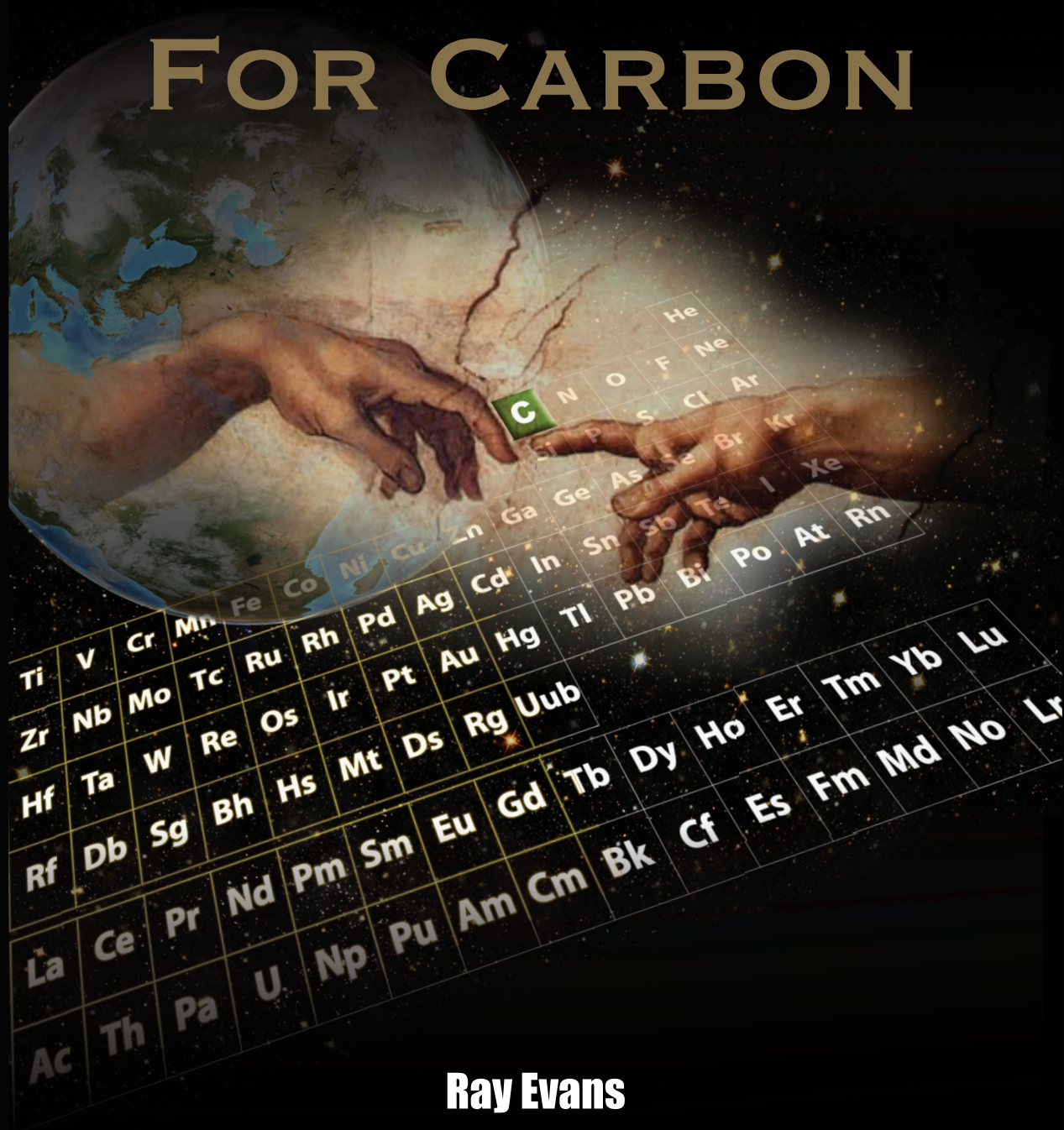


THANK GOD FOR CARBON



Ray Evans

The Lavoisier Group

November 2008



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At the end of the day, however, the author has to accept full responsibility for what he has written. This I am pleased to do.

Ray Evans
November 2008

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Thank God for Carbon

Overview

Despite the gravity of the economic crisis arising from the collapse of financial and credit markets in the US and from thence to Europe and to the rest of the world, the Rudd Government continues to proceed with drafting legislation which will require emitters of carbon dioxide, notably coal-fired power stations, to purchase permits to continue to operate. This scheme of decarbonisation is based on the notion that anthropogenic emissions of carbon dioxide (the consequence of burning fossil fuels) have caused, and will continue to cause, global warming. Because 'carbon' fits more easily into newspaper headlines than does 'carbon dioxide', carbon has been substituted for carbon dioxide in political discourse, and has become the target of legislation.

In Europe, such a scheme, known as an Emissions Trading Scheme (ETS), has led to rapidly increasing energy costs and severe political tensions between EU nations and between governments and their peoples. An ETS is a euphemism for a carbon tax, but because in Australia it will be a tax imposed primarily on our energy-intensive industries, it will have particularly adverse consequences for our export industries and our import-competing industries. Many rural and urban enterprises will collapse. Investment in our energy-intensive industries will cease, and within a few years electricity blackouts will become commonplace. Britain is now facing this prospect in the forthcoming northern winter.

The arguments advanced in support of restructuring Australia's industries to a 'carbon restricted' economy are based on the theory that anthropogenic emissions of carbon dioxide will cause catastrophic climate change. It is claimed that burning fossil fuels during the twentieth century has caused global temperatures to rise and that unless these emissions are drastically curtailed the world will reach a 'tipping point' that will trigger 'runaway global warming'. It is claimed that it will be the end of the world as we have known it for thousands of years.

As part of this doctrinal structure, the sixth element of the periodic table, carbon, has been cast as a symbol of mankind's malevolent behaviour towards the planet, and it has been demonized accordingly. This demonization of carbon is an absurdity. Carbon is essential to the biosphere. Carbon dioxide [CO₂] is fundamental to life-supporting processes such as photosynthesis. Without carbon and carbon dioxide, there would be no life on earth. The average human body is 18 per cent carbon by weight.

The belief that anthropogenic emissions of carbon dioxide are responsible for raising the world's temperature during the last 30 years or so is shown here to be without any solid foundation. Annual increases in atmospheric concentrations of carbon dioxide, and anthropogenic emissions of CO₂, show no correlation between the two variables. The mechanism which is promoted as the instrument of global warming is called the 'greenhouse effect'. The reader will find here a discussion of the greenhouse effect and may be surprised to discover the confusions and uncertainty surrounding this concept.

All of the predictions of rising temperatures, melting ice-caps, rising sea-levels, acidifying oceans, dying coral reefs, more frequent droughts, are all based on simulations carried out on very large computer models of the world's climate. All the models are constructed on the assumption of global warming caused by increasing atmospheric CO₂. These climate models have suffered major credibility setbacks in recent years. They have been unable to predict the temperatures we have actually experienced, particularly since 1998, as temperatures have remained stationary or, as in the last two years, declined by 0.7 °C, despite increasing atmospheric CO₂ concentrations. Furthermore, there have been major changes in the model predictions, but these have not diminished the faith of the global warmers (or *carbonistas*), nor of the policy makers who follow them. Early predictions included the idea of ever-increasing temperatures (as in the notorious hockey stick graph), but now we are told that global warming has been delayed until 2015.

The satellite and radiosonde (weather balloon) measurements taken of tropospheric temperatures in the tropical regions have shown no increase in the last ten years. Every climate model requires these particular temperatures to increase with increasing atmospheric carbon dioxide.

It has been admitted by some of the climate modellers connected to the IPCC that their simulations cannot describe in any detail clouds or cloud formation. The type and extent of cloud cover over the earth has a very large impact on radiation input to the earth from the sun and on the earth's radiation to space. This is, therefore, a damning admission from within the global-warming community.

There is also widespread acceptance that computer models cannot predict climate processes on a regional scale, especially El Niño and La Niña events in the Pacific Ocean. Those Australians whose lives are dominated by rainfall or drought are well aware that El Niño–La Niña events control Australian rainfall. Australian droughts (48 of the last 144 years have been drought years) have been driven by El Niño events. Years of good rainfall have been driven by La Niña events.

Despite this basic understanding of Australian climate, many hundreds of millions of taxpayers' funds have been poured into attempts to reinforce and underpin the belief that we can control our climate, or perhaps even 'drought-proof' Australia, by reducing our emissions of carbon dioxide.

Many scientists believe that the sun is the main driver of climate change here on earth. The very close correlation between the length of the sunspot cycle, and subsequent climate, continues to be a subject of very close attention. In this tract the events leading up to the Dalton Minimum (1795–1820) and the likelihood of a return of those conditions are discussed. Such an outcome will have very serious implications for world food production, amongst other outcomes.

The conclusion that carbon dioxide is a pollutant has no scientific foundation, and when carbon itself is regarded as a ‘pollutant’ the situation is utterly non-scientific. Furthermore, attempts to decarbonise the Australian economy in order to forestall climate catastrophe will have zero impact on our climate, but will be very damaging to our economy.

Introduction

Throughout the West the Environmentalist movement has energetically promoted and exploited apocalyptic fears of the end of the world. For example, the London *Guardian* published an article by Oliver Tickell (11 August 2008) entitled:

On a planet 4 °C hotter: all we can prepare for is extinction

Prime Minister Kevin Rudd has made many statements on what he sees as the primacy of the threat posed by ‘climate change’. For example:

if we do not begin reducing the nation’s levels of carbon pollution, Australia’s economy will face more frequent and severe droughts, less water, reduced food production and devastation of areas such as the Great Barrier Reef and the Kakadu wetlands.¹

Robert Manne, former editor of *Quadrant*, and now a prominent left-wing intellectual has written:

If emissions of carbon were allowed to continue unabated, by the end of this century an unthinkable level of 1000 ppm of greenhouse gases could be reached. By that time, sea levels would most likely have risen by many metres; huge numbers of species would be extinct; vast parts of the Earth would be devastated by fires, hurricanes, heat waves, permanent droughts, acid oceans, and acid rains. The human story would effectively be over.²

Sixteen Australian scientists, twelve of them professors, sent an open letter to PM Rudd on 26 September 2008 which claimed:

If this trend [rising CO₂ concentrations] is not halted soon, many millions of people from around the world will be at risk from extreme events such as heat waves, drought, fire, floods and storms, our coasts and cities will be threatened by rising sea levels, vector-borne, water- and food-borne diseases will spread rapidly, food yields and water supplies will be impaired in many regions, and many ecosystems, plant and animal species will be in serious danger of extinction. Some of Australia's natural assets such as the Great Barrier Reef, Kakadu and the Daintree World Heritage areas, which bring great wealth and recognition to our nation, could be damaged for all time.³

In recent months a feature of this apocalyptic campaign has been the attempt to demonize carbon. Some recent newspaper headlines illustrate this campaign; a campaign reminiscent of the mediaeval campaigns against witchcraft.

