

Submission to the Senate Select Committee into Lessons to be Learned in Relation to the Australian Bushfire Season 2019-20

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Summary and recommendations

2019 was the hottest year on record for Australia, and was also the driest year on record for Australia. Aspects of the 2019-20 fire season were unprecedented. Climate change has already influenced the likelihood and severity of heat and fires extremes experienced. Increases in fire weather and severity are projected for fire-vulnerable regions under future climate change.

Key recommendations:

1. Commitment to zero net emissions by 2050
2. Commitment to climate adaption through funding collaborative research centre on climate adaption
3. Commitment for funding for research centres on climate extremes and natural hazards.

Background: scientific expertise

I am a leading scientific expert researching climate variability and climate change in Australia. My specific focus is on observed and projected changes in weather and climate extremes, such as heatwaves. I have published peer-reviewed scientific articles on heatwaves, drought, heavy rainfall and bushfires in Australia. I am currently a Lead Author on the Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report (AR6). These assessment reports are comprehensive and authoritative assessments of the state of knowledge on climate change written for a non-scientific audience. Reports aim to assist governments worldwide to progress evidence-based policies around climate change. I am the current ACT Scientist of the Year. I volunteer for the NSW State Emergency Service (SES) and provided support to the Rural Fire Service (RFS) during the 2019-2020 season.

1. Adequacy of existing measures and policies to reduce future bushfire risk, including in relation to assessing, mitigating and adapting to expected climate change impacts [Terms of Reference (d)]

2019 was the hottest year on record for Australia, and was also the driest year on record for Australia. The low rainfall was equivalent to that experienced during the Millennium Drought. All capital cities were warmer and drier than average. Widespread severe fire weather occurred throughout the year, nationally it was the Forest Fire Danger index was the highest since 1950. In 2019, new records were set for high daily Forest Fire Danger Index (FFDI) in all states and territories throughout spring. 95% of Australia had FFDI values in spring in the highest 10% of values recorded ever.

Climate change has already influenced the likelihood and severity of heat and fires extremes experienced. Extreme fire weather has increased over the last 30 years in south and east Australia. The bushfire season is now longer and there are more extreme and catastrophic fire danger days. More regions are experiencing high fire danger days. Increases in fire weather and severity are projected for fire-vulnerable regions under future climate change. The number of 'very high' and 'extreme' fire

danger days is projected to increase as the average temperature increases further by 4%–25% by 2020 and by 15%–70% by 2050.

Current Federal Government policies on climate change mitigation and adaptation are inadequate for avoiding the impacts of worsening heat and fire extremes for Australia. The 2019-20 bushfire season occurred in the context of global average warming of 1 degree Celsius, with current international emission reduction pledges projected to result in over 3 degrees Celsius of global warming. First, greenhouse gas emissions must be reduced significantly and rapidly to reduce the severity of climate change impacts. A goal of zero emissions is necessary. Second, we must prepare for longer, more severe fire seasons occurring over larger spatial areas.

2. Best practice funding models and policy measures to reduce future bushfire risk, both within Australia and internationally [Terms of Reference (e)]

Australia has deep expertise in research into the physical science of climate extremes, climate risks and natural hazards. Expertise is housed in various university and government research centres, including the Bureau of Meteorology and CSIRO. Collaborative research centres including the Australian Research Council's Centre of Excellence for Climate Extremes and the Bushfire and Natural Hazards CRC provide critical information for preparedness for extremes. Such centres are funded through short term funding models, which leaves us vulnerable to critical knowledge gaps. In addition, there is no dedicated collaborative research centre focused on climate change adaption. This is a critical gap in funding to reduce future bushfire risks.