"We are well past the time of niceties, of avoiding the dire nature of what is unfolding, and politely trying not to scare the public. The unparalleled setting of new heat extremes is forcing the continual upwards trending of warming predictions for the future, and the timescale is contracting."

Liz Hanna, convener of the human health division at the
Australian National University's Climate Change Adaptation Network
The Age, 9th January 2013

Dear Senators,

Re: Recent trends in and preparedness for extreme weather events

Thank you for the opportunity to make a submission on this critical issue.

This submission is made on behalf of Healesville Environment Watch Inc. and C4 (Communities Combating Climate Crisis) Healesville. Our groups are based in Healesville, at the foot of the Great Dividing Range but operate over a wider area adjacent to the forested Victorian Central Highlands. We were impacted by the Black Saturday fires, which occurred during the unprecedented extreme weather in early 2009. Our submission to the Victorian Bushfires Royal Commission is attached. Also attached are explanatory brochures we have prepared on Bushfires and Extreme Weather (published by the Climate Emergency Network).

The submission addresses a number of issues relating to the Inquiry's Terms of Reference. We do not propose to restate the voluminous scientific evidence demonstrating the present reality of climate change that is already available in authoritative reports from bodies such as the IPCC[1], the Climate Commission[2], CSIRO[3] and the Bureau of Meteorology[4]. However there are several related matters to which we wish to bring your attention.

(a) Recent trends on the frequency of extreme weather events
The observed increased frequency of a range of extreme weather events within Australia and around the world in recent years,

[1] IPCC *Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (SREX), March 2012
[2] **Off the charts: Extreme Australian summer heat**, January 2013
[3] **Understanding the causes and impacts of extreme weather events**, November 2012
[4] **Special Climate Statements, including Extreme January Heat**, January 2013

* is consistent with the predictions of climate scientists over many decades[5], and
* is not satisfactorily explained by any other known phenomenon[6].

(b) Comment on reports of the Intergovernmental Panel on Climate Change

While the IPCC is undoubtedly the premier authority on agreed climate science, the Inquiry should be cognizant that, while comprised largely of active scientists, the IPCC itself does not carry out original research but compiles, summarises and synthesizes the research conducted and published by the global scientific community. This process of careful deliberation strengthens the results but is necessarily slow, introducing a significant lag between new science and its inclusion in an IPCC report. In addition published IPCC reports represent a consensus position agreed by all participating governments. Achieving consensus introduces further delay and also means that the process is inherently and unavoidably conservative[7]. Nothing is published that any participating government will not support, for whatever reason. IPCC reports therefore do not generally focus on "worst case projections".

Prudent planning for emergency situations is often summarized as, "plan for the worst and hope for the best". Therefore the limitations noted above must be allowed for when using IPCC reports as the basis for responding to climate change, as this inquiry does.

(b)(i) Comments on Projections on the frequency of extreme weather events

1. Consistent with the above comment on the reports of the IPCC, it has been documented that:

* Global Carbon emissions have continued to rise "at the high end of a range of emissions scenarios"[8];
* Past projections of several climate related phenomena are already being exceeded and/or are being realized sooner than expected.[9]

2. Because of the classic "bell" curve shape of graphed normal distribution of weather records, a small increase in the mean results in a disproportionately large increase in high records, past extremes become relatively common and new high extremes are established[10]. This is all being noted in current records and is expected to continue.

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[5] **Climate change conforming to UN predictions: scientists**, ABC News Online, 10th December 2012

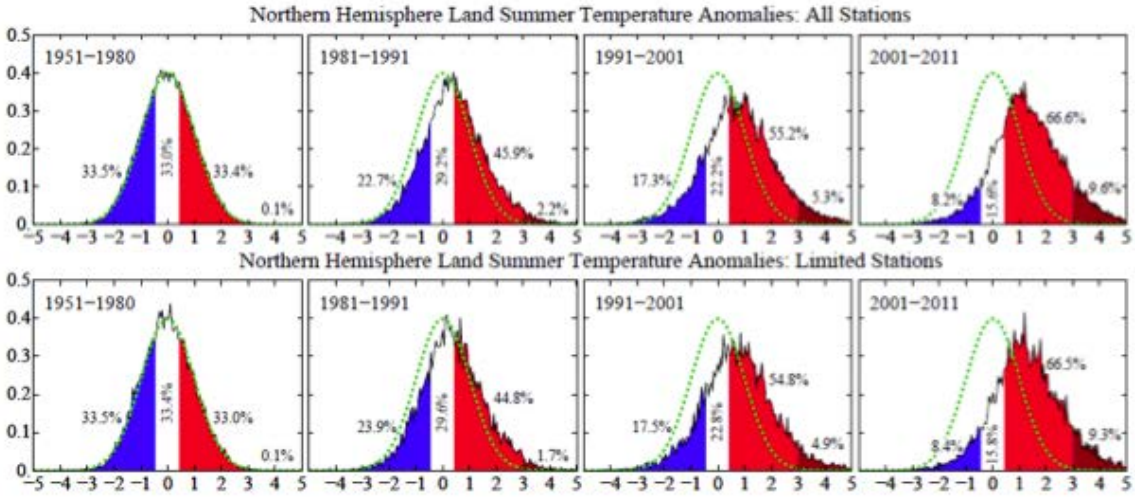
[6] Rob Painting, **Observed warming of the Ocean and Atmosphere is Incompatible with Natural Variation**, Skeptical Science, 9 January 2013