Carbon's a diabolical foe:

Knowledge without courage won't help us reverse the effects of climate change writes Geoffrey Barker, *Australian Financial Review*, 21 July 2008.

Globetrotting boomers fly in the face of carbon reality:

Travel is bad, very bad, for the fate of the planet, at least the kind of travel that has made globetrotting an Australian passion: air travel. I have heard about the climate impact of aeroplanes for some time but I was happy for someone else to be concerned, to fight the fight for whatever it would take to make flying ethical. Adele Horin, *SMH*, 9 August, 2008.

And all of this media frenzy was in the context of the Rudd Government's Green Paper entitled *Carbon Pollution Reduction Scheme* released on 16 July 2008 by the Minister for Climate Change, Senator Penny Wong.

The most appalling Australian example of this doomsday preaching is the taxpayer-financed TV advertising campaign which depicts families going about their ordinary domestic life, and in so doing generating little black balloons which float to the ceiling. The black balloons symbolise the carbon dioxide emissions with which we are speeding up the final catastrophe of rising sea levels, pandemics of malaria and other so-called 'tropical diseases', and run-away global warming. A small point in this context is that carbon dioxide is heavier than air, and a CO₂-filled balloon would sink to the floor. This is just one example of gross ignorance, or worse, on the part of those who seek to shut down irreplaceable sectors of our economy.

The Commonwealth Government is still committed to enacting legislation to establish machinery for decarbonising our lives but which will have very serious but quite unpredictable consequences for our economy. It can claim however, quite correctly, that virtually every business organisation in the country has supported a policy of decarbonisation. Some have lobbied energetically in its favour. The trade unions,

almost without exception, have joined in the clamour. One notorious example of such collaboration was the article entitled

United front to weather change

by joint authors Sharan Burrow, President of the ACTU, and Peter Anderson, Chief Executive of the Australian Chamber of Commerce and Industry.⁴ The opening sentence reads:

‘The response to climate change is a defining issue of our generation.’

The chain of argument which carries these headlines, these advertising campaigns, the corporate lobbying and the Emissions Trading Scheme (ETS) legislation now being proposed by the Commonwealth Government, is as follows.

- Anthropogenic emissions of carbon dioxide (that is, emissions from the burning of fossil fuels) have led to unprecedented increases in atmospheric concentrations of carbon dioxide.
- The increasing volume of carbon dioxide in the atmosphere has been the cause of rising global temperatures, particularly in the last 30 years.
- Unless the volume of atmospheric carbon dioxide is kept at current levels (through severely constraining, if not eliminating, anthropogenic emissions from this date forward), we will soon reach a ‘tipping point’ in the world’s climate which will bring global catastrophe—Sodom and Gomorrah on a world-wide scale.

These are the articles of faith which give coherence to the religious movement we can call the global warming movement. The adherents of this religion, who have been described by Austin Williams as *carbonistas*⁵ do not rely on evidence or reason to justify their faith. For them it is a self-evident and compelling creed in which they unquestioningly believe. If challenged, they rely on the *ex cathedra* authority of the Intergovernmental Panel on Climate Change, the IPCC.

Fortunately, this faith is held tenaciously by only a small proportion of the population, but who are, unfortunately, extremely influential within business, intellectual and political elites. For example, Tony Blair, the former British Prime Minister, has called global warming ‘the great moral challenge of our time.’ The Australian Prime Minister, Kevin Rudd, uses similar language.

This is a situation in the Western World which is almost without precedent. Only the campaign against witchcraft during the fifteenth and sixteenth centuries, and the campaign against genetics under Stalin and Lysenko in the Soviet Union during the 1930s and 1940s, provide historical parallels.

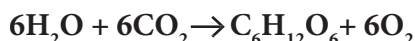
Part One:

Carbon Dioxide and the Carbon Cycle

A. Carbon in the World

Carbon is the sixth element in the periodic table and is unique in the vast number and variety of compounds it can form. With hydrogen, oxygen, nitrogen, and other elements, it forms a very large number of compounds. There are close to ten million known carbon compounds, many thousands of which are vital to organic and life processes.

Without carbon, no life on earth could exist. In its oxide form as carbon dioxide it is the essential raw material for photosynthesis in which plants use the energy of the sun to turn water and carbon dioxide into sugar and oxygen. The reaction is written



which means six molecules of water plus six molecules of carbon dioxide, using the radiant energy of the sun, produce a molecule of sugar (glucose) and six molecules of oxygen.

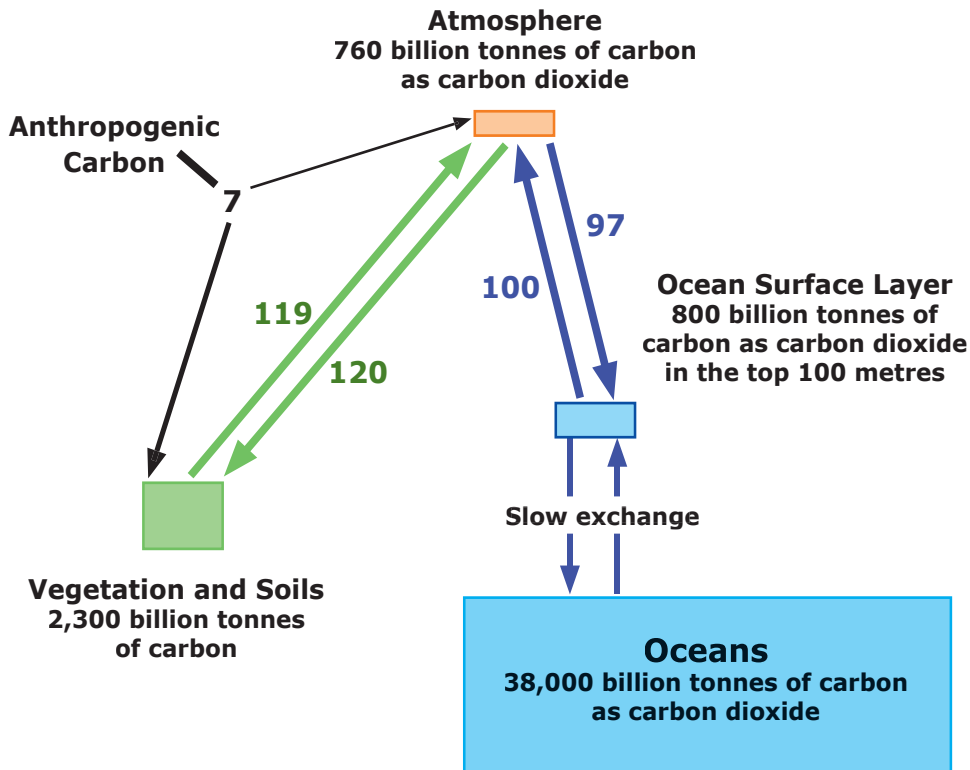
This chemical reaction is the basis for all life on earth. As atmospheric concentrations of CO_2 increase, so does plant growth. That is why we inject carbon dioxide into our glasshouses, to more than 1000 ppmv, to increase the yields of many vegetable and cut-flower crops.⁶

Carbon dioxide has a molecular weight of 44, compared with oxygen (32) and nitrogen (28). Air is a mixture of gases, nitrogen 78 per cent, oxygen 21 per cent, argon 0.93 per cent, and carbon dioxide 0.038 per cent. The water vapour content of the atmosphere changes continually but a typical value is one per cent. Its molecular weight is 18.

The flow of carbon between the oceans, the biosphere, and the atmosphere are shown in Diagram 1.

The earth's atmosphere contains approximately 760 billion tonnes (760 Gigatonnes, GtC) of carbon contained in atmospheric carbon dioxide. If we divide the oceans into a surface layer (100 metres deep) and the rest, we have 800 GtC in the surface layer, and 38,000 GtC underneath that. Much more carbon is stored in ocean sediments of calcium carbonate. There is constant movement of carbon dioxide from the atmosphere to the oceans and to the biosphere. The annual flux, to and fro, between the biosphere and the atmosphere is estimated at 120 GtC annually, and between the atmosphere and the oceans the estimate is 90 GtC.⁷ Diagram 1 indicates the differences between carbon flows in and out of the atmosphere. These figures have to be

Diagram 1: Carbon dioxide flows to and from the atmosphere



Source: This is a slightly modified version of a diagram in David Archibald, Submission to the Senate Select Committee on Fuel and Energy, 'A Non-Problem and a Real Problem: global warming and Australia's declining oil self sufficiency', October 2008, page 42.

taken as indicative rather than definitive, but they lead to the conclusion that nearly one-third of the atmosphere's carbon dioxide is turned over every year. Estimates of anthropogenic emissions of CO₂ indicate that they have increased from 5.5 Gt contained carbon (GtC) in 1979 to 8.5 GtC, in 2007.⁸ We now understand that only a fraction of these emissions makes its way into the atmosphere. According to the readings taken at Mauna Loa, atmospheric concentrations of CO₂ have increased from 338 ppmv (parts per million by volume) to 378 ppmv during the same period. Thus anthropogenic emissions of CO₂ comprise approximately 4 per cent of the annual flux between the atmosphere and the oceans and biosphere combined.

Compared with former geologic times, our present atmosphere, like the Late Carboniferous Period atmosphere (300 million years ago [mya]), is CO₂-impoverished. In the last 600 million years of Earth's history, only the Carboniferous Period and our present age, the Quaternary Period, have witnessed CO₂ levels less than 400 ppm.

In previous ages there has been much more CO₂ in our atmosphere than exists today. For example, during the Jurassic Period (200 mya), average CO₂ concentrations were about 1,800 ppm or about 4.7 times higher than today's. The highest concentrations

of CO₂ during all of the Paleozoic Era (540–250 mya) occurred during the Cambrian Period (540–490 mya). CO₂ concentrations were then nearly 7,000 ppm—about 18 times higher than today's.

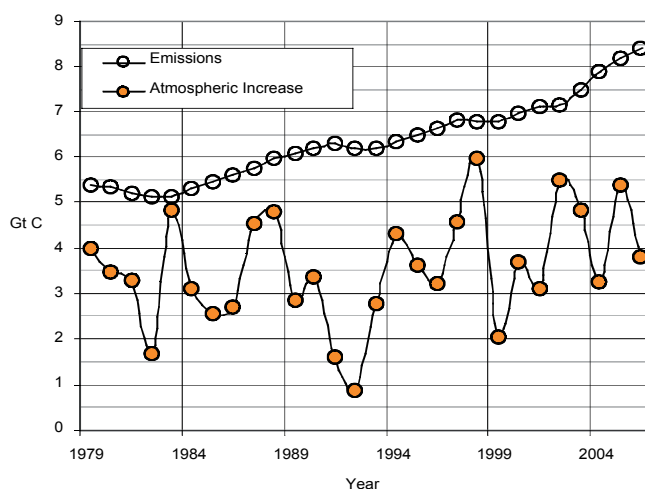
The Carboniferous Period and the Ordovician Period (490–440 mya) were the only geological periods during the whole of the Paleozoic Era when the temperatures were as low as they are today. To the consternation of the *carbonistas*, the Late Ordovician Period was also an Ice Age while at the same time CO₂ concentrations then were nearly 12 times higher than today—4,400 ppm. According to greenhouse theory, the Earth should have been exceedingly hot. Instead, global temperatures were no warmer than today. Clearly, other factors besides atmospheric carbon dioxide influence the Earth's temperatures and global warming.⁹

The evidence of temperatures and atmospheric CO₂ concentrations from geological history should make us very sceptical about the current claims of the *carbonistas*. Indeed, recent careful analysis of current atmospheric concentrations and anthropogenic emissions of CO₂, by Tom Quirk,¹⁰ reveal a surprising result. The changes in anthropogenic emissions and the atmospheric concentration of CO₂ are shown in Figure 1.

