24 January 2017

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Committee Secretary
Select Committee into the Resilience of Electricity Infrastructure in a Warming World
Department of the Senate
PO Box 6100
Canberra ACT 2600

Dear Secretary,

I'm a retired professional electrical engineer and am somewhat ashamed that my profession is not better represented in either House of the federal parliament so that the technology behind electric power grid infrastructure cannot be directly explained to involved Members and Committees such as yours.

However, I would like to offer some opinions which might assist your Committee. At Ministry and cabinet level, I would like to see my Government formulating and enacting policies which:

- implement emission reduction targets that respond to the climate science
- lead the transition away from gas for Australian households. It is increasingly uneconomic for homes to remain on gas, so governments should be helping consumers achieve both least-cost and low carbon energy supply.
- recognise the full value of distributed energy and storage in the electricity supply chain
- recognise that investment in new coal and gas infrastructure is now considerably more expensive than investment in renewable energy and energy efficiency.

At the private consumer level, I have installed photo-voltaic solar cells and lead-acid storage batteries in an attempt to reduce fossil fuel emissions, and of course to reduce my power bills. Furthermore, the use of stored energy equipment allows me to avoid importing energy from the grid at those times when the grid is under stress, or to export energy to the grid to help ride through disturbances, such as those which blacked out large parts of South Australia in September 2016.

That event showed how little the community and Government understood issues relating to system stability, with most media and government representatives blaming SA's wind turbines for causing the blackouts. These machines were not, per se, the direct cause of the problem, rather that there was insufficient synchronous inertia in the generating equipment powering the grid. This inertia is normally provided by the rotating mass of large synchronous generators of the type typically found in fossil-fueled power stations, many of which were out-of-service on the day of the event, and more of which will be removed from the system when Hazelwood Power Station is shut down in March 2017. It is possible to increase the inertia of wind turbines though various techniques, often software based, and the large scale export of privately generated solar power can similarly simulate increased synchronous inertia. Furthermore, the old generators at Hazelwood and elsewhere could continue to provide system inertia, simply by remaining connected to the grid, and being

rotated at synchronous speed. Effectively they would be idling, consuming very little fuel, but would continue to provide the same synchronous inertia as if they were generating power. So there are ways to improve our grid performance which need whole-of-community involvement, and of course bi-partisan support at all levels of Government.

Many private individuals who have installed renewable energy generation equipment are dismayed by the action of energy distributors in reducing the tariffs for energy exported to the grid from roof-top solar panels, small wind generators etc. Not only is this blatantly unfair and dishonest, but is a doomed business model for the distributors. For complex reasons, some related to the “inconvenience” of private power generation and its present low contribution to synchronous inertia, the distributors have set a completely unfair price, typically around 6 cents per kilowatt-hour, which is either discouraging further roof-top solar installation, or encouraging individuals to go completely “off-grid”. Neither outcome is good for the nation overall if it is to meet its carbon dioxide emission reduction targets. As a minimum, distributors should pay PV households the same for exported energy as they charge for supplied energy. No doubt, this issue will also be considered seriously by your Committee.

I hope the above comments will be helpful to your Committee as it deliberates the complex issues relating to infrastructure resilience, many of which are outside my area of expertise. However, if you need further elaboration on these matters, please feel free to contact me.

Yours sincerely

Robert Fincher

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