A Christian Response to Climate Change

Abstract

This paper sets out to develop a Christian response to the claims of climate change, in particular global warming with feared knock on effects for weather patterns, ice caps and ocean sea levels. We do so recognising that a variety of Christian responses are feasible.

It is acknowledged that climate change and possible responses to it, is more properly the domain of scientists, technologists, economists, corporations and governments. The Christian cannot claim a privileged position though the Bible does assist in the assessment of the issue, including possible remedial actions.

Whilst focussing on the findings of the Intergovernmental Panel on Climate Change, attention is also given to the Kyoto Protocol, the Stern Report, some of the more strident voices calling for immediate and deep cuts to greenhouse gas emissions and as well, the views of those expressing reservation and even opposition to the consensus view on climate change.

This paper has been prepared with a desire to inform, to take the concerns of the Intergovernmental Panel on Climate Change seriously, but at the same time to retain a healthy scepticism over mankind's ability to know the future, remembering that no one in advancing a particular position is dispassionate and therefore free of bias. This applies as much to bankers and corporations seeking to benefit from Government largese in new investments as the scientists funded by the IPCC, or ourselves for that matter.

We remain unconvinced that the science on climate change is settled, in particular we doubt the direct and controlling linkage to greenhouse emissons has been established, but equally recognise that Governments must prudently act on the basis that ongoing global warming may be a reality.

Given our perceptions and convictions, we offer, hopefully with modesty, some comments on what might be the most appropriate actions the Australian government might consider.

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1. Introduction

There has been a veritable flurry of activity over the issue of climate change and global warming in the past year, and especially in recent months.

While the global climate is understood to be naturally variable, it is generally understood that rising temperatures, changing weather patterns, the retreat of glaciers and the loss of ice cover in polar regions with concomitant rising sea levels *is human induced*, arising from the emission of greenhouse gases, principally carbon dioxide (CO_2). The knowledge that the global community is in a strong growth phase with escalating energy demand being supplied largely by fossil fuels[1] exacerbates the concern, indeed desperation of many. Further cause for alarm is the fact that China with its dirtier technology will overtake the USA as a CO_2 emitter sometime in 2009

In order of importance, the main sources of greenhouse gases in Australia are electricity generation (35%), energy for industrial processes, commercial properties and homes (21%), agriculture (16%), transportation (13%), remainder – industrial non energy related, waste, land use (15%)[2,3].

Levels of CO_2 in the atmosphere began increasing in the early industrialisation period of Europe and as global gross domestic product (GDP) has increased, so likewise CO_2 emissions with a corresponding and escalating build-up of atmospheric CO_2[4].

The main channel of information on climate change has been the United Nations Intergovernmental Panel on Climate Change (IPCC)[5]. The IPCC produces very complex computerised models for future temperature rises based on specified assumptions for a number of scenarios, including atmospheric concentrations of carbon dioxide, taken as the main "greenhouse gas" culprit. Their predictions are updated every few years. The reports of the IPCC are the main drivers for concern over climate change and represent the majority view amongst climate scientists and overwhelmingly so amongst environmentalists, the media and state legislators[6].

There is a smaller band of largely independent scientists and economists who remain sceptical, not so much about the climate changing but rather the reasons for climate change and the best way to manage climate change. One of the leading sceptics has been Bjorn Lomborg, author of "The Skeptical Environmentalist", published in 2001.

It should be understood that the use of the expression "sceptic" is not to deny climate change per se (unless otherwise indicated) but rather is used in relation to the extent of climate change, particularly into the future; secondly, the extent to which man is responsible, principally through greenhouse gas emissions; thirdly, the impact of climate change on the world's ecology; and fourthly, the appropriate way to respond to climate change and more particularly global warming.

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[1] Thus, there are plans in place in the USA and China to build 150 and 550 coal fired power plants respectively with China opening one new coal fired power plant per week.

[2] Source: National Greenhouse Gas Inventory 2004 http://www.greenhouse.gov.au/inventory/2004/pubs/inventory2004.pdf. greenhouse gas emissions are expressed as tonnes of carbon dioxide equivalent. In 2004 Australia's greenhouse gas emissions were assessed to be 564.7 million tons of CO_2 equivalent, the highest per capita consumption in the world.

[3] Road transport accounts for 10% of emissions and livestock 11.5%, the latter principally as methane.

[4] Atmospheric CO_2 concentration builds up as none is able to escape into space.

[5] The Intergovernmental Panel on Climate Change (IPCC) was established by World Meteorological Organization (WMO) and United Nations Environment Programme in 1988 to assess scientific, technical and socio- economic information relevant for the understanding of climate change, its potential impacts and options for adaptation and mitigation. See http://www.ipcc.ch/

According to their own website, the role of the IPCC is "to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation. The IPCC does not carry out (original) research nor does it monitor climate related data or other relevant parameters."

[6] The production of final IPCC reports involves a consultative process whereby the work of scientists is reviewed by scientific experts and Government representatives who are to "use all best endeavours to reach consensus".

2. Disentangling Varieties of Approach to Climate Change among Christians

Climate change is not a subject that Christians have given a geat deal of formal attention to, in the same way as they have to, say, pro life issues. The subject of climate change draws extensively on natural phenomena and future projections, subjects properly the domain of scientists.

Without specific Biblical teaching on climate change and in the absense of debate on the subject generally among Christians a variety of responses can be expected from Christians reflecting individual and group prior commitments.

Thus there will be those, given the signs of the times including the current doom and gloom scenarios for weather) who look for the imminent return of our Lord Jesus and may therefore be unlikely to attach great importance to the issue. Others may espouse amillenial or postmillenial views and therefore, drawing from Genesis 1-3 in particular, want to take note of concern over possible deleterious effects of significant climate change and accordingly argue in favour of remedial action.

A variation on this latter response and one more clearly attuned to the concerns of environmentalists runs along the following lines.

"We must err on the side of the environment not economics, the globe not the government, climate not capitalism. If we err we must err on stewardship of the environment realising that sin taints our development. We must learn to live with less.".

This paper has been prepared with a desire to inform, to take the concerns of the IPCC (as the chief informed driver for the understanding of climate change) seriously but at the same time to retain a healthy scepticism over mankind's ability to know the future, remembering that no one in advancing a particular position is dispassionate and therefore free of bias. This applies as much to bankers and corporations seeking to benefit from Government largese in the development of new technologies as the scientists funded by the IPCC.

Whilst setting economics against environment has a certain rhetorical flair, it is not helpful. If capitalism has caused a problem, then capitalism will be required to fix the problem. Whilst affluent persons in Australia may well need to "learn to do with less", we would not wish to apply such a maxim to all people everywhere.

There is a particular responsibility upon the scientific community, the media, parents and teachers not to overwhelm children in particular with catastrophic scenarios of the future that are unsupported by the findings of the IPCC. It will be regretable if Al Gore's climate change documentary *An Inconvenient Truth* is shown to high school children without at the same time including the more sober and authoritative assessments of the IPCC, and even some of the material from sceptical sources. Schools after all are meant to be places for learning including assessing the weight of an argument, not for propaganda.

An attempt is made in section 16 to articulate a Christian response to climate change without in any way denying alternative Christian responses that seek both fidelity to the Word of God and accountability in relation to climate change.

These are early days in the study of climate change and how best to respond. The position of this report is that it is wise to keep an open mind on climate change, to treat the prophets of doom[7] with caution and always remain willing to adjust our views on the potential risks of climate change as new data emerges.

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[7] An example of a prophecy of doom that needs to be carefully weighed is provided by a Dr Roger Jones in an opinion piece in *The Age* (http://www.theage.com.au/news/business/debate-needs-temperature-mitigation/2007/01/31/1169919403856.html?page=2) in which he seeks to rebut an earlier contribution from a Dr Len Walker, a global warming sceptic, who appears to favour adaptation to actual problems as they occur.

> "A "wait and see" strategy may avoid the worst possible outcomes, by incurring minimal short-term costs, but Australians would have to be prepared to write off significant natural heritage, including icon systems such as the Great Barrier Reef, wetlands in the Murray Darling Basin, the montane tropic ecosystems and alpine ecosystems. It may be that abundant and cheap energy becomes available later this century, or we may be all so rich that no one cares about the environment or the remnant poor (whoever or wherever they may be).".

It is salutory to remember that scientists have a poor track record in making predictions. In 1972 the Club of Rome predicted oil would run out within 30 years and economic growth was doomed because the world would run out of raw materials. Earlier, in the 1960's, population growth was said to exceed the world's capacity to produce enough food. Wrong! This time around, the science may be better understood, but a degree of scepticism remains warrented.

3. The Greenhouse Effect

The so called greenhouse effect[8] and relating it to certain chemicals in the atmosphere goes back to the mid 19th century. The understanding goes as folllows.

Sunlight penetrates the earth's atmosphere; a proportion is reflected back by the clouds, and a proportion finds its way to the earth's surface. Much of this heat is then radiated back and absorbed by the so called greenhouse gases in the atmosphere so that they act as a heat trap, rather like a blanket wrapped around the planet.

Without the greenhouse effect, planet Earth would be vastly colder (by 33°C on average), and present life forms would be very different, if not non-existent. Water vapour is the main greenhouse gas, accounting for some three quarters of the greenhouse effect. Generally speaking, apart from very localised sites, human activity does not impinge on atmospheric water vapour concentration. Water vapour as a result, has been excluded by climatologists from their considerations of greenhouse gases.

The six greenhouse gases recorded by scientists are carbon dioxide (CO_2), methane, nitrous oxide, perfluorocarbons, hydrofluorocarbons, and sulphur hexafluoride. Methane and nitrous oxides are mainly derived from livestock. Measurements of these six gases are combined to give an equivalent CO_2 reading, represented as CO_2 e. In this paper the "e" is dispensed with, but understood.

