

Submission by Mr KG Blake to Select Committee into the Resilience of Electricity
Infrastructure in a Warming World

Mr K.G. Blake

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Committee Secretary

Select Committee into the Resilience of Electricity Infrastructure in a Warming World

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Submission to Committee

In respect of the terms of reference of the Committee I wish to mainly address the following:

(a) the role of storage technologies and localised, distributed generation to provide Australia's electricity networks with the resilience to withstand the increasing severity and frequency of extreme weather events driven by global warming;

(b) recommend measures that should be taken by federal, state and local governments to hasten the rollout of such technologies in order to:

(i) create jobs in installation, manufacture and research of storage and distribution technologies,

(ii) stimulate household and business demand for storage technologies,

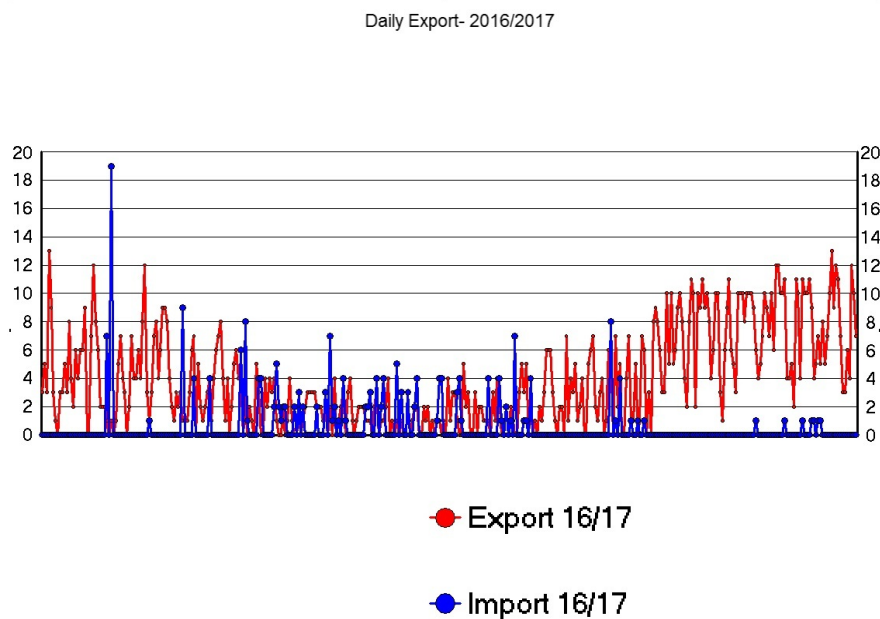
In 1965 I joined the Army Apprentice Scheme as a radio mechanic, and was introduced to the concept of Photovoltaic Electricity by my instructors. I have since that time maintained a constant interest in renewable energy, particularly solar power. In 2009 I installed 1,000 watts of solar panels on the roof of my house in the Hills behind Perth, connected to the local grid via an inverter. Within a few months I upgraded to 1,600 watts of panel. Several years later I installed a second parallel 1,600 watt system with its own grid-connected inverter. In December 2014 I installed a set of batteries and a hybrid inverter/charger to manage this

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power.

RESILIENCE

I keep very detailed records and the following two graphs show for the past 12 months daily import and export of power (in kiloWatt hours) for my household as at 9 January 2017. The "export" figure is my excess of power, after accounting for domestic consumption.



Even in winter time you will observe that there is only a small number of days when I did not export *some* power. (The large spike early in 2016 import was due to testing a new air conditioner over 24 hours.)

In an event such as the weather caused total grid failure which occurred in South Australia last year, I would submit that had I lived in South Australia, whilst I personally would probably not have suffered even minor inconvenience, this excess power would *not* have been available to other consumers *unless* I was connected to a local microgrid.

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SECURITY

In December 2015/January 2016 Ukraine was suffering from an apparently terrorist inspired attack on its power system which left huge numbers of people without power, and displayed the vulnerability of centralised generation and/or distribution of electricity.

In India, on 30 July 2012 a blackout affected over 300 million people and was briefly the largest power outage in history, counting number of people affected, beating the January 2001 blackout in Northern India. (230 million affected) The blackout on 31 July is the largest power outage in history. To quote from the Wikipedia article on the Indian blackout:

Some villages that were not connected to the grid were not affected, such as Meerwada, Madhya Pradesh which had a 14 kW solar power station built by a United States-based firm for \$125,000.

It was later revealed that apparently the grid itself failed.

Australian society depends to a very large degree upon centralised generation and large scale distribution of power, making it vulnerable to attack, either natural or manmade, physical or cyber. Taking recent events into consideration even something as ubiquitous as a large truck or light aircraft could be used as a weapon when crashed into an essential piece of infrastructure such as an electrical switchyard, with all its transformers and wiring (pictured below). During certain times of the year (such as summer), with climate change occurring, the entire system could be under massive stress and such an event could cause an impact similar to that in South Australia, but further, with the physical destruction of the hardware, it may take a long time to restore the system. It has also been demonstrated that it is possible to physically destroy devices such as generators with a few lines of malicious computer code.

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I draw your attention to the following on-line article, particularly to the last two or three paragraphs.

<https://www.wired.com/2016/03/inside-cunning-unprecedented-hack-ukraines-power-grid/>

Recent history has shown a strong uptake of domestic renewable energy generation, and this will continue in all likelihood. Therefore there is an existing resource which is not being fully utilised. The country needs a united, national leadership to make best use of this resource, both to secure our power and protect the environment from further change.

CONCLUSION

I would finish my submission by asking that the committee make a strong recommendation to institute, as soon as possible, a program to create microgrids based upon domestic and business hosted renewable generation, with a view to securing our future power requirements.

Yours truly

KG Blake