Holden at Elizabeth in 2017, South Australia needs new industrial and infrastructure development to maintain employment in this State. "SA can no longer ignore the significant economic potential of (its vast reserves) of uranium and we should be mature enough to have an informed public debate on the pros and cons of developing a nuclear industry." It proposes both a nuclear reactor for power generation and value adding to our uranium exports by modest enrichment to around 5% U-235, which is suitable for reactors here and for export, but poses no proliferation risks.

Unfortunately, in the leaders' debate on February 6, both leaders avoided the issue, as expected in a close race. Politicians are scared of controversy, even though they know what is the right course. An open debate would empower people to weed out the scaremongers and look clearly at the issue. Fear of the unknown is the enemy of progress. When given the opportunity I believe many would be persuaded by the strong arguments in favour of nuclear.

When people express hatred of all things nuclear, they argue from radiation leaks, the risk of weapons proliferation, the nuclear waste problem, and nuclear power is too expensive and will take too long to develop. "In any case we just don't need it", they say. None of these reasons have any solid scientific backing. If they did, why would countries around the world, like USA, France, UK, China, Finland, Russia, India, South Korea, UAE, be building and operating new reactors to supply their growing energy needs? There must be more to the issue.

The advantages of nuclear are threefold:

- 1) Environmental: Australia could reduce its greenhouse gas emissions by 10 % in less than 10 years with a large reduction in present pollution levels from coal power stations. Even carbon capture and storage were it to become economic, cannot prevent the pollution.
- 2) Economic: the costs to our health and wellbeing of this pollution are enormous. James Hansen has estimated that 1.8 million deaths were avoided in the past 40 years by the small (15%) contribution of nuclear power to world electricity generation. In France 78% of electricity is nuclear. The cost of pollution damage from burning coal is an externality which is disregarded by governments, except for the unpopular move to introduce a carbon tax. Such a tax is unnecessary with nuclear.
- 3) Health benefits: the avoidance of pollution will reduce the incidence of respiratory illness, cancer and cardiac disease in our society saving millions of dollars. Whereas

people charge nuclear with huge numbers of deaths related to the Fukushima accident, the fact established by the World Health Organisation is that there have been no deaths directly attributable to radiation from Fukushima. The deaths that did occur were due to the tsunami, accidents, forgotten medication and psychological impact, which was badly handled by Tepco and the Japanese government.

The Way Ahead: We require strong regulatory legislation to even consider nuclear. Australia has an established reputation, national and international. We should start with one modern design (generation 3 or 4) medium power reactor with a proven safety record, and located away from a major city as a trial demonstration to the public. At all stages give the public a say over where it is to be located. Then over a period of twenty years to increase the number of reactors to reach 25 to 30% of electricity demand. The remainder would be a combination of gas fired conventional stations (40%) with a number of wind and solar installations (20%) as well as the small amount of hydroelectricity generated in the Snowy Mountains and Tasmania (10%).

Establish an underground nuclear waste repository at a suitable location again with public consultation. The obstacles to acceptance of nuclear are all political, not scientific or technological.