Analysis of various historic markers gives an atmospheric CO_2 reading of about 280 ppm in 1750, slowly climbing to 315 ppm in 1950 and then gradually speeding up to the current figure of 380 ppm and expected to double in the next 100 years[9]. This increase is largely put down to the burning of fossil fuels to provide energy, particularly electricity, but also for transport, industry, etc, with the remaining proportion coming from deforestation and other land changes, principally in the tropics. Currently, over 25 billion tonnes of CO_2 annually are released into the atmosphere. Of this amount approximately 55% is absorbed by the oceans, by forest re-growth principally in the northern hemisphere and more generally by increased plant growth, leaving a substantial proportion to be cumulatively added to the atmosphere[10].

The picture is then made complete by linking rising global temperatures and changing weather patterns with this rising CO_2 concentration in the Earth's atmosphere.

4. UN Intergovernmental Panel Findings on Climate Change

The third IPCC assessment report was issued in 2001 and the fourth report will be progressively released in 2007 with the 21 page Summary for Policymakers[11] of the first volume ("The Physical Science Basis) made available on the 2nd February 2007.

The main findings of the 2007 Summary are:

1. the historic temperature rise of 0.65°C since the mid 20th century was 90% certain to have been the result of man-made release of greenhouse gases.

This is an intemperate emotive "straw man" response, designed to silence an opponent who would act to save the Barrier Reef.

[8] This section is largely adapted from a paper on the Uranium Information Centre website: http://www.uic.com.au/ueg.htm.

[9] 380 ppm (parts per million) is equivalent to 38 persons in the Melbourne Cricket Ground when full for the Boxing Day Test.

[10] Bjorn Lomborg, "The Skeptical environmentalist", p259, 260

[11] As of the 12th February, the material in the Summary has been rearranged and condensed down to 18 pages. The full Report will not be made available until May 2007.

2. global temperature increases by 2090-2099 will range between 2°C and 4.5°C[12] , with warming expected to be greatest over land and at most high northern latitudes, and least over the Southern Ocean and parts of the North Atlantic ocean.
3. it is very likely that hot extremes, heat waves, and heavy precipitation events will continue to become more frequent.
4. contrary to recent cinematic depictions[13] of the shut down of the Gulf Stream, it is very unlikely that such an event will occur.
5. mountain glaciers and snow cover have declined on average in both hemispheres with the widespread decreases in glaciers and ice caps having contributed to sea level rise
6. contraction of the Greenland ice sheet is not expected until after 2100 being dependent on global average warming in excess of 1.9°C to 4.6°C – it would require a 1,000 years for sustained warming to completely eliminate the Greenland ice sheet.
7. the Antarctic ice sheet will remain too cold for widespread surface melting and is expected to gain in mass due to increased snowfall.
8. the range of projected rises in sea levels is from 0.18m to 0.59m, but with 38.5 cm the most likely result.

Whilst the findings have a certain vagueness in mathematical precision, the report is peppered with qualitative statements of great certainty in the use of a finding being "very likely" or "extremely likely".

Certainly the 2007 findings are considerably less confronting than the scenarios painted by climate alarmists, and indeed represent something of a partial retraction on the IPCC's 2001 report in terms of temperature and sea level rises[14]. The most notable difference between the two reports is the reduction in "radiative forcing"[15] of 2.43 watts per square metre down to 1.6 watts in the more recent report – the higher the figure the greater the drive for temperature rise.

The statement in the Summary that the historic temperature rise of 0.65°C since the mid 20th century was *90% certain to have been the result of man-made release of greenhouse gases*, is open to question if only because *global temperature actually fell between 1940 and 1975 despite the continuing rise in CO_2 concentration over this period*.

Actually the most helpful thing in the report and a useful antidote to those calling for immediate drastic cuts in greenhouse gas emissions is the report's finding that no matter how much civilisation slows or reduces its greenhouse emissions, global warming and sea level rise will continue on for centuries. Kevin Trenberth, one of the report's co-authors is reported to have said, "this is not something you can stop. We're just going to have to live with it"[16].

It needs to be pointed out that modelling future climate is extraordinarily problematical given the complexity of factors influencing the climate – the atmosphere, the oceans, the land surface, the ice sheets and the Earth's biosphere.

The report will not achieve universal acceptance.

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[12] The precise wording, including use of italics in the IPCC report, reads "the global average surface warming following a doubling of carbon dioxide concentrations…..is *likely* to be in the range 2 to 4.5°C with a best estimate of about 3°C, and is *very unlikely* to be less than 1.5°C. Values substantially higher than 4.5°C cannot be excluded, but agreement of models with observations is not as good for those values."

[13] The movies, "The Day after Tomorrow" and "An Inconvenient Truth".

[14] The maximum temperature rise falls from 5.8°C to 4.5°C and the most likely sea level rise is down from 48.5cm to 38.5cm whilst the maximum rise falls from 88cm to 59cm in a most unlikely scenario.

[15] In an improvement over the 2001 Report, the 2007 Summary lists what it calls the individual *global average radiative forcing* estimates for CO_2, methane, ozone, aerosols and solar irradiance. Aerosols act in favour of cooling not warming while solar irradiance can go either way, but currently is judged to be warming. The Summary indicates that the level of scientific understanding for aerosols and solar irradiance is "low".

[16] http://www.foxnews.com/story/0,2933,249659,00.html

There will be those who will argue that the IPCC report has been too conservative[17], ie temperature rises will be higher, ice caps melt faster, oceans rise higher.

Conversely, there will be those who will argue the opposite[18].

A further line of critique is that the IPCC models are unduly pessimistic and fail to account for future technological progress. Thus in Bjorn Lomborg's earlier words on the 2001 Report, the IPCC scenarios "are more concerned about plotting a better course for the Titanic (to avoid icebergs) than investigating the likeliness of alternative means of travel (planes replacing passenger ships)".

5. A Brief Sampling of Climate Change Alarmists

Al Gore's documentary, "An Inconvenient Truth" makes for riveting, if not anxiety raising viewing with its depiction of ferocious storms, melting glaciers, collapsing ice mountains, parched deserts and prolonged droughts and failing ocean currents (read collapse of the Gulf Stream). Somewhat less compelling is Gore's solution: the US (and Australia's) Government should sign Kyoto and the rest of us need to make "personal choices" in favour of limiting greenhouse gas limitations.

Whilst all of Mr Gore's scenarios may be feasible and therefore have the potential to do immense harm, no where does he indicate possible time frames, but rather leaves the impression that these disasters are possible within the lifetime of viewers, unless remedial action is immediately taken. Mr Gore claims that climate change is a moral issue. It is a moral issue but what is immoral is his failure to anchor his material in the best science readily available and to spell out the implications for deep cuts in CO_2 emissions. They are not trivial but his viewers would not have a clue from his documentary as to what they might be.

Another example.

Tim Flannery, the director of the South Australian Museum and 2007 Australian of the year and author of The Weather Makers, warns that to do nothing about climate change makes the collapse of civilisation inevitable. According to Flannery action needs to be taken now to slow global warming.

"The delay of even a decade is too much," he says[19].

The ABC Science programme ran a story on Australia in conjunction with Flannery's nomination as Australian of the year reporting that in order to avert biological disaster, he argues the coal industry should be shunted aside and alternative power sources be used to establish a desert metropolis.

"We need to decarbonise the economy extremely rapidly," (Flannery) said.

Asked whether this approach would cripple the country's economy, currently riding a commodities boom thanks to North Asia's hunger for Australian resources, Flannery was unmoved.

"Won't the Australian economy collapse if climate change continues?" he said.

"There are a lot of ways to make electricity. Burning coal is just one of the more antique and stupid ways of doing it. We've got solar [energy], we've got wind, we've got geothermal."[20]

Although Flannery subsequently said he wasn't arguing for the immediate closure of the coal industry, Senator Bob Brown, leader of the Australian Greens has subsequently advocated

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[17] Found in many newspaper articles but also the editorial in New Scientist, 9th February 2007: http://environment.newscientist.com/channel/earth/mg19325902.900-editorial-climate-consensus-us-not-enough.html

[18] Lord Monckton, http://ff.org/centers/csspp/pdf/20070201_monckton.pdf

[19] http://www.smh.com.au/news/environment/ill-winds-that-whisper-the-collapse-of-civilisation/2005/09/23/1126982230825.html

[20] http://www.abc.net.au/science/news/stories/2007/1834059.htm

phasing out of all coal exports - Australia's largest export dollar earner which employees 26,000 workers - within the three year term of one government[21].

"Australia must urgently kick the coal habit and get on with what Australian of the Year Tim Flannery calls a war footing in terms of investing in solar, geothermal and other efficient technologies."[22]

6. Comment on Rising Global Temperatures and Atmospheric CO_2 Levels

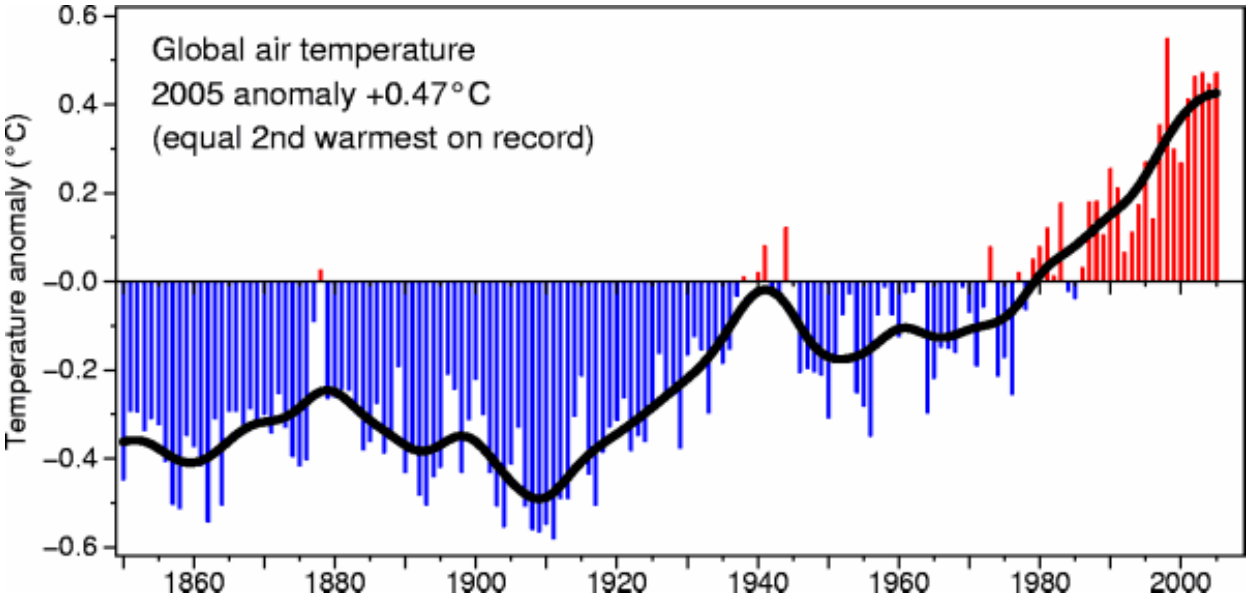
There is no argument that atmospheric CO_2 levels have been rising consistently, and in the 20th century at ever faster rates.