These results show that there is little connection between anthropogenic emissions and changes in atmospheric CO₂ concentrations. These two variables behave quite independently.

The two curves show that the annual increment of atmospheric CO₂ is usually about half the anthropogenic injection into the atmosphere. However,

Figure 1: Atmospheric CO₂ as measured at Mauna Loa and estimated CO₂ emissions from fossil fuels



- In 1983 and in 1998 the increase in atmospheric CO₂ was almost the same as the anthropogenic contribution; while
- In 1982, 1993, and 1999, atmospheric concentrations fell significantly, indicating that almost all of the anthropogenic contribution was absorbed by the biosphere and the oceans. 1983 and 1998 were El Niño years. The ENSO MEI Index is shown in Figure 2.

The El Niño/Southern Oscillation (ENSO) is the most important coupled ocean-atmosphere phenomenon to cause global climate variability on inter-annual time scales. ENSO is monitored by constructing the Multivariate ENSO Index (MEI) on the six main observed variables over the tropical Pacific. These six variables are: sea-level pressure (P), zonal (U) and meridional (V) components of the surface wind, sea surface temperature (S), surface air temperature (A), and total cloudiness fraction of the sky (C). These observations have been collected and published in the International Comprehensive

Ocean-Atmosphere Data Set (COADS) by NOAA (National Oceanic and Atmospheric Administration, within the US Department of Commerce), for many years.

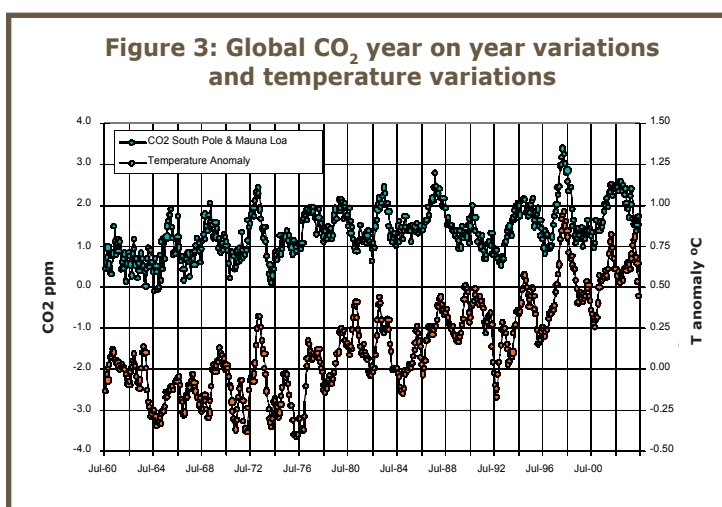
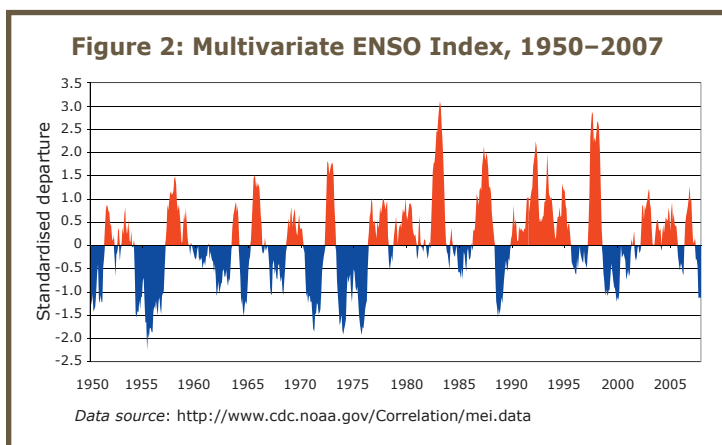


Figure 3 shows annual increments of CO₂ and the temperature anomaly based on the HadCRU surface data. (Hadley Centre—Climate Research Unit, attached to the University of East Anglia in Norwich). There is a correlation of temperature pulses with CO₂! This is strong, with coefficients of around 0.8 for El Niño times but weak with coefficients of 0.2 at other times.

What processes would turn the absorption of CO₂ on and off so dramatically and rapidly? The El Niño of 1998 seems to have induced both record maximum temperatures and the largest recorded annual increase in atmospheric CO₂. Ocean outgassing (CO₂ is driven out of solution by rising ocean temperatures) and El Niño pulses of CO₂ offer a simple explanation.

Isotopic analysis of atmospheric CO₂ confirms the argument that anthropogenic emissions have little impact on atmospheric CO₂ concentrations. Carbon has two stable isotopes, C₁₃ and C₁₂. C₁₂ comprises about 99 per cent of the total and C₁₃

one per cent. Because C₁₂ is lighter than C₁₃ it is slightly more concentrated in fossil fuel and biogenic emissions of CO₂. C₁₃ is more concentrated in contributions from the oceans. So careful examination of the C₁₂/C₁₃ ratio by hemisphere and latitude provides fingerprints of anthropogenic emissions compared with emissions from the oceans and the biosphere.¹¹ This analysis reinforces the arguments put forward above.

In summary, then, the major contribution to increasing CO₂ in the atmosphere over the last 40 years has been from the oceans. Both El Niño events, and isotopic analysis of atmospheric carbon dioxide, support this hypothesis.

This conclusion has profound consequences. It has to be remembered that global warming is alleged to be the outcome of increasing atmospheric concentrations of carbon dioxide. If these concentrations go up or down without any connection to anthropogenic emissions, the attempt to control atmospheric concentrations of CO₂ by curtailing anthropogenic emissions, or by burying CO₂ deep underground, is utterly futile.

It is very well established that increasing concentrations of CO₂ foster plant growth, particularly in arid conditions. Since CO₂ concentrations began to increase in the 1950s there has been an upsurge in the growth of vegetation in the northern hemisphere (where most of the biomass is to be found). Roy Spencer¹² notes that

The bigger concern has been the possible effect of the extra CO₂ on the world's oceans, because more CO₂ lowers the pH of seawater. While it is claimed that this makes the water more acidic, this is misleading. Since seawater has a pH around 8.1, it will take an awful lot of CO₂ to make the water neutral (pH=7), let alone acidic (pH less than 7).

Still, the main worry has been that the extra CO₂ could hurt the growth of plankton, which represents the start of the oceanic food chain. But recent research (published on April 18 in *Science Express*) has now shown, contrary to expectations, that one of the most common forms of plankton actually grows faster and bigger when more CO₂ is pumped into the water. Like vegetation on land, it loves the extra CO₂, too!¹³

Economists who are committed to decarbonisation often comment on the 'negative externalities' of which emitters of carbon dioxide (such as power stations) are presumed guilty. The facts are otherwise. Such emitters contribute greatly to the agricultural productivity, if not of the world, then of those regions in their immediate vicinity. If we are going to penalise alleged negative externalities we should, presumably, pay for undisputed positive externalities. It is an indictment of the coal-based electricity industry that they have not pointed this out to governments and the public at large.

B. Carbon Dioxide and the ‘Greenhouse Effect’

The *carbonistas*, of course, are not concerned with these issues. Their claim is that anthropogenic CO₂ will cause global warming at first, and then sudden and irreversible catastrophe at some future ‘tipping point’. Some discussion of the so-called ‘greenhouse effect’ is therefore relevant at this point.

Given that the words ‘Greenhouse Effect’ have become common parlance in the Anglosphere and beyond, one would assume that there would be a wide understanding of the physical reality which those two words purport to describe. That assumption is not true.

It should first be pointed out that the term ‘greenhouse effect’ is a complete misnomer. Glasshouses (or greenhouses) used for increasing plant growth (particularly in cold climates) do not increase internal temperatures by selective blocking of infra-red radiation. They do this by eliminating convective cooling within them. The interior of a car on a sunny day provides an example of the so-called ‘greenhouse effect’. The sun’s rays penetrate the car through the windows. The interior heats up. While the car is closed up, there is no possibility of convective cooling. If all the doors were to be opened and a breeze was blowing, the heat stored within the car would soon be swept away.

So the term ‘greenhouse effect’ is a nonsense to begin with, but it is a nonsense with which we seem to be stuck. The analysis which is set out in *Appendix A* is an attempt to describe to the layman how the earth’s atmosphere and oceans contribute to the regulation of the climate. In summary we can say that greenhouse gases such as water vapour and CO₂ cool the outer stratosphere, and this cooling maintains a temperature gradient between the outer stratosphere and the earth’s surface. This temperature gradient is required to generate the deep convective overturning of the atmosphere, and in this way heat from the tropics and sub-tropics is distributed around the globe to the higher latitudes, thus underpinning the relative climate stability we have enjoyed since the end of the last Ice Age, some 12–15,000 years ago.

C. The Climate Models

It is easy to forget that all the predictions of rising temperatures, rising sea-levels, more severe droughts, increasing malaria, etc, are based on the results obtained from the climate models which are run on large, fast, and very expensive computers. These climate models now have an independent reality of their own. The embarrassing fact that they do not, and cannot, represent the real world in which we live, is ignored by their custodians. Christopher Monckton recently summarised the situation.

The models have not projected the current multidecadal stasis in ‘global warming’: no rise in temperatures since 1998; falling temperatures since late 2001; temperatures not expected to set a new record until 2015 (Keenlyside et al., 2008). Nor (until trained ex post facto) did they predict the fall in surface temperatures from

1940–1975; nor 50 years’ cooling in Antarctica (Doran et al., 2002) and the Arctic (Soon, 2005); nor the absence of ocean warming since 2003 (Lyman et al., 2006; Gouretski & Koltermann, 2007); nor the behaviour of the great ocean oscillations (Lindzen, 2007), nor the magnitude nor duration of multi-century events such as the Mediaeval Warm Period or the Little Ice Age; nor the decline since 2000 in atmospheric methane concentration (IPCC, 2007); nor the active 2004 hurricane season; nor the inactive subsequent seasons; nor the UK flooding of 2007 (the Met Office had forecast a summer of prolonged droughts only six weeks previously); nor the solar Grand Maximum of the past 70 years, during which the Sun was more active, for longer, than at almost any similar period in the past 11,400 years (Hathaway, 2004; Solanki et al., 2005); nor the consequent surface ‘global warming’ on Mars, Jupiter, Neptune’s largest moon, and even distant Pluto; nor the eerily-continuing 2006 solar minimum; or the consequent, precipitate decline of $\sim 0.8^{\circ}\text{C}$ in surface temperature from January 2007 to May 2008 that has cancelled out almost all of the observed warming of the 20th century.

