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Committee Secretary
Select Committee into Fair Dinkum Power
Department of the Senate
PO Box 6100
Parliament House
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Submitted online to:

https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Fair_Dinkum_Power/FairDinkumPower

Dear Dr Palmer,

Terms of Reference

Thank you for inviting the Australian Energy Council (the “**Energy Council**”) to make a submission to the Senate Select Committee into Fair Dinkum Power’s (“**the Committee’s**”) Terms of Reference.

The Energy Council is the industry body representing 23 electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. These businesses collectively generate the overwhelming majority of electricity in Australia, sell gas and electricity to over ten million homes and businesses, and are major investors in renewable energy generation.

Introduction

The benefits of competitive markets are without question. Since the introduction of competition in the wholesale electricity market in 1998 and the retail markets progressively since 2002, these competitive market structures have been able to deliver least cost outcomes for consumers. Markets have continued to evolve since their establishment and market participants have developed innovative product offerings and solutions. Unfortunately government policy uncertainty over the past decade has hobbled further retail product development and capital investment in the wholesale market, and the Energy Council is keen that any recommendations made by the Committee will have a positive return on investment, and be tangible and enduring.

To this end the Energy Council would like the Committee to note that it has considered the likely changes to the National Electricity Market’s (“**NEM’s**”) structure as a result of technology and policy changes, and recently commissioned a report by Rajat Sood of Frontier Economics,¹ a copy of which is appended to this submission. In addition, last year the Energy Council commissioned KPMG to consider long-term market design principles,² and that report is appended also.

¹ Sood, R., *NEM Structure in Light of Technology and Policy Changes*, 13th December 2018, available at:

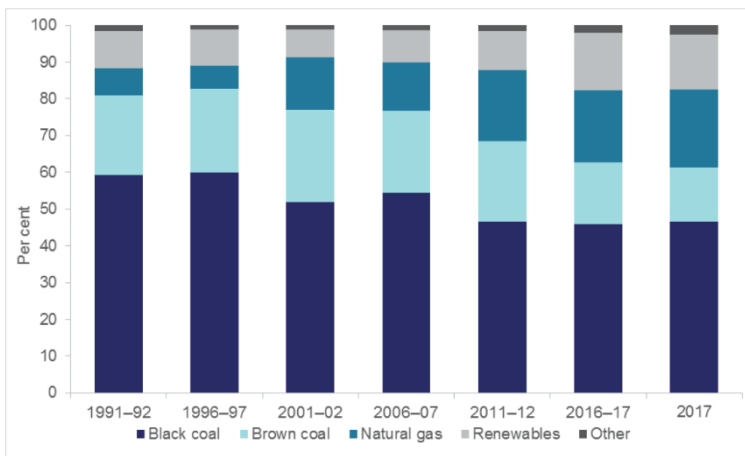
<https://www.energycouncil.com.au/media/14945/20181213-final-report-advice-on-nem-structure-in-light-of-technology-change-stc.pdf>

² KPMG, *Electricity Market Design Principles – Identifying long-term market design principles to support a sustainable energy future for Australia*, 19th April 2018, available at: <https://www.energycouncil.com.au/media/12077/market-design-principles-final-report-180419.pdf>

Discussion

There is no doubting that Australia’s power system is in transition, as the proportion of variable renewable energy supply increases and aging conventional generation reaches the end of its economic life and retires.

Figure 3.5: Australian electricity generation fuel mix



While the closure of large generation units such as Hazelwood Power Station in Victoria (1,600MW) attracts significant media attention, in reality the change in generation mix does not occur as a single well-defined event or a series of such events. Instead the displacement of conventional generation has occurred gradually, as shown in the graph from the *Australian Energy Update 2018*.³

Thus it is important for the Committee to consider the interaction of all sectors of the generation mix, including, but not limited to:

- small, distributed generation “behind the meter” (in the form of photovoltaic cells and batteries);
- large-scale renewable generation (such as wind farms and solar farms);
- small, conventional generation such as diesel and natural gas generators (which may or may not be configured as an aggregated array); and
- large-scale conventional generation, such as gas-fired generators and high-efficiency low-emissions coal-fired power.