The data on global temperature, however, is open to alternative interpretation.

In an important review of 240 prior scientific studies[23], Willie Soon and colleagues from Harvard University confirm the existence both of a "Medieval Warm Period" extending from the AD 9th to 14th centuries and a "Little Ice Age" commencing round AD1300 (other estimates have it commencing around 1400 and extending to 1900[24]), as well as the current global warming of the past 100 or so years.

They make the important conclusion: "thermometer warming of the 20th century across the world seems neither unusual nor unprecedented within the more extended view of the last 1,000 years. Overall, the 20th century does not contain the warmest or most extreme anomaly of the past millennium in most of the proxy records."

Turning to the 20th century, the Climatic Research Institute at the University of East Anglia in conjunction with the UK Met Office Hadley Centre maintains the following graph[25] of the combined global and marine surface temperature recorded from 1850 on, annually adjusted.



Source: Global Temperature Record by Phil Jones[26], http://www.cru.uea.ac.uk/cru/info/warming/

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[21] http://www.theage.com.au/news/national/howard-and-rudd-slam-coal-plan/2007/02/10/1170524334072.html?s_cid=rss_age

[22] http://www.theaustralian.news.com.au/story/0,20867,21208072-7583,00.html

[23] Published in the journal, Energy and Environment and found here: http://www.marshall.org/pdf/materials/132.pdf. The review examined the findings of studies of so-called "temperature proxies" such as tree rings, ice cores and historical accounts which allow scientists to estimate past temperatures prevailing at sites around the world.

[24] Bjorn Lomborg, "The Skeptical environmentalist", p 261-263. Lomborg did not have the benefit of the work of Soon et al.

[25] http://www.cru.uea.ac.uk/cru/info/warming/

Rather than the IPCC's summarised simplification given on page 5, we may equally conclude as follows:

- there has been a somewhat erratic upward move in global temperatures since 1850 of less than +0.8°C, but certainly not in any straight line relationship with constantly rising CO_2 levels
- (the upward curve may have looked a lot less daunting had data extending back to the medieval warm period been available; as well, it needs to be remembered that the Earth was commencing to come out of a cool period by 1900)
- between 1880 and 1910, there was a period of global cooling of about -0.25°C
- then a warming phase between 1910 and 1940 of +0.5°C, thence a mild cooling phase to the early 1970's of -0.1°C[27]
- from the early to mid 1970's, the world moved back into a warming phase, gaining +0.5°C by the late 1990's.
- this phase peaked in 1998 with the curve flattening out if not commencing to turn over, suggesting the world may be entering a cooling period again. The next 5 years will be crucial to this assessment[28].

Indeed there are climatologists on the basis of changing patterns of solar magnetic behaviour who predict the world is about to enter a cooling period again. It is worth pointing out that a colder climate will do far greater damage than the current late 20th century phase of gentle warming[29].

Given the actual small temperature differentials involved, postulating temperature rises of up to 4.5°C within 100 years should give cause to some reflection that something may not be quite right with the modelling.

What is remarkable about the graph is comparing the small changes in actual temperature movement over time with the exaggerated hyperbole of public discourse over climate change. To listen to the public discourse would be to assume temperatures have increased by degrees centigrade rather than the correct tenths of a degree. Climate has always had its extremes, the destruction of Galveston in 1900, the eruption of Krakatau in1883 and so on. The public discourse fuelled by climate apocalypticism and a loss of historical perspective needs to be re-anchored in reality.

7. Kyoto Protocol

The Kyoto Protocol[30] is an international treaty made under the United Nations Framework Convention on Climate Change and designed to limit global greenhouse gas emissions.

The treaty was negotiated in Kyoto, Japan in December 1997. Australia was one of the original signatories. The agreement came into force on February 16, 2005. As of December 2006, a total of 169 countries and other governmental entities have ratified the agreement. The two notable exceptions are the United States and Australia. Other countries, like India and China,

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[26] Do not be misled by the comment of Mr Jones re 2005 being the second warmest on record. It was the second warmest *with 2003*.

[27] There was talk of global cooling in this period, with Newsweek magazine publishing an alarmist article entitled "The Cooling World" on April 28, 1975.

[28] On 12th Dec 2006, the WMO issued its preliminary estimate for 2006 giving a global mean temperature of about +0.42°C above average, ie the lowest rise above mean since 2001 increasing the likelihood at the very least of a pause in global warming if not a declining global temperature.

[29] See for example "Will the sun cool us?", http://www.canada.com/nationalpost/story.html?id=5c8d30c6-9d77-4ccc-99d9-c3a095750cdc&p=1

[30] The information in this section has been drawn from Wikipedia, principally found here: http://en.wikipedia.org/wiki/Kyoto_Protocol

which have ratified the protocol, are not required to reduce carbon emissions under the present agreement despite their relatively large populations and greenhouse gas emissions.

Countries that ratify this protocol commit to reduce their emissions of the six greenhouse gases or engage in emissions trading, if they maintain or increase emissions of these gases.

At its heart, Kyoto establishes the following principles:

- Kyoto is underwritten by governments and is governed by global legislation enacted under the UN's aegis
- Governments are separated into two general categories: developed countries who have accepted greenhouse gas emission reduction obligations and developing countries who have no greenhouse gas emission reduction obligations but must submit an annual greenhouse gases inventory.
- Any developed country that fails to meet its Kyoto target will be penalised by having its reduction targets decreased by 30% in the next period.
- By 2008-2012, developed countries are required to have reduced their greenhouse gas emissions by an average of 5% below their 1990 levels. While the average emissions reduction is 5%, national targets range from 8% reductions for the European Union to a 8% emissions increase for Australia.

The objective is the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."

As noted earlier, the IPCC has predicted an average global rise in temperature of 2°C and 4.5°C between 1990 and 2100. Current estimates indicate that even if successfully and completely implemented, the Kyoto Protocol will reduce that increase by somewhere between 0.02 °C and 0.28 °C by the year 2050 (source: Nature, October 2003). Another way of expressing this is to say that a fully implemented Kyoto Protocol would gain the world a extra 6 years breathing space, a truly minuscule gain.

Proponents note that Kyoto is but a first step, to be followed by further and deeper cuts to emissions.

Whilst it acknowledged some positive elements, the Australian Government decided not to ratify Kyoto because in its view it did not provide a comprehensive or environmentally effective long-term response to climate change[31]. It also pointed out that there was no clear pathway for action by developing countries, and further pointed to the decision of the United States not to ratify the treaty.

According to the World Energy Outlook 2006 produced by the International Energy Agency, China will exceed the USA as an emitter of CO_2 by 2009, far earlier than previously expected whilst non OECD countries will exceed OECD countries in CO_2 emissions by more than 70% in 2030[32].

The Australian Government maintains that it is on track to meet its agreed target of limiting emissions to 108% of 1990 levels between 2008 and 2012[33]. The Federal Opposition is critical of this stance and has promised to ratify Kyoto on gaining power.

The European Union has been the strongest proponent of Kyoto, establishing the EU Emissions Trading Scheme[34] whereby on a national allocation, major individual CO_2 emitting companies were allocated a number of allowances called EUAs which matched their CO_2 targets.

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[31] By signing the Protocol, Australia agree to continue with the treaty-making process, but by failing to ratify it in effect Australia did not consent to be bound by the Protocol

[32] http://www.worldenergyoutlook.org/

[33] http://www.greenhouse.gov.au/international/index.html. More recent evidence is that Australia will overshoot by an extra one percentage point.

[34] Source of information: http://www.carbonpositive.net/ .

Companies not requiring all their EUAs can sell them whilst companies exceeding their CO_2 targets must purchase additional EUAs or else pay a fine according to excess CO_2 emitted.

There have even been suggestions of personal EUAs for a nation's citizens operating on a similar basis.

Despite the EU's enthusiasm for Kyoto, CO_2 emissions from the original 15 EU nations have not fallen but *increased* by over 5% between 1999 and 2004. This compares badly with the USA increasing CO_2 emissions over the same period by less than 2%[35].

Currently the EU is imposing big reductions on EUAs for 2008 with considerable political fallout occurring, including either actual or threatened relocation of industrial production to China and other developing countries[36].

At this point in time there is considerable acrimonious debate in Europe over Kyoto and EUAs. Benny Peiser, who operates a clearing house for global warming scepticism puts the matter this way.

"At the heart of the escalating confrontation lies Europe's Emissions Trading Scheme and mounting concerns about its prospective failure. The crisis centres on a fundamental conflict between economic realism and environmental idealism, between national interest and green ideology. It has exposed the increasing tension between Europe's green enthusiasm and the realisation that its unilateral framework comes at a hefty cost that is beginning to erode the economic stability of a waning continent."