But worse still, all the climate models require temperatures in the troposphere in the tropical regions to rise as concentrations of atmospheric carbon dioxide increase. But more than a decade of close observation with radiosonde measurements (weather balloons) and satellite observations has failed to find any temperature rise. None. The outputs, then, from these large computers with their highly sophisticated simulation programmes are not worth the paper they are printed on. It is not a question here of ‘garbage in–garbage out’ but a great gulf between the highly complex simulations of the atmosphere, which have taken many man-years of highly qualified mathematicians to construct, and the real world, which is so much more complex than they have been able to describe.

Part Two: Climate and Temperature

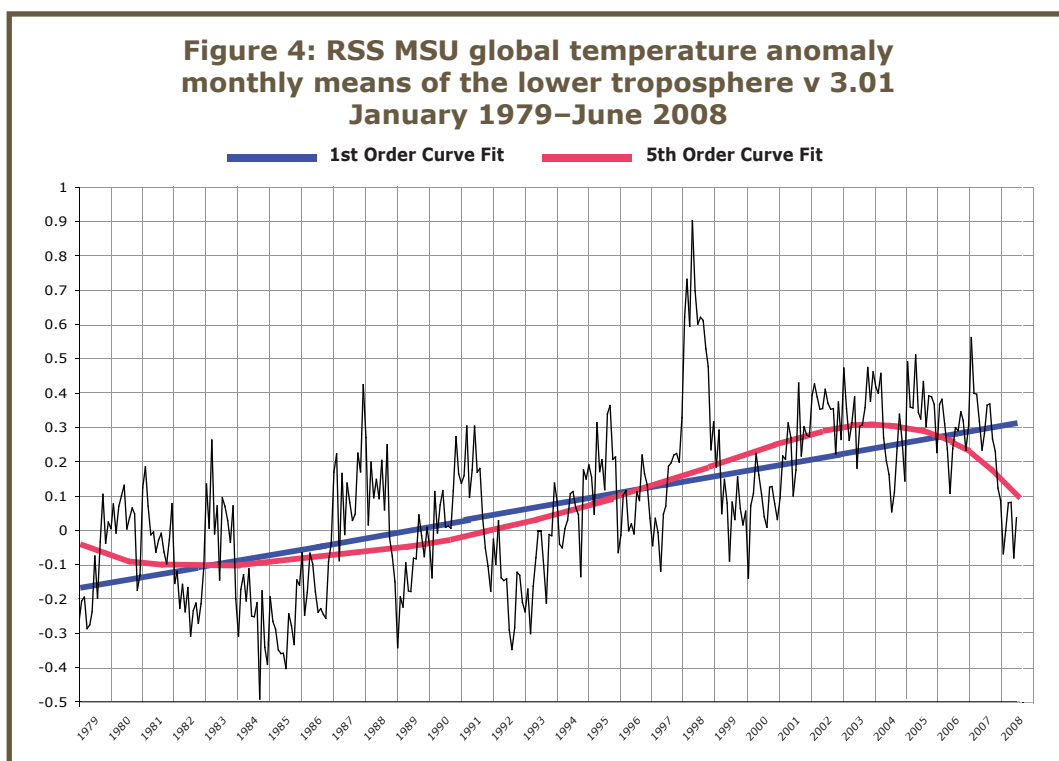
Climate is average weather, and has components which include temperature, rainfall, windiness, cloudiness, humidity, and others. Climate varies greatly around the world, but the greenhouse alarm is based on temperature, which is allegedly increasing because of increasing CO_2 , and the *carbonistas* use average global temperatures as the starting point of their concern. Other speculations, or computer-based predictions, are ultimately based on CO_2 -induced temperature increase.

A. Temperature: What Do We Mean by Global Warming?

A long-time Speaker of the US House of Representatives, Tip O’Neill, once remarked ‘All politics is local’. Similarly it is true that ‘All weather is local’. We are not interested in tomorrow’s temperature or rainfall in other parts of the world unless we are travelling there, or have friends or family there.

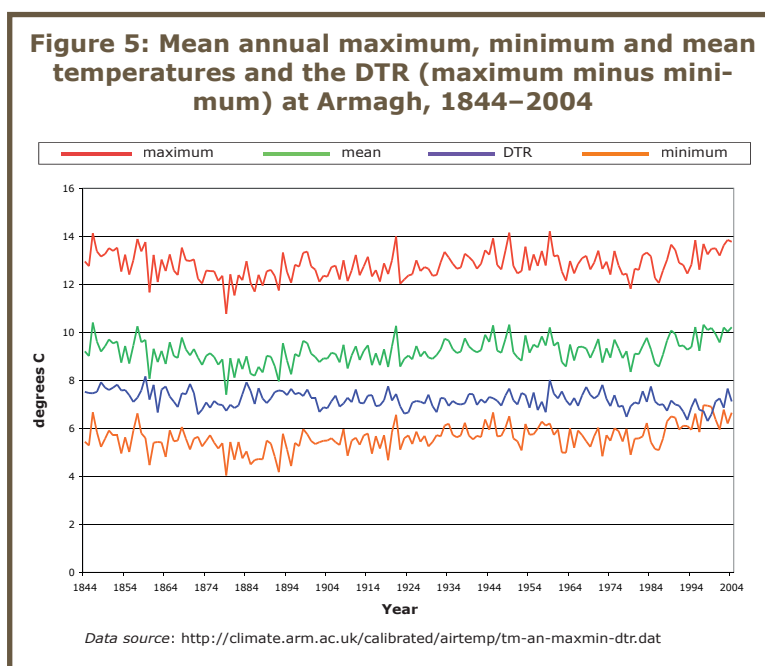
But we have now become so accustomed to writing and speaking of global temperatures throughout history that we assume that we are dealing with reality. In truth, the abstraction we call ‘global temperature’ only became plausible with the advent of satellite measurements in 1979, when it was found that orbiting satellites, using microwave technology deriving temperatures from the microwave spectrum of oxygen, could measure and record atmospheric temperatures at different levels of the atmosphere on a truly global basis. So, given that the temperature data was obtained on a global grid pattern regardless of population distribution or of land or sea, it became meaningful, for the first time in our history, to calculate average temperatures for the southern and northern hemispheres and then to combine them, giving a global average. These temperature results are still abstractions, but they provide a consistent data set going back nearly 30 years, and we can see events such as the eruption of Mt Pinatubo (June 1991) and the 1998 El Niño very clearly delineated in the record which these satellite measurements provide.

There are two independent groups involved in this work—the group at the University of Alabama in Huntsville led by John Christie and Roy Spencer, and the RSS (Remote Sensing Systems) Group, based in Santa Rosa, California, led by Frank Wentz. Both groups publish monthly results which are very similar but not identical. Figure 4 shows the temperature record from the RSS group, with two lines of best fit overlaid on the record. One is a straight line which shows an increase over the 30-year period of 0.5 °C, and the other, a fifth order polynomial, which shows that, over the last 3½ years, the smoothed temperature has fallen by 0.2 °C. The actual temperature drop over the past 18 months has been 0.65 °C.



Continuous temperature records have been kept at observatories such as the Armagh Observatory in Northern Ireland, which was founded in 1790 by Archbishop Richard Robinson. These records provide a valuable data source for investigating theories of periodic influences on the climate, although they provide a data set which is accurate and reliable

only for the North Atlantic. Figure 5 shows a range of temperature measurements from Armagh for the period 1844 to 2004.



However, we all refer, quite matter-of-factly, as did the IPCC in its First Assessment Report (1990), to the Roman Warm Period (250 BC–450 AD), which was followed by a cold period (450–950 AD, the Dark Ages), which was terminated by the onset of the Medieval Warm Period (950–1400 AD), which was followed, tragically, by the Little Ice Age (1400–1850 AD), including the Maunder Minimum (at around 1700 AD), which was then succeeded by the recent Modern Warming Period (1850 AD to the present).

However, thermometers were not invented until, in 1724, Daniel Gabriel Fahrenheit produced the temperature scale which now (slightly adjusted) bears his name. He could do this because he manufactured thermometers using mercury (which has a high coefficient of expansion) for the first time, and the quality of his production could provide a finer scale and greater reproducibility, leading to its general adoption.

How, then, can we have any idea of what the climate was like prior to the systematic recording of temperatures which began at the end of the eighteenth century?

In the first instance we have a mass of documentary evidence which tells us about life in the days of the Roman Empire; an empire which extended from Hadrian's Wall in northern England to Palestine and Judea. We know, for example, that wine grapes were grown in Yorkshire, and from that fact we can deduce that the climate in Yorkshire, then, was at least as benign as the climate in the wine-producing regions of contemporary France.

During the Mediaeval Warm Period we know that Greenland was settled, and cattle were grazed there, for 300 years or more.

Since 1996 the IPCC's scientists have tried to show that these manifestations of a much warmer climate were purely local in their occurrence. The Mediaeval Warm Period, they say, was confined to the North Atlantic Basin. Of great interest, then, is the research carried out in the South China Sea by K F Yu and his collaborators. They used coral samples from the northern part of the South China Sea, and determined temperature values from the Strontium/Calcium ratio in the coral. They dated the samples using Uranium-Thorium dating techniques.

They found that temperatures were high during the Roman Warm Period and low during the Dark Ages. Their conclusion:

These observations add to the voluminous evidence for the reality and global extent of the millennial-scale oscillation of climate that has alternately produced, not only the Roman Warm Period and Dark Ages Cold Period, but the subsequent Medieval Warm Period, Little Ice Age and Modern Warm Period, all without any help from changes in the air's CO₂ content.¹⁴

Paul Williams has used similar techniques to work out the climatic history revealed by stalagmites in New Zealand.¹⁵ P D Nunn found surrogate evidence for similar climatic changes in the Pacific.¹⁶

I have discussed the notorious case of Mann's Hockey Stick in a previous publication.¹⁷ Mann's Hockey Stick was used as a reredos at the Shanghai launch in January 2001 of the IPCC's Third Assessment Report. It was subsequently used by the IPCC as a quasi-corporate logo. When it finally became impossible to deny that the Hockey Stick was a fraud, it was quietly dropped.

It is noteworthy that, over the past 500,000 years, brief intervals of inter-glacial warmth such as the recent 12,000 years or so, have been followed, very quickly, by long periods of ice-age conditions, typically 85,000 years in duration. If this historical pattern is to continue (and we have no reason to think it will not do so), then the next Ice Age will be upon us some time during the next millennium, or perhaps the one after. Our current state of knowledge does not allow us to predict when this will happen. Nor does it tell us what we could do to forestall its arrival, even if we could predict when it was due to arrive.

B. Rainfall

Although it has become entrenched within our thinking to summarise climatic conditions in terms of temperature, what has been far more important to those countries for whom agriculture has been the basis of their economy has been rainfall and/or

river flows. The annual inundation of the Nile Delta was the basis of Egyptian life for thousands of years. Monsoon failure in India brought mass starvation. The Murray–Darling basin, the ‘food-bowl’ of Australia, depends for its prosperity on the flows down those two rivers.

