

# OPEN REPORT TO THE PRIME MINISTER

by

**THE FAIR FARMING GROUP**

## **CRITICAL SCIENTIFIC INFORMATION OVERLOOKED IN THE GARNAUT REVIEW NEGATES THE CASE FOR AN AUSTRALIAN CARBON TAX OR EMISSIONS TRADING SCHEME**

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# ANALYSIS OF THE GARNAUT CLIMATE CHANGE REVIEW UPDATE 2011

## **Introduction**

In preparing this analysis The Fair Farming Group brings extensive agricultural, commercial and scientific experience to the issues covered by the Review of the Science of Climate Change Update 2011 submitted by Professor Ross Garnaut.

The Garnaut Review's principal conclusions are:

1. Mainstream science has a high level of certainty that the earth is warming and that human induced emissions of greenhouse gases are the primary cause.
2. The severe consequences of a 550ppm concentration of greenhouse gases make it worthwhile to achieve a 450ppm outcome.
3. The rate of sea level rise has accelerated and is tracking above the range suggested by the UN International Panel on Climate Change (IPCC).
4. The land and oceans are running out of their ability to absorb more CO<sub>2</sub>.

These conclusions are taken to justify the introduction of a carbon tax and an emissions trading scheme (ETS) to drive reduction in emissions of greenhouse gases. These gases are principally comprised of carbon dioxide (CO<sub>2</sub>) produced by burning fossil fuels and methane arising from grazing animals and fugitive coal seam gas emissions.

The following report provides an analysis of the science relevant to each of these conclusions, using information available from the Bureau of Meteorology, the CSIRO and other climate science research institutions.

Our analysis demonstrates that the conclusions of the Garnaut Review:

- are not supported by scientific facts or objective measurements
- ignores the geological history
- are based on projections from questionable computer modelling

This indicates that Professor Garnaut has not been well advised on climate science. Critical scientific information overlooked in the Report negates the case for an Australian carbon tax or emissions trading scheme.

## **Garnaut Conclusions 1 and 2 – Climate Change**

Underlying all Garnaut's major conclusions is the belief that CO<sub>2</sub>, sequestered in fossil fuels and now being released through human activity, and methane, arising from coal mining and grazing animals, will have a dangerous impact on climate. The following scientific evidence does not support this belief.

### **(i) Fossil Fuels and CO<sub>2</sub> Cycle**

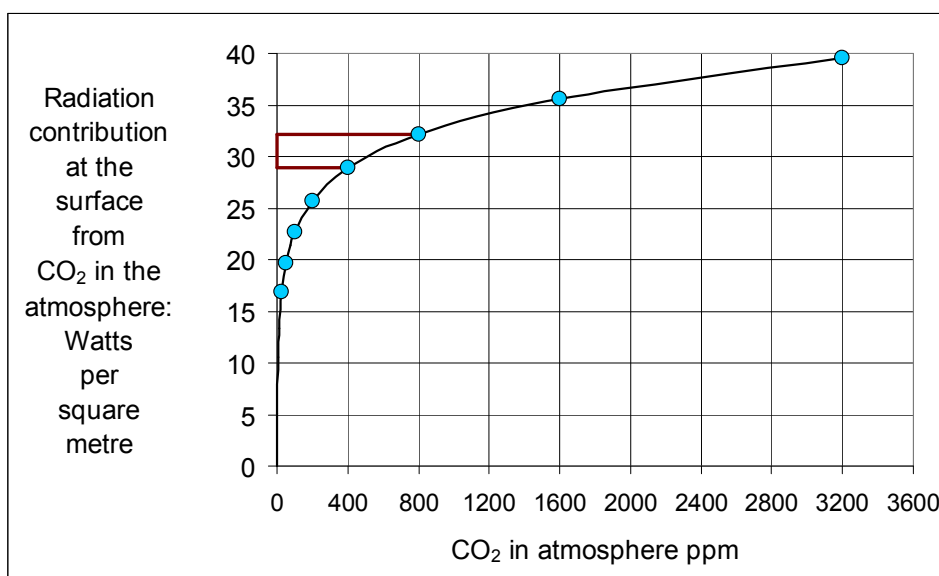
The burning of all currently identified fossil fuel reserves in the world would double the level of CO<sub>2</sub> in the atmosphere to about 800ppm. This is well below the concentrations of 2000 to 3000ppm at the time when fossil fuels were formed in the Carboniferous era. That was a very good time for life on earth and for the growth of the vegetation which subsequently formed fossil fuels. The eminent scientist Dr. Richard Dawkins described the period as supporting abundant plant and animal life. Yet the Garnaut Review predicts severe consequences with greenhouse gas concentrations of 550ppm.

