Submission to the Senate Committee in regards to the referred inquiry "*Lessons to be learned in relation to the Australian bushfire season 2019-2020"*

Introduction

Dear Senate Committee,

As members of the Homeward Bound community, we are writing to you as one of the largest international networks of women in STEMM (Science, Technology, Engineering, Mathematics and Medicine)[1]. Our expertise covers human and nature interactions: we are scientists, medical doctors, engineers, teachers, farmers and researchers.

As women in STEMM, we offer our expertise to support Australia in leading the changes that are required to both mitigate and adapt to the unprecedented crises that humanity now faces in the form of human-induced climate change. This challenge requires courageous leadership where an innovative and affluent nation like Australia - the 'Lucky Country'[2] - should play a leading role. In return, there will be economic and social benefits.

Key points

- As the devastating impact of climate change escalates, we believe it is necessary to honour our moral obligation to future generations and speak up with the power of our collective knowledge.

- Further evidence that Australia is facing a climate crisis is unnecessary. The crisis needs to be acknowledged and immediate action taken.

- The cost of inaction far outweighs that of being proactive. Until carbon neutrality is achieved, Australia will move along a downward economic, environmental and social trajectory. There are vast opportunities and natural advantages for Australia to be at the forefront of a low-carbon global economy.

- We believe Australia can and should champion intelligent and creative responses to climate change by committing - as a minimum - to the pledges made at Kyoto[3] and Paris[4] and lead by example towards a better future, particularly in view of the direct impacts the country is currently experiencing.

- A shift to 100% renewable energy in Australia powered by the sun and wind would pay for itself through cost savings within only two decades.

<u>Term of reference (d)</u>: The adequacy of the Federal Government's existing measures and policies to reduce future bushfire risk, including in relation to assessing, mitigating and adapting to expected climate change impacts, land use planning and management, hazard reduction, Indigenous fire practices, support for firefighters and other disaster mitigation measures

Scientific evidence on climate change

Since 1990, climate experts have been providing regular comprehensive scientific assessments on climate change and its implication for the future of our planet via the Intergovernmental Panel on Climate Change (IPCC)[5]. The scientific community agrees on four potential global warming trajectories based on greenhouse gas concentrations[6], all showing that the planet is warming at an unprecedented rate, with the global temperature projected to increase by as much as 4.3°C on average by the end of the century if no action is taken[7]. This rapid increase in temperature is recognised by the IPCC to be human-induced and will, without doubt, lead to dramatic consequences for both human and natural systems. These consequences include the melting of polar ice-sheets, sea level rise, mass species extinctions, loss of biodiversity and extreme weather events (floods, bushfires, tropical storms and hurricanes)[8].

As a response to the climate crisis, the 2015 Paris Agreement was signed by nearly 200 countries, including Australia, to set the limit of the increase in global average temperature to a maximum of 1.5°C[3]. Achieving this goal requires immediate global action to reduce carbon emissions. This means Australia must switch from burning fossil fuels to clean renewable energy. Yet, more than 4 years after the Paris Agreement, Australia is still amongst the highest emitters of carbon dioxide per capita in the world[9]. This is despite Australia having one of the world's highest solar capacity[10], which offers immense potential to transition to clean renewable energy. As a wealthy, stable and intelligent country, we must do better.

Australia is facing a climate crisis

Thirteen years ago, a consultancy report was prepared in collaboration between Bushfire CRC, the Australian Bureau of Meteorology and CSIRO Marine and Atmospheric Research for the Climate Institute of Australia. This report provided evidence that fire danger will increase by as much as 10% in Australia by 2020, and by as much as 30% by 2050, with the greatest change being expected in the northern New South Wales[11].

From December 2019 until early March 2020, the East Coast of Australia experienced the worst bushfires in history in terms of duration and intensity, burning 18.6 million hectares of bush and forest, destroying thousands of homes, killing 33 people[12] and more than one billion animals[13]. Impacts of the Australian bushfires were exacerbated by the subsequent flooding, which was predicted to follow the drought, with heavy rainfalls unable to be retained by soil lacking in vegetation[14]. The bushfires were catastrophic, not only for wildlife habitat and ecosystems, but also for human health[15]. These include direct effects, such as bushfire fatalities, injury and heat stress, as well as indirect health impacts, including infectious disease, mental trauma, respiratory illnesses and water scarcity. The economic, social and health impacts on these regions and the nation will be felt for months and years to come.

The annual climate statement showed that 2019 was the warmest and driest year on record, with an annual national mean temperature 1.5°C above average and the nationally-averaged rainfall being 40% below average[16].

In 2016 and 2017, the Australian Great Barrier Reef (GBR), which is the world's largest coral reef system, experienced two unprecedented consecutive temperature-driven mass bleaching events, killing more than 50% of its coral community[17] and undermining a natural shelter for what is an area of the greatest marine biodiversity on Earth[18]. In 2020, the GBR experienced its third mass coral bleaching in five years, which has been confirmed as the most widespread GBR bleaching event ever recorded, expanding further than before to include southern refuges[19]. Clearly, this natural wonder is calling for urgent help and the destruction of a globally-recognised Australian cultural, economic and social icon undermines our international reputation.