Excessive rain can lead to floods, causing serious economic loss. Inevitably these floods have been blamed on anthropogenic CO₂.

Lack of rain causes droughts, and these have also been blamed on anthropogenic CO₂. It is not widely known that there is virtually no correlation between temperatures in Australia and droughts.

The Australian Bureau of Meteorology has published a history of Australian droughts going back to 1864–66.¹⁸

In summary the drought record tells us that, in the 144 years since 1864, 48 years, one-third of this history, have been drought years, seriously affecting much of the Australian continent and causing widespread losses in the rural sector. In 1942, for example, the Murray River was reduced to a series of stagnant pools, and correspondents recall walking across the Murray at Tocumwal.

The federation drought from 1895 to 1903 was arguably the worst in Australia’s history. Sheep numbers were halved, and cattle numbers reduced by 40 per cent. Coming after the collapse in wool prices in the early 1890s and the banking collapse in Victoria in 1893, Australia’s population declined, with significant emigration to New Zealand and to South Africa.

C. Sea Levels and Global Warming

Predictions of rises in sea level have become a serious issue in Australia as planning authorities begin to take seriously CSIRO predictions of rising sea levels consequent to global warming. Families on the Victorian coast have been effectively expropriated as a result of decisions by the Victorian Civil and Administrative Tribunal (VCAT), in August 2008, which were based on CSIRO advice.¹⁹

The chain of argument is this. Global temperatures keep rising. The Antarctic and Greenland Ice Caps keep melting. The melted ice becomes part of the world’s oceans and raises sea levels everywhere.

In reality the Greenland and Antarctic Ice Sheets overlies basins over 1,000m deep. Boreholes on the ice caps have produced cores that record the history of snow deposition and its associated air, from which a history of CO₂ has been derived. The system only works, of course, because the snow accumulates year by year as thin but intact strata. This shows that the ice caps are not melting at the surface. The EPICA core in Antarctica

has a climatic record going back 800,000 years, which is a long time without melting. When the ice gets thick enough, the pressure is enough to make the ice slowly flow by plastic deformation. The global warmers present a 'model' of the ice sliding downhill, aided by meltwater, but this is not true even of small valley glaciers, and the big Ice Caps would have to flow uphill. The lower parts of the ice cores often have no record of climate because the ice has started to flow. The rate of flow depends on the stress (and therefore the thickness of the ice), and the temperature. The big ice caps are well below freezing point at the surface, and in fact most temperature effect is at the base, and it is geothermal heat that results in most flow being near the base of the ice cap.

In brief:

- Greenland and East Antarctica ice sheets occupy deep basins.
- The ice in these basins cannot slide downhill.
- The centres of the ice sheets are far too cold to melt at the surface.
- The only flow possible in the centre of the ice sheets is by creep, and most such flow takes place in the lower regions where it is induced by geothermal heat.
- Such flow is 'glacially slow' and would not permit the 'collapse' of these ice sheets, that is melting of the ice in tens of years, as predicted by the IPCC, Al Gore, and other *carbonistas*.

The *carbonistas* and the media make much out of collapses on the margins of ice caps, showing total lack of appreciation of the budget of an ice cap. Dr Cliff Ollier²⁰ wrote the following letter to *The Australian*, where it was duly published.

A report in *The Weekend Australian* (23–24 August 2008, p. 3) describes a crack in the Arctic ice that may lead to the birth of an iceberg. It is reported that 'Scientists blamed global warming for the collapse.'

This illustrates the way that global warming alarmists are now clutching at straws. The icecaps of Greenland and Antarctica grow by precipitation in the uplands, flow at depth, and at the ice front the ice either melts or breaks off as icebergs. Icebergs were seen by Captain Cook and a famous one sank the Titanic. Icebergs are always produced during an ice age and hundreds are formed every year. They are produced in both times of warming and times of cooling. The ice has never simply kept flowing to the equator. Furthermore the flow of ice is controlled largely by the thickness (hence weight) of ice, which depends on precipitation long ago: the present climate is unimportant. The detection of a single iceberg does not indicate global warming, which is an even more improbable hypothesis given that we have experienced global cooling for the past ten years.

Yours sincerely
Cliff Ollier
Perth

Readers are referred to Dr Ollier's paper on the Lavoisier website entitled 'The Greenland-Antarctica Melting Problem does not exist'.²¹

D. The El Niño–Southern Oscillation (ENSO)

It is widely understood that the *El Niño–La Niña* phases of the Pacific Ocean dominate our climate and that Australia's drought record is closely correlated to El Niño events. The term El Niño first appeared in 1892, when Captain Camilo Carrillo told the Geographical Society congress in Lima that Peruvian sailors named the warm northerly current 'El Niño' because it was most noticeable around Christmas. We now refer to the El Niño–Southern Oscillation or ENSO. The atmospheric signature, the Southern Oscillation (SO) reflects the monthly or seasonal fluctuations in the air pressure difference between Tahiti and Darwin.

During major warm events, El Niño warming extends over much of the tropical Pacific and becomes clearly linked to the intensity of the Southern Oscillation. ENSO effects are manifest in the Indian Ocean phase as well the Pacific.

Along the Peruvian coast we usually find a cold southerly current (the Humboldt Current) with deep up-welling of cold water from the Antarctic; the up-welling nutrients lead to great oceanic productivity. However, these cold currents lead to very dry conditions on land. This is the La Niña condition. But the replacement of this cold current with warmer northerly water (El Niño) leads to lower biological productivity in the ocean, and more rainfall—often flooding—on the west coasts of North and South America, and to droughts in Australia and India.

Towards the end of the nineteenth century there was much interest in forecasting climate anomalies (for food production) in India and Australia. Charles Todd, the famous South Australian astronomer, telegraph pioneer, and meteorological pioneer, suggested in 1893 that droughts in India and Australia tended to occur at the same time.

Despite the critical importance of the El Niño–La Niña phenomenon to Australian life, our governments have been throwing billions of taxpayer's funds into the *carbonista* cart, and research into El Niño has been almost entirely carried out by amateurs, retired scientists, and the US Government, which established a set of ocean buoys after the 1983 El Niño. An article by Professor Stewart Franks of the University of Newcastle summarises the El Niño–La Niña impact on recent Australian rainfall.²²

The recent drought was caused by an entirely natural phenomenon: the 2002 El Niño event. This led to particularly low rainfalls across eastern Australia. The subsequent years were either neutral or weak El Niño conditions. Significantly, neutral conditions are not sufficient to break a drought. In 2006, we had a return to El Niño conditions which further exacerbated the drought. What we didn't have was a strong La Niña.

Last year finally brought a La Niña event but it was relatively weak. It produced a number of major storm events in coastal areas and some useful rainfall in the Murray-Darling basin and elsewhere. Approximately half of NSW drought-declared areas were lifted out of drought (albeit into 'marginal' status) and Sydney's water supply doubled in the space of a few months.

This was the first rain-bearing La Niña since 1999 but proved insufficient to break the drought. In short, the drought was initiated by El Niño, protracted by further El Niño events and perhaps more importantly, the absence of substantial La Niña events.

Despite the known causes of the drought, many have claimed that CO₂ emissions are to blame. There have been arguments put forward to justify this claim, all eagerly adopted by various groups, but none of which have serious merit.

A key claim is that the multiple occurrence of El Niño is a sign of climate change. This is speculative at best. Recent analysis showed the nine-year absence of La Niña was not unusual. In fact long-term records demonstrate alternating periods of 20-40 years where El Niño is dominant, followed by similarly extended periods where La Niña dominates. Ominously, the data demonstrates that it is possible to go 14-15 years without any La Niña events. The consequent drought would be devastating but entirely natural.

The observation that El Niño and La Niña events cluster on 20-40 year, multi-decadal time scales is an important one. It demonstrates that Australia should always expect major changes in climate as a function of natural variability. When viewed in this light, the drought is most likely a recurring feature of the Australian climate.

A more recent claim is that higher temperatures are leading to increased evaporation of moisture. The weather bureau acknowledges that rainfall from September 2001 until now has not been the lowest recorded, however much has been made of the fact that consequent inflows have been the lowest. It has been claimed increased evaporation, driven by climate change, can make up this discrepancy. Indeed, Wendy Craik, the chief executive of the Murray Darling Basin Commission has stated that temperatures were warmer, leading to more evaporation and drier catchments.

This is disturbing to hear from the head of the MDBC, as it is completely at odds with the known physics of evaporation. While it sounds intuitively correct, it is wrong.

When soil contains high moisture content, much of the sun's energy is used in evaporation. Consequently, there is limited heating of the surface. When soil moisture content is low (as occurs during drought) nearly all of that energy is converted into heating the surface, and air temperatures rise significantly. Consequently, higher temperatures are due to the lack of evaporation, not a cause of significantly higher evaporation.

Cloud cover also provides a major control on air temperatures. El Niño delivers less rainfall but also less cloud cover. This has a major impact on the amount of the sun's energy reaching land; far greater than the trivial increase in radiant energy caused by increased CO₂. Again, in the absence of soil moisture, air temperatures increase.

These are known and accepted processes of environmental physics and are not contentious. They are ignored because they detract from the simple message that we should sign up to the concept of 'dangerous climate change' and an emissions trading scheme. After all, who would pay for carbon emissions if they were not proven to be detrimental? Who would provide extra funds for climate change science if it wasn't a proven significant factor compared to natural climatic variability?

E. The Pacific Decadal Oscillation (PDO)

The following details about the Pacific Decadal Oscillation are drawn from Nathan Mantua's entry in *Wikipedia*.²³

The 'Pacific Decadal Oscillation' (PDO) is a long-lived El Niño-like pattern of Pacific climate variability. While the two climate oscillations have similar spatial climate fingerprints, they display very different behaviour in time. Fisheries scientist Steven Hare coined the term 'Pacific Decadal Oscillation' (PDO) in 1996 while researching connections between Alaska salmon production cycles and Pacific climate. Two main characteristics distinguish PDO from the El Niño/Southern Oscillation (ENSO): first, twentieth century PDO 'events' persisted for 20 to 30 years, while typical ENSO events persisted for 6 to 18 months; second, the climatic fingerprints of the PDO are most visible in the North Pacific/North American sector, while secondary signatures exist in the tropics—the opposite is true for ENSO. Several independent studies find evidence for just two full PDO cycles in the past century: 'cool' PDO regimes prevailed from 1890–1924 and again from 1947–1976, while 'warm' PDO regimes dominated from 1925–1946 and from 1977 through to (at least) the mid-1990s.

Major changes in northeast Pacific marine ecosystems have been correlated with phase changes in the PDO; warm eras have seen enhanced coastal ocean biological productivity in Alaska and inhibited productivity off the west coast of the contiguous United States, while cold PDO eras have seen the opposite north-south pattern of marine ecosystem productivity.

