Submission to the Royal Commission into National Natural Disaster Arrangements

20 April 2020

Introduction

This submission to the Royal Commission into National Natural Disaster Arrangements is provided by the ACT Climate Change Council. The ACT Climate Change Council (hereafter, the Council) was established by the ACT Government in 2011 under the Climate Change and Greenhouse Gas Reduction Act 2010, and advises the Minister for Climate Change and Sustainability on matters relating to reducing greenhouse gas emissions and building resilience and adapting to climate change. Council members are appointed to cover a range of experience and expertise in social, scientific, economic, transport and construction fields.

Our submission primarily addresses issues of resilience, adaptation and mitigation listed under item (b) of the Letters Patent. It is informed not only by the diverse opinions and expertise of the ACT Climate Change Council members, but also by the results of three community forums that the Council held in March 2020 with about 50 members of the Canberra community.

Reducing Climate Change

We specifically note that the Commission's terms of reference avoid discussion of the contribution of climate change to the risk of natural disasters such as bushfires. Nonetheless, no rational or balanced discussion of the reduction of impacts can exclude consideration of the causal factors underlying the occurrence of natural disasters. The best and most recent scientific analysis shows that human-induced climate change is very likely to be making disasters such as the recent bushfires more frequent and more intense. On-the-ground observations and climate models show that the Fire Weather Index (FWI) has been increasing with time. Specifically, the World Weather Attribution Centre computed that the extreme values of FWI experienced in south-east Australia in 2019/20 have increased by at least 30% since 1990 due to human-induced climate change. Projected into the future, this work shows that 2019/20 FWI levels will be at least four times more likely with a 2ºC temperature rise, the upper end of the Paris targets[1].

Dangerous fire weather conditions in south-east Australia are well-known to be driven by four key factors: 1) drought conditions, 2) high temperatures, particularly daytime temperatures 3) low relative humidity and 4) strong winds. The drought experienced in 2019 is one of the most severe (if not the most severe) in the historical record. Australia had

[1] See: www.worldweatherattribution.org/bushfires-in-australia-2019-2020. More details can be found in G.J. van Oldenborgh, et al. Attribution of the Australian bushfire risk to anthropogenic climate change. Natural Hazards and Earth System Sciences (2020). https://doi.org/10.5194/nhess-2020-69

the lowest rainfall on record and the highest temperature on record (for example, the average maximum temperature was 2.09°C above the 1961-1990 baseline).[2]

The increases in temperature have been definitely attributed to climate change, whereas reductions in rainfall are more complex. In SW and SE Australia there is a clear fingerprint of climate change in the long-term trends to lower rainfall, but the effect is less clear in other regions. The 2019 drought was in particular influenced by the strong positive Indian Ocean Dipole (IOD) with this being the strongest event in the historical record. The frequency and intensity of positive IOD events increased during the twentieth century and may continue to intensify in a warming world.[3] Drought conditions are particularly important as 1) they cause leaf drop, increasing fuel load and 2) because they reduce fuel moisture, increasing ease of ignition. In addition, the relative humidity was extremely low due to long-term trends associated with climate change[4] and the drought conditions during 2019.

Lastly, many particularly intense fires in the south-east of Australia are associated with strong winds drawn from the hot continental interior that are channelled ahead of powerful cold fronts. These appear to be getting more frequent and stronger with climate change, and are projected to increase by up to a factor of four by the end of this century. These and other connections of fire risk with climate change mean that in the view of the Council it is necessary to include climate change in this inquiry.

Australia is a key player in determining the speed and magnitude of global climate change. Our country is responsible for a significant part of the world economy and is a major exporter of fossil fuels, the combustion of which is the single biggest driver of global heating. Unfortunately, to date Australia has arguably hindered rather than enhanced international consensus processes for climate change mitigation. One of the prices we pay for this position is the increasing scale and ferocity of climate-driven disasters.

If we want to protect the Australian way of life for our children and their children, we must act to reduce our contribution to greenhouse gas emissions as a matter of urgency. The starting point for this action would be to establish clear and structured plans for greenhouse gas reduction aligned with the Paris Agreement temperature goals, starting with strong interim targets for 2030. Importantly, many robust analyses have shown that rather than causing economic and social damage, proactive and balanced approaches to addressing climate change will actually lead to a stronger economy without the huge and growing costs

[2] www.bom.gov.au

[3] Abram, N.J., Wright, N.M., Ellis, B. et al. Coupling of Indo-Pacific climate variability over the last millennium. Nature 579, 385–392 (2020). https://doi.org/10.1038/s41586-020-2084-4

[4] Yuan, W., Zheng, Y., Piao, S., 3, Ciais, P., 4, Lombardozzi, D., et al. (2019) Increased atmospheric vapor pressure deficit reduces global vegetation growth. Science Advances, 5. DOI: 10.1126/sciadv.aax1396

in terms of lives, livelihoods, quality of life and the environment that have become all too evident in the 2019-2020 bushfire period.