Germany will be at the heart of the flashpoint over Kyoto. "Germany is extremely vulnerable to imposed energy caps. It is strongly opposed to plans for replacing its coal-fired power plants with gas-fired facilities, as such a move would only increase its already precarious dependency on Russian gas imports. Furthermore, successive governments have agreed to shut down all (non CO_2 emitting) nuclear power plants, which account for a third of Germany's electricity generation. The Greens' anti-nuclear achievement has thus turned ideological triumph into an energy nightmare."[37]

Regardless of the above commentary, within the time frame for global warming envisaged by the IPCC, Europe will do far more for reducing its CO_2 emissions through the catastrophic collapse in its birth rate than will ever be achieved by arbitrary limits on CO_2 emissions or Kyoto style agreements[38].

Within the projected time frame for global warming, Europe will do far more for reducing CO_2 emissions through its collapsing birth-rate than will ever be achieved by Kyoto type agreements with arbitrary limits on emissions. To borrow Tim Flannery's colourful expression, it will be Europe's declining birth-rate and not global warming that "makes the collapse of (Europe's) civilisation inevitable".

8. The Stern Review

On the 31st October 2006, Sir Nicholas Stern, a UK Treasury official, with heavy reliance on the 2001 IPCC data, produced a 700 page review for the British Government entitled "The

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[35] "Kyoto's Future" by Christopher Horner - see graph on page 1: http://ff.org/centers/csspp/pdf/200702_horner.pdf. The disparity in CO_2 emissions between the USA and Europe is also the subject of a lecture given by Kurt Volker: http://www.state.gov/p/eur/rls/rm/80465.htm. Volker quotes a different set of figures but they still show Europe' s emissions growing at double the rate of the USA.

[36] The irony in this is that if, in battling pollution, the EU forces less production in Europe, but replaces such production with imports from places with fewer environmental regulations. In this event global emissions will actually rise. See http://www.iht.com/bin/print.php?id=4128544; http://www.canada.com/nationalpost/story.html?id=03445f57-0777-4554-ac7c-ec63cb073223

[37] "Kyoto sinks Europe", http://www.canada.com/nationalpost/story.html?id=03445f57-0777-4554-ac7c-ec63cb073223

[38] Europe according to the 2004 UN projections is likely to see an absolute fall in its population of 75 million people with the corresponding share of the world's population decreasing from 21.7% in 1950 to the current figure of 11.3% with a further decline to 7.2% in 2050. See http://www.un.org/esa/population/publications/WPP2004/WPP2004_Vol3_Final/Chapter1.pdf

Economics of Climate Change"[39]. The basic message from Stern was that the world has to act now on climate change or face devastatingly irreversible economic consequences. On temperature, carbon emissions have already pushed up global temperatures by 0.5°C and without action taken on emissions there was a 75% chance that average global temperatures would rise between 2°C and 3°C over the next 50 years and a 50% chance the rise would be 5°C.

Stern makes the following predictions for the environment in the absence of action to curb greenhouse gas emissions. It warns that if no action is taken, then floods from rising sea levels could displace up to 200 million people, melting glaciers could cause water shortages for 1 in 6 of the world's population, wildlife will be harmed; at worst up to 40% of species could become extinct after only 2°C of warming, droughts may create tens or even hundreds of millions of "climate refugees"

Stern states that the damage from climate change will *accelerate* as the world gets warmer.

Economically, taking no action would lower global GDP by 5% up to 20%, now and into the future, whereas the annual costs of stabilising CO_2 at around 550 ppm are likely to be around 1% of global GDP by 2050. Stern's conclusion is that all Governments should immediately and collectively invest annually 1% of global GDP to reduce the impact of global warming. Reducing European-wide emissions by 30% by 2020 would be required, and at least 60% by 2050.

The Stern Review had a tremendous impact when it was released, mainly because its analysis and conclusions painted a far more disturbing and indeed dramatic future environmental and economic consequences of global warming. At this point in time Stern's pessimism is now de rigueur for politicians, environmentalists and informed citizens on climate change.

Thus with the release of the Review, the British Prime Minister, Mr Blair said the consequences for the planet of inaction were "literally disastrous".

"This disaster", according to Mr Blair, "is not set to happen in some science fiction future many years ahead, but in our lifetime"[40].

The BBC publicity for a new programme, "Climate Change: Britain under threat" has presenter David Attenborough saying Britain "will be tropical by 2100"[41] (which of course might suit many Britons).

However, already the Stern Review has come in for trenchant criticism for its pessimistic modelling assumptions and consistent bias towards the most pessimistic of scientific studies.

In the December 2006 issue of the respected journal, World Economics[42] there are three papers that cast considerable doubt upon the Stern Review, two from separate groups of climatologists and one from a group of economists.

From the abstract for the first two papers: "In relation to both scientific and economic issues, the authors question the accuracy and completeness of the Stern Review's analysis and the objectivity of its treatment. They conclude that the Review fails to present an accurate picture of scientific understanding of climate change issues, and will reinforce ill-informed alarm about climate change. Two interrelated features of the Stern Review are that it greatly understates the extent of uncertainty as to possible developments, in highly complex systems that are not well understood, over a period of two centuries or more; and its treatment of sources and evidence is persistently selective and biased. These twin features have combined to make the Review a vehicle for speculative alarmism."

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[39] The 27 page executive summary of the Stern Review is found here: http://www.hm-treasury.gov.uk/media/8AC/F7/Executive_Summary.pdf and a helpful BBC news summary is found here: http://news.bbc.co.uk/2/hi/business/6098362.stm.

[40] http://news.bbc.co.uk/2/hi/business/6096084.stm

[41] "Alarmism based on dubious economics" by Dominic Lawson, found here: http://comment.independent.co.uk/columnists_a_l/dominic_lawson/article2157379.ece.

[42] World Economics volume 7, number 4 (October-December 2006). It is interesting to note that Sir Nicholas himself chose to preview the findings of his report two issues backing World Economics.

There have been a number of other scathing assessments from expert opinion, who themselves do not deny global warming but rather are intrinsically supportive of green economics [43].

A number of critiques of the Stern Review giving more detail are found in the attached appendix while that of Nigel Lawson is given separately as a major section (#13) of this paper.

If the question is "why such scary, biased scenarios?" from people like Sir Nicholas Stern, then the answer has probably to do with capturing and inflating the public's imagination in order to put pressure on the politicians "to do something".

It is hard to escape the conclusion that the Stern Review is a deeply discredited document.

9. The Nuclear Option for Australia

Nuclear powered generators currently supply 18% of the world's demand for electricity with proven technologies. Most plants were built in the 1970's and 1980's, but with renewed interest being shown partly for security of electricity supply purposes and partly in response to concerns over CO_2 emissions. The major uses of nuclear power with proportion of electricity supply met by nuclear power shown in brackets, are: France (78%), Belgium (60%), Sweden (43%), Spain and South Korea (36%).

An indication of changing attitudes to nuclear power comes from Germany where, following the Russian decision in early January 2007 to turn off gas supplies into Europe, without warning[44] the German Chancellor has flagged reconsideration of earlier plans to mothball German nuclear power by 2020[45].

In June 2006, the Australian Prime Minister established a task force headed by Dr Ziggy Switkowski to investigate the possibilities for more extensive mining of uranium, uranium enrichment and nuclear power.

The task force was also required to report on "(t)he extent to which nuclear energy will make a contribution to the global greenhouse emissions".

Black and brown coal account for 75% of electricity generation in Australia, natural gas 15%, hydro 7%, and all other sources with less than 1% each. Coal is used for base load generation and natural gas largely for peak load generation.

In terms of CO_2 generation, Victoria's brown coal gives the highest emission of CO_2 followed by black coal (25% less), natural gas (40% less) and wind turbines and hydro (98% less), Emissions from nuclear generation would be 95% less than from brown coal.

The task force produced a draft report entitled "Uranium Mining, Processing and Nuclear Energy – Opportunities for Australia?"[46] on the 21st November 2006.

The task force report says the location of 25 nuclear power stations located within kilometres of major centres of population on the east coast could supply 30 per cent of the nation's electricity needs by 2050, and in so doing would drastically cut greenhouse gas emissions.

Overall, it is predicted that demand for electricity will grow 100 gigawatts by 2050 over current capacity. Committing 25 GW of that new capacity to nuclear power generation[47] would stabilise Australia's CO_2 emissions at 710 million tonnes of CO_2 (cf 2004 emissions of 564

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[43] Sources: http://www.nytimes.com/2006/12/14/business/14scene.html?_r=2; http://www.fnu.zmaw.de/fileadmin/fnu-files/reports/sternreview.pdf; http://www.econ.cam.ac.uk/faculty/dasgupta/STERN.pdf.

[44] This was because of Russia's contractual dispute with the Ukraine – the supply was quickly resumed.

[45] "Go nuclear – or gamble national security on the benevolence of Russia's President" http://comment.independent.co.uk/columnists_a_l/dominic_lawson/article2145111.ece; Also http://thescotsman.scotsman.com/international.cfm?id=46942007&format=print

[46] Found here in full: http://www.dpmc.gov.au/umpner/docs/draft_report/full_report.pdf with a 10 page summary here: http://www.dpmc.gov.au/umpner/docs/draft_report/summary.pdf

[47] 25 nuclear power stations each of 1 GW capacity.

million tonnes). Failure to install nuclear power capacity would see emissions climb to 870 million tonnes by 2050.

The report summarises the issue this way:

"The additional capacity will need to be near-zero greenhouse gas emitting technology if Australia is just to keep greenhouse gas emissions at today's levels."

The report says that within 15 years, nuclear energy could be competitive as the price of the electricity produced from coal, and other fossil fuels, increases.

The Prime Minister who commissioned the report strongly backed nuclear power to help combat climate change. He has said it was potentially "the cleanest and greenest" of all energy sources.

