



Australian Government

Department of the Environment and Energy

**SENATE FOREIGN AFFAIRS, DEFENCE AND TRADE REFERENCES
COMMITTEE INQUIRY INTO THE IMPLICATIONS OF CLIMATE CHANGE
FOR AUSTRALIA'S NATIONAL SECURITY**

Submission on behalf of the Environment and Energy portfolio

September 2017



1. The Department of the Environment and Energy ("the Department") advises on and implements Australian Government policies and programs relating to protecting and conserving the environment and heritage, addressing climate change and providing adequate, reliable and affordable energy.
2. In preparing this submission, the Department consulted closely with the Bureau of Meteorology, given its role as Australia's national weather, climate and water information agency, operating under the authority of the *Meteorology Act 1955* and the *Water Act 2007*. The Bureau provides a wide range of products and services to support informed decision-making by governments, emergency services, industry and the community. The Bureau's products and services include a range of observations, forecasts, warnings, analysis and advice covering Australia's atmosphere, water, oceans and space environments.
3. This submission reflects the Department's role in understanding, communicating and responding to the implications of climate change. We interpret national security to include state and human security. It is inherently linked to the security of economic systems, energy, food, health and water at the local, national, regional and global level.
4. In considering the implications of climate change for Australia's national security, we know the future is not fixed. Instead, the impact of climate change depends on concerted action from all countries to reduce greenhouse gas emissions and adapt to the projected impacts of climate change. The 2015 Paris Agreement made by Parties to the United Nations Framework Convention on Climate Change (UNFCCC) is historically significant, given the commitment of all parties (developed and developing) to a low-carbon, climate-resilient future. The treaty sets in place a durable foundation for future global action, with an in-built process to ratchet up country-led ambition over the coming decades.
5. The Agreement includes a global goal to hold the average temperature increase to well below 2°C and pursue efforts to keep warming below 1.5°C above pre-industrial levels. This goal recognises scientific advice from the Intergovernmental Panel on Climate Change that the risks of climate change can be significantly reduced if warming is limited to below 2°C.
6. Australia's ratification of the Paris Agreement, and our target to reduce greenhouse gas emissions so they are 26-28 per cent below 2005 levels by 2030, represents our commitment to global action and recognises that action to reduce emissions and manage the impacts of climate change is in the national interest, including national security. To date, 160 parties have ratified the Paris Agreement.

Understanding the impacts of climate change

7. Understanding the impacts of Australia's variable and changing climate is fundamental to assessing the risks to our national security. The Bureau of Meteorology and CSIRO produce a biennial State of the Climate report that draws on the latest monitoring, science and projection information to describe variability and changes in Australia's climate, and how it is likely to change in the future. The latest report, released in 2016, synthesises the science informing our understanding of climate in Australia, and includes new information about Australia's climate in the past, present and future.
8. Australia's climate has warmed since national records began in 1910, especially since 1950. Mean surface air temperatures have increased by around 1.0°C since 1910. Increases in surface temperature are leading to an increase in the frequency, duration and intensity of

heatwaves over many parts of Australia, while sea-level rise has increased the risk of coastal flooding associated with storm surges.

9. The State of the Climate report notes that some further changes in our climate, such as an increase in mean temperatures, are almost certain to result from greenhouse gases that have already been emitted.
10. The future climate change impacts described in the State of the Climate Report are relevant under all climate projection scenarios, with projected changes largely locked in for the next two decades. Temperature projections become much more sensitive to the emission scenario in the second half of the 21st century.
11. The future climate change impacts described in the State of the Climate Report include the following projections: an increase in the number of days with weather conducive to fire in southern and eastern Australia; extreme rainfall events are likely to increase in intensity by the end of the century across most of Australia; a decrease in winter and spring rainfall across southern continental Australia; fewer tropical cyclones form in the southern hemisphere than are currently observed, but a higher proportion of those will be more intense, with ongoing large variability from decade to decade; and further sea-level rise around Australia in coming decades.
12. More information on the Australian climate projections developed by CSIRO and the Bureau of Meteorology is available at the *Climate Change in Australia* website (www.climatechangeinaustralia.gov.au).

Climate change intersects with other risks

13. The terms of reference of this inquiry refer to the United States Department of Defense report *National security implications of climate-related risks and a changing climate* (2015), which outlines numerous risks to international stability as a result of climate change. The Australian Government's 2016 Defence White Paper recognises the impact of climate change on Australia and our immediate neighbourhood, noting the "South Pacific region will face challenges from slow economic growth, social and governance challenges, population growth and climate change."
14. Work done by the Bureau of Meteorology since 2011 in the Pacific, often in partnership with CSIRO, highlights risks from more frequent and severe coastal inundation or river flooding, and more intense tropical storms. Their work indicates that climate change is likely to cause increased disruption to rainfall patterns across the Pacific, increasing the likelihood of the need for more frequent humanitarian assistance in response to food and water shortages.
15. It is not possible to foresee, prevent or mitigate all adverse or extreme weather events. Australia experiences a high incidence of naturally occurring, geographically, and climatically diverse events that can affect our critical energy infrastructure and its operation. These include heatwaves, cyclones, droughts and bushfires. Consequently, extreme weather events are an existing challenge to the resilience of Australia's infrastructure, and will continue to be so as they become more frequent or intense due to climate change.
16. According to the International Energy Agency (IEA), a wide range of climate change impacts could affect the basic components of the energy sector: production, transformation, transportation and storage, and demand. The IEA's *Energy, climate change & environment* report (2016) provides examples of these impacts, noting that they will vary by region and within regions.

