

IPCC claims are proven False?

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The IPCC's 36 page *Summary for Policy Makers* published on 27 September sets out a series of claims about what has been happening to various aspects of the climate and offers assessments of the connection between human activity and the changes in climate, particularly temperatures. The economic implications remain much the same as in the 2007 report - that is, unless our governments take urgent action to reduce ever increasing emissions of greenhouse gases – usually limited to mentioning only CO₂ emissions – higher and higher temperatures will destroy life and plants, even threaten human existence. Although there has been some increase in scepticism about this threat, almost all political leaders, science bodies, international organisations and media outlets still seemingly accept the dangerous warming thesis in one form or another. One of the originators of the scare, economist Nicholas Stern, has declared that “what is coming from [sceptics] is just noise...”

My intention today is to argue that no definitive causal correlation can be established between past changes in measured temperatures and in atmospheric concentrations of CO₂. In short, I assert there is no substance to the basic thesis adopted by the fifth IPCC report. I will examine the more important assessments of this Summary component of the report but I start by pointing out that the main conclusions on temperature increases and human activity are decidedly unclear in terms of detail and bewildering even to the intelligent layman.

On the one hand it claims as *extremely likely* that more than half of the temperature increase between 1951 and 2010 was caused by the anthropogenic increase in greenhouse gas emissions. This purports to give human activity a 95 per cent certainty tick. Despite the ongoing predictive failure of the modelling of temperatures, it is greater than the 90 per cent certainty offered in the IPCC's 2007 report. On the other hand the current report also claims that “*the best estimate* of the human induced contribution to warming is similar to the observed warming over this period”. But it does not say what it means by “similar to” or whether the “best estimate” has greater or less certainty than 95 per cent.

This may sound like nit picking but the uncertainties about specific assessments on a range of climate happenings has created widespread confusion. This has occurred despite the claim that the IPCC's assessments derive from “observations” of the climate system which provide a comprehensive view of the variability and long term changes in the atmosphere, the ocean, the cryosphere and the land surface”. This supposedly allows the IPCC to conclude at the start that “warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over the millennia”.

The difficulties of interpreting IPCC assessments extend to both what has actually happened to temperatures as well as to the future temperatures the IPCC models predict.

As to actual temperatures, the graph published in the report, which is similar to Figure 4 in the graphs I have circulated, suggests global average temperatures increased about half a

degree between the early 1950s and the period since 1997. However the IPCC report claims that, of the “observed warming of approximately 0.6C to 0.7C “, greenhouse gases contributed 0.5C to 1.3C. This invented temperature appears to be an attempt by the IPCC to explain the pause in temperature increases after 1997 - that is, it seems to be saying that if there had not been *temporary* forces operating to reduce temperatures, the actual increase might have been as high as 1.3C! It is little wonder that expert sceptic Professor Richard Lindzen has written that “the latest IPCC report has truly sunk to (the) level of hilarious incoherence”.

A similar incoherence arises in regard to temperature predictions. We are left in no doubt that they will increase, but by how much? Whether temperatures increase by more than 2C is supposed to be very important because that is said to be a tipping point beyond which it will be impossible to stop temperatures increasing to dangerous levels. Indeed, the UN Secretary General has said political commitment is needed to keep the temperature rise below 2C and, surprise surprise, an international conference is being planned for 2015 in Paris. US Secretary of State Kerry proclaimed “this is science, these are facts and action is our only option”. But is this another red line like Copenhagen which the US Administration will allow to be crossed?

In the IPCC report there is modelling of possible future temperatures but no offer of one possible outcome. Instead we see four possible ranges for the period from 2081 to 2100, with the lowest being 0.3 to 1.7C and the highest 2.6C to 4.8C. These possible increases are from the average in the period 1986 to 2005 and their extent seems to be dependent on the corresponding extent of (cumulative) fossil fuel emissions, the possibilities of which are set out in a Table and have an enormous range from 140 to 1910 GtCs (Gigatonnes of Carbon).

Given the absence of any one preference, it is not surprising that commentators have offered differing suggestions about the IPCC’s temperature prediction to 2100. But there is also dissatisfaction with the failure of the IPCC to present any alternative view of the underlying science. For example, Professor Judith Curry of the School of Earth and Atmospheric Sciences in Georgia, USA has published an article headed “Kill the IPCC: after two decades and billions spent, the climate body still fails to prove humans behind warming” (Financial Post, 1 October 2013). She postulates that there is “paradigm paralysis” involving a “refusal to see beyond the current models of thinking”.