The report makes clear that Australia needs to consider a broad range of technologies including geothermal (hot rocks), and renewables such as small scale hydro-electric, wind, biofuel, solar photovoltaic, solar thermal, tidal and wave power.

In relation to carbon capture and storage (CCS), the report notes that the technology has the potential to deliver 70% to 90% reductions in CO_2 emissions from fossil fuel technologies[48]. However the report also notes that CCS remains to be proved in relation to coal and oil based power utilities, as well as uncertainties existing over cost, reliability, security and effectiveness when retrofitted to existing plants.

10. ExxonMobil Energy Projections

ExxonMobil, the largest of the non Government oil majors, provides an annual energy supply and demand outlook report. The 2006 report predicting supply and demand out to 2030 provides cold comfort on future global CO_2 emissions.

ExxonMobil expect a 60% increase in energy demand by 2030 compared to 2000 with most of this increased demand being met of the fossil fuels – oil, gas and coal, indeed with virtually no change in the supply mix. Thus while the report notes that the fastest growing non fossil fuels – wind and solar power – are expected to climb by 10.5% annually on average, their share of global energy demand by 2030 will only be about 1%.

On CO_2 emission, ExxonMobil predicts an annual increase of 1.6% with most of the growth in the developing world and for power generation alone, an increase in CO_2 emissions from 10 billion tonnes pa now to 15 billion tonnes pa by 2030.

In terms of CO_2 mitigation options, the report assess the use of natural gas as the lowest cost option, nuclear and clean coal technologies incorporating CCS as middle cost and wind power as the highest cost option (with solar substantially higher again).

11. Wind Farms

Wind farms date from the 1970's and operate on the windmill principle with the energy of the rotating propeller turned into electricity. Worldwide capacity of wind farms in 2005 amounted to 60 gigawatts or less than 1% of worldwide electricity supply.

The US and Europe account for 90% of wind farms. There is significant usage in Denmark and Germany with 20% and 6% of energy consumption respectively derived from wind farms.

With the great attraction of minimal CO_2 emissions, wind farms are set to proliferate.

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[48] CCS is an approach to capturing CO_2 and storing it away safely instead of releasing it into the atmosphere. Technology for capturing of CO_2 is already available but storage of CO_2 is a relatively untried concept. As yet (2007) no power plant operates with a full carbon capture and storage system. Currently, the United States government has approved the construction of world's first CCS power plant, while BP has indicated that it intends to develop a 350 MW carbon capture and storage plant in Scotland. Storage of CO_2 is envisaged either in deep geological formations such as those left from former oil and gas fields and underground coal mines, or in deep oceans, or in the form of mineral carbonates. Capturing and compressing CO_2 requires much energy and these and other system costs are estimated to increase the cost of energy from a power plant with CCS by 30-60% depending on the specific circumstances. Source: http://en.wikipedia.org/wiki/Carbon_capture_and_storage. See also http://www.ga.gov.au/image_cache/GA5536.pdf - note that CCS also is known as carbon geosequestration.

However there are a number of disadvantages and difficulties associated with wind farms. By themselves they are not suitable for base load electricity supply. Their use in fact requires additional peak load capacity able to be ramped up as wind power diminishes (and vice versa). There are also visual, community and environmental issues associated with each installation as well.

Reports from Germany with its large investment in wind farms, indicate that wind farms cause dangerous power surges and outages with the potential to cause prolonged blackouts across the European electricity grid[49].

Trying to get a fix on comparative electricity generation costs is not easy, with various "interested parties" doing the calculations.

The Royal Academy of Engineering in 2004 undertook a comparative study in the UK context of costs of generating electricity "in an even handed and dispassionate manner"[50]. In the case of fossil fuels the study added a notional cost of £30 per tonne of CO_2 emitted as a penalty and in the case of a wind farm, an additional amount has been added for the provision of adequate standby generation (for times of loss of wind).

Their analysis demonstrated nuclear as the cheapest followed by gas, coal and onshore wind in that order.

As another point of reference, AGL in Victoria charges a premium of 5.5¢ per KWh for their Green Power (100% derived from accredited renewable sources such as solar, wind, landfill and biomass), said to add $360 to the annual electricity bill. This represents a 28% premium on normal supply. No carbon tax is applied to fossil fuel generation in Australia at this point in time.

As soon as carbon taxes appear the case for nuclear power generation strengthens.

12. Christian Contributions that accept the majority view on Climate Change

Australian Multi Faith Forum on Climate Change

On the 5th December a multifaith forum organised by The Climate Institute of Australia launched an initiative called "Common Belief: Australia's faith communities on climate change[51]. A media release was put out by The Climate Institute. Participants included the Australian Christian Lobby, the Evangelical Alliance and various churches. The Presbyterian Church through its Federal Church and Nation Committee declined to participate.

In the media release put out by the Climate Institute it is said that "every faith community affirms that action on climate change is a moral imperative for individuals, communities, business and governments. Inaction by Australia cannot be justified for any reason, the faith communities say". Further, Climate Institute founder Mark Wootton is reported as saying, "(t)he response has been unequivocal. Australia's faith communities demand a firm government response to climate change which protects our children's future and prevents further harm to the world's poorest people who are already living with the impacts of climate change."

Jim Wallace of the Australian Christian Lobby is reported in The Age saying that climate change was likely to be added to the Lobby's pre-election voters' guide.

"We have a range of issues that we put on our voters' guide, and ask for party and individual (candidate) positions on, and I think given the importance of climate change we'd certainly be doing that in the future," said the lobby's managing director, retired SAS commander Brigadier Jim Wallace. "…there's no doubt climate change and environmental issues have got a rightful degree of importance which perhaps we haven't given them in the past." [52]

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[49] "Go nuclear", http://comment.independent.co.uk/columnists_a_l/dominic_lawson/article2145111.ece

[50] http://213.130.42.236/wna_pdfs/rae-summary.pdf

[51] a search of the web has not produced any statement with this title.

[52] http://www.theage.com.au/news/national/climate-change-unites-religions/2006/12/04/1165080880920.html

Statement from the Evangelical Alliance

In a paper, "Christians and Climate Change" [53], Dr Brian Edgar of the Evangelical Alliance first helpfully sets out a biblical understanding for why Christians should care for the environment and then briefly reviews the IPCC data for climate change, moving to a fairly standard "global warming is a big problem and we have got to act now" position. This later material is put into a Christian context for a Christian and wider audience – Government, environmental, etc - by presenting the demand to act now as a Christian moral imperative.

What is clearly evident though is that whilst the biblical understanding of man's mandate over creation as God's image bearer[54] is without controversy, the material presented in support of "global warming is a big problem and therefore we have got to act now", is at the very least arguable.

Evangelical Climate Initiative

In February 2006 a group of self styled evangelical Christian leaders (College Presidents and Pastors of large churches for the most part) issued a statement, "Climate Change: An Evangelical Call to Action" [55] in which they make four claims.

Their case begins with the argument that because all religious/moral claims about climate change are relevant only if climate change is real and is mainly human-induced, everything hinges on the scientific data. They find the supporting scientific data in the 2001 report of the IPCC. They are particularly impressed by the IPCC working group on the physical science basis for climate change being chaired for a lengthy period by Sir John Houghton FRS, said to be a devout evangelical Christian.

Their response to the rhetorical question "is there a scientific consensus that the problem is real?" is to assert, "while a few are in denial about the reality of the problem, a scientific consensus that climate change must be addressed has actually existed since 1995".

This leads to their first claim that "human-induced climate change is real".

That "the consequences of climate change will be significant, and "will hit the poor the hardest" is their second claim. Even small rises in global temperatures they claim, will lead to all the weather outcomes and impacts contained in the IPCC documents as well as Stern.

Claim 3 buttressed by quotes from Scripture, a poor selection in contrast to Brian Edgar's EA paper, is the assertion that "Christian moral convictions demand our response to the climate change problem".

Claim 4 is the necessary conclusion that "the need to act now is urgent. Governments, businesses, churches, and individuals all have a role to play in addressing climate change, starting now".

They include in their FAQ sheet a question, "Are the solutions expensive big-government approaches that will wreck the economy?". Their answer is a less than compelling:

> "No. For example, Senators McCain and Lieberman have put forward a market-based approach that an MIT study says would cost the average household a mere $20 a year. A recent poll of evangelicals found that 66% would favour such a bill even if it cost $15 a month".

This claim is hard to take seriously.

Apart from drawing attention to the 2001 IPCC study, the only scientific source they offer is Sir John Houghton's presentation to the National Association of Evangelicals in March 2005, ie the 2001 IPCC material.

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[53] http://www.evangelicalalliance.org.au/pdf/Climate%20Change.pdf

[54] though these precise words are not used by Edgar

[55] http://www.christiansandclimate.org/

Sir John Haughton's Presentation on Global Warming

Houghton[56] begins by quoting with approval Margaret Thatcher's view of the need to care for the Earth. He says, quoting Thatcher, " 'We have a full repairing lease on the Earth,' meaning that we must pass it on to the next generation in a better state than we found it. In saying that she is echoing the Christian doctrine of creation that 'The Earth is the Lord's' and to be good stewards of it is fundamental to our Christian obedience.".

Houghton quotes the familiar IPCC story including the various scenario's attending climate change: rising sea levels, etc. He extends the data beyond 2100 saying for instance, "(c)omplete melt down (of Greenland) is likely to take 1000 years or more but it would add 7 metres (23 feet) to the sea level.". He acknowledges some beneficial effects of climate warming but tells us "careful studies demonstrate that adverse impacts will far outweigh positive effects, the more so as temperatures rise more than 2 or 3 ºC above pre-industrial."

Houghton draws attention to environmental sceptics in these terms: "Unfortunately, there are strong vested interests that have spent tens of millions of dollars on spreading misinformation about the climate change issue". This is somewhat rich considering the massive governmental financial outlays supporting the work of the IPCC.