There is clearly a discrepancy between the computer models' alarmist predictions contrasted with the geological record of no runaway temperature at much higher atmospheric CO<sub>2</sub> levels. This points to a fundamental question of the ability of the computer models to reproduce the characteristics of the climate system and predict future temperatures.

Recent measurements and analysis by Professor Richard Lindzen at MIT, Dr Roy Spencer at the University of Alabama at Huntsville and Dr. Frank Wentz at Remote Sensing Systems in Santa Rosa, California exposed a problem with the computer modelling of the atmosphere, let alone its accuracy.

There is general scientific acceptance that an increase in CO<sub>2</sub> will cause a lessening in the increase in infra-red radiation and as a result a reduced temperature increase at the earth's surface (*Figure 1*). Thus a doubling of CO<sub>2</sub> in the atmosphere will give rise to about a 1<sup>0</sup> centigrade increase in temperature.

To this extent the science is settled.



**Figure 1** This graph shows that the warming radiation caused by CO<sub>2</sub> declines with concentration. As the concentration of CO<sub>2</sub> increases, there is increased radiation back to the surface of the earth (the basis of the greenhouse effect). **However the relationship is not linear.** In fact doubling the concentration of CO<sub>2</sub> from 400 ppm to 800 ppm, a 100% increase, only increases the radiation at the surface by some 10%. (Results derived for US standard atmosphere and cloudless sky from MODTRANS, an international and IPCC accepted standard for atmospheric radiation transfer calculations).

The IPCC models multiply this effect by a factor of 2 to 4 from the assumed “feedback” effect of increased cloud cover and water vapour, the most important greenhouse gas. It is on this assumption that the science is certainly not settled.

The analysis of actual measurements in the atmosphere by the above-named scientists shows that the multiplier is of the order of one or even less. This reduced multiplier has also been explained by William Kininmonth, former Head of the Australian National Climate Centre.

Dr. David Evans, a carbon accounting modeller who consulted full-time for the Australian Greenhouse Office (now the Department of Climate Change) from 1999 to 2005 and part-time from 2008 to 2010, in a speech in Perth on 23 March 2011 noted that this critical information had not been given or explained to the general public.

There is no geological evidence of extreme or runaway global temperatures in the past when there have been high levels of CO<sub>2</sub>. This can be understood after taking into account the diminishing greenhouse impact from increasing CO<sub>2</sub> levels in the atmosphere, when combined with the measured temperature multiplier of one or even less.

### (ii) Measured Temperature Change

Temperatures rose in Australia during the last century by 0.8° centigrade, however 0.5° of this increase was caused by the Great Pacific Climate Shift of 1976-77, an event identified by oceanographers as a part of the Pacific Decadal Oscillation that is recognised by the IPCC as not related to increasing atmospheric CO<sub>2</sub>. After allowing for the Great Pacific Climate Shift, the temperature increase attributed by climate modellers to rising CO<sub>2</sub> as the primary cause, is then 0.3° centigrade for the century, not the full measured 0.8° centigrade increase.

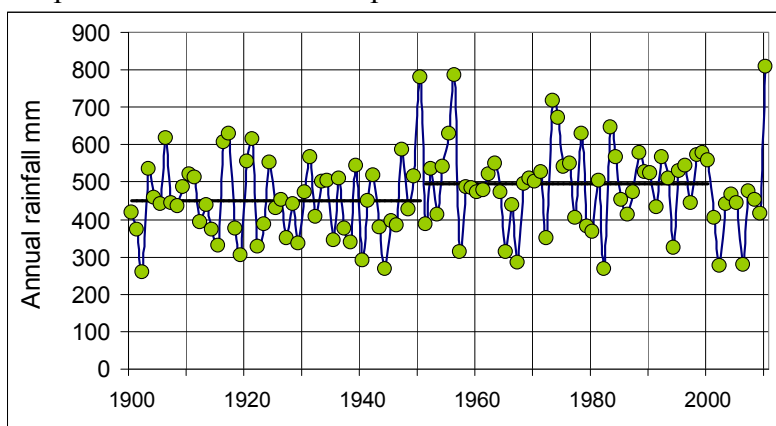
In the twentieth century CO<sub>2</sub> increased by 5ppm in the first half and by 70ppm in the second half of the century. In the corresponding periods the Australian temperature increased by 0.15° C in the first half and by 0.15° C in the second half of the century after adjusting for the Great Pacific Climate Shift. CO<sub>2</sub> is clearly not the only cause of the temperature increase, otherwise there would have been a greater increase in temperature in the second half of the century.

It must be acknowledged too that temperature has increased in the 20<sup>th</sup> Century, independent of CO<sub>2</sub> levels, as a recovery from the Little Ice Age, which peaked around 1670.

