

SUMMARY OF THE PUBLIC LECTURE ADDRESSING THE MYTHS OF CLIMATE CHANGE, 20 SEPTEMBER 2012, AND THE SYMPOSIUM CLIMATE CHANGE SCIENCE: IMPACTS AND ADAPTATION FOR VICTORIA, 21–22 SEPTEMBER 2012

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ADDRESSING THE MYTH OF CLIMATE CHANGE: PUBLIC LECTURE, 20 SEPTEMBER 2012

PROFESSORS Will Steffen, Lesley Hughes and Jon Barnett spoke of the indisputable evidence of climate change, both in the recent past and projections for the future. The evidence, from the basic physics to observations of the climate system, is very strong that human activities, mainly through the emission of carbon dioxide from the burning of fossil fuels, are the main cause of global warming since the mid-20th century. At the current rate, global warming is projected to lead to an increase in the intensity and frequency of extreme events.

Impacts on the infrastructure in Victoria (e.g. on power lines, railways and the capacity to distribute electricity across the state) as a result of extreme events, such as the extreme heat experienced during the summer of 2008–2009 have already been observed. Average temperatures have risen across Victoria by 0.8°C since the 1950s. This trend is forecast to continue for the remainder of the century, resulting in an increase in the number of extreme fire days and a considerable reduction in snow cover in the Alps, which will threaten the alpine ecosystem. Increases in sea levels, which are projected to be up to 1 m, will result in the loss of residential and commercial buildings, sandy beaches, coastal infrastructure, estuaries and wetlands.

Managing these risks is called ‘adaptation’, which promises to help address some of the problems associated with climate change. However, although adaptation strategies will help mitigate some of the consequences of climate change, it would be foolish

to believe that ‘adaptation’ is a panacea. There are limits, but the scale of the change will far outweigh the capacity to adapt, not to mention the cost and complexity of implementing these adaptation strategies.

The current decade is critical and even though it will not be possible to reverse the human-induced climate change, it is possible to limit the change to the climate in the future to allow successful adaptation and eventual reversal of human-induced climate change. It is essential to act now.

These issues are addressed in greater detail in this issue of the Journal in the paper *Climate change in Victoria: trends, predictions and impacts* by Lesley Hughes and Will Steffen (2013).

CLIMATE CHANGE SCIENCE: IMPACTS AND ADAPTATION FOR VICTORIA (SYMPOSIUM HELD 21–22 SEPTEMBER 2012)

The session on the Physical Science of Climate Change addressed the measurement of and evidence for climate change that has occurred during the past century, and the predictions for the next 50–100 years. The various speakers highlighted the following points:

- the average temperature in Australia has increased by approximately 1°C over the past century
- using different measurement techniques, it has been shown that the average temperature of the oceans has also increased by approximately 1°C over the past century

- sea level rises are occurring right now, at a rate of approximately 3 mm/year, with an overall rise of 0.2–0.8 m predicted by 2100 (and possibly much higher), although not uniformly over the globe
- southern Australia will be drier and northern Australia will be wetter, although rainfall distribution is uncertain
- there will be an increase in the number of extreme weather events
- there will be an average warming of 0.1–0.7°C by 2020, and 1.1–6.4°C by 2100, as a result of human activity; all future decades will be warmer than the warmest to date
- to have any chance of restricting the global rise in temperature to approximately 2°C, world emissions must decrease by approximately 50% by 2050; this means that emissions from Australia must decrease by approximately 90% and in the developed world overall by approximately 70%
- if emissions stopped tomorrow, residual effects from past actions would still ensure that emissions rose for a while
- global extreme temperatures have become much more common and this is the shape of things to come
- this is the critical decade for reducing emissions; over most of the globe, the minimum overnight temperatures have risen, which is more serious than daytime increases for human health
- the extent of the current Arctic ice melt was not predicted to occur for approximately 40 years; the pace of change is very worrying
- plants to prepare for spring flowering and the migration of pests, and is already happening, as evidenced by the occurrence of Dengue and Ross River virus fevers resulting from the spread of mosquitoes)
- there are effects on health, including heat stress and mental problems
- a small reduction in rainfall associated with climate change results in a large drop in runoff and a major effect on water availability
- increased heat waves, diminished air quality, fires floods and droughts will have a direct impact on human health
- an increased frequency of extreme events will affect agriculture more than changes in mean climatic conditions.

Some of these issues are addressed in the paper *Impacts on agriculture* by Leanne Webb (2013) in this issue of the Journal.

The session on Climate Change Adaptation for Victoria made the point that the economic cost of not doing anything is far greater than the cost of combating climate change and planning for adaptation. The key points made during the session were:

- it is vital to involve the community in discussions, plans and decisions; these are not only difficult decisions to make, but we need better ways of making them
 - policy is derived from a combination of flow-on effects from the past, present decisions and attempted predictions for the future, so is very complicated
 - scenario planning is a very important tool in planning for adaptation; there are various viable ways for different communities to solve their particular problems and it is important to move away from a ‘the one future mentality’ and, instead, to a ‘build the bridge just that bit higher’ outlook for example
 - the impact of climate change is not only very complex, but the various effects are interconnected
 - some local councils (e.g. Melbourne, Greater Geelong and Greater Bendigo) are already following their own plans for ‘greener action’;
- The session on climate change impacts on Victoria focused mostly on the predictions for the next 50–100 years. Key points made by the speakers included:
- rainfall over south Victoria will decrease by approximately 5% by 2030, although the trend may be masked by natural variability for some decades
 - effects on agriculture include earlier harvesting (e.g. wine, already happening) and a reduction in the chilling period (which is necessary for

such plans are very adaptable to different circumstances.

Lauren Rickards (2013) and Helmut Fünfgeld (2013) provide greater information on scenario planning and climate change adaptations in their papers in this issue of the Journal.

From the global perspective, Australia and the US (and Canada, with the exception of British Columbia) are the only countries where the argument about climate change is still taking place; the rest of the world is getting on with reducing emissions. However the US is actually doing a lot 'under the radar', and several states are well ahead of the rest of the nation. In other countries around the world:

- the European Union emission reductions are ahead of the 2050 target
- Brazil and Korea are well on the way to reducing emissions substantially
- China is doing an enormous amount and emissions should be down by 40%–50% by 2050
- Japan is not returning to coal after Fukushima.

In Australia, the present mechanism for carbon pricing tied to the European Union is a good way to go, but may take a while to stabilise and it can be upset by Parliament. It is likely that the upgrading of

Queensland coal facilities may turn out to be a waste of money, as buyers turn to cleaner technology.

OVERALL MESSAGE

This is the critical decade. Action must be taken this decade to address human-induced climate change by both reducing emissions and planning for adaptation. Otherwise the magnitude of the change will be catastrophic for life on Earth.

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