

10 July 2018

Dr Kerry Schott AO
Independent Chair
Energy Security Board
Department of the Environment and Energy
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Dear Dr Schott

“STAIRWAY TO NOWHERE”

The attached pdf is MM Technology's (MM) response to the Energy Security Board (ESB) Draft Consultation Paper on the National Energy Guarantee (NEG) dated 15 June 2018. This email is intended to integrate the significant conclusions, in the presentation paper and the proposed detailed policy, now being developed for the Eastern Regions of the National Electricity Market (NEM) outlined in ESB's Consultation Paper.

SIGNIFICANT DISPARITY IN CAPACITY FACTORS

1. The Consultation Paper's last sentence in Section 2.3 Paragraph 3 states:
”From a reliability standpoint, variable renewable generation is not a direct replacement for coal fired generation, due to having a lower capacity factor”.

Whilst MM Technology concurs with the sentence, it does not say in totality what we believe it should namely that the capacity factor differences are very significant, even when comparing solar and wind farm renewables to older coal fired plants. This disparate comparison remains true, even if the renewables are supported by batteries, as the current state of battery technology, only supports the renewables effective output for a very limited time, consequently driving up renewables capacity factors by only a few percent.

As a consequence the key conclusion in the attached paper is that; closing existing Power Stations without a considered Energy (MWh) replacement plan is leading Australia to a massive Energy Crisis.

The NEM does require dispatchable base load generation replacements and they must be able to address the demands from customers for reliable, stable and cost effective energy. The wholesale closure of the NEM's existing fossil fuelled Power Stations will trigger additional stress on the NEM. This additional stress is likely to see increases in price to customers, along with a decrease in reliability and stability of the networks.

2. Assuming that Snowy 2.0 becomes a reality, the project's planned significant storage capacity of 350,000 MWh (provided that the upper reservoir Tantangra Reservoir is at maximum water storage capacity) still does not provide enough storage to allow the replacement of retired Fossil Fuel Base Load Generation by Renewables alone. The issue in the Australian context may well be not only the final assessed capital cost, but the limited opportunities on the “driest inhabited continent in the world”. However, given the climatic and water supply issues surrounding augmenting the Snowy Scheme with additional pumped storage hydro, Snowy 2.0 is far more feasible than Lithium-Ion grid scale battery back-up for renewables.

AS THE NEM IS A STANDALONE SYSTEM- THE SENSIBLE LIMIT OF RENEWABLES PENETRATION WILL BE AROUND 30%

3. It is likely that given current technology the overall limit on renewables penetration may be 30% due to:
- The intermitted nature of renewables;
 - The potential cost of Storage to support Renewables;
 - The cost of any dispatchable generation represents an investment that must be supported with capacity payments thus adding to overall costs; and
 - Difficulty with gas fired firming plant needing both gas supply and gas haulage on demand.

The above points have been well displayed in a number of other countries, as has been show in the German example, as well as Australia's own experiences with South Australia, both of which are set out in the attached paper.

4. **It is recommended that further study be urgently initiated, by the Australian Energy Regulator (AER) or the ESB so we can get accepted recognition that Regional renewable targets should realistically not exceed 30% of NEM overall existing demand.**

One of the key risks to future operations of the NEM i.e. the failure by a NEM Region to export electricity to another Region, being limited by the exporter's region renewables target, actually limiting dispatchable energy output, therefore will not occur.

REPLACEMENT OF DISPATCHABLE ENERGY CAPACITY WITHIN THE NEM NEEDS TO BE 70% OF EXISITING DEMAND

5. **Given the points made above, there needs to a replacement of dispatchable generation capacity within the NEM of the order of 70% of existing demand.** The NEM requires the existing fleet of plant to be maintained and optimised in order to allow time for realistic replacements to be developed. The existing NEM fleet will need replacing over time. Only after dispatchable energy sources are deployed can the existing fleet be retired in a controlled manner.
6. New means of using existing fuels in more environmentally sustainable ways need to be deployed, whilst delivering real sustainability. Australia needs new ways of better using coal and gas as key fuels for the generation of electricity. Failure to do so will condemn Australia to a new "dark age".

Australia needs to embrace new approaches that use proven technologies, such as gasification, along with emerging technologies such as Hydrogen Storage and Fuel Cells amongst others.

RELIABILITY CONCERNS INCREASE AS WE STEP DOWN THE "STAIRWAY TO NOWHERE"

7. Whilst MM agrees with the architecture of the NEG, the Consultation Paper outlines a plan to achieve grid reliability by **effectively limiting electricity demand rather than increasing supply**. To an extent this is just an increase in demand side management, which comes at a significant cost for large energy users particularly and industry generally.

Even given the significant forward planning proposed in the NEG, MM's concerns in relation to effectively having the Eastern NEM's 100 biggest users, or their retailer contractors, provide reliability by limiting demand, is that as we step down the stairway the requirement to limit industry demand will ratchet up each time a fossil fuelled plant closes.

The assumption in the attached paper is a constant annual new customer demand of about 200,000 MWh but annual population increases, through high immigration, could well accelerate the ratcheting process and cause high electricity usage industries to continue to either close or move off-shore.

NO CONFIDENTIALITY REQUIREMENT

We are happy to see this response and attachment entitled "Stairway to Nowhere" be published on the ESB's website or further ESB documents concerning the NEG **and that MM Technology be stated as the author and or respondent to the ESB.**

We would also be happy to provide a briefing on the paper to the ESB.

I am the contact for



Jeff Jamieson