### (iii) Climate variability

Climate variability, in particular rainfall variability, is a key measure in assessing farming risks. Greater climate variability is predicted by computer models as a result of higher CO<sub>2</sub> levels. The 1963 study by Sir Samuel Wadham and his colleagues, of rainfall variability for Australia compared with overseas, used as a measure the percentage variation each year compared with the average. This measure can be used to compare the first half of the last century with the second half. The 50 year periods for comparison are chosen because selected shorter periods can provide information that is not representative.

The average variability of rainfall in the Murray-Darling Basin during the first half of the century was 24% compared with 22% in the second half. On the other hand, average annual rainfall in the first half of the century was 451mm but increased in the second half to 496mm (*Figure 2*). IPCC computer models in contrast predict less rain and more variability.



**Figure 2:** Yearly rainfall in the Murray-Darling Basin: Mean annual rainfall for 1900-1950 451 +/- 15 mm and for 1951-2000 496 +/- 15 mm. Source - Bureau of Meteorology.

#### **(iv) CO<sub>2</sub> is essential to plant life**

The frequent referral to CO<sub>2</sub> as a pollutant lacks any scientific credibility. CO<sub>2</sub>, an odourless and colourless gas, as scientists know is essential for plant life where photosynthesis enables plants to capture the carbon in CO<sub>2</sub> to grow and produce food and release oxygen essential for animal and human life.

The use of the word carbon as an abbreviation for CO<sub>2</sub> in the atmosphere is not correct and referring to it as a pollutant is simply misleading.

Prior to industrialisation the level of atmospheric CO<sub>2</sub> was near 270ppm (0.027%) and it has now reached 390ppm (0.039%). These levels are much lower than at the time when plants evolved. The levels are deficient for optimal plant growth and constrain food production. For this reason market gardeners for the past 100 years have been adding CO<sub>2</sub> to glasshouses to achieve levels near 1000ppm.

Some 550 million years ago, CO<sub>2</sub> is estimated to have been at 7,000ppm (the US Navy allows 8,000ppm level in the air inside its fleet of submarines). In the past CO<sub>2</sub> levels were therefore many times the present level. Over subsequent geological time atmospheric CO<sub>2</sub> levels have declined. This is because the equivalent of 20,000,000 billion tonnes of CO<sub>2</sub> has been removed by combining it with calcium, mainly in marine skeletal material, to form limestone. This process continues.

The white cliffs of Dover are an example of these huge deposits which have removed CO<sub>2</sub> from the atmosphere.

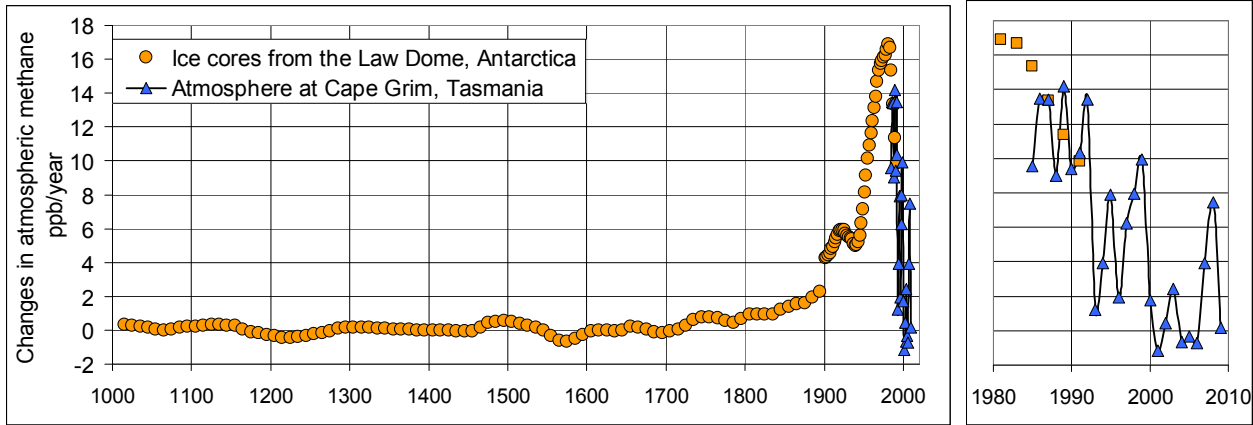
This explains why CO<sub>2</sub> levels have reached such a low level by historical standards. It emphasises the importance of the CO<sub>2</sub> now being recycled from sequestered CO<sub>2</sub> in fossil fuels to improve food production.

In the Carboniferous period a much lower quantity of some 3,000 billion tonnes of CO<sub>2</sub> was captured by plants which subsequently formed fossil fuels. As these fuels are burnt this becomes available to replenish CO<sub>2</sub> depleted by limestone formation.

#### **(v) Methane**

Methane is a greenhouse gas associated with grazing animals and considered a factor causing global warming. Methane from grazing animals is estimated by government to be 10% of Australian emissions of greenhouse gases. However, these estimates also show no increase in agricultural methane emissions over the last 20 years.

