

**Submission
No 5**

SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW

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Engineers use the laws of physics and chemistry to create electricity supply systems. The laws of physics cannot be changed by popular opinion, wishful thinking, or by direction from authority.

In 2012 Australian engineers showed that the introduction of renewables into the existing Australian grid was putting more carbon dioxide into the atmosphere than if they were not there and this has continued. For most non-engineers and indeed many engineers this outcome is incomprehensible. A fundamental knowledge of physics plus a detailed knowledge of electricity grid design and operation is required to fully understand the issues involved. A simple insight is that all other generation plant is forced to run less efficiently to support renewable energy intermittency. Running less efficiently through under utilisation and for a range of other reasons also causes costs to rise when renewable energy is forced into an electricity grid either by market subsidies or direction. If under utilisation is pushed too far operational costs rise unsustainably and plants shut down causing shortage and high prices particularly if the market system they are operating in has no payment for capacity support. These early insights provided a wake up signal for engineers to exercise great care when considering the impact of renewables in electricity grids.

In summary the pursuit of intermittent renewable energy around the world has not effectively reduced carbon dioxide levels (the prime objective?) and has caused electricity supply costs to rise because of the need to fully support their intermittent supply characteristics. A comprehensive report on the much (favourably) publicised German renewables experience by a group of scientists and engineers provides sobering reading, with many examples of failure and hugely wasteful expenditure. The report is attached and should be considered as part of this submission.

The OECD - NEA has determined that the only cost-effective method of decarbonisation for the electricity sector is through the use of nuclear energy. The committee should note that this outcome is quite at odds with similar investigations by CSIRO and AEMO for reasons which are not yet clear. A comprehensive review of the engineering principles and economics involved with specific reference to the Australian generation and supply sector is provided in my submission to another committee of the NSW parliament attached below and relevant sections should be considered as part of this submission.

My recommendation is that the committee carries out its investigations cognisant of the summary information provided in this submission and with great care given the opposing views which are evident in the community. The committee may wish to commission specific engineering advice on the current and likely future impact of existing and extended use of renewable energy in the New South Wales electricity grid given the problems and issues now evident here and overseas.

The fact that a large number of Australian households are now being disconnected from the electricity grid each month because of inability to pay is already an emerging social disaster for this country. Energy intensive industry is also closing or moving offshore. A continuation of laissez faire energy policy relying on uninformed populist opinion or political expediency will lead to long term economic and social misfortune for the people of New South Wales.

I would be happy to expand on the summary information provided in this submission for consideration by the committee.

Yours Sincerely
Barrie Hill

Attachments included with submission:

The Costs of Decarbonisation: System Costs with High Shares of Nuclear and Renewables, Nuclear Energy Agency and the Organisation for Economic Co-operation and Development, 2019.

Submission to the Standing Committee on State Development Inquiry into the *Uranium Mining and Nuclear Facilities (Prohibitions) Repeal Bill 2019*, NSW Legislative Council, 8 July 2019.

Compendium for a Sensible Energy Policy, Vernunftkraft, 2017.