17. As the climate changes, different seasonal demand patterns, coupled with increasing electrification, infrastructure operating close to capacity, and increasing implementation of low-carbon technologies may require an upgrade of electricity grids (Dawson 2016).
18. The Australian Government's Critical Infrastructure Resilience Strategy and associated Plan support the continued operation of critical infrastructure in the face of all hazards by bringing together owners and operators of critical infrastructure assets with state, territory and Australian governments, to ensure effective management of risks to the continuity of their operations.
19. The Department's Energy Security Office supports the sustainability and reliability of Australia's electricity, gas and transport fuel markets. The Department is engaged in a number of initiatives to help ensure energy security in Australia and internationally, including: participation on domestic and critical energy infrastructure groups; oversight of Commonwealth involvement in energy emergencies response; and engaging in fora such as the IEA.

Climate change intersects with Antarctic interests

20. Australia possesses strong and longstanding national interests in Antarctica. These interests were articulated in the whole-of-government Australian Antarctic Strategy and 20 Year Action Plan. Implementation of the strategy is supported by a \$2.2 billion package of investment across the Australian Antarctic Program. This supports our scientific research, develops critical infrastructure and safeguards Australia's interests in the region.
21. Australia's Antarctic interests were defined in the whole-of-government Australian Antarctic Strategy and 20 Year Action Plan in 2016 and include:
 - supporting a strong and effective Antarctic Treaty System
 - maintaining Antarctica's freedom from strategic and/or political confrontation
 - preserving our sovereignty over the Australian Antarctic Territory, including our sovereign rights over adjacent offshore areas
 - being informed about and able to influence developments in a region geographically proximate to Australia
 - protecting the Antarctic environment, having regard to its special qualities and effects on our region
 - conduct world-class scientific research consistent with national priorities
 - fostering economic opportunities arising from Antarctica and the Southern Ocean, consistent with Antarctic Treaty System obligations, including the ban on mining and oil drilling.
22. Australia is an active participant in the Antarctic Treaty System, which provides a strong global governance framework for Antarctica as a place of peace and science.
23. In terms of science, Antarctica provides information on past and current climate trends, and on the nature, extent and consequences of future climate change. Consequently, Antarctic science is crucial to the Australian Antarctic Program, and is supported by the Department's operational capabilities. Better understanding the implications of climate trends in Antarctica, especially when coupled with science conducted in other regions, helps build a picture of global trends and supports better climate change preparedness and mitigation strategies. Antarctica and the Southern Ocean are important to the global weather and climate system.

Changes in the Southern Ocean's circulation as a consequence of climate change is expected to have global effects, including a reduced ability for the ocean to absorb atmospheric carbon dioxide. Australia's reputation in Antarctic science, including climate change research, is world-leading internationally recognised and reciprocated by other leading institutions in the field. Ongoing research is important to better document and interpret patterns of change and to better understand their potential impacts.

24. In terms of human safety, the potential security risks most relevant to the Australian Antarctic Division's operations identified in the United States Department of Defense report relate to natural disasters or changes in the environment. These include impacts caused by increased temperatures, more frequent and severe weather events and sea-level rise, all of which could challenge human safety, especially in undertaking activities and responding to emergencies in an inherently high risk operational environment such as the Polar Regions.
25. A strong and effective Antarctic Treaty System is fundamental to Australia's strategic interests in the Antarctic region. The 1959 Antarctic Treaty and associated instruments of the Antarctic Treaty System provide a framework for the international governance of Antarctica and support international rules-based global order. For those State Parties that are signatories to the Treaty, it ensures principles of non-militarisation, environmental protection and freedom of scientific investigation underpin international engagement on Antarctic issues. In addition, the Treaty provides a carefully crafted compromise on differences over territorial sovereignty in Antarctica that helps protect Australia's sovereign interests and limits the potential strategic tension in the area to Australia's south.

Portfolio responses to managing the impacts of climate change

26. The Bureau of Meteorology works in partnership with the emergency management sector and the community to ensure that warning messages are effective and that communities are informed, prepared and able to make decisions and take action for their safety and wellbeing. The Bureau provides the critically important warning products, intelligence and services to support the jurisdictional emergency response and government emergency management. This is even more important when multiple events occur simultaneously.
27. The Australian community depends on this information and has high expectations of the Bureau to provide forecasts, warnings and advice for extreme weather and natural disaster events, including tropical cyclones, bushfires, floods, thunderstorms, heatwaves, tsunamis and droughts. While some natural hazard events are unforeseen, many can be anticipated, forecast, measured and monitored and warned for by the Bureau using its expertise in weather, climate, water and ocean behaviour.
28. Working in partnership with other governments, donor agencies and the Australian Department for Foreign Affairs and Trade, the Bureau shares this expertise and builds capability in these essential services in national meteorological and hydrological services across our region.
29. The Department and the Bureau of Meteorology have had key roles in delivering a long-term investment in climate change science and data, meteorological capability, and adaptation information and planning for the Pacific, often in partnership with CSIRO. Initiatives include the Climate and Oceans Support Program in the Pacific, the Pacific Risk Resilience Program, and the Pacific-Australia Climate Change Science and Adaptation Planning program.

