

Time submitted: 21/04/2020 03:17:04 PM

Submission Number: NND.001.00578

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What is your submission based on? I am making this submission based on my professional knowledge, qualifications or experience or on behalf of a group or organisation

What is your area of professional expertise?

If you are lodging your submission on behalf of a group or organisation, what is the name of the group or organisation? DefendTex Research Labs Pty Ltd

Your Submission

In your experience, what areas of the bushfire emergency response worked well?

In your experience, what areas of the bushfire emergency response didn't work well?

In your experience, what needs to change to improve arrangements for preparation, mitigation, response and recovery coordination for national natural disaster arrangements in Australia?

Is there anything else you would like to tell the Royal Commission?

Do you agree to your submission being published? Yes I agree to my submission being published in my name

Supporting material provided:

DefendTex Submission to the Royal Commission into National Natural Disaster Arrangements April 2020.pdf



DefendTex Research Labs Pty Ltd¹

Innovation in firefighting technology in the Australian context

Submission to the Royal Commission into National Natural Disaster Arrangements

Authors J Donnelly² and T Reddy³

Introduction

Australia is experiencing unprecedented climatic conditions leading to wide spread outbreaks of fire across rural and fringing urban areas. The direct impact of these conditions has been catastrophic loss of life, property, business and extensive environmental loss of wildlife and habitat⁴. Widespread deterioration in environmental health including respiratory and other illness, has ensued in Australia's most populous cities. One of the further astonishing features of this fire season, has been the relentless nature of the fire emergency, stretching emergency services and volunteers to their limits.

Australia is regarded as one of the most experienced firefighting nations in the world, and yet this season, communities and government have been blindsided by the intensity and vehemence of the firefighting task. Despite several significant fire events in recent decades, including a Royal Commission into the Black Saturday Bush Fires, the focus of legislatures and governments has been on the community education and bush fire preparation. It could be argued that the Royal Commission recommendations have been effective as evidenced by the relative low loss of life in this recent campaign. However, the social and economic cost of this recent season has never been higher.

Following the 19/20 bush fire season, perhaps now the focus of government should shift to strategic fire prevention. This white paper considers the role of new technology in fire prevention and civil defence and argues that government should consider the role of innovation in responding and preparing for future fire emergencies.

¹ DefendTex was established in 2014 and is an Australian owned company based in Victoria. The company invests significantly in research and development in defence and law enforcement areas.

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⁴ Dickman, Chris, University of Sydney, *A Statement about the 480 million animals killed in NSW bushfires since September*, January 2020



Firefighting technology status

Firefighting technology has not significantly changed over the past 50 years. Although there have been improvements to firefighter safety equipment, surveillance and communications for instance, the general approach to fighting fires using manned ground and air assets to distribute water and other fire suppressants, remains substantially the same. Grounds vehicles and aircraft continue to put the firefighter safety at risk by placing personnel near fire fronts. The asset and operational architecture of current firefighting organisations relies heavily on carrying water and other types of fire suppressants over long distances at great expense. Access to water both contaminated and uncontaminated is becoming increasingly problematic as Australia experiences sustained drought conditions. Some have argued that the distribution of water on fires is largely ineffective. Alternative fire suppressants in the form of chemical suppressants have left, and continue to leave, a toxic legacy for firefighting personnel and communities and there is a diminishing justification for use of such materials. Governments should explore the long-term use of fire-fighting assets and move to more strategic, non-toxic alternatives. Although some people working in fire management are calling for funding to purchase more expensive air assets⁵ without compelling evidence that they are effective in a 'mega' fire storm⁶. Some of the concerns associated with dropping water over large bushfires is that the water evaporates before the water reaches the source of the flames at the base of the fire. Another operational constraint is that such aircraft can only be utilised in daylight in low winds and reasonable visibility. In the present fire emergency, the fire threat has continued through the night.

2009 Victorian Bushfire Royal Commission

The terms of reference for 2009 Victorian Bushfire Royal Commission (hereafter the Bushfire Royal Commission), established the lines of enquiry of a range of topics including *inter-alia*, causes and circumstances of bushfire prevention, preparation and planning, current laws, policies and practices and the assessment of bush fire risks. The Bushfire Royal Commission also included the examination of "training, infrastructure and overall resourcing needs" associated with bushfires prevention. The Commission recognised that many research gaps existed to enable future generations to build capacity and capability in minimising the effects of major bush fire events in the future. Notably, the Commission had concluded that among a complex range of causes of the catastrophe, there has been little investment in new technology⁷.

⁵ Hasham, Nicole, The Sydney Morning Herald, "We need our own Elvis: Former fire chiefs warn Australia is unprepared for bushfire peril", March 12 2019. <https://www.smh.com.au/politics/federal/we-need-our-own-elvis-former-fire-chiefs-warn-australia-is-unprepared-for-bushfire-peril-20190311-p5139j.html>

⁶ Tomlin, Sam, ABC News, "Water Bombers a waste of money for preventing catastrophic bushfires says veteran fire researcher", 3 February 2016. <https://www.abc.net.au/news/2016-02-03/veteran-fire-researcher-labels-water-bombers-a-waste-of-money/7134574>

⁷ 2009 Victorian Bushfire Royal Commission, *Final Report Summary*, July 2010, p11



Bushfire and Natural Hazards Cooperative Research Centre and Agency Responsibility

The Bushfire Cooperative Research Centre (now the Bushfire and Natural Hazards CRC) has been established to coordinate national research into a range of natural hazards including bushfires. Research partners include the Bureau of Meteorology, Geoscience Australia, universities and international research organisations. There are virtually no industry participants in this CRC and very little emphasis on the development of new technology in the research program⁸. Much of the research is focussed on social and economic research and institutional strengthening to aid community resilience in bushfire and natural disaster management and recovery.

There is currently no Commonwealth body with responsibility for bushfire and natural disaster research and development. This could potentially be a responsibility of Emergency Management Australia, to coordinate and evaluate funding and government investment in new technology.

Recommendation: The time for innovation

The economic cost of Australia's bushfires will be in the billions in lost property, productivity and recovery. A small percentage of the current emergency management budget should be diverted to research and development into developing the next generation of firefighting technologies. Australia has much experience in natural disaster and bush fire management and could be a world leader in bush fire innovation leading to significant export growth.

Current research platforms such as the *Bushfire and Natural Hazards CRC* has not led to innovation and new technology in bushfire prevention and control. A new funding mechanism must be dedicated to encourage innovation in more effective fire prevention and firefighting technology.

DefendTex Research Labs recommends that new powers be provided to Emergency Management Australia, or other Commonwealth bodies to develop a framework for funding to encourage the development of new technology and innovation to build resilience in Australia's management of natural disasters.

⁸ Bushfire and Natural Hazards CRC, *Research Projects, Achievements and Outcomes* (undated)