Economic Implications

Before examining “the science”, let me refer to the wide differences among experts on the economic implications of eliminating fossil fuels or, as the case may be, of *not* eliminating them.

In 2008 two major reports were commissioned by the previous government, one from economist Ross Garnautⁱ and one from Treasury,ⁱⁱ which was released by then Treasurer Swan and then Climate Change Minister Wong. Although Garnaut acknowledged that there were different perspectives on the science, these reports accepted the IPCC version without questioning. Their basic message was that our great-grandchildren would be saved **and** their GDP in 2100 would even be higher as a result of the elimination of fossil fuels.ⁱⁱⁱ However, according to the Garnaut report, even if there is no reduced usage of fossil fuels between now and 2100, “Australian material living standards are likely to grow strongly through the 21st century, **with or without** mitigation”^{iv} (my emphasis).

By contrast, Climate economist Professor Richard Tol, a former IPCC lead author, estimates the cost of mitigatory action by 2100 would be about 40 times greater than the benefits.^v

An important question here is the extent to which other countries take mitigatory action. For a country adopting mitigatory action which is more intensive than in most other countries, an OECD report^{vi} (with a Treasury official's input) published in September assesses adverse economic effects from the loss of international competitiveness. This report indicates that, unless the developing world also implemented a carbon tax, Australia would see considerable de-industrialisation, moderated only by protectionism. And the competitive pressures would have further adverse effects if other major OECD countries did not adopt a comparable carbon tax.

As the OECD report acknowledges that “the prospects for a globally harmonised carbon market are weak”, this effectively justifies the decision by both major Australian political parties to abolish the current carbon tax. However, even if the carbon tax is abolished, the subsidies to wind and photovoltaics remain through the 20 per cent Renewable Energy Target. Although less onerous than the carbon tax, the RET still undermines Australia's competitiveness in energy-intensive industries where our energy resources should make us world leaders.^{vii}

In existing circumstances the most important economic question is why not wait before restricting usage of fossil fuels and subsidising alternative sources of energy. At the very least there is no point in Australia becoming a leader. Nuclear power is already close to being economically efficient and historical experience suggests continued technological advances will improve the economics of other renewable energy sources.

Assessing the Science – New Evidence & Doubts about Existing Evidence

The dangerous warming thesis adopted by the IPCC is based on the widely held belief that a proportion of CO₂ emissions is added to the atmosphere and the extra heat then radiated back to earth by the CO₂ causes a temperature increase at the surface of the earth. But is there a causal connection between the increasing concentrations and any increase in temperatures? In considering this I draw on important new research by physicist Tom Quirk.

Let me first note that an internationally accepted standard for atmospheric calculation shows that the increases in CO₂ concentrations do *not* result in a *commensurate* increase in radiation back to the surface of the earth. In fact, an example calculation shows that if concentrations doubled from existing levels of about 400ppm to 800ppm, there would only be a 10 per cent increase in radiation back to the earth's surface (see the left axis of the graph in **Figure 2**).^{viii}
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The effect of this radiation on temperatures is open to serious debate. Bill Kininmonth, the former head of the Climate Centre of our Bureau of Meteorology, argues persuasively that the evaporation from the oceans (which constitute 70 per cent of the earth's surface) has an offsetting effect on upwards temperatures from radiation. Accordingly, although the fifth IPCC report re-affirms its view that there will be a positive effect on temperatures, the evaporation may involve sufficient temperature dampening to significantly reduce the temperature increasing from the radiation. This is a major uncertainty about the proposition that we face dangerous warming unless countervailing action is taken.

A further important uncertainty arises from the acceptance by the climate establishment of the estimate that 55 per cent of CO₂ emissions from fossil fuels remain in the atmosphere. This estimate reflects an investigation made some 30 years ago on the basis of very limited observations. But important recent research by Tom Quirk suggests that the 55 per cent estimate of concentrations is far too high and it may be only about 16 per cent (see **Figure 3**). If this is correct, it means the fossil fuel emissions contribution is only a third of what has been assumed in the analysis used by the IPCC.^x

It is important also to examine what might be termed supporting evidence.

Temperatures and Concentrations of CO₂ – More New Evidence

Moving to the relationship between temperatures and emissions, look first at **Figures 4, 5 and 6**.

Figure 4 shows both annual averages and ten year averages for *global* temperatures from 1900 as published by the Hadley Centre of the UK's Met Office and used by the IPCC. This demonstrates the considerable climate variations from year to year^{xi} but it is not easy to detect the major change-points indicating changes in the trend. However **Figure 6** shows global temperatures with major red dot points in the ten year averages and this statistical analysis shows major change points in the early 1920s, late 1940s, mid 1970s and late 1990s.