Causes for the PDO are not currently known. Likewise, the potential predictability for this climate oscillation are not known. Even in the absence of a theoretical understanding, PDO climate information improves season-to-season and year-to-year climate forecasts for North America because of its strong tendency for multi-season and multi-year persistence. From a societal impacts perspective, recognition of

PDO is important because it shows that ‘normal’ climate conditions can vary over time periods comparable to the length of a human’s lifetime.

Discovery of the PDO occurred only 12 years ago, and has generated a considerable research agenda. As far as the IPCC’s climate models are concerned, the PDO does not exist.

Part Three: The Solar Connection

For nearly 20 years, the scientists connected to the IPCC have pretended that the sun has only a marginal impact on our climate. As their model predictions became increasingly the subject of scorn (particularly since their failure to predict the cooling of recent years became an acute embarrassment) more and more scientists, many retired, or from other fields, have been examining the long history of solar influences on our climate.

Until belief in the IPCC doctrine of anthropogenic carbon dioxide as the instrument of climate control became virtually mandatory throughout the Western world of government-controlled science, the study of solar influences on the world’s climate had occupied scientists for at least two centuries.

In 1800, William Herschel, the Astronomer Royal, published his famous paper in which he took the wheat prices recorded by Adam Smith in *The Wealth of Nations*, and found that they correlated extremely well with the sunspot record as it was then known. He was probably spurred into this investigation because the Thames had frozen again in London for the first time for nearly a century, an early manifestation of the *Dalton Minimum*. The *Dalton Minimum* was named after John Dalton (1766–1844) an English chemist, meteorologist and physicist, who is best known for his pioneering work in the development of modern atomic theory.

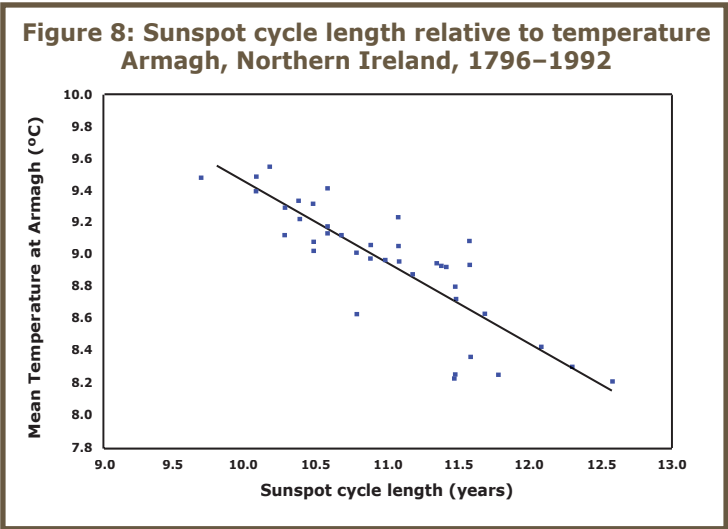
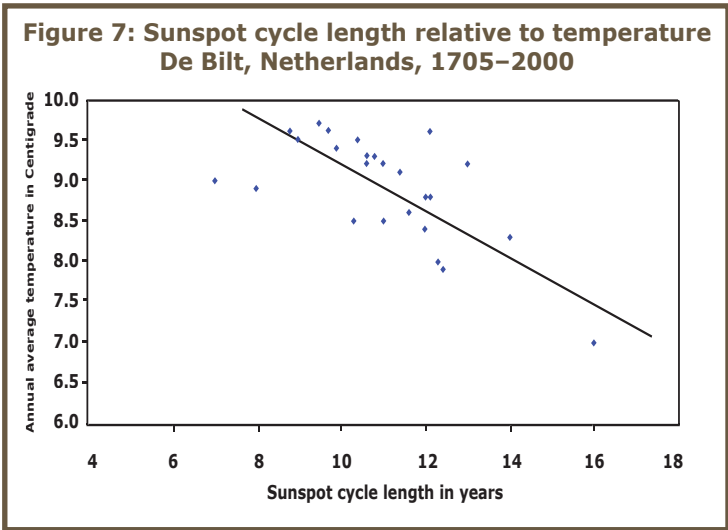
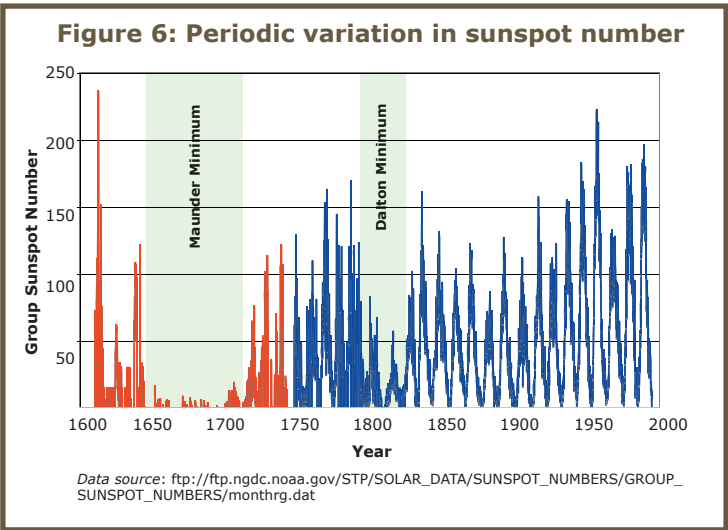
The *Dalton Minimum*, which began about 1795, and which persisted until 1820, cut a grim passage throughout all of Europe, where the combination of bad harvests, and then the Napoleonic Wars, caused very great distress. It was coincident with Solar Cycles 5 and 6, which were of very low intensity. But of greater significance was that Solar Cycle 4 had been of high intensity and long duration—13 years—and a period of warmer temperatures and excellent harvests.

Historically, such long-duration, high-intensity solar cycles have been excellent predictors of weak cycles and miserable weather for the next 25–30 years. Why this should be so is an issue over which many scientists now argue. But the correlation is beyond argument and provides a fertile field of research for astronomers and scientists in related fields.

The *Maunder Minimum* is the name given to the period roughly from 1645 to 1715, when sunspots became exceedingly rare, as noted by solar observers of the time. It is named after the solar astronomer Edward W. Maunder (1851–1928) who discovered the dearth of sunspots during that period by studying records from those years. During one 30-year period within the Maunder Minimum, for example, astronomers observed only about 50 sunspots, as opposed to a more typical 40,000–50,000 spots.

The sunspot cycle is shown in Figure 6.

The most compelling evidence of the linkage between solar activity and the earth’s climate is shown in Figure 7. This data is taken from the temperature record at KNMI (Royal Netherlands Meteorological Institute) located in De Bilt, a suburb of Utrecht in Holland. A chart showing the statistical relationship between the temperature record at Armagh and the length of the sunspot cycle is shown in Figure 8.²⁴



All of this analysis shows that global temperatures and sunspot activity are related. But it does not explain how they are related. And it is here that the *carbonistas* have a polemical advantage. They have a theory of climate control which argues that anthropogenic emissions of carbon dioxide, at least since the 1970s, control the climate. Some of them admit that, in the past, solar influences may have been important, but they say that all that has changed since mankind started to use fossil fuels to create modern civilisation. In reality the Industrial Revolution started long before 1970.

The evidence is overwhelming that solar influences have played a major role in the past, and there is no reason to believe that the laws of celestial mechanics and solar physics suddenly changed sometime during the last 50 years. As Albert Einstein remarked 'God does not play dice with the universe'.

But can we explain how these manifestations of solar activity mesh with the global climate? There are a number of competing scholars seeking to win scientific immortality by providing the definitive answer.

There is the Copenhagen school, led by Eigil Friis-Christensen and Henrik Svensmark, which argues

The varying activity of the Sun is indeed the largest and most systematic contributor to natural climate variations. The effect goes through solar modulation of the cosmic radiation, which affects the formation of aerosols and thereby also the formation of clouds.

Solar activity has been exceptionally high in the 20th century compared to the last 400 years and possibly compared to the last 8000 years. When solar activity is high, the flux of galactic cosmic rays is reduced due to increased magnetic shielding by the Sun. The cosmic rays may influence Earth's climate through the formation of low-lying clouds.

Cosmic rays ionize the atmosphere and an experiment performed at the Danish National Space Centre has found that the production of aerosols in a sample atmosphere with condensable gases (such as sulfuric acid and water vapour) depends on the amount of ionisation. Since aerosols work as precursors for formation of cloud droplets, this is an indication that cosmic rays affect climate.

Climate models only include the effects of small variations in the direct solar radiation (infrared, visible and UV). The effects of cosmic rays on clouds are not included in models and the models do a rather poor job of simulating clouds in the present climate. Since cloud feedbacks are a large source of uncertainty, this is a reason for concern when viewing climate model predictions.²⁵

The experiments on cosmic rays and cloud formation are continuing. But even if this theory is successfully proven, the question still arises 'What is it that generates the solar behaviour which changes the solar winds and magnetic fluxes which have such a huge impact on our climate?'

We now enter into the field of celestial mechanics and the influence of the large Jovian planets on the Sun, and its movements within the solar system. The number of scholars contributing to this debate grows all the time. Some of them work with NASA, an organisation which is deeply concerned about the effect of solar activity on satellite communications and space exploration. Others are retired scientists and still others come from completely unrelated fields of scholarship. One of the early pioneers was Theodore Landscheidt, a German jurist who wrote a series of path-breaking papers in the 1990s. His name has been proposed for the next solar minimum, as he was the first to predict its arrival within the next decade.²⁶ Rhodes Fairbridge was another pioneer.²⁷

Part Four: The Role of the IPCC

The key institution promoting belief in the theory of anthropogenic carbon dioxide as an instrument of climate control is the Intergovernmental Panel on Climate Change (IPCC). The IPCC was founded jointly by UNEP (UN Environment Programme) and the World Meteorological Organization (WMO) in 1988 and has issued four assessment reports since 1990, each successive report becoming more alarmist and more incredible than the previous one. William Kininmonth has provided a detailed account of the origins of the IPCC in his *Quadrant* article of October 2008.²⁸

Many Western governments have initiated far-reaching and economy-destroying policies on what the words 'greenhouse effect' are supposed to mean, and given that the scientific legitimacy for these policies is wholly grounded in the reports issued by the IPCC, one would expect to find a precise and compelling description of the Greenhouse Effect within the IPCC literature. There is none.

The IPCC reports provide the basis for the Stern and Garnaut Reports. Both Stern and Garnaut, being non-scientists, admit to an incapacity to make judgements about IPCC science, but they then go on to make personal statements about the carbon-induced terrors facing mankind. In Australia, key personnel within the CSIRO have tied themselves to the IPCC.

Every Australian university has jumped on the global warming bandwagon. For example, the University of Melbourne's Vice-Chancellor, Glynn Davies, used his chairmanship of the PM's 2020 Summit held in April 2008 to proclaim his fervent adherence to global warming doctrine and in the UK, the Royal Society has sought to suppress opposing views. In September 2006, the Royal Society wrote an extraordinary, official letter to US corporations such as Exxon-Mobil, demanding the end of any corporate support for groups or scientists who had differing views on climate change from those propagated by the Royal Society.²⁹ All of these institutions are now engaged in a campaign which has strong religious characteristics, and as happened

in the past during periods of religious ferment, they are extremely intolerant of dissident views. This fervour has spread to education departments all over Australia, and even to the Commonwealth Treasury and other key sectors of the Commonwealth bureaucracy.