Recent research shows that the increase in methane emissions in the past can be explained by the dramatic increase in natural gas (fossil methane) use and leakage from badly managed transmission and distribution systems in the Northern Hemisphere. With the improvement of these systems leakage has been reduced and there has only been a slight methane increase since 1990 - the level has in fact varied with El Ninos and La Ninas (*Figure 3*).



**Figure 3:** Annual changes in atmospheric methane in parts per billion derived from ice core and direct atmospheric measurements. **Left:** From 1000 to 2010 AD and **Right:** Expanded detail from 1980 to 2010. The annual increase in atmospheric methane from 2000 to 2009 is 1.3 ppb/year, about the rate at the early part of the nineteenth century. The peaks in the direct atmospheric measurements reflect the influence of El Ninos. The peak in 1992 is an indirect effect from the eruption at Mt. Pinatubo in June 1991. Data source CSIRO.

Grazing animals only release carbon that has already been removed from the atmosphere by the pastures they consume. This process, which recycles carbon over the short term, is carbon neutral as methane is broken down in the atmosphere. It is the same closed cycle which is recognised to justify biofuels.

Therefore there are no grounds for the later inclusion of methane from grazing animals in a carbon tax or ETS.

**Garnaut Conclusion 3 – Ocean Levels**

Alarmist predictions of rising temperatures in turn have led the IPCC to forecast an acceleration in the rate of rise in ocean levels to rates several times that measured over the past 100 years of 2 to 3mm per year. However, this has not been observed to date despite rising CO<sub>2</sub> levels.

In fact actual values derived from satellite altimeter measurements by University of Colorado scientists demonstrate no measurable increase in the rate of annual sea level rise over the period 1993 to 2010. Indeed they show that the annual sea level rise over this period has actually declined in more recent years as shown in the following table.

Oceans	Annual sea level rise from 1993 to 2010 - mm per year	Annual sea level rise from 2002 to 2010 - mm per year
Global – all oceans	3.1 +/- 0.4	2,2 +/- 0.3
Pacific Ocean	2.8 +/- 0.2	0.9 +/- 0.3

The reported rise in sea levels on some Pacific Islands has been due to the slow consolidation of underlying coral causing subsidence. The mining and erosion of protective reefs has made the islands more vulnerable to violent storms and the subsequent damage has been wrongly attributed to climate change.

**Garnaut Conclusion 4 - Ocean Acidity**

The claim that oceans will become more acidic and threaten coral is open to serious question. The oceans are alkaline and range from 7.9 to 8.2pH (less than 7pH is acidic) depending on location. Minerals dissolved in seawater buffer the pH level by reacting with dissolved CO<sub>2</sub> to form neutral compounds and thus safeguard the ocean against any significant change in pH levels. This would occur even with massive absorption of CO<sub>2</sub> well in excess of what has been generated by human activity.

Coral which has existed for over 500 million years and other marine life which form limestone have been protected by this pH buffer, when CO<sub>2</sub> levels were many times the present level. The Garnaut Review ignores that alkaline seawater provides a buffer against acidity.

The oceans contain about 80 times as much dissolved CO<sub>2</sub> as is contained in the atmosphere. On this basis even a doubling of CO<sub>2</sub> in the atmosphere will lead to a negligible increase in total CO<sub>2</sub> dissolved in the oceans, which can be accommodated as past geological events demonstrate.

## **Conclusion**

**There is no clear or compelling scientific evidence to support the conclusions in the Garnaut 'Review of the Science of Climate Change Update 2011'. The Review overlooks recent analysis of the climate measurements which expose the fundamental problems at the heart of the IPCC climate models.**

Mankind is simply returning CO<sub>2</sub> to the atmosphere from whence it came. This is at a time when a low level of CO<sub>2</sub> is limiting plant growth when more food is required for a growing world population. CO<sub>2</sub> is essential for all plant life and thus not a pollutant. From the perspective of food production, a carbon tax or ETS would also be inappropriate.

Scientific evidence based on past events demonstrates that the release of CO<sub>2</sub> previously sequestered in fossil fuels will not cause dangerous global warming. Again it follows that a carbon tax or an ETS which would impose a severe cost penalty for agriculture and for the economy overall is not required.

Scientific evidence supports the conclusion we need CO<sub>2</sub> rather than fear it. To suggest otherwise, ignores our obligation to provide increasing food production for a growing world population and the best interests of the Australian community.

**The Fair Farming Group**, which prepared this report and analysis, has two key objectives:

1. To ensure that discussion of issues related to climate is based on scientific fact and analysis.
2. To protect Australian agriculture and industry from any unwarranted penalties in the guise of a carbon tax or Emissions Trading Scheme (ETS), either of which would have an adverse impact on the farming community and the economy.