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Friday, 21 March 2014

Agricultural Competitiveness Taskforce
Department of Prime Minister and Cabinet
Submitted online

Dear Sir/Madam,

Agricultural Competitiveness and Climate Change

I write to provide a submission to the Agricultural Competitiveness Task Force on the impact of climate change on food security and the competitiveness of the Australian agricultural sector.

I have postgraduate qualifications in geography and in law, and am actively engaged in research on legal and policy frameworks for climate change mitigation and adaptation at national and international scales.

Australia's climate has warmed by 0.9°C since 1910, and this warming is consistent with human-induced warming observed across the globe. All of the warmest 20 years on record have been recorded since 1990. There are 'multiple lines of evidence...that it is extremely likely that the dominant cause of recent warming is human-induced greenhouse gas emissions' (CSIRO/BoM, 2014).

Temperatures in Australia will continue to rise in coming decades, by up to a further 1.5°C by 2030. Warming by 2070 may be up to a further 5°C from current temperatures, if greenhouse gas emissions are not reduced (CSIRO/BoM, 2014). These temperature changes, and associated impacts upon the climate system, are likely to be significantly beyond the adaptive capacity of Australia's agricultural sector.

Changes to Australia's climate over the past century driven by greenhouse gas emissions have already have significant impacts upon agricultural productivity.

Temperature increases, including the frequency of high temperature extremes, has impacted upon Australian agricultural systems. A further rise in temperature will drive significant reductions in the yields of major crops, potentially halving yields of some cultivars within decades (Howden et al, 2014). Accompanying temperature change is an increase in evaporative demand, which also contributes to increased drought risk (Howden et al, 2014).

Observed temperature increases are being accompanied by significant declines in rainfall in key agricultural regions in southern Australia. There has been a significant decline in rainfall in southwest and southeast Australia since the 1970s in cool seasons (CSIRO/BoM, 2014). With projected temperature increases of up to 5°C by 2070, rainfall in southern Australia is likely to fall further (by 25 per cent or more), and in some regions this is likely to result in a doubling of the frequency of exceptional droughts (Howden et al, 2014). Previous estimates of wheat production under conditions of rising temperatures and reduced rainfall have suggested that even with lower-end global warming (up to 2.8°C) Australia's wheat production will decline by 13 per cent and beef production by 19 per cent by 2050 (Howden et al, 2014). These changes will be profound, and will cancel out, many times over, any gains made from more efficient land use and a more competitive agricultural sector.

The Terms of Reference for the Agricultural Competitiveness White Paper and the Issues Paper make no mention of climate change. An attempt to ignore or downplay the most significant threat to Australia's agricultural sector will not alter its physical reality. Under even the most optimistic projections the productivity of Australian agriculture will be significantly impaired, and the changes well beyond existing climate variability will exceed the effectiveness of tactical adaptation strategies (Howden et al, 2014). By way of illustration, even with high levels of farm-level climate adaptation, Australian wheat exports are projected to fall significantly, and under some scenarios will result in Australia becoming a wheat importer by mid-century (Stokes and Howden, 2011).

In view of the impacts of climate change on Australian agriculture, there is an urgent need for Australia to do its fair share in reducing global greenhouse gas emissions. As recommended by the Climate Change Authority in its *Targets and Progress Review*, in light of the scale and pace of global action, the emission reduction targets for Australia should be in the vicinity of 15 per cent below 2000 levels by 2020, and between 40 and 60 per cent below 2000 levels by 2030 (Climate Change Authority, 2014). As Garnaut has noted, 'Australian farmers have no interest in failure of global mitigation—this is the circumstance that would deny them the opportunity profitably to expand production and exports in a period of rising global prices' (Garnaut, 2011).



The evidence is overwhelming that a failure to adopt urgent and deep cuts in greenhouse gas emissions will very likely result in the very significant decline in the productivity and competitiveness of Australia's agricultural sector well before the end of this century. This will have major implications for food security in Australia, in our region, and globally.

Yours sincerely,

A handwritten signature in black ink that reads "T Stephens".

Dr Tim Stephens

References

- Climate Change Authority, *Reducing Australia's Greenhouse Gas Emissions: Targets and Timetables Review – Final Report* (2014).
- CSIRO and BoM, *State of the Climate 2014* (2014).
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- Howden, M and C Stokes, 'Adapting Agriculture to Climate Change' in CSIRO, *Climate Change: Science and Solutions for Australia* (2011) 85.
- Howden, M, S Schroeter and S Crimp, 'Agriculture in an Even More Sunburnt Country' in Peter Christoff, *Four Degrees of Global Warming: Australia in a Hot World* (Routledge, 2014).