The role of the IPCC in promoting and legitimising faith in anthropogenic carbon dioxide as an instrument of climate control has been crucial to the success of this doctrine. Most political and business leaders haven't got the slightest knowledge of the physics or chemistry of the atmosphere, or of the sun's influence over the centuries on our climate. Prime Minister Kevin Rudd frequently proclaims his unswerving belief in the basic doctrines of the IPCC described on page 3 above, but always relies on the authority of the IPCC when challenged about them. Along with the authority of the IPCC, the agreement of 2,500 scientists to the IPCC's predictions is frequently cited as evidence of an overwhelming 'consensus of the world's scientists' about the threat of 'global warming'.

Recently John McLean published an article in *The Australian*³⁰ in which he carefully analysed exactly how many scientists associated with the IPCC had actually endorsed the IPCC's *carbonista* principles. His conclusion was that 37 scientists met this test, and they were all connected with climate modelling groups. These computer models, and the computers which are used to drive them, have soaked up huge amounts of taxpayers' funds around the Anglosphere since the late 1980s. It would be unthinkable for those responsible for the expenditures of such large sums to conclude that CO₂ was harmless, and that their predictions of climate catastrophe were a mistake.

Part Five: The Politics and Economics of Decarbonisation

The fall-out from the inevitable collapse of the faith in the *carbonistas'* doctrines will be far more serious than the fall-out from the collapse of the Ptolemaic system of cosmology which maintained that the earth was the centre of the solar system. Amongst many other totally wasteful expenditures, many billions of dollars have been spent in carbon trading schemes, both state-sanctioned and speculative. The collapse of Lehman Bros in the second week of September 2008 is a portent of what lies ahead. Al Gore's carbon trading business, GIM, was banked with Lehman Bros. Merrill Lynch was also deeply involved in this business.

Respected Australian economist Geoff Carmody has warned that 'Australia's emissions trading model cannot work, that it is misconceived and that it will damage Australia's economy with almost no prospect of solving the global problem'.³¹

The role of governments throughout the Western world in providing huge sums of money looking for proof that faith in anthropogenic carbon dioxide, as an instrument

of climate control, is scientifically justified, and the behaviour of those scientists who have made very successful careers in promoting this nonsense, will be something that future generations will find astonishing.

Conclusion

The branding of carbon by the Rudd Government as a ‘pollutant’, and the acceptance by the Opposition of the label, is a consequence of belief in the doctrine that anthropogenic carbon dioxide has caused global temperatures to rise in recent decades, and that droughts, rising sea-levels, malarial plagues, increasing numbers and intensity of hurricanes, unprecedented species loss, etc, will surely follow. The belief in a catastrophic tipping point is a familiar, ‘end-of-the-world’ phenomenon, of the kind which gripped Europe at the end of the first millennium.

The degree to which anthropogenic emissions have been the main driver of increasing atmospheric concentrations of carbon dioxide is now an open question, and early results indicate that the anthropogenic contribution is small.

Predictions of rising temperatures are based on complex simulations of the world’s climate which are run on very large, very fast and very expensive computers. However, these climate models have no connection to the real world in which we live, since they have not been able to predict the climate we have experienced since 1997, and their predictions of increasing temperatures in the tropical atmosphere are contrary to all the experimental data that have been gathered in recent years.

Australia’s weather is dominated by the El Niño–La Niña events of the Pacific Ocean, not by carbon dioxide.

We are threatened by an Emissions Trading Scheme based on the gross superstition that carbon is a pollutant. The Emissions Trading Scheme is a much greater threat to our lives and to our nation than any increase in carbon dioxide that man can produce.

Appendix

A Detailed Consideration of the Greenhouse Effect

Many Western governments have initiated far-reaching and economy-destroying policies on what the words 'greenhouse effect' are supposed to mean, and given that the scientific legitimacy for these policies is wholly grounded in the reports issued by the IPCC, one would expect to find a precise and compelling description of the Greenhouse Effect within the IPCC literature.

This is what we find in the IPCC's First Assessment Report (1990), which has the usual diagram of the sun and the earth (which is represented as a flat plate) with solar radiation penetrating the atmosphere and being partially absorbed and partially reflected at the earth's surface (Diagram 2).

It also has the earth's surface emitting infra-red radiation where it states:

some of the infrared radiation is absorbed and re-emitted by the greenhouse gases. The effect of this is to warm the surface and the lower atmosphere.

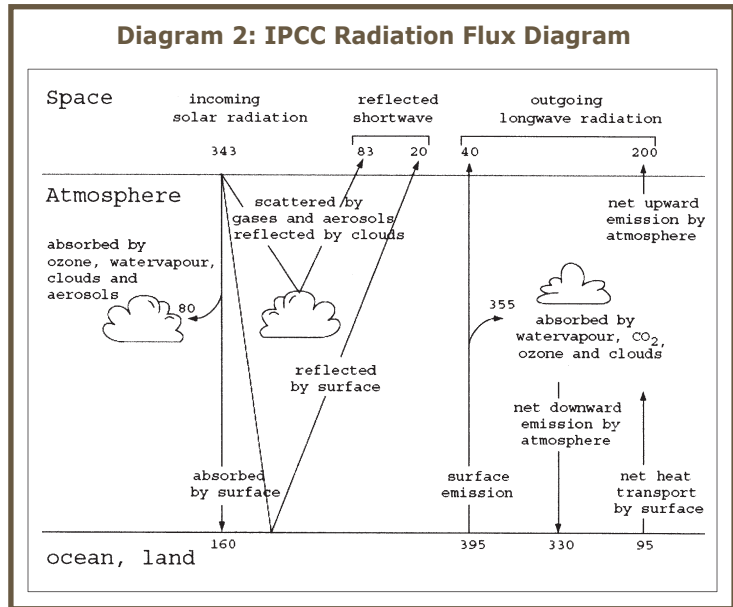
The Report then asks the following question.

'How do we know that the natural greenhouse effect is real?

And replies to its own question with the following words.

The greenhouse effect is real; it is a well-understood effect, based on established scientific principles. We know that the greenhouse effect works in practice, for several reasons.

Firstly, the mean temperature of the earth's surface is already warmer by about 33 °C (assuming the same reflectivity of the earth) than it would be if the natural greenhouse gases were not present. Satellite observations of the radiation



emitted from the earth's surface and through the atmosphere demonstrate the effect of the greenhouse gases.

Secondly, we know the atmospheric composition of Venus, Earth and Mars are very different, and their surface temperatures are in general agreement with greenhouse theory.

Thirdly, measurements from ice cores going back 160,000 years shows the earth's temperature closely parallels the amount of carbon dioxide and methane in the atmosphere (see Figure 2). *Although we do not know the details of cause and effect, calculations indicate that changes in these greenhouse gases were part, but not all, of the large (5-7 °C) global temperature swings between ice ages and interglacial periods.* (emphasis added)

Thus the IPCC argued in 1990 that there is a greenhouse effect due to the greenhouse gases and, although the cause and effect is not known, calculations can be made that are in accordance with what is expected! We also know (as they did not know in 1990) that the temperature changes manifest in the Vostok ice cores *preceded* the changes in carbon dioxide by 800 years or so.

More recently the IPCC has sought to inform the casual inquirer by having a series of explanations for 'frequently asked questions', or FAQs. The first FAQ is

What factors determine earth's climate?

The IPCC tells us that, on average, the earth emits 240 Wm^{-2} of radiation to space and that this equates to an emission temperature of -19°C , at the surface. The earth's average surface temperature, however, is about $+14^\circ\text{C}$ and the -19°C temperature is found at a height of about 5 km (16,400 ft) above the surface. To quote the IPCC:

The reason the earth's surface is this warm is the presence of greenhouse gases, which act as a partial blanket for the long-wave radiation coming from the earth's surface. This blanketing is known as the natural greenhouse effect.

This explanation by the IPCC is wrong. Kininmonth³² points out:

The inference that the greenhouse gases are acting like a blanket suggests that they are increasing the insulating properties of the atmosphere. However, the main gases of the atmosphere are oxygen and nitrogen, non-greenhouse gases, and they are also excellent insulators against the conduction of heat (like a blanket); thus adding tiny increments to carbon dioxide concentrations will have no measurable impact on the insulating properties of the atmosphere.

In its third FAQ, '**What is the greenhouse effect?**' the IPCC comes to the nub of the issue but provides a different but equally incorrect explanation.

Much of the thermal radiation emitted by the land and the ocean is absorbed by the atmosphere, including clouds, and re-radiated back to earth. This is called the greenhouse effect.

According to the IPCC's global energy budget, the earth's surface emits 390 Wm^{-2} of radiation and the energy radiated back to the surface is 324 Wm^{-2} . It is difficult to see how an ongoing net loss of long-wave radiation energy from the surface of 66 Wm^{-2} to the atmosphere can lead to warming! To quote Kininmonth again:

The IPCC has not explained, in a scientifically sound and coherent way, how the 'greenhouse effect' is maintained. The greenhouse gases do not increase the insulating properties of the atmosphere and the back radiation does not warm the surface. The IPCC explanation of the greenhouse effect is pure obfuscation and, even to the mildly scientific literate, reflects ignorance of the basic processes of the climate system.

I am of the view that 'the greenhouse effect' is one of those things that is accepted because it is there, everybody claims to understand it because it is so important, but in reality few know how it comes about.

The main error within the IPCC storyline is that they focus on long-wave radiation absorption, and the re-emission of the absorbed radiation. The fact is that the greenhouse gases and clouds of the atmosphere emit long-wave radiation not because of what they have previously absorbed, but because of their actual temperature and the emissivity of their characteristic wavelength bands. Without a compensating energy source the atmospheric greenhouse gases would get colder and colder until absolute zero! The emission of long-wave radiation by the greenhouse gases according to Stephan's Law is the primary driver of the climate system. The second driver is the ongoing absorption of solar radiation, primarily at the surface of the tropics. Convection is a response to these drivers and the magnitude of convective distribution of energy (heat and latent) from the surface to the atmosphere is regulated by the temperature lapse rate. As energy is distributed and the temperature lapse rate approaches the moist adiabatic lapse rate, then the convection slows; as the lapse rate increases then so the convection also increases. That is, it is the convection transport that adjusts to the radiation processes.

The atmosphere works to make the earth inhabitable (over most of the biosphere) in the following way. The energy flow through the climate system is predominantly by way of four stages:

1. Solar radiation is absorbed at the earth's surface, principally in the tropical oceans.
2. Heat is transferred to the atmospheric boundary layer (0–1,000 ft) through the evaporation of water from the ocean surface and the latent energy of the water vapour is now held in that atmospheric boundary layer.

3. Convective overturning of the atmosphere distributes heat and latent energy from the tropical boundary layer throughout the entire troposphere; and
4. Energy is radiated from the upper atmosphere to space, at a rate and wavelength determined by the absolute temperature of the upper atmosphere.