Houghton wants to see the world community stabilise atmospheric CO_2 concentration at 500ppm, ie a third higher than current levels. He sees this as requiring "strong measures" and taking about a century to achieve. Achieving 500ppm means "emissions must reduce to a fraction of their present levels during the 21st century".

The essay closes with comments to the effect that action taken now will mean the costs will not be excessive, citing various alternative non fossil fuel sources of energy, though curiously omitting to mention nuclear power.

There are a number of excellent slides accompanying the article.

Houghton's presentation is an attractive presentation of the IPCC case for a non technical audience but is naïve with respect to the political and economic dimensions of climate change.

13. A Sceptical Christian Contribution

In July 2006 the Interfaith Stewardship Alliance[57] issued a document called the "Cornwall Declaration on Environmental Stewardship" setting out certain principles. The Alliance said it would be seeking to promote these principles in the discussion of various public policy issues including population and poverty, food, energy, water, endangered species, habitat, and other related topics.

Immediately we notice the Interfaith Stewardship Alliance is casting a wider net than the Evangelical Climate Initiative. Those signing the declaration are said to include a "coalition of religious leaders, clergy, theologians, scientists, academics, and other policy experts committed to bringing a proper and balanced Biblical view of stewardship to the critical issues of environment and development".

In looking at the list of clergy signing the declaration it is clear that they represent a more conservative grouping to which the Presbyterian Church of Australia is more naturally aligned and the list includes Catholics and Jews as well.

What are the concerns of the Cornwall Declaration?

Before stating its concerns, the declaration sets the context in the following manner:

> "The past millennium brought unprecedented improvements in human health, nutrition, and life expectancy, especially among those most blessed by political and economic liberty and advances in science and technology. At the dawn of a new millennium, the opportunity exists to build on these advances and to extend them to more of the earth's people.

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[56] http://www.christiansandclimate.org/resources/brief

[57] http://www.interfaithstewardship.org/pages/home.php

At the same time, many are concerned that liberty, science, and technology are more a threat to the environment than a blessing to humanity and nature. Out of shared reverence for God and His creation and love for our neighbours, we Jews, Catholics, and Protestants, speaking for ourselves and not officially on behalf of our respective communities, joined by others of good will, and committed to justice and compassion, unite in this declaration of our common concerns, beliefs, and aspirations."

Their concerns then follow and are worth reporting in full as they do provide a broad and balanced viewpoint that extends concern over climate change to a wider set of issues.

Human understanding and control of natural processes empower people not only to improve the human condition but also to do great harm to each other, to the earth, and to other creatures. As concerns about the environment have grown in recent decades, the moral necessity of ecological stewardship has become increasingly clear.

At the same time, however, certain misconceptions about nature and science, coupled with erroneous theological and anthropological positions, impede the advancement of a sound environmental ethic. In the midst of controversy over such matters, it is critically important to remember that while passion may energize environmental activism, it is reason—including sound theology and sound science—that must guide the decision-making process. We identify three areas of common misunderstanding:

1. Many people mistakenly view humans as principally consumers and polluters rather than producers and stewards. Consequently, they ignore our potential, as bearers of God's image, to add to the earth's abundance. The increasing realization of this potential has enabled people in societies blessed with an advanced economy not only to reduce pollution, while producing more of the goods and services responsible for the great improvements in the human condition, but also to alleviate the negative effects of much past pollution. A clean environment is a costly good; consequently, growing affluence, technological innovation, and the application of human and material capital are integral to environmental improvement. The tendency among some to oppose economic progress in the name of environmental stewardship is often sadly self-defeating.

2. Many people believe that "nature knows best," or that the earth—untouched by human hands—is the ideal. Such romanticism leads some to deify nature or oppose human dominion over creation. Our position, informed by revelation and confirmed by reason and experience, views human stewardship that unlocks the potential in creation for all the earth's inhabitants as good. Humanity alone of all the created order is capable of developing other resources and can thus enrich creation, so it can properly be said that the human person is the most valuable resource on earth. Human life, therefore, must be cherished and allowed to flourish. The alternative—denying the possibility of beneficial human management of the earth—removes all rationale for environmental stewardship.

3. While some environmental concerns are well founded and serious, others are without foundation or greatly exaggerated. Some well-founded concerns focus on human health problems in the developing world arising from inadequate sanitation, widespread use of primitive biomass fuels like wood and dung, and primitive agricultural, industrial, and commercial practices; distorted resource consumption patterns driven by perverse economic incentives; and improper disposal of nuclear and other hazardous wastes in nations lacking adequate regulatory and legal safeguards. Some unfounded or undue concerns include fears of destructive manmade global warming, overpopulation, and rampant species loss.

The real and merely alleged problems differ in the following ways:

1. The former are proven and well understood, while the latter tend to be speculative.
2. The former are often localized, while the latter are said to be global and cataclysmic in scope.
3. The former are of concern to people in developing nations especially, while the latter are of concern mainly to environmentalists in wealthy nations.
4. The former are of high and firmly established risk to human life and health, while the latter are of very low and largely hypothetical risk.

5. Solutions proposed to the former are cost effective and maintain proven benefit, while solutions to the latter are unjustifiably costly and of dubious benefit.

> Public policies to combat exaggerated risks can dangerously delay or reverse the economic development necessary to improve not only human life but also human stewardship of the environment. The poor, who are most often citizens of developing nations, are often forced to suffer longer in poverty with its attendant high rates of malnutrition, disease, and mortality; as a consequence, they are often the most injured by such misguided, though well-intended, policies.

This section is followed first by a conventional set of beliefs which places its authors in the mainstream Judeo-Christian heritage and then a set of aspirations which read like a christianised version of free enterprise principles all with the objective of seeking advancements in agriculture, industry and commerce not only to minimise pollution, etc but also to improve the material prosperity of people everywhere.

Their website provides an extensive set of papers in part opposing the Evangelical Climate Initiative.

14. Lord Lawson's Sceptical Contribution

Nigel Lawson was Chancellor of the Exchequer in Margaret Thatcher's Government in the 1980's.

His lecture entitled, "The Economics and Politics of Climate Change: An Appeal to Reason" [58], was given on the 1st November 2006 at the Centre for Policy Studies (CPS). CPS is a British think tank, existing in its own words to "promote coherent and practical public policy, to roll back the state, reform public services, support communities, and challenge threats to Britain's independence".

Lawson dismisses the "scaremongering" Stern Report in the following terms.

> "(The) Stern Report adds disappointingly little to what was already the conventional wisdom – apart from a battery of essentially spurious statistics based on theoretical models and conjectural worst cases. This is clearly no basis for policy decisions which could have the most profound adverse effect on people's lives, and at a cost which Stern almost certainly underestimates."

Lawson poses three questions to answer. "First, is global warming occurring? Second, if so, why? And third, what should be done about it?".

The answer to the first question is that the 20th Century while following a somewhat erratic path nevertheless saw a 0.7°C rise in temperature though Lawson notes that no further global warming has occurred since 1998.

In response to the second question, he answers "we don't know". He notes the conventional answer: the rapid build up of CO_2 in the 20th century (+30%) and acknowledges CO_2 as one of the greenhouse gases "to keep the planet warmer than it would otherwise be". He acknowledges the UK Met Office view that more than half the warming of recent decades is attributable to man made sources of greenhouse gases, principally CO_2. He doubts this citing various uncertainties: science of clouds, increasing urbanisation; lack of correlation between constantly increasing CO_2 levels and temperature increasing in "fits and starts"; the fact that the earth's climate has always been subject to natural variation. He notes that while "(t)he fringes of the Greenland ice shelf appear to be melting, .. the centre of the shelf ice is thickening".

At this point Lawson quotes the 2001 IPCC conclusion "that, by the end of this century, on a business-as-usual basis, global mean temperature might have risen by anything between 1°C and 6°C", pointing out that the this conclusion, based on complex computer modelling, "is not .. a scientific matter at all, but consists of economic forecasting".

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[58] http://www.cps.org.uk/cpsfile.asp?id=641

This observation leads him to dispute the IPCC's assumptions of high population growth, growth in energy intensiveness and "dumb" farmers and technologists hypothesis.

In answer to the third question, Lawson's compelling answer is "adapt to it" because "it is by far and away the most cost effective approach".

Lawson claims, citing support from other quarters, that the cost of effectively curbing carbon emissions will be enormous.

Kyoto is absurd: It is not affordable and it is ineffective. It will do virtually nothing to reduce future rates of global warming. America has stayed out because the major contributors to future CO_2 emissions, China and India, will never sign on believing it is now their turn to build their economies on the basis of cheap power. "China alone last year embarked on a programme of building 562 large coal-fired power stations by 2012 – that is, a new coal-fired power station every five days for seven years. Putting it another way, China is adding the equivalent of Britain's entire power-generating capacity each year. Since coal-fired power stations emit roughly twice as much carbon dioxide per gigawatt of electricity as gas-fired ones, it is not surprising that it is generally accepted that within the next 20 years[59] China will overtake the United States as the largest source of emissions. India, which like China has substantial indigenous coal reserves, is set to follow a similar path, as is Brazil".

He notes that in the unlikely event of fresh rounds of Kyoto, as energy prices increase in Europe so the remaining European manufacturing base will move to China and India with no net reduction in global emissions at all.

Renewable sources of power such as wind farms, receive short shift, on the basis of high cost and lack of base load capability.

Lawson concludes that it is best to adapt to a warmer world and if required, there is a moral obligation for richer countries to help poorer countries to do so.