[7] Glenn Scherer, **Report: IPCC Underestimates Climate Risks**, Climate Central, 10th December 2012

[8] **The widening gap between present emissions and the two-degree target**, CSIRO, 3 December 2012

[9] Glenn Scherer, **How the IPCC Underestimated Climate Change**, Scientific American, 6th December 2012

[10] Climate Commission, **The Critical Decade: Science Update**, May 2011 p. 39



Source: Hansen, Sato & Ruedy, 2013[11]

For example, the figure above illustrates how Northern Hemisphere land summer temperatures have increased. From 1951 – 1980 temperature anomalies matched closely to normal distribution, indicated by the green curve, with cold, typical and normal seasons occurring in approximately equal proportions. By 2001 – 2011 the frequency of hot seasons had doubled, becoming the "New Normal". Typical seasons had halved and cold seasons were one-quarter as frequent. Weather that in the earlier period was considered extremely hot had become more than ninety times as frequent, becoming more common than cold seasons.

3. The surface temperature does not increase evenly around the Earth. Oceans are slower to warm than land and two-thirds of the planet's surface is covered by water. This means that a 4°C increase in the global average infers a 3°C rise over the oceans and a 6°C rise over land-masses, where people live.

4. Global warming of 1 to 5 degrees by 2070 (projected by the IPCC and CSIRO) implies that multiple "tipping points" will have been passed. If this is the case, then the temperature will not stabilize at that level but will continue to increase into the 22nd century and beyond, possibly not leveling off before reaching 11°C or more, resulting in a planet unlike any that mankind has ever experienced.

These are important considerations because, as stated above, in planning for emergencies the general rule of thumb is, "Plan for the worst and hope for the best." In contrast the approach adopted by the Australian, and many other national governments, appears to have been, "Plan for better than we can reasonably expect and hope the 97% of expert climate scientists are all wrong, while taking minimal action that gives the misleading appearance of serious engagement."

While the current government is to be commended for finally putting a price on carbon pollution in difficult circumstances this must be recognized as only a tiny first step toward the comprehensive restructuring of Australia's agriculture, industry and economy if global climatic disaster is to be avoided.

[11] J Hansen, M Sato & R Ruedy, **Global Temperature Update Through 2012**, 15 January 2013

This means removing our reliance on fossil fuels for domestic energy production and export. We must cease subsidizing these dirty industries and transfer support to the production of clean energy and development of clean technologies. We must finally abandon the myth of "Clean Coal" and acknowledge that fossil fuels are in fact nature's means of permanent carbon capture and storage. The only clean fossil fuels are those that are left undisturbed where nature has sequestered them, deep underground.

Because the advice of climate scientists has been ignored for several decades too long, the Earth's atmosphere already contains around 394 parts per million of carbon dioxide[12]. This is higher than at any previous time for 800,000 years, long before modern humans evolved[13]. Again nature provides a solution that we undervalue at our peril. Green plants absorb and store carbon dioxide and the moist and wet sclerophyll forests of Tasmania and south-eastern Australia are among the most carbon-dense forests in the world. We must stop clear-felling these concentrated carbon banks and support regeneration of those areas that have previously been disturbed by logging and fire.

Our forests themselves are sensitive to climate change and if we fail to urgently adopt a new paradigm of conservative husbandry we will lose them forever, together with the unique and valuable ecosystems they support and the ecological services they provide[14]. Amongst these services is the absorption of carbon dioxide, so loss of forests to climate change will exacerbate further climate change – just one example of many feedbacks likely to occur without urgent and effective action by Australia and the global community.

Yours faithfully,

Steve Meacher
Chairman, HEWI and
Spokesman for C4

[redacted]

[redacted]

Att: HEWI/C4 Submission to the Victorian Bushfires Royal Commission 2009
Bushfires and the Climate Emergency
Extreme Weather and the Climate Emergency

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[12] Earth System Research Laboratory, **Recent Global CO_2**, November 2012
[13] CSIRO, **State of the Climate Report 2012**
[14] D Lindenmayer, **Victorian forestry is definitely not ecologically sustainable**, The Conversation, 17th January 2013