In 2011, incessant rainfall and category 1 cyclone Tasha led to one of the top 10 floods in Australian history, affecting Queensland from south to north, flooding 28,000 homes and killing 35 people[20]. These climate crises are affecting our nation on a major scale.

Australia should be a world-leading country in renewable energy

Growing numbers of countries around the world have adopted extensive policies around renewable energy, with Iceland, Costa Rica and Norway leading the way[21]. Given that Costa Rica is still classified as a developing country by the International Monetary Fund[22], it is astonishing to see that Australia, classified as a top 20 country in regards to economy, education, health, lifestyle and biodiversity[23], falls way behind. This is deeply concerning, especially when reports of experts from nine different organisations indicate that a total shift to a renewable energy system in Australia powered by the sun and wind is not only technically feasible but economically responsible as it would pay for itself through cost savings within only two decades[24]. Recent analyses even show evidence that new-built renewables are now the cheapest option to generate power for two thirds of the global population, including Australia[25], meaning that Australia could not only become a competitive manufacturer for new-build technology but also claim energetic autonomy by 2030.

Our suggestions to the Australian Government

We expect immediate and pragmatic measures from our Australian leaders, with the most urgent action being a transition from coal to renewable energies. Australia has a huge potential for solar as well as wind- and water-generated energy systems[26]. Urgent investment is needed in the infrastructure required to allow mixed-source renewables and to support policy for more local actions.

Diversity is essential at the decision-making table. As such, indigenous communities and other under-represented groups need to be included. Acknowledging and valuing the traditional owners of Australia is key to understanding sustainable land management practices and to open the pathway for healing and knowledge sharing.

Alongside switching from coal to solar and wind energy on land, the latest IPCC report offers ocean-based solutions, which alone could account for 25% of the total greenhouse gas emissions that need to be reduced by 2050 to meet the 1.5°C maximum increase in temperature set by the Paris Agreement[7]. Some of these solutions include using ocean-based renewable energy, decarbonising maritime transportation, protecting blue-carbon ecosystems such as seagrass, mangrove and saltmarsh, and storing atmospheric carbon in the ocean seabed. Introducing policies and incentives to slow land clearing will also reduce emissions from deforestation as well as provide resilience to future climate impacts as Eastern Australia is

increasingly becoming a world deforestation hotspot[27]. We currently have the resources and technology available to make these solutions actionable as a matter of policy and priority.

<u>Term of reference (g)</u>: the role and process of advising Government and the federal Parliament of scientific advice

Our planet needs effective and responsible leaders to make decisions that will make a positive difference for the environment and for the generations to come. Here is an opportunity to become role models for our people, Australia and other countries that have already started to move their economy to renewable energy. We implore you to take into consideration the scientific evidence of climate change and address the climate crisis with leadership.

This implies following recommendations from panels of experts such as the IPCC, Australian Academy of Science (AAS) and Australian Academy of Technology and Engineering (ATSE), who provide independent and impartial scientific advice. As a community of women in STEMM, we also offer our expertise to support Australia in leading the change, and would be honoured to contribute to making Australia a world-leading country in renewable energy.

Yours in anticipation,

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References

[1] Homeward Bound; [2] The Lucky Country 50 years on; [3] Kyoto protocol; [4] Paris protocol; [5] Climate change: the IPCC 1990 and 1992 assessments; [6] IPCC fifth assessment report; [7] IPCC Special Report on the Ocean and Cryosphere in a Changing Climate, summary for policymakers; [8] The Garnaut Climate Change Review; [9] The Guardian: "Australia worst carbon emitter per capita among major western nations"; [10] The Global Solar Atlas; [11] Consultancy report: Bushfire weather in southeast Australia: recent trends and projected climate change impacts.; [12] BBC News: "Australia fires: A visual guide to the bushfire crisis"; [13] ABC News: "Have more than a billion animals perished nationwide this bushfire season? Here are the facts"; [14] News.com.au: "Climate expert warns worst is yet to come with cyclones and floods predicted"; [15] Australian Government Department of Health: "Health alert: bushfires and smoke"; [16] Australian Government Bureau of Meteorology: "Annual climate statement 2019"; [17] National Geographic: "Half of the Great Barrier Reef Is Dead"; [18] Great Barrier Reef Foundation: "Biodiversity on the reef"; [19] The Guardian: "Great Barrier Reef's third mass bleaching in five years the most widespread ever"; [20] Twisted History: "Australia's top 10 deadliest floods"; [21] Click Energy: "12 Countries leading the way in renewable energy"; [22] International Monetary Funds: "World Economic and Financial Surveys, World Economic Outlook, Challenges to steady growth"; [23] Australian Government, Department of Foreign Affairs and Trade: "Australia is a top 20 country"; [24] Repower Australia Report: "A plan to repower Australia"; [25] BloombergNEF report: "Scale up of solar and wind puts existing coal gas at risk"; [26] The Guardian: "What would Australia look like powered by 100% renewable energy?"; [27] The Guardian: "Global deforestation hotspot: 3m hectares of Australian forest to be lost in 15 years".