For Australia, **Figure 5** shows annual averages from 1910 as published by our Bureau of Meteorology with its supposedly high quality data. This Figure has a black line showing a major change point in the mid 1970s. The jump then in Australian temperatures of about 0.4 of a degree reflects an ocean temperature change known as the Pacific Decadal Oscillation.

This Pacific Decadal Oscillation effect is important because it reflected *natural* causes arising from a sudden replacement of cold water with warm water along the western Pacific coast of the North Americas. That had no causal connection with fossil fuel emissions.

This analysis suggests about half of the published temperature increase over the past 100 years of about 0.8 of a degree reflected natural causes, *not* increased emissions of fossil fuels.

Figure 7 allows a comparison of changes in concentrations with the changes in temperatures shown in **Figure 6**. The lack of any continuing connection between the two seems obvious.

This leads to **Table 1** summarising these changes in the different periods. First, there have been two periods during which temperatures were relatively stable but CO₂ concentration levels increased quite strongly (except for a brief period in the 1940s). Those two periods are from 1948 to 1977 and from 2000 to the present. Second, the period from 1977 to 2000 shows both temperatures and CO₂ concentration levels increasing. This is the period when the Pacific Decadal Oscillation clearly made a major contribution to the temperature increase.

Third, only the 1922 to 1947 period suggests a possible causal connection between changes in concentrations and temperatures. But **Figure 7** shows that period had only a small increase in concentrations.

Considering all this analysis, how can there be any definitive conclusion that a causal correlation exists between changes in temperatures and changes in CO₂ concentration levels?

Accuracy of Temperatures, Comparisons with the Past and Modelling of the Future

Other reasons for questioning any definitive conclusion include serious doubts about the accuracy of the temperatures published by official agencies and used by the IPCC. These published temperatures are calculated by averaging only the minimum and maximum recorded for the day. But if the daily averages are calculated more properly by averaging temperatures *every 30 minutes* a vastly different picture emerges.

Such data is available back a few years and Tom Quirk has done the calculation for 101 days in March to June 2013 in two locations (see **Figure 8**). For a location on the east coast (Cairns), the result is an average markedly lower than the *published* average. In short, the existing maximum and minimum method of calculating averages produces a systematic upward bias, probably as much as 0.3-0.4C of a degree.^{xii}

If Australian published temperatures have an upward bias so too will any modelling of our future temperatures. These systematic errors also apply to other continents where maximum and minimum thermometers are used for land temperatures^{xiii}.

Another upward bias in published temperatures arises from failing to take account of the urban heat island effect. In urban areas temperatures recorded include the effect of heat retained by buildings. Tom Quirk has tested this by comparing the Bureau of Meteorology recording site in Melbourne with that at Laverton for the period from 1940 to 2010 (see **Figures 9-10**). Given the commonalities apart from buildings, urban heating is clearly the main reason for the significantly larger increase in the minimum recorded for Melbourne.

However the BOM's published temperatures appear to make no allowance for the effects of urban heating and there also appear to be other upwards bias influences in its published data.

But what about the oft-made claim that temperatures are higher now than they were a century ago? As soon as August finished we were told that Australia's eastern coast had experienced the highest winter temperature since 1910. Yes indeed, our 2013 winter temperature was 0.03 higher than in 1973 – clearly a signal of danger!

Temperature records such as this do not establish a need for government action. The test is whether a causal relationship exists between increased CO2 concentrations and increased temperatures – and whether published data are correct.

What is the most credible conclusion about the total published temperature increase of around 0.8 of a degree over the last century? My view is that about half is incorrectly calculated and the other half reflects natural causes.

Bear in mind also that during past periods when fossil fuels usage was very small, the IPCC now acknowledges that humans experienced temperatures as high as now during the Medieval Warming Period (about 800-1,100AD). This acknowledgement is made grudgingly by relating it only to “some regions” and no mention is made of the similar experience during the Greco-Roman period (600BC – 200 AD).

Finally on temperatures, the fifth IPCC report claims that climate models have improved since the 2007 report and it appears to rely on models for predictions to an even greater extent. Importantly it claims that, while “there are differences between simulated and

observed trends over periods as short as 10-15 years (eg 1998 to 2012)”, the long term simulations show “a trend in global-mean surface temperatures from 1951 to 2012 that agrees with the observed trend”. The pause over the period 1998-2012 is said to be due “in roughly equal measure to a reduced trend in radiative forcing and a cooling contribution from internal variability, which includes a possible redistribution of heat within the ocean. The reduced trend in radiative forcing is primarily due to volcanic eruptions and the timing of the downward phase of the 11 year solar cycle”.

