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## **INQUIRY INTO RECENT TRENDS IN AND PREPAREDNESS FOR EXTREME WEATHER EVENTS**

On behalf of The Climate Institute I would like to thank the Senate Standing Committee on Environment and Communications for the opportunity to provide our work and views to the Committees' inquiry into trends in and preparedness for extreme weather events.

In our presentation to the hearing in Canberra on 11 April, we discussed some research reports relating to the importance of expanding analysis of climate impacts to incorporate interdependencies among different systems. One of these reports is our own *Infrastructure Interdependencies and Business-level impacts* (2013), of which hard copies were provided at the hearing, and a soft copy is attached. This report, which assessed the implications for businesses of the impacts of a heatwave on Melbourne's interdependent infrastructure systems, found that extreme heat in Melbourne in 2009 was not only the direct cause of severe disruptions to electricity and transport systems, but also created numerous second-, third-, fourth- and fifth-order impacts across multiple infrastructure networks as failures in one system caused failures in others.

Modelling showed that, for a hypothetical large manufacturing and distribution business in Melbourne, the extra days of extreme heat forecast by climate change projections would result in disruption and reduced performance of key assets and services. The costs for the business from disruption to labour supply alone ranged from \$1 to 5 million, or 0.2-1.1 per cent of revenue.

These findings make it clear that data about the state of infrastructure assets needs to be shared within and across sectors for effective planning. The Climate Institute recommends that the Commonwealth Government move swiftly to:

- + Implement a national initiative to better identify current and emerging climate risk impacts for interdependent infrastructure networks and engage stakeholders in cross-sectoral collaborative solutions.
- + Expand the approach for "critical" infrastructure taken by the Federal Critical Infrastructure Program for Modelling and Analysis (CIPMA) to all other key infrastructure assets and industry sectors.
- + Require private-sector proponents or owners of infrastructure—especially those seeking Commonwealth approval or funding—to disclose how their assets and interdependencies will manage climate risks under likely and plausible climate scenarios such as two and four degrees of global warming above pre-industrial average temperatures.

In Workplace Health and Safety law courts have pointed out in a number of cases that defences of due diligence depend upon a 'mind concentrated on the likely risks' (see e.g. *Kumar v Ritchie (2006)* and *Alfred v Herbert (2007)* NSWIRComm 170). Two and four degree warming are likely risks that require far greater attention than at present. Australia and over 170 countries have committed internationally at the UNFCCC to keep warming to below 2 degrees. Agencies such as the World Bank and the International Energy Agency are among those warning of temperature rises of 4 degrees and more on current policy settings.

The urgent need for better understanding of interdependencies in the context of climate change adaptation has been highlighted by the UK Government's *Economics of Climate Resilience* report (also attached). This report notes that "interdependency across infrastructure systems and supply chains can create costs on others that decision makers do not account for". As we mentioned at the hearing, the first recommendation of this report is for research to "understand infrastructure and supply chain dependencies for sectors and organisations at high risk of climate change impacts (currently and in the near, medium and long-term)." More information about the role of this report in the development of the UK's National Adaptation Programme is available here: <http://randd.defra.gov.uk/Default.aspx?Module=More&Location=None&ProjectID=18016>).

We also recommended to the Committees a presentation on the growing costs of current government arrangements for natural disaster relief and recovery (NDRRA). This presentation, "Government Risk Management of Physical Assets in Respect of Natural Disaster", by KPMG's Jefferson Gibbs and Melissa Yan, shows that federal funding provided through NDRRA totalled around \$1.5 billion for the eight years to 2010. Since then, however, NDRRA assistance has spiralled, with an estimated total of \$7.8 billion for 2011-2015. It should be noted that these estimates were made before the natural disasters of 2013, so likely understate the extent of taxpayer assistance. What is particularly concerning, however, is that the conditions attached to the funding provided via this mechanism require infrastructure to be rebuilt to the same standards as before, effectively preventing "betterment" or increased resilience in the physical asset stock and setting up the conditions for continued and unnecessary rebuilding costs.

Yours sincerely

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