NCCARF
National
Climate Change Adaptation
Research Facility

The Secretary
Energy White Paper Taskforce
Department of Industry
GPO Box 1564
CANBERRA ACT 2601

7th February 2014

Dear Sir/Madam,

Response to Energy White Paper Issues Paper

The National Climate Change Adaptation Research Facility (NCCARF) was set up in 2008 by the Australian government to develop and communicate knowledge for decision makers seeking to effectively adapt Australia to climate change.

NCCARF was surprised to see that the Energy White Paper Issues Paper made no mention of climate change. The Issues Paper contains a section on renewable energy sources, but is silent on the reasons why Australia might wish to move to energy generation technologies that are less carbon intensive, and on targets for emissions reduction. As importantly, the Issues Paper has nothing to say about the impacts that climate change is likely to have on the energy sector.

Below, we highlight some examples of the likely impacts of climate change on the energy sector. Since the lifetimes of power stations and transmission infrastructure are long, design and planning decisions being made now must take into account the impacts of climate change many decades into the future.

Hot weather extremes: impacts on demand

The Energy White Paper Issues Paper does not consider the impact of climate change on energy demand. It makes the statement:

> "It is estimated that 25 per cent of retail electricity costs is accounted for by peak demand that occurs for less than 40 hours per year.' (page 31)

This statement clearly recognizes the important role of peak demand. Despite this, the Issues Paper takes no account of the fact that peak energy demand is likely to increase substantially in the future as climate change causes more hot weather extremes and heat waves, leading in turn to increased demand for air conditioning.

The Intergovernmental Panel on Climate Change (IPCC) in its recently released Working Group I Fifth Assessment is clear that global temperatures have already increased and will, beyond reasonable doubt, continue to increase in response to climate change. As a result, it has been estimated that, for example, in southern South Australia the number of days over 35°C could double from an average of 17 days per year at present to 35 days per year by 2070 (see http://www.climatechangeinaustralia.gov.au/documents/resources/Climate_change_poster.pdf

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Extreme events: impacts on energy infrastructure

Electricity infrastructure is vulnerable to climate extremes. The intensity and frequency of these extremes is likely to change as a result of climate change. Of particular relevance are:

- *Bushfires*: Hotter temperatures mean an increased likelihood of extreme fire weather days. Bushfires can damage electricity infrastructure. CSIRO have estimated that, by 2050, the number of extreme fire weather days may double or triple for a high emissions scenario.
- *Cyclones and storm surge*: Although it is uncertain whether cyclone frequency will change in future, there is a very high likelihood that mean sea levels will rise (by as much as 1 m by 2100, according to the latest projections from the IPCC). Higher sea levels mean that storm surges linked to wind storm events such as cyclones and East coast lows will be higher, since the perturbation due to the storm will be superimposed on a higher baseline sea level, causing more widespread coastal inundation. Electricity infrastructure in the coastal zone will be at greater risk.
- *Flooding*: Flooding destroys buildings and electricity infrastructure, disrupts transport routes and can cause mines to be out of action for many months. NCCARF has commissioned a number of reports on the risks of flooding in urban areas, and to the mining industry (see, for example, Sharma et al., 2013). The IPCC Fifth Assessment considers it very likely that there will be an increase in rainfall intensity over mid-latitude land masses and over wet tropical regions. Independent of climate change, changes in the distribution and wealth of the population makes the nation more vulnerable to flooding.

Impacts of efforts to reduce emissions (mitigation)

We already see some impacts of mitigation, such as the very negative response to some windfarm developments from local residents. More distributed sources of power, such as wind, solar and wave generators, are likely to encounter such resistance more frequently in the future. The energy industry needs to understand the strength of public reaction and seek ways to work with communities to arrive at solutions that address their concerns.

Contribution of NCCARF

NCCARF has commissioned research projects that directly contribute to the discussion on energy security under climate change. In particular, we would draw your attention to:

Foster, J, Bell, WP, Wild, P, Sharma, D, Sandu, S, Froome, C, Wagner, L, Misra, S & Bagia, R 2013,*Analysis of institutional adaptability to redress electricity infrastructure vulnerability due to climate change*, National Climate Change Adaptation Research Facility, Gold Coast, 345 pp.

Mason, L & Giurco, D 2013, *Climate change adaptation for Australian minerals industry professionals*, National Climate Change Adaptation Research Facility, Gold Coast, 62 pp.

Saman, W, Boland, J, Pullen, S, de Dear, R, Soebarto, V, Miller, W, Pocock, B, Belusko, M, Bruno, F, Whaley, D, Pockett, J, Bennetts, H, Ridley, B, Palmer, J, Zuo, J, Ma, T, Chileshe, N, Skinner, N, Chapman, J, Vujinovic, N, Walsh, M,

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Candido, C & Deuble, M 2013, *A framework for adaptation of Australian households to heat waves*, National Climate Change Adaptation Research Facility, Gold Coast, 242 pp.

Sharma, V, van de Graaff, S, Loechel, B & Franks, DM 2013, *Extractive resource development in a changing climate: Learning the lessons from extreme weather events in Queensland, Australia*, National Climate Change Adaptation Research Facility, Gold Coast, 110 pp.

The reports from these projects are available on the NCCARF web page at www.nccarf.edu.au.

In conclusion, NCCARF would argue strongly for the inclusion of consideration of climate change in the Energy White Paper.

Yours faithfully,

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