In addition, the increasing availability and use of storage in the form of grid-scale batteries and pumped hydro will also need to be considered.

The Energy Council therefore advocates that the Committee consider the interaction between these sectors and how market efficiency can best be encouraged. As a first step, market efficiency may be improved by providing better signals between the different generation sources and demands, for example to ensure that customers receive advice on the overall market supply & demand balance, and in return provide the market with knowledge of their intentions. It is also important to ensure that different technologies receive the same market signals, to ensure that innovation is fostered and development is as efficient as possible.

Of course if customers are participating in the market, even in a limited way and with modified market signals, their contributions will need to be directly comparable with those of other generation sources, and it is important for the Committee to consider the reliability of consumer-provided energy services in its deliberations.

While reliability in this context generally refers to the power system within the NEM and the ability of the market to count on small generation when it is needed, being connected at the distribution system level rather than the transmission system level, having significantly more connections than large generators, and finally being in proximity to the general public indicates that these types of small installations may have higher risk, and the Energy Council therefore recommends that the Committee consider the electrical safety of these installations and their ongoing compliance with relevant standards. As an example, in its report on the 25th August Separation Event,⁴ AEMO observed that of the sampled behind-the-meter photovoltaic systems installed after the introduction of the new Australian standard, AS4777.2-2015 *Grid Connection of Energy Systems via Inverters – Inverter Requirements*, around 15% of the installations in Queensland and 30% in South Australia did not provide the over-frequency reduction capability required by the standard.⁵

³ Figure 3.5, p.22, Department of the Environment and Energy, *Australian Energy Update 2018*, August 2018

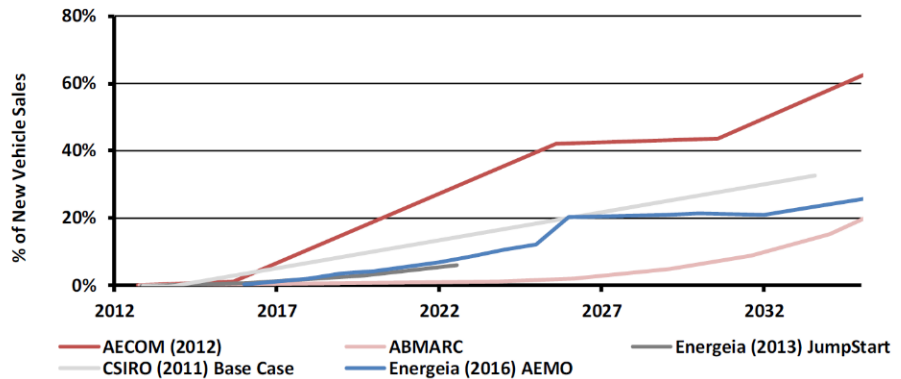
⁴ Australian Energy Market Operator, *Final Report – Queensland and South Australia System Separation on 25 August 2018*, 10th January 2019

⁵ *Ibid.*, p.6

The integration of consumers in the broader market also raises questions about the equitable treatment of the different market segments. The Energy Council believes the remit of the Committee should be such that it considers the issues of cross-subsidisation between different market segments, and the appropriate tariff structures for different market segments' distribution network utilisation.