Whatever the claimed “long term” trend calculation produces for the 1951-2012 period, we can see from analysis by a US climate scientist of the very extensive modelling (**Figure 11**) that none of the many predictions has coincided with actual published temperatures. Moreover, as already noted, the pause from 1998-2012 is not the only one over the period since 1900. There was a much longer pause (actually a slight decline) from 1948 to 1977 but this is not explained by the IPCC. Nor is any mention made of the very little change in temperatures (as published by the Hadley Centre) from the mid 19th century to 1920 and no explanation is attempted for the upward trend from the early 1920s to the late 1940s when CO₂ concentrations increased by only just over 3 per cent over about 25 years. In essence the IPCC dangerous warming thesis appears to be based on the increase in temperatures that occurred over the 1977 to 2000 period but was due primarily to natural causes

Overall, it is difficult to see that temperatures are at all sensitive to changes in CO₂ concentrations.

Other Greenhouse Gases

Figures 12 and 13 show a sharp increase in the contribution of methane gases to atmospheric concentrations between 1940 and 1980 and then a subsequent sharp drop. The CSIRO-BOM State of the Climate report, published in 2010, asserted that methane has shown similar increases to carbon dioxide. But both the rise and fall reflect initial leakages from pipelines and the subsequent fixing of those leakages. This is just one of many examples of the failure of the CSIRO to properly identify events which influence climate – and those that don't.

Droughts and Rainfall

Another part of the dangerous warming scare is that below average rainfalls and droughts are a sign that higher temperatures and more droughts are on the way. The IPCC fifth report acknowledges that precipitation has increased since 1901 and, while it predicts more frequent hot and fewer cold days, and more extreme precipitation events, there is no prediction of an increase in droughts or for that matter floods. Past Australian droughts occurred when global temperatures were lower than now and wet years occurred when such temperatures were rising. Annual rainfall records for the Murray Darling Basin (**Figures 14 and 15**) do not suggest any threat from persistently lower rainfalls or that there is a close connection between changes in average temperatures and in rainfalls.

Antarctic and Arctic Ice Sheets –Sea Levels and the Reef

The IPCC report claims a “substantial” anthropogenic contribution to the sea level increase since the 1970s and asserts this comes from thermal expansion and glacier mass loss. It predicts that sea levels will *very likely* increase at a faster rate during the 21st century and

offers a range from 26cms to almost 82 cms. As might be expected, the top of this range is higher than the 57cms given in the 2007 report.

Satellite measurements of global sea levels (**Figure 16**) show that from 1994 the rate of increase has averaged 3.2mm a year but from 2002 it fell to a rate of about 2.6mm a year. This reduction is not mentioned in the IPCC report. If the average rate of increase of 3.2mm a year were to continue average sea levels in 2100 would be about 30cms, which is slightly above the IPCC's lowest prediction. Such an increase hardly signals danger and most sea-side property owners would have time to take appropriate preventive measures.^{xiv}

As to the Arctic (**Figure 17, Top Half**), there is a downward trend in ice extents. The IPCC report claims it is *very likely* it will continue to shrink but does not say disappear. Recent reports indicate that some re-icing is now in progress and extensive Arctic meltings have occurred in the past when CO2 emissions were very much lower.^{xv} The IPCC report makes no mention of the fact that meltings in the Arctic have no effect on sea levels because the ice there is already in the sea.

As to the Antarctic, the IPCC acknowledges that the total ice area has been increasing but with *low confidence* it projects a decrease in extent and volume by 2100 because of temperature increases. No mention is made of the fact that satellite data covering the past thirty years show a distinct cooling of the Antarctic region.

Turning to the Great Barrier Reef, a major concern relates to possible bleaching caused by global warming. However, most of the reef recovered from the bleachings of 1998 and 2002 and any action by Australia to reduce emissions would not help there unless there is an effective international agreement by major emitters.

Possible Errors in Estimated Influences on Warming/Cooling

The foregoing has suggested errors in analysis but did not refer to the wide margins of error which the IPCC itself suggests as applying to the estimates of the ten various possible warming and cooling influences on temperatures. These are important because the combined effect of the various influences determines what the IPCC decides is their total effect on temperatures.^{xvi} (**Figure 18**) shows that the estimated total of these influences from the 2007 report amounts to 1.6 watts per square metre, with an error margin ranging from 0.6 to 2.4 watts. This estimate is not included here in order to comment on the various influences but to illustrate the very wide potential for error.