30. These programs make an important contribution to regional security. For example, the Pacific-Australia Climate Change Science and Adaptation Planning program informed water planning and investment at national and regional scales by:
 - partnering with the Secretariat of the Pacific Community and the Government of Kiribati to better understand the impacts of climate change and inundation events on the Kiribati's major groundwater supply
 - using economic analysis to develop a portfolio of cost-effective options to enhance water security in Tuvalu.
31. Australia also cooperates with other countries to reduce emissions and the impacts of climate change by researching and developing clean energy technologies, conserving rainforests and coastal blue carbon ecosystems, and building capacity for measuring and reporting on emissions. Cooperation initiatives between Australia and others in the international community include bilateral and multilateral initiatives such as the Asia-Pacific Rainforest Partnership, the Global Forest Observations Initiative, the International Partnership for Blue Carbon, and the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security.
32. The Department and the Attorney-General's Department have together established the Australian Government Disaster and Climate Resilience Reference Group. The Reference Group considers the risks and opportunities arising from climate change and natural disasters, and has senior executive representatives from more than 20 Australian Government departments and agencies. The Reference Group is particularly focussed on the strategic implications of climate change and natural hazards across portfolios, including complex issues that affect multiple agencies.
33. The National Climate Resilience and Adaptation Strategy to strengthen Australia's climate change preparedness was released in December 2015. It identifies a set of principles to guide effective adaptation practices and resilience building. It noted that climate change mitigation and adaptation actions are complementary approaches. Climate change mitigation works to avoid the risks of a changing climate by reducing the emission of greenhouse gases and preventing more severe climate change.
34. Overall, climate change risks to national security need to be addressed through an enduring and effective global framework to reduce emissions and adapt to impacts. The Department contributes to an effective global response to climate change through the negotiation and implementation of obligations under the UNFCCC, through the Kyoto Protocol and the Paris Agreement, working closely with and supporting the Department of Foreign Affairs and Trade.
35. As outlined earlier, Australia's ratification of the Paris Agreement on 10 November 2016 reaffirms our commitment to effective international action on climate change. Ratification also confirms, internationally, Australia's target to reduce emissions to 26-28 per cent below 2005 levels by 2030. This target is in step with the efforts of other developed countries, and takes into account Australia's national circumstances. Australia will continue to work with the global community, including through the UNFCCC negotiations and bilateral engagements, to reduce the risk of climate change impacts.

Reference list

Attorney-General's Department 2015, *Critical Infrastructure Resilience Strategy*. Available at: <https://www.tisn.gov.au/Pages/default.aspx>

Australian Bureau of Meteorology, CSIRO 2016, *State of the Climate 2016*. Available at: www.bom.gov.au/state-of-the-climate/

CSIRO and Bureau of Meteorology, Climate Change in Australia website. Available at: <http://www.climatechangeinaustralia.gov.au/7>

Dawson, R.J., Thompson, D., Johns, D., Gosling, S., Chapman, L., Darch, G., Watson, G., Powrie, W., Bell, S., Paulson, K., Hughes, P., and Wood, R. 2016, *UK Climate Change Risk Assessment Evidence Report: Chapter 4, Infrastructure*. Available at: <https://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Chapter-4-Infrastructure.pdf>

Department of Defence 2016, *2016 Defence White Paper*. Available at: <http://www.defence.gov.au/whitepaper/docs/2016-defence-white-paper.pdf>

Department of the Environment and Energy, Energy Security Office website. Available at: <http://environment.gov.au/energy/energy-security-office>

Intergovernmental Panel on Climate Change 2014, *Climate Change 2014: Impacts, Adaptation, and Vulnerability Part A: Global and Sectoral Aspects - Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp 758. Available at: https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-FrontMatterA_FINAL.pdf

International Energy Agency 2016, *Energy, Climate Change and Environment: 2016 Insights*, IEA Publishing, Paris. Available at: <http://www.iea.org/publications/freepublications/publication/ECCE2016.pdf>

National Climate Resilience and Adaptation Strategy 2015. Available at <http://www.environment.gov.au/climate-change/adaptation/publications/national-climate-resilience-and-adaptation-strategy>

US Department of Defense 2015, *National Security Implications of Climate-Related Risks and a Changing Climate - Response to Congressional Inquiry on National Security Implications of Climate-Related Risks and a Changing Climate*. Available at: <http://archive.defense.gov/pubs/150724-congressional-report-on-national-implications-of-climate-change.pdf?source=govdelivery>