In addition to the transition which is currently being witnessed, technology change will continue. As an example there are differing views as to the uptake of electric vehicles within Australia over the next ten years, as shown in the graph, taken from the *Australian Electric Vehicle Market Study*.⁶

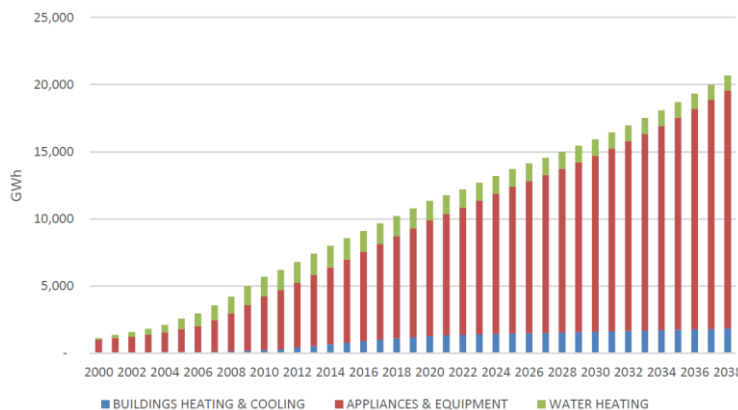
Figure 44 – Selected Historic Australian PEV Uptake Forecasts



Therefore considering the penetration of electric vehicles and their effects on consumer supply and demand profiles will be an important consideration for the Committee. It will also be important for the Committee to consider the complementary sides of likely technology changes, being technology changes which affect electricity generation (such as the increasing size of wind turbines, and the use of micro-inverters with photovoltaic panels), as well as technology changes which will affect demand.

As an example, under a moderate scenario, 20TWh of residential energy savings are expected over the next 20 years, as shown in the graph, taken from *Energy Efficiency Impacts on Electricity and Gas Demand to 2037-38*.⁷

Figure 14: Residential GEMS Savings by End-Use Type, Moderate Scenario



As an example, under a moderate scenario, 20TWh of residential energy savings are expected over the next 20 years, as shown in the graph, taken from *Energy Efficiency Impacts on Electricity and Gas Demand to 2037-38*.⁷

Technology changes will not be limited to appliance efficiency improvements and new generation sources. As homes become "smarter", old appliances are replaced with internet-connected devices, and new appliances such as home speakers and smart watches become commonplace, the opportunity for more localised supply and demand control

exerted either by consumers, service providers or artificial intelligence become more likely scenarios, and the Energy Council recommends that the Committee considers these types of futures in its deliberations, and ensures that different technologies receive the same market signals.

These sorts of changes will change the nature of the customer relationship with retailers, and third parties such as demand response aggregators may increasingly interact with consumers. It is important that when considering the regulatory reforms necessary, the Committee reviews the roles of these different entities and, most importantly, ensures that customer protections are maintained.

⁶ Energeia, *Australian Electric Vehicle Market Study prepared for ARENA and CEFC*, May 2018, Figure 44, p.53,

⁷ Strategy. Policy. Research, *Energy Efficiency Impacts on Electricity and Gas Demand to 2037-38: Final Report*, 1st June 2018, Figure 14, p.30

Conclusion

In conclusion, the Energy Council supports the work of the Committee and believes that its Terms of Reference should be broadened to consider the interaction between smaller generators and consumers, and larger generators and consumers. The additional matters the Committee should consider have been set out in this submission, but for ease of reference a summary is appended.

Yours sincerely,


Duncan MacKinnon
Wholesale Policy Manager
Australian Energy Council

Appendix Additional Terms of Reference

In addition to the Terms of Reference initially set out for the Committee, the Energy Council recommends including the following:

1. The reliability of consumer-provided energy services;
2. The interaction between customer participation and the National Electricity Market to maximise efficiency, and the need for market signals to be uniform and bidirectional;
3. The effects of increasing consumer generation on the distribution network, including electrical safety;
4. The ongoing compliance of behind-the-meter installations with relevant standards;
5. Cross-subsidisation between the different market segments, and the appropriate distribution network tariff structures;
6. The effect of electric vehicle uptake on consumer supply and demand profiles;
7. Likely technology developments which will affect electricity generation;
8. Likely technology developments which will affect demand;
9. The future of artificial intelligence and remote operation on consumer demand profiles;
10. The role of retailers and third parties such as demand response aggregators; and
11. How customer protections will be proposed to be maintained.

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