The recent bushfire crisis and the current COVID-19 crisis has demonstrated that Australia can act radically and effectively to meet short-term crises. However, if we want to avoid such actions becoming an annual event – in effect, destroying the Australian way of life – we must also address the issue of reducing greenhouse emissions with equal urgency and determination.

Adaptation and Resilience

Despite the clear evidence that mitigation of greenhouse gas emissions is urgent, we must acknowledge that the climate has already changed substantially enough that we must adapt to these new conditions. We must also accept that climate change will continue to result in weather patterns that increasingly deviate from historical norms for some time. This means that we have to re-think the goals of fire management, fire planning, fire-fighting technologies and resourcing so that we are ahead of these fire danger changes rather than continually being behind the eight ball.

The bushfire crisis was a terrifying reminder of how completely what we all think of as "normal life" can be disrupted by the heating climate. In our community consultations, we received a great deal of feedback about how the long duration of the fires and the ever-present threat of the smoke led people to become housebound, anxious and isolated. This start to 2020 makes the social isolation and anxiety accompanying the COVID-19 crisis all the more challenging. Every climate-driven disaster exacerbates the difficulty of managing society health and building resilience in these increasingly volatile times.

The Built Environment

In Canberra, it was the scale of the smoke and fires that took everyone by surprise. In previous bushfire seasons, even in the devastating 2003 bushfires, the fires and smoke were – for most – something that happened to other people or that were a problem for a couple of days and then gone. The 2019/20 bushfire season affected people altogether differently. It has been estimated in the Medical Journal of Australia that bushfire smoke pollution from the 2019-2020 fires caused 417 deaths, more than 10 times the number of deaths caused directly by the fires themselves[5].

[5] https://www.mja.com.au/journal/2020/213/6/unprecedented-smoke-related-health-burden-associated-2019-20-bushfires-eastern

It was clear to anyone affected that our building stock was ill-prepared to handle prolonged smoke haze. While directives were given for people to stay indoors, these were of little use through a prolonged smoke event, as most houses lack adequate sealing to be able to keep smoke out. Furthermore, many of Canberra's houses rely on being able to open up windows overnight to access Canberra's cool overnight airs during hot summer months. Weeks of smoke and high temperatures meant that many homes were suffering from both dangerous levels of smoke particulates and extreme overheating for much of December and January. Evaporative air-cooling – a favoured air-conditioning solution in Canberra – was unusable in the presence of hazardous smoke. Traditionally, places like shopping centres and public buildings have been used as respite from heat, but these provided at best limited protection from smoke and in some cases were closed.

To create a more resilient building stock, a number of factors need to be addressed for new and existing buildings.

The Building Code of Australia must be modified to address the need for homes to be able to shut out smoke for longer periods. This, as a minimum, requires increased requirements to minimise air infiltration. Australian buildings are very "leaky" by comparison to many overseas countries[6], with air leakage rates more than 5 times higher than would be considered good, let alone best, practice. Rectification of this issue is largely an issue of workmanship and has been successfully regulated at low cost in many countries.

Consideration should be given as to whether homes should be required to have outside air ventilation systems, such as specified in Passive House projects, which provide filtration and heat recovery of outside ventilation in order to avoid condensation issues. Improving the sealing and ventilation of Australian homes would also have significant benefits for the energy efficiency, health and day-to-day comfort of homes.

Also needed is further consideration of a re-specification of filtration requirements for outside air ventilation systems in buildings housing the vulnerable (hospitals, rest homes) or likely to be used as refuges (offices, shopping centres). While permanent use of smoke-capable filtration would be both expensive and unnecessary, consideration should be given to ensuring that these sites can install smoke-capable filters at short notice to enable the internal environment to be protected during smoke events.

[6] The National Database of Air Building Tightness Tests (http://aivaa.asn.au/action trashed/national-database/), which is likely to be biased towards better buildings, indicates a median tightness in the region of 11-13ACH50 for Australian homes, with some sites well over 30ACH50. By contrast, the Passive House standard, which represents international best practice, is 0.6ACH50. (ACH50 is the number of air-changes per hour when the house is pressurised to 50Pa)

The Natural Environment

Warmer temperatures and modified rainfall patterns have been observed as a result of climate change in Australia. Even before the 2019/2020 fires, extensive areas of stressed and dying trees had been observed and attributed to the hotter and drier climate.

These climate changes have had substantial impacts on vegetation, including a reduction in its resilience and resistance to disturbances like pests, fire and heavy rainfall events. Fires have begun to repeatedly burn at a rate that severely disrupts the regeneration and survival of long-term perennials, especially obligate seeders like Alpine and Mountain Ash. This change will increase the relative cover of short-lived species and annuals, which will increase the potential for further fires by increasing fuel loads. Furthermore, the heat and altered rainfall pattern has caused creeks and waterways, which otherwise would act as fire refuges for plants and animals, to become relatively dry and affected by high levels of litter and fine fuel during the fire season, thereby turning what might be a fire refuge into a major fire hazard. Such changes have a disproportionate effect on survival of fauna and re-establishment speeds for flora and may substantially change the appearance and function of the Australian bush.

