Members of the Select Committee

into the

Resilience of Electricity Infrastructure

in a

Warming World

Department of the Senate

Dear Members of the Select Committee;

I am writing to you in the hope that I can highlight some serious concerns I have in relation to the Resilience of Australia's Electricity Infrastructure while there is still an opportunity to advert a potential crisis.

In December 2012 while still working in the Solar Industry, I became extremely concerned in regard to the push for households to install battery systems as a means to address changes to the FIT (Feed in Tariff).

At the time I wrote the following briefing paper: (PASTED) which I emailed to The Prime Minister's Office, several members of the parliament, the media, and numerous members of the solar industry.

RAPS Systems, the Feed-In Tariff and Public Health

Briefing paper prepared for

The Prime Minister, Senators and Select Members of the Renewable Energy Industry

By Michelle Drummond

Purpose:

To argue that recent reductions in the national Feed-In-Tariff for Solar Power have resulted in market trends toward Grid Connect Battery Backup Systems that could result in future health and environmental problems, and to propose solutions for such problems.

Rationale:

Remote Area Power Supply (RAPS) systems are a battery based system for storing electricity produced from solar and/or wind power generation. The design and installation of RAPS systems is highly specialised and requires accredited professionals. Properties situated in remote areas can have an additional costs associated with being connected to Mains Power. Such costs can be prohibitive and can range from $5,000-$200,000. In these circumstances a properly designed RAPS system can be a viable and valuable alternative to connecting to the Mains Power Supply. RAPS systems may also be employed in cases where properties have previously been supplied with power from a diesel or petrol generator in an attempt to reduce fuel use – an economic and more environmental y friendly alternative. Similarly, there are legitimate situations wherein a property connected to the Mains power supply can be seriously affected by power outages (e.g., when storing medicines, or for supplying oxygen), and in these cases a Grid Battery Backup (similar to a RAPS system) is a potentially useful option.

However, RAPS systems have significant downsides.

Owning and maintaining a RAPS system requires large investment of time and resources to ensure their maintenance. A particularly problematic issue for RAPS owners is the need to replace the

batteries every 5-10 years. The replacement of batteries carries with it two distinct issues. First, owners of RAPS systems face considerable ongoing maintenance costs when replacing their system's batteries. Second, the chemicals used in the batteries are highly toxic and damaging to the environment. As such, the batteries require recycling, which carries with it significant financial costs and time expenditure on the owners of RAPS systems. Currently, there is no legislation that requires that RAPS users recycle their batteries as opposed to turning them into landfill, and there is little economic incentive to encourage users to adopt such recycling practice. Indeed, for users in remote areas, the cost of transporting the batteries to a recycling centre, along with the difficulties associated with safe transport of the batteries themselves may act as a significant disincentive to recycling behaviour. This may result in highly toxic materials being improperly disposed of in remote communities, leading to health risks and environmental damage.

Remote areas are not the only cause for concern. Grid Battery Backup systems are becoming more commonplace in urban areas.

Recent changes to governmental policy have resulted in Grid Battery Backup systems being implemented in non-remote areas as common practice. Until recently, solar power users would receive a reasonable price if they produced more electricity than they used – courtesy of the Feed-In Tariff (FIT). Dramatic reductions in the FIT have led to the adoption Grid Battery Backup systems in locations where they would otherwise be unnecessary. Simultaneously, the rising cost of power has increased the number of consumers looking to use solar power as an alternative, which has resulted in an increase in consumers, many of whom, due to the FIT reductions, are opting to install Grid Battery Backup systems. This is increasing the demand for RAPS batteries in areas where they are not necessary. If these systems are not properly installed, maintained, and the batteries recycled when their lifespan is reached, then there will be significant health and environmental risks. Finally, the out-dated nature of the electricity systems in Australia makes it difficult for renewable energy sources to feed electricity back into the grid with high levels of efficiency?

What can be done?

Fundamentally, there are three things that must be done to ensure that Grid Battery Backup systems are appropriately installed maintained and their installation limited in urban areas:

First and foremost, the National Feed-In-Tariff (FIT) must be restored and consumers must be given a reasonable price for feeding energy back into the grid. A failure to do this will result in Grid Battery Backup systems being preferred by consumers over grid-connect systems. A national net metering scheme which offers 1:1 is the preferred option.

Secondly, a national upgrade of the existing power networks is required to ensure that the electricity networks can handle an eclectic mix of renewable energy inputs. This will ensure that the electricity networks will be able to benefit fully from the increased input from consumers.

