SUBMISSION

STANDING COMMITTEE ON THE ENVIRONMENT AND ENERGY

Inquiry into modernising Australia's electricity grid

Members of the Parliament,

I am writing because of an issue I and many others care deeply about – the sustainability of our planet and civilisation. It is essential that the modernisation of Australia's electricity grid is planned and performed in a way that is sensitive to the threats Australia will face in the future from global warming, fossil fuel scarcity and energy dependency on foreign sources. The threat of global warming is already manifesting itself in ways that may be irreversible and will detrimentally affect the conditions under which future generations of Australians will live. There are a number of ways the parliament can assist in transition to a sustainable electric grid. Most importantly, future planning must be conducted to take account of the coming transition of electrically powered transport. The grid will also need to develop battery technology which will allow the storage of power produced by renewables until it can be used in peak periods.

The current state of renewable energy sources in Australia is growing but currently limited. Already about 15% of Australian homes have solar panels. Australian energy use is currently approximately 6,000 PJ[1] annually and 250GJ annually per capita[2]. Currently approximately 14% of energy in Australia is from renewable sources[3].

Dressing selected issues and questions posed in the discussion paper,

• security—the electricity grid is able to continue operating in the event of the disconnection of a major system element and/or during a severe weather event;

A decentralised solar grid supported by large scale advanced technology battery storage provides an excellent security outcome. Battery capacity can be used to bridge the demand during a serious weather event. A decentralised production model has enormous advantages over a centralised plant distribution network because a serious weather event is unlikely to damage or destroy the entire production network at once and less likely than in the case where large scale centralised power stations nuclear, gas or otherwise are an integral part of the grid. A decentralised solar grid also avoids the dangers of a nuclear solution to Australia's electricity grid future.

• reliability—the grid has sufficient capacity to meet demand;

The recent development of advanced battery technology also means that energy can be stored in the grid during production periods and then applied during peak consumption period. This means that the former problems with renewables of intermittent supply can be alleviated. This could eventually eliminate the need for large centralised power stations drawing energy from fossil fuels or nuclear power.

• sustainability—the grid anticipates and meets the changing needs and expectations of consumers, provides certainty for current and future electricity generators, regardless of scale, and is able to facilitate the transition to a low-emissions economy; and

1 *Department of Industry and Science (Cth), Australian Energy Statistics - Table C1: Total net energy consumption in Australia, by fuel, energy units (2015) Office of the Chief Economist*
2 *Department of Industry and Science (Cth), Australian Energy Statistics - Table B1: Australia – population, GDP and energy consumption (2015) Office of the Chief Economist*
3 *Embedded generation data sourced from Australian Energy Regulator (2014) State of Energy Market Report*

Solar power and other renewables are the best option for addressing the need for a low emissions economy and is in step with changing community attitudes about global warming and the demand for clean, cheap, sustainable energy. From the point of view of public attitudes about possible alternatives to renewable power, nuclear power would seem to have a number of serious disadvantages. Community concerns about nuclear power from the risk of nuclear meltdown to the disposal of nuclear waste seem to make renewable energy a far preferable alternative.

• affordability—the system provides universal access to electricity services at the lowest practicable cost to consumers. The Committee welcomes evidence on the relationship between these and any other relevant aspects of the grid, and to what extent a modern electricity system can simultaneously achieve acceptable outcomes in each of these areas.

The reducing cost of solar panels which is being created by economies of scale at the global production capacity for them increases will mean that a large scale solar grid will be able to be installed cheaply and therefore bring the solar grid up to a capacity which will easily meet demand. A decentralised solar grid will also reduce the costs to consumers through efficiencies gained from reducing the need to transmit power through a grid to distant locations.

2. The current technological, economic, community, and regulatory impediments and opportunities to achieving a modern electricity transmission and distribution network across all of Australia, and how these might be addressed and explored. Given the complexity of the electricity system, and its central role in our economy and society, the modernisation of the grid presents a diverse range of challenges and opportunities. The terms of reference identify the following areas of focus:

• technological issues—ways in which the system could be designed to integrate the features and limitations of a diverse mix of electricity generation, while ensuring compatibility with other emerging technologies;

Battery technology which is currently emerging is making it possible to store the energy created by solar systems for use dung peak periods. Previously, this level of technology was not available cheaply on a large scale but the establishment of large battery production facilities globally has led to greater affordability of this battery technology. Recent technological advances have also greatly increased the efficiency of solar panels and their longevity making their relative output of power compared to the space occupied by the panels and the resources used to manufacture them far more favourable to their adoption.

• economic issues—the cost of grid modernisation, barriers to investment in the system, and the cost of not keeping pace with the evolving demands on the grid;

Government is in a position to incentivise consumer adoption of a decentralised solar grid in a way which minimises large scale infrastructure investment with significant capital risk on the part of government. At present a seeming obsession with coal fired power supply is acting as an impediment to investment in technologies with lesser exposure to obsolescence such as solar, wind and hydroelectric power. The long term cost of failing to modernise the grid will be enormous. The cost of unaddressed climate change will be a more volatile and unpredictable climate which will affect Australia's agriculture, infrastructure risk, tourism and the general amenity of Australia's climate. The most important cost is the degradation of environmental conditions for future generations due to emissions contribution to global warming. Elevated costs will also be associated with the increasingly complex and expensive extraction of fossil fuels including coal.

• What might be the role of new technologies in improving system security, reliability, sustainability, and affordability? What is the potential for new technologies to alter the inter-relationships between these objectives?

Battery technology currently being developed around the world and in particular in the United States will make solar power and other renewables more capable of delivering power at peak periods when production is lowest. Also, the development of large scale production facilities for solar power and batteries is constantly reducing the cost of renewable power generation.

3. International experiences and examples of electricity grid modernisation in comparable jurisdictions. The Committee welcomes evidence on the progress of grid modernisation (including the integration of variable electricity generation) in comparable countries, and any lessons that could be applied to the Australian context.

Questions for stakeholders to consider:

• How does Australia compare with other countries in the rate of adoption of variable electricity generation and other new technologies?

Australia already has a high level of domestic household solar power adoption. However, given Australia's climate and availability of open land for the installation of solar facilities, our country's potential for the installation of solar power generation facilities is drastically underutilised. The level of Indeed, it is estimated that a land area approximately the size of South Australia alone could accommodate enough solar panels to power the entire world. A land area about the size of Victoria covered in solar panels could very comfortably supply Australia's energy needs. By way of comparison, New Zealand as our closest cousin and neighbour has almost complete adoption of renewable hydroelectric power.

• What are examples of best-practice governance and regulation in other countries?

Countries with high level of renewable power generation adoption such as the United Kingdom, Germany, Norway, Sweden and New Zealand have a number of features of regulation which include incentive schemes for the adoption of renewable energy resources and incentives for the adoption of electric vehicles as the favoured emergent technology of broad based transport infrastructure. These countries have also implemented carbon taxation systems as a method of incentivising the adoption of emissions friendly electricity generation and transport infrastructure. The combination of financial incentives for the adoption of emissions friendly electricity generation and sustainable transport with financial disincentives for the continued use of fossil fuel based electrical generation and transport infrastructure is essential for the acceleration of the needed transition to a sustainable energy based economy.

I humbly invite you to consider these submissions and earnestly hope that you seriously consider the recommendations above.

Yours,

David Coleman