Overall, then, there are two countervailing processes at work. First, solar radiation warms the earth's surface and, second, infra-red radiation to space (from the greenhouse gases in the outer atmosphere) cools the upper atmosphere. Air is an excellent insulator against the conduction of heat and will not conduct heat through the atmosphere. In order to maintain energy balance other mechanisms are required. Further, the thermodynamic properties of air (potential energy increases with height) ensure that turbulent motions of the atmosphere will mix energy downward, not upward.

The process for transferring energy from the earth's surface to the atmosphere, necessary to achieve overall energy balance of the climate system, was explained by Riehl and Malkus in a 1958 paper, 'On the Heat Balance of the Equatorial Trough Zone', (*Geophysica*). The authors noted that boundary layer air, rising buoyantly in the protected updraughts of deep tropical convection clouds, converts heat and latent energy to potential energy. Away from the convection, compensating subsidence converts potential energy to heat, thus distributing heat and latent energy through the troposphere.

What is implied in the Riehl and Malkus model is that deep tropical convection, and the transfer of energy from the surface to the atmosphere, will not take place without buoyant updraughts within deep convection clouds. Thus there is a need for the temperature of the atmosphere to decrease with altitude and that the rate of decrease of temperature must be sufficient to allow air to buoyantly ascend in the updraughts. From well-known thermodynamic laws, the rate of decrease of temperature must be at least $6.5\text{ }^{\circ}\text{C}/\text{km}$ ($1.9\text{ }^{\circ}\text{C}/1,000\text{ ft}$) to allow the buoyancy forces of convection to overcome the natural stratification of the atmosphere.

The climate system will come into energy equilibrium when temperatures are such that the net solar radiation absorbed, is balanced by the long-wave (infra-red) radiation to space and the rate of distribution of heat and latent energy by convection is offset by net radiation loss in the troposphere. At equilibrium, the so-called greenhouse effect (ie, that the average surface temperature of $14\text{ }^{\circ}\text{C}$ being greater than the $-19\text{ }^{\circ}\text{C}$ black body emission temperature of earth) is an outcome of the thermodynamic requirements for convective overturning of the atmosphere.

Essentially, the role of greenhouse gases is to cool the atmosphere through radiating energy to outer space (something the non-greenhouse gases cannot do) and this, with the surface warming from solar radiation, generates convective instability and the transfer of massive amounts of energy from the surface (particularly the tropical

oceans) to the upper atmosphere including the polar regions. It is the temperature lapse rate required for deep convection that leads to the 'greenhouse effect'.

Given this analysis, the next question to be answered is: 'Will increasing CO₂ concentrations in the atmosphere (from whatever source), have any impact, up or down, on average global temperatures? Kininmonth's reply is this:

Increasing CO₂ concentrations do not change the essential characteristic that the greenhouse gases tend to cool the atmosphere. Overall the net radiation loss from the atmosphere is more than 100 Wm⁻² and the radiation forcing from a doubling of CO₂ is less than 4 Wm⁻². The changing CO₂ concentration does have secondary impacts that will feed through to changing surface temperature.

1. The net radiation cooling of the atmosphere.

An increase in CO₂ concentration will reduce the long-wave radiation to space in the CO₂ bands; it will also increase the downward radiation at the surface. These are opposing effects on the net radiation loss of the atmosphere and tend to cancel. However, depending on whether the net radiation loss is increased or decreased the convective overturning will increase or decrease in response. The changing convective overturning will not, in itself, act to change the tropospheric temperature: increased net radiation loss will prompt more overturning and distribution of more energy from the boundary layer; and vice versa for a decrease in the net radiation loss. It should be noted, however, that an increase in convective overturning will tend to dry the atmosphere (subsidence and drying over a very large area of the tropics compared to the relatively small area occupied by convection); this latter will increase the long-wave emission to space in the water vapour bands, tending to compensate the reduction in emission of the CO₂ bands.

2. At the surface.

An increase in CO₂ concentration will increase the back radiation that is absorbed at the surface and change the surface energy balance. The increase in back radiation will tend to warm the surface. A warming of the surface will increase the rate of energy loss from the surface by way of direct heat exchange with the overlying boundary layer, evaporation of latent energy, and emission of black-body radiation. We will have a new temperature equilibrium when the temperature rise is such that the increased energy loss equates with the CO₂ forcing of the back radiation. For a doubling of CO₂ concentration the surface temperature responds by rising about 0.3 °C. However there is amplification due to water vapour feedback and the overall temperature rise from a doubling of CO₂ concentration is near 0.5 °C. The warmer surface temperature will also increase the long-wave radiation to space through the atmospheric window to compensate for the reduction in the CO₂ bands. The warmer surface temperature will increase the convective instability

and thus rate of convective overturning—also increasing the radiation to space in the water vapour bands.

There will be an impact on surface temperature from CO₂ concentration increase but the impact will be minimised by the damping effects of increased emission to space in the water vapour bands, increased emission to space in the atmospheric window, and constraint of surface temperature increase by the increased evaporation of latent energy at the surface.

So there is a 'greenhouse effect', but a doubling in atmospheric concentrations of CO₂, *ceteris paribus*, will have barely observable consequences.

This summary, by Kininmonth, of how the atmosphere actually works has the most profound implications. It tells us that the entire theoretical edifice which the IPCC scientists such as James Hansen, John Houghton, and their Australian followers in the CSIRO and the universities (Graham Pearman and David Karoly are good examples), and elsewhere, has no connection to the real world. It is no wonder, then, that the climate models, all of which are based on this spurious construct, cannot pass any test which requires them to give accurate predictions to past events (based on ex-post inputs). Nor can they get the temperatures right in the tropical troposphere, a point which David Evans has been successfully hammering home.³³ Their so-called scenarios are not worth the paper which comes out of their printers.

Endnotes

1. *The Australian*, 8 July 2008.
2. 'The Nation Reviewed', *The Monthly*, August 2008.
3. www.science.unsw.edu.au/ruddletter
4. *Australian Financial Review*, 17 June 2008.
5. William Austin, *The Enemies of Progress: The Dangers of Sustainability*, 2008, Imprint.
6. Glasshouses located near power stations or other plants producing carbon dioxide have used the availability of this resource to increase greatly the size of their produce and the speed with which it is grown.
7. From the IPCC's *First Assessment Report*, 1990.
8. Carbon Dioxide Information Analysis Centre, Oak Ridge, US National Laboratory.
9. Thomas W Quirk M.Sc. Melb, D. Phil.Oxon, former nuclear physicist.
10. To be published in *Energy & Environment*, Spring 2009.

11. Thomas W Quirk, private communication.
12. Roy W. Spencer Ph.D. is a principal research scientist for the University of Alabama in Huntsville and the U.S. Science Team Leader for the Advanced Microwave Scanning Radiometer (AMSR-E) on NASA's Aqua satellite. He has served as senior scientist for climate studies at NASA's Marshall Space Flight Center in Huntsville, Alabama.
13. Roy Spencer, 'More Carbon Dioxide, Please', *NRO*, 1 May 2008.
14. Yu, K.-F., Zhao, J.-X., Wei, G.-J., Cheng, X.-R., Chen, T.-G., Felis, T., Wang, P.-X. and Liu, T.-S. 2005. $\delta^{18}\text{O}$, Sr/Ca and Mg/Ca records of *Porites lutea* corals from Leizhou Peninsula, northern South China Sea, and their applicability as paleoclimatic indicators. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 218: 57–73.
15. Paul Williams, Professor of Geography, University of Auckland.
16. Patrick D. Nunn, Professor of Oceanic Geoscience at the University of the South Pacific.
17. See *Nine Facts about Climate Change*, 2006, www.lavoisier.com.au
18. Australian Bureau of Meteorology, *Drought, Dust and Deluge—A history of Climate extremes in Australia*, 2004.
19. *Herald Sun*, 6 August 2008.
20. Cliff Ollier, D.Sc., Emeritus Professor from the University of New England and an Honorary Research Fellow at UWA.
21. *The Australian*, 12 September 2008. See also the Lavoisier website for the longer version of this paper.
22. Stewart Franks, *The Australian*, 12 September 2008.
23. Nathan Mantua, University of Washington, School of Aquatic and Fishery Sciences, Department of Atmospheric Sciences, JISAO: the Joint Institute for the Study of the Atmosphere and Oceans.
24. See David Archibald's paper, 'The Past and Future of Climate Change', www.lavoisier.com.au
25. Centre for Sun-Climate Research, Danish National Space Centre, www.spacecenter.dke/research/sun-climate
26. Theodore Landscheidt, 'New Little Ice Age Instead of Global Warming', *Energy & Environment*, 2003, Vol. 14.
27. See Rhodes Fairbridge, www.lavoisier.com.au
28. See William Kininmonth, www.lavoisier.com.au
29. See, for example, <http://www.guardian.co.uk/environment/2006/sep/20/oilandpetrol.business>
30. William Kininmonth, Director of Australia's National Climate Centre 1986–98, author of *Climate Change: A Natural Hazard*, 2004, Multi Science Publishing Co.
31. Paul Kelly, *The Australian*, 6 August 2008.
32. William Kininmonth, private communication.
33. See 'The Missing Greenhouse Signature', July 2008, www.lavoisier.com.au

The Lavoisier Group Inc

The Lavoisier Group is named after the founder of modern chemistry, Antoine-Laurent Lavoisier, who discovered oxygen, identified carbon dioxide as the product of combustion of carbon in air, and who laid down the theoretical basis of modern chemistry. He was also an ingenious experimenter and instrument-maker who insisted on the highest possible accuracy when taking measurements. He was executed by the French Revolutionary Government in 1794.

The Lavoisier Group was incorporated in April 2000. At that time, the founders were concerned that the Australian Government might ratify the Kyoto Protocol without proper understanding of the scientific claims on which it was based, or of the economic implications of the decarbonisation regime which ratification would have required.

During the federal election campaign of 2007, ALP leader Kevin Rudd campaigned strongly on the need to manage 'climate change' and after winning the election on November 26, he went, as Prime Minister, to Bali to ratify the Kyoto Protocol. Since assuming office, he and 'Climate Change' Minister Penny Wong have vigorously pursued their ambition to introduce a decarbonisation policy based on an Emissions Trading Scheme, a plan almost identical to that promised by former Prime Minister John Howard before losing office.

Overseas progress towards agreement on a post-Kyoto global decarbonisation treaty has been derailed by the financial crisis now spreading throughout the world.

But as the debate which followed the release of the Stern and Garnaut Reports made clear, there exists a huge global network of institutions, scientists, economists and would-be carbon traders who have hitched their wagons to the global warming star. Although the *carbonistas* have been defeated in scientific debate after debate, it is only the financial crisis which now threatens to bring to an end their political ascendancy.

The Lavoisier Group provides a network and a Website which enables Australians who are concerned about this issue to keep abreast of developments here and overseas. Those who sympathise with our aims, and wish to join, can apply for membership through the Website: www.lavoisier.com.au

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