Thirdly, regulations surrounding the installation, maintenance and disposal/recycling of batteries used in RAPS and Grid Battery Backup systems must be established. Regulations ensuring that consumers are aware of the battery life and hidden costs involved in maintenance and recycling of batteries in the RAPS and Grid Battery Backup systems are required to ensure that these systems are safely maintained. Additionally, by providing consumers with incentives for the safe recycling of batteries in the RAPS and Grid Battery systems, the government could ensure that gel, lead Acid and lithium based batteries do not pose significant health risks in the future.

Sincerely

Michelle Drummond

Michelle Drummond has worked in the renewable energy industy for over 14 years, and is commintted to creating a safe, sustainable energy future.

Since then I have watched in horror as the solar industry, governments, battery manufactures, and energy suppliers, have taken the residential battery concept and are pursuing it with zeal. Talking up the benefits, suggesting that families will not need to stay connected to their energy suppliers, that they will have complete freedom and control, all of which are exaggerations, and furphies.

I need to make it clear I support using large scale utility storage using technologies such as (Hydrogen, Salt, Molten Salt) in conjunction with utility style operations; (Solar Thermal, Solar Towers, Hydro, Wind, or Wave) however, the push for residential batteries has the potential to create a significant list of issues, some of which are listed in the above briefing paper, and others which I will endeavour to touch upon here.

Some of the other issues are:

When I started in the solar industry I was constantly reminded by my employers that RAPS (Remote Area Solar/Wind Systems) should not be offered/sold to individuals that used more that 4-5kWh per day, the reason for this hard line was that the cost of a system using more than 4-5kWh per day would be prohibitive, and the family would find that their high energy consumption would results in energy outages, over cycling of batteries (destroying them) or needing to run a generator for long periods.

There are many factors that need to be considered when designing a stand alone power system. These factors include:

a. How many people will be living at the property full time or part time
b. What appliances will be used in the home and their wattage
c. What will be the frequency and duration of each appliance

It is therefore very helpful to the system designer, if the customer has a clear understanding of what their power needs will be for their home. This can be estimated by making a list of appliances, their wattage (which is usually listed on the back of the appliance) and an estimated length of use per day. Purchasing a power usage meter may also be useful in gathering information on your power consumption or referring to your current electricity bill.

While stand alone power systems can operate a lot of every day household appliances, the customer needs to have a clear understanding of the limitations of a stand alone solar power system. In most cases we recommend the use of air conditioning and electrical cooktops / hotwater be avoided or limited as these appliances are very high power consumers and to install a system to accommodate these is very expensive indeed.

To save on cost outlay, energy efficient appliances and general energy conservation are very important elements in a stand alone power system. Customers who wish to install a stand alone power system should take the time to research the most efficient appliances, a helpful guide can be found at www.energyrating.gov.au http://www.allnaturalenergy.com.au/solar-power-solutions/stand-alone-remote-area-solar-power-systems

Many individuals and families are now using around 8-25 kWh per day on average.
https://www.billrepublic.com/average-electricity-usage/

https://www.energymadeeasy.gov.au/benchmark
https://www.energymadeeasy.gov.au/benchmark

The current suggestion that residential consumers will be able to live without uninterrupted power supplies without adopting the complete complex model related to RAPS systems is a dangerous precedent.
Even in the following article there are concerns about the viability of the Tesla Powerwall producing what is required to run a house.

https://www.theguardian.com/vital-signs/2015/jun/10/tesla-batteries-environment-lithium-elon-musk-powerwall

One thing that is very clear is that the community does not react or function well without power.

There is also the issue of equity, as highlighted a solar/battery system (properly sized and designed) will be prohibitive, for many it will beyond their reach, this has the potential to create serious energy injustices.

As I mentioned in my briefing paper there are several environmental issues in relation to the recycling of batteries.

Shipping lithium ion batteries as of Feb 2016 became more difficult, there was a flight ban imposed on shipping these batteries on passenger/cargo planes, it would seem they can still be shipped by cargo planes and by sea under strict regulations. However, this has serious implications to be taken into account in relation to supply and demand.

https://www.theguardian.com/world/2016/feb/23/lithium-ion-batteries-banned-as-cargo-on-passenger-flights

http://www.batterypoweronline.com/main/articles/the-brave-new-world-for-shipping-lithium-ion-batteries-by-air/

I personally found this you tube presentation https://www.youtube.com/watch?v=NERPsFWHhng extremely valuable, it identifies where the issues lie, (with Australia's network structure) and it shows what Australia could do to rectify the current lack of resilience of Australia's energy supply. If Australia adopted the ideas in the presentation it would create many jobs, and showcase Australia as a leader in the production of clean renewable Energy for all.

I look forward to reading the report from your committee.

Thankyou, I appreciate the committee taking the time to read my submission.

Sincerely

Michelle Drummond

Michelle Drummond worked in the renewable energy industy for 15 years, and is commintted to creating a safe, sustainable energy future.

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