Adaptation to these currently observed changes of vegetation to reduce the vulnerability of flora and fauna are essential. However, management must still ensure that there is a spatial heterogeneity of vegetation and not simply burn large contiguous tracts of land to reduce the fine fuel loads. Biodiversity relies on various levels of litter, woody debris and other forest structures. Management must consider a diversity of objectives of different relative importance (e.g. asset protection in some areas, but encouragement of regeneration and better structural diversity in others). Large contiguous areas of relatively homogenous age, species and structure is at high risk for further disturbance and loss from fire or pest and disease attack.

A diversity of tools must be developed to allow for practical management of the various structural elements within the natural environment to achieve a diversity of objectives. Near human settlements or high-value assets, for example, minimisation of the quantity and spatial arrangement of fine and coarse litter and the removal of standing dead and a proportion of living trees may be prioritised and justify the use of mechanical systems for precision control. The objectives for forests further away from high value assets may prioritise the development of a diversity of age classes and an early return of large dimension coarse woody debris in locations to support biodiversity. These objectives may be met by a variety of relatively small, highly controlled fires in combination with human and mechanical support.

Access to all areas of the natural environment for active management and rapid response to unplanned fire is essential. However, further research is required to develop approaches

that minimise the negative impacts of access on sensitive fauna, while still allowing feasible use of machinery in a timely manner.

Information

Our consultations with the Canberra community confirmed repeatedly the importance of reliable, real-time information in assisting community members with managing their lives during the bushfire crisis. Positive feedback was received for the regular and trusted updates by Georgina Whelan, the ACT Emergency Commissioner, for the Bushfires Near Me website and app provided by the NSW Rural Fires Service, and for the reporting on ABC Community radio.

Nonetheless, there were key areas where members of the community felt that information exchange could have been improved:

1. Real-time information on road closures. It was felt that information on road closures was not adequate for the fast-moving situations associated with bushfires on the urban fringe and around regional roads.

2. Realtime information – and more measurement points - on smoke and air quality. The ACT Health website and Air-rater app were commonly referenced by the public as a means of managing activity. However, there are only three measurement points in the ACT and few in surrounding areas of NSW. Furthermore, for much of the crisis, the information was provided as a 24-hour average, which bore limited relation to the lived experience of people. In reality, smoke density could change from relatively clear to quite hazardous in a short period of time – and vice versa – but the 24-hour average would not report this, leading to erroneous decisions.

3. Predictive information. While it is understood that predictive information on smoke movement is difficult to derive, even short-term predictions would have been useful to the public, but were unavailable. It was also felt that warnings could have been made more effectively in association with the destructive hail event, given that the intense storm cell was being tracked on the Canberra weather radar.

4. Multi-cultural language services. We received specific feedback from representatives of the multi-cultural community that the availability of emergency information for those with poor English was inadequate. They suggested that a chain of communication between agencies and peak cultural organisations, as well as improved information flows to non-English language community radio stations, would help address this need. Furthermore, they suggested that all emergency

information on the web should be accompanied by Google translate facility or similar to assist in rapid translation for non-English speaking members of the community (providing that it can be shown to be sufficiently accurate not to cause misdirection).

Community

Throughout our community consultations, it was clear that attendees felt that a strong local community was essential for resilience in the face of adversity. A strong community means that people know their neighbours, can help support and protect the vulnerable, and share resources. However, such strength of community does not always exist, leaving individuals to face disasters alone. The development of such strength of community is complex, but starts with town planning considerations around transport and community spaces that bring neighbours into casual contact as they go about their daily business. The car-based structure of Canberra's suburbs – and those of most Australian cities – promotes isolation rather than community. Isolation in turn engenders poorer mental health in general and higher levels of stress during disaster in particular.

The strong and important role of community-based organisations like the Rural Fire Service was widely acknowledged in our community consultations. There is a case to be made that other layers of community support both existing and not currently existing should be engendered and supported at a similar level to take care of people's health and wellbeing during crises. In a crisis, everyone is vulnerable and in need of support.

Conclusions

The bushfire crisis, the associated smoke event and the subsequent destructive hailstorm affected the ACT, its environment and its citizens in unprecedented and unexpected ways. To build resilience, all of Australia must learn from the past months and build new processes, regulations and structures that:

- Address the causal factors driving the frequency, intensity and duration of natural disasters, and most particularly rapidly reduce the human induced greenhouse gas emissions that are driving climate change.
- Develop adaptation measures that include climate change so that we can proactively manage changing risk rather than reactively responding after the fact.
- Provide refuge in homes and buildings for people where they can be shielded from the health impacts of smoke and heat.

- Develop a diversity of hazard reduction approaches that include mechanical as well as fire-based approaches. Hazard reduction objectives should be integrated with asset protection and biodiversity / forest age class and structure requirements.
- Provide up-to-date and accurate information and predictions in formats accessible to all citizens to keep them informed during crises.
- Build and resource communities in ways that ensure that everyone is supported during a crisis.

The ACT Climate Change Council would welcome the opportunity to present more information in support and in relation to this submission should the Commissioner request this.

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This document is submitted on behalf of the full Council