He makes a number of other helpful concluding observations:

- While the prospect of catastrophic consequences from global warming cannot be regarded as impossible, nor can a number of other possible catastrophes.
- It is perfectly possible, for example, that over the next hundred years or so, the world might enter another ice age. There is ample evidence that this has happened at fairly regular intervals over the long history of the planet, and that we are overdue for another one.
- More immediately – and thus demanding much more urgent attention and priority in the expenditure of resources – there are the possible consequences of nuclear proliferation to worry about, not to mention the growth in the terrorist threat in an age when scientific and technological developments have brought the means of devastation within the reach of even modestly funded terrorist groups.
- Above all, in a world of inevitably finite resources, not only can we not possibly spend large sums on guarding against any and every possible eventuality in the future; but the more we do spend on this the less there is available to deal with poverty and disease in the present.

There is much to admire and learn from in Lord Lawson's paper, including his final paragraph, in which he draws attention to the dangers of what he calls "eco-fundamentalism", and drawing a link with "the supreme intolerance of Islamic fundamentalism",

> "It could not be a worse time to abandon our own traditions of reason and tolerance, and to embrace instead the irrationality and intolerance of eco-fundamentalism, where reasoned questioning of its mantras is regarded as a form of blasphemy. There is no greater threat to the people of this planet than the retreat from reason we see all around us today."

[59] As noted earlier, the IEA has recently collapsed the 20 years into 2 years, ie in 2009 China will overtake the USA as a CO_2 emitter.

15. Further Papers, Newspaper Articles, etc

Attention has already been drawn to:

a) the main texts supporting the linkage between global warming and increasing atmospheric greenhouse gas concentration and the need to reduce the emission of these gases, and

b) a variety of source critical of the main story line on climate change in way or another.

Additional such critical material is included in the Appendix, some of it from those who endorse the IPCC story but fear the consequences of an exaggeration of risks, such as those found in Stern's report and Al Gore's "An Inconvenient Truth". Whilst most of this material has not been quoted (and nor does it form the whole of more than 200 documents consulted), it has formed part of the basic reading undertaken and therefore helped to shape both the content of this paper and the views expressed therein.

Bjorn Lomborg's highly acclaimed and criticised "The Skeptical Environmentalist" [60] is recommended reading along with the hostile reviews in the journals Science, Nature and Scientific American together with Lomborg's responses[61]. Lomborg is currently in the process of writing a new book on Climate Change due to be published in about 12 months time. Reviewers have drawn attention to Indur Goklany's recently published "The Improving State of the World" as a useful antidote to all the output of the "gloom and doom".

Lomborg's important essay, "The truth about the closely associated with environment" appeared in The Economist, 2nd August 2001. Many of Lomborg's theme's in this essay reappear in the writings of others.

Lomberg is considerably more positive[62] toward the 2007 report of the IPCC declaring "(c)limate change is real and serious problem", while at the same time a) drawing attention to the Reports reduction in expected sea level rise and lack of support the Gulf Stream shutting down because of global warming and b) making a distinction between the Report ("the IPCC has produced a good report") and the media frenzy associated with the Report, which he says has "little or no scientific backing".

Closely associated with Lomborg and The Economist has been the "Copenhagen Consensus", in which UN Ambassadors and other senior diplomats were asked to rank the 10 key challenges facing developing nations. Kyoto and other climate control issues trail along way behind other issues such as disease control, sanitation and clean water, poverty alleviation and education.

Also recommended is the daily posting from the clearing house operated by Dr Benny Peiser, Faculty of Science, John Moores University, Liverpool, United Kingdom. His website is: http://www.staff.livjm.ac.uk/spsbpeis/

Benny Peiser, "Climate Change and Civilisation Collapse" on environmental apocalypticism, Lord Monckton's open letter to two US Senators are also recommended reading, as is Margaret Wente's "Climate change a 'questionable truth'". The latter with a poorly chosen title results from interviews with a broad range of scientists who are "alarmed at the alarmism" of an Al Gore or a Tim Flannery.

The paper, "An examination of the Scientific, Ethical and Theological Implications of Climate Change Policy" found on the Interfaith Stewardship Alliance website is an excellent resource[63].

John Stone, former Treasury official and National Party Senator has written an original and compelling critique, entitled "Global warming scare mongering"[64].

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[60] http://www.lomborg.com/books.htm

[61] http://www.lomborg.com/critique.htm

[62] "Climate hysteria not justified" by Bjorn Lomborg: http://www.shanghaidaily.com/article/shdaily_opinion.asp?id=305598&type=Opinion

[63] Found here: http://www.interfaithstewardship.org/pdf/ISA_Climate_Change.pdf

Dr Dennis Jensen MP, Federal Member for Tangney (WA) is a global warming sceptic and has a web page (http://www.dennisjensen.com.au/news/default.asp?action=article&ID=205) listing a number of sites covering a wide variety of viewpoints.

The Royal Society offers a robust indeed partisan defence of the IPCC (pre 2007 Report)[65] refuting a list of 12 objections posed by sceptics to climate change. The section on the Kyoto Protocol is less than convincing, and no attempt is made to explain the drop in global temperature between 1940 and 1970. Also missing is any explanation for the current flat temperature after 1998.

16. The Articulation of a Christian Response to Climate Change

A Christian View of Creation

The study of climate and the possible negative influence upon it that humans may be having properly has to do with the scientific study of climate and other natural phenomena, including complex computer modelling of future trends.

Equally, dealing with negative effects by eliminating, reducing and/or mitigating such effects is properly the province of technologists, economists, corporations and governments.

The Christian has no distinctive voice on these matters deserving some privileged position.

Nevertheless as Christians, we want to affirm that God is committed to His creation. We see this in the following way:

1. The first book in the Bible, Genesis, describes God's six day creation of the world with each day closing with the appellation, "and God saw that it was good". Indeed, it is said that God saw the creation of our first parents "in His own image", the crown of creation, as "very good".
2. Our first parents were charged with the responsibility to "be fruitful and multiply and fill the earth and subdue it and have dominion over (it)". We understand therefore that the earth (and indeed the universe beyond) as God's creation has been committed to the peoples of the world as their home that is to be maintained, enhanced, beautified and offered back to God with thankfulness and praise.
3. Unfortunately the world and everything in it has been contaminated by our first parents' and every succeeding generation's, rebellion against God and his purposes for themselves and the world, so that the world has become "subjected to futility", in "bondage to decay".
4. God however is not to be thwarted. He demonstrated His love and commitment to His creation by sending His Son, Jesus into the world as a human being to redeem the world, something to be fully realised at the time of His coming again.
5. In the meantime, we remain as God's stewards in God's world. In the parable contrasting faithful and unfaithful stewards, Jesus said, "From everyone who has been given much, much will be demanded; and from the one who has been entrusted with much, much more will be asked.". (Luke 12:48)

Introductory Remarks

The concern over climate is directly related to the public perception that temperature is rising and weather patterns changing for the worse, probably in an accelerating manner, and further, that humans are responsible.

More specifically, humans are held responsible because power stations and cars are spewing out more and more greenhouse gases, principally carbon dioxide into the atmosphere.

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[64] Found on the National Observer website: www.nationalobserver.net

[65] http://www.royalsoc.ac.uk/page.asp?id=2986

A very direct association of increasing global temperatures following increasing atmospheric CO_2 levels has been proposed with the accompanying injunction that to limit such temperature increases requires immediate action to reduce CO_2 emissions.

Without wishing to dismiss climate change as a reality, we are concerned that the public perception of climate change is susceptible to manipulation in which adverse scientific findings on climate can be given undue prominence and other contrary findings suppressed, all the while ignoring the uncertainties and limitations of scientific study, as well as not forgetting the biases built into the funding processes for such study.

The Al Gore documentary, "An Inconvenient Truth", as noted earlier is an example of such manipulation[66]. Of course, Mr Gore is playing a well known game of wild exaggeration so as to get at least some attention, and hopefully some action on climate change from those who can make a difference, especially the politicians. If everyone understands the game, not too much damage is done. Unfortunately many do not understand the game, especially the young, and so anxiety in the wider community is excessively heightened and unrealisable expectations established, with the potential for disillusionment to follow.

It is interesting to speculate how many Australians, when asked to nominate the increase in temperature since the late 1990's compared to say 20 years earlier, and offered the choice of 0.5°C or less, 1°C, 2.5°C, or 5°C, would opt for the correct answer of 0.5°C[67]. With the answer being less than 0.5°C we see that the average temperature has not risen all that much, and in many parts of the world, Europe, Russia and North America in particular, it is more the *minimum* temperature that has risen, bringing many benefits.

Many Christians, and here we include ourselves, are naturally and deeply sceptical of current environmental "apocalypticism", that bears the hallmarks of a religion[68] that substitutes the creation for the creator, that seeks to make preservation of the environment in remembered form or at least in its current configuration as the single most important issue pressing upon mankind, that ignores other pressing issues like disease and poverty in the developing world, that takes enormous conceits to itself regarding mankind's ability to change the environment for better or for worse[69].

As religious people we understand mankind's deep spiritual need for purpose and significance beyond the existential emptiness of life lived without God.

Our Position

The position adopted in this paper for climate change on the basis of our Christian convictions and the literature available to us may be summarised as follows:

1. It is clear that there has been a small rise in global temperature of about 0.8°C (with quite sharp local variations) since 1900.

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[66] The following critiques of "An Inconvenient Truth" are recommended: http://www.onlineopinion.com.au/view.asp?article=4938 (Professor Bob Carter is a researcher at the Marine Geophysical Laboratory at James Cook University, Queensland), http://www.tcsdaily.com/article.aspx?id=052506C and the rather comprehensive http://www.cei.org/pdf/5539.pdf.

[67] This data is drawn from the Annual Australian Climate Statement 2006 put out by the Bureau of Meteorology. The correct answer is 0.45°C, with two years, 2000 and 2001 actually being cooler than the reference period, 1961-1990.

[68] See for example, "The green fervour" by Joseph Brean at http://www.canada.com/nationalpost/story.html?id=07407be3-1f9f-4f41-a16a-5a286a5b374c&k=53926

[69] John Stone has provided his own version of this observation in his paper, "Global warming scare-mongering": "perhaps the strangest aspect of the whole global warming movement is its sheer presumption. You don't have to be a rocket scientist, or even a believer in the Deity, to comprehend the sheer vastness and wonder of the world we live in. Think, for example, of the massive water volume of the oceans, or the ever-changing nature of the weather in the atmosphere above us. Consider the almost infinite complexity even of such everyday processes as cloud formation, or the even greater complexity of the interactions between the oceans and the atmosphere, which result in transporting truly massive amounts of energy from the equatorial regions to the polar ones. Into all this humbling and infinitely vast firmament a few extraordinarily arrogant climatologists — most of them, it seems, with limited knowledge of other relevant disciplines such as geophysics, geochemistry, the planetary sciences, marine biology and so on — have injected their hypothetical and entirely unproven speculations as to how, in detail, all this works. Even more arrogantly, they have thrust forward their computer-driven predictions to create such a tide of scare-mongering as has not been seen since mediaeval times. If it were not actually happening, one would never have believed it possible."

2. What is not so clear is that a direct correlation with continuously rising atmospheric greenhouse gas concentration has been demonstrated – witness the 1940-1970 period of global cooling and the current pause in rising global temperatures since 1998.

3. Nor is it clearly evident that the weather has become more extreme. Thus the current drought in SE Australia, which may well be breaking, is no worse than Federation (1895-1903) drought in which **s**heep numbers halved and more than 40 per cent cattle were lost[70]. Hurricane Katrina was no worse than the one that destroyed Galveston in 1900 whilst the eruption of Krakatau in 1883 remains unrivalled in modern human history.

4. The IPCC 2007 Summary's conclusion that "Most of the observed increase in globally averaged temperatures since the mid-20th century is *very likely*[71] due to the observed increase in anthropogenic greenhouse gas concentrations" sits uncomfortably both with the above observations and the fact that in each of its successive reports the IPCC has reduced its estimates for future phenomena whether radiative forcing, global temperature or ocean sea levels .

5. Given the complexity of the factors controlling climate (the atmosphere, the oceans, the land surface, the ice sheets and the Earth's biosphere) and the low concentration of greenhouse gases in the atmosphere it appears incredibly reductionist to tie global warming down to a single factor, particularly given the Earth's millennial long pattern of changing weather patterns well before the current increase in atmospheric greenhouse gases.

6. Our conclusion therefore is that at this point in time the science has not been settled in favour of continuing future global warming.

7. However given the status of the IPCC with its predictions of rising temperatures in conjunction with more unsettled weather and a (modest) rise in sea level, Governments are required to give careful consideration to the evidence of actual global warming and if convinced of the seriousness of the risk of possible global warning must put in place measures to alleviate any adverse consequences.

8. Because climate change is a long term issue, extending beyond today's horizon of 2100, Governments, political parties and non Government groups including Churches need to take collective deep breaths and avoid rushing into the advocacy, and worse, the implementation of scheme(s), before finding out what works.

9. The first such (illustrative) scheme was Kyoto. Kyoto is a failure, and will increasingly be seen to be a failure for three reasons. Firstly it is calculated that Kyoto will only achieve a lowering of global temperature that will gain the world a minuscule extra 6 years breathing space; secondly all the developing nations including China and India are excluded from having to comply with Kyoto and this is a fatal omission; and thirdly, it is already clear that most European nations, the strongest supporters of Kyoto, will not achieve their Kyoto targets.

So what is the way forward?

In what follows we lay aside our reservations concerning climate change and its supposed relationship to CO_2 emissions and consider what actions might be appropriate in the event of the IPCC findings being correct.

Background Considerations

In the first place it needs to be recognised that the use of fossil fuels, whether to drive cars or trains or provide energy for industry and the home has been enormously beneficial to the peoples of the western world.

Secondly, it needs to be understood that Africa, Asia, Central and South America believe it is their turn to benefit from the harnessing of energy, principally the cheapest source, ie fossil

[70] http://www.bom.gov.au/climate/drought/livedrought.shtml

[71] "very likely" is stated in the IPCC Summary to have a probability in excess of 90%

fuels. And who would wish to deny them the benefits of freely available electricity, benefits people in the developed world so freely enjoy?

Thirdly, it needs to be remembered that not all the effects of global warming are harmful. CO_2 is an essential plant food. Increased levels of CO_2 will make Earth a greener planet with greater crop productivity. Whilst not much help to Australia, vast stretches of Canada and Siberia will be able to accommodate far larger numbers of people. Who knows, Siberia may become the breadbasket of the world as North Africa was once for Rome! Remember too, far more people die as a result of cold weather than hot weather.

Fourthly, the current evidence for global warming should not be considered unique in human history or sufficient to be alarmed about, noting simple historical facts such as the Roman warming period from 200 BC to around AD 600 when North Africa and the Sahara were wetter and supported crops while wine was produced in the north of England; the Medieval warming of AD 900 to 1300, when Eric the Red's Viking descendants colonised Greenland and the Little Ice Age of 1300 to 1850 which saw the Norse dairy farmers on Greenland grow short from malnutrition and eventually die out.

Fifthly, if fossil fuels are to be phased out (or carbon capture and storage added), it is vital that it be done so without blunting economic growth, since large expenditures will be required to support the development and commercialisation of new technologies, whether carbon capture and storage, solar and or geothermal.

In the sixth place, with the anticipated temperature changes taking decades to work through (and therefore to be demonstrated), and with the proviso that global GDP growth remains high (to provide funding), time will then exist for the multiplication of existing technologies and development of new technologies for cleaner energy, new farming techniques including the development of new crops able to sustain higher temperatures, building dykes to hold back rising sea levels, relocating populations, etc.

In the seventh place in the time frame of a hundred years plus, it needs to be recognised that CO_2 emissions will become more and more an issue driven by the currently described "developing world". With Australia's share of CO_2 emission at 1%, its contribution will be strictly at the margin. Considering that Europe's share of world population is set to decline 65% by 2050, at a time of rapid population growth in the developing world couple with its industrialisation (China, India and Brazil in particular), Europe itself will have a declining influence on CO_2 emissions. As one of the IPCC Summary's co-authors said, "(global warming) is not something you can stop. We're just going to have to live with it"

Finally, in the eighth place, grand schemes like Kyoto should be forgotten. National interest will always defeat attempts to achieve a coordinated world wide response to an issue like global warming. The industrialised world will never succeed in imposing CO_2 targets on the developing world. The ability of the industrialised nations is fairly limited given that non OECD nations already outstrip OECD nations on CO_2 emissions and are doing so at an ever increasing rate. The fact is that CO_2 emissions are going to increase into the future for decades regardless of any actions that might be taken by developed nations. This is a given that must be accepted, but not used to beat Governments about the head

Mitigation and Adaptation[72]

So, what can be done in the Australian context to tackle global warming?

The first response is usually described as *"mitigation"* in the sense of taking action so as to "put off the evil day" or better, to defer it indefinitely.

This could be achieved by making deep cuts in CO_2 emissions now. For example some arresting measures that could be considered would be drastic cuts in cattle numbers, prohibition of air conditioners, punitive tariffs on luxury cars and especially four wheel drives

[72] In this section, ways of mitigating and adapting to global warming are given by way of illustration with comment as thought appropriate. It is far too early to promoting specific courses of action when specific technology remains to be proven and the social, environmental and economic case to be made.

to suppress their sales and most importantly, the closure of Latrobe Valley power generation based on brown coal.

Such measures would dramatically impress upon Australians the cost of fighting climate change. The personal and economic costs would be enormous and yet go no where near meeting the environmentalist calls for 60% cuts by 2050. No Government would ever consider them.

A milder form of mitigation would be to seek gradually deeper cuts over say a 25 year time span. The virtue of this approach is that an attempt is made to manage the change to lower emissions technology without causing Australian and other economies to falter. Australia's energy generation industry estimates that the cost of new low emission technology (principally nuclear power to meet new demand for electricity plus carbon burying for existing coal fired power stations) would cost a not inconsiderable $75 billion.

The Australian Government decision to join the six nation Asia Pacific Partnership on Clean Development and Climate (along with the USA, China, India, Japan and South Korea) is potentially a good move with money being allocated to research into clean coal technology, solar[73], etc.

Also important in any set of measures to combat rising CO_2 levels will be tackling the issue of CO_2 emissions from cars, again another testing issue for a nation's resolve to reduce CO_2 emissions. CO_2 emissions from transport, and cars in particular, provide the fastest rising source of CO_2 emissions. Particularly to blame for this has been the trend to bigger, heavier vehicles, particularly four wheel drive vehicles. If as a nation we are concerned about CO_2 emissions, then at an individual level we need to ask questions about issues like the vehicles we drive[74], the energy efficiency of our homes, etc. There is room for Government to gently shape our choices in these areas at reasonable cost.

There is no way of escaping the fact that if Australia is to make deep cuts in its CO_2 emissions, investment in nuclear energy will be required. Without in any way minimising the difficult issues of siting nuclear power stations and disposing of nuclear waste, the adoption of nuclear power generation will in fact become a test of the nation's willingness to seriously grapple with global warning. In the meantime the Australian Government has indicated that it has a carbon tax under consideration as a first step toward curbing Australia's carbon emissions. This would need to be carefully managed as in the absence of a global carbon trading scheme it has the potential to move marginal Australian manufacturing industry offshore. Any moves towards the imposition of a carbon tax will only hasten the day that nuclear energy arrives. In time carbon burying technologies for existing coal fired power stations will be developed, as most likely solar power, all however significantly more expensive than current coal fired stations. Wind farms are unlikely to be significant sources of electricity because of their lack of base load capability.

The alternative strategy is one of *adaptation*, which can also work in conjunction with partial mitigation. A good historical example of adaptation was the building of the Dutch system of dikes to reclaim land already lost to the encroaching sea. Another example is the Australian Government's $10 billion plan for the recovery of the Murray Darling basin. The virtue of waiting to adapt is that real