Conclusion

In summary, many uncertainties emerge from a careful assessment of claims that a danger exists of ever increasing temperatures and the claim in the fifth IPCC report of increased certainty does not hold water. No substance can be established for that claim because no definitive causal correlation can be established between past changes in temperatures and in atmospheric concentrations of CO2. Some past temperature increases are clearly due to natural causes and new research shows published temperatures have a significant upward bias. New research also suggests that, as the extent of CO2 concentrations in the atmosphere is much smaller than previously thought, any danger from rising temperatures is much diminished. Once account is taken of naturally caused increases, of the much smaller CO2 concentrations, and of the upward bias, the need for action to reduce fossil fuel emissions

disappears. Of course, some argue that precautionary government action should be taken just we insure our houses and buildings against damage we know will occur. But the various deficiencies in the dangerous warming thesis suggest any risk that might exist from higher temperatures could well be handled by preventative action by businesses and individuals.

ⁱ The Garnaut Climate Change Review Final Report, 30 September 2008

ⁱⁱ *Australia's Low Pollution Future: The Economics of Climate Change Mitigation*, 30 Oct 08.

ⁱⁱⁱ After the move to less efficient energy reduces annual growth for the next 50 years or so, there would then be a lift in growth rates and the "the main benefits of mitigation (would) accrue in the 22nd and 23rd centuries and beyond" (Garnaut Report p249)

^{iv} Ditto p565

^v "Climate folly before failure", Alan Wood, *The Australian*, 1 Oct 09.

^{vi} OECD Environment Working Papers No 58, "Addressing Competitiveness and Carbon Leakage Impacts Arising from Multiple Carbon Markets", 11 Sept 2013. The report acknowledges that "the prospects for a globally harmonised carbon market are weak", that "country-level experiences with greenhouse gas emissions related taxes remain fairly limited", and that there are no international linkages between emission trading schemes.

^{vii} For further consideration of the implications for Australia of the OECD report of 11 September, see article on "Energy costs continue to dog industry", Alan Moran, *The Australian*, September 25, 2013.

^{viii} The graph shows an increase in the level of radiation of only about 3 watts per square metre – from 29 to about 32 watts.

^{ix} *This analysis comes from an online calculator of energy in the atmosphere (MODTRAN) and, as indicated, it provides an internationally accepted standard for atmospheric calculation.*

^x By way of background, it should be noted that CO₂ emissions into the atmosphere are continuously exchanged with sources and sinks in the ocean and on land. That is, there are various sources of emission and absorption. In fact, the overall CO₂ imbalance is only 1-2 per cent of the annual atmosphere-land-ocean exchanges of CO₂. In the ocean CO₂ is absorbed and dissociated in water and it is also removed by ocean plant life, like phytoplankton. The amount of CO₂ exchanged (absorbed or emitted) with the oceans varies with water temperature: the higher the water temperature, the less CO₂ is absorbed or the more is emitted and conversely for a lower water temperature. Also, the behavior of oceans varies. There is absorption taking place in the North and South of the Atlantic and Pacific oceans whereas the tropical oceans are emitters of CO₂. Overall, the oceans are net emitters of CO₂. For the land the sources of CO₂ emissions are plant decay and fossil fuel usage. The sinks are plants that with photosynthesis absorb CO₂, with the extent of absorption by forests being very high: they are net absorbers of course.

^{xi} Including from El-Ninos.

^{xii} For example, a 10 minute 1degree fluctuation that increased the temperature would give a 0.5 degree increase in the average calculated by the maximum and minimum method whereas it would only give an increase of 0.01 degree in the average calculated by taking temperatures every 30 minutes.

^{xiii} *As ocean temperatures are measured in a quite different manner, this means there are additional systematic uncertainties when land and ocean temperatures are combined to give a global temperature.*

^{xiv} The 2007 IPCC report predicted an increase in average global sea levels to 2100 ranging between 18 and 59 cms (about 2 feet). The satellite measurements of sea levels from 1994 show an increase of about 3mm a year or 20cms by 2100.

^{xv} *Canada's North West passage has in fact been navigated in periods when fossil fuel usage was low*

^{xvi} According to the IPCC, this estimate of 1.6 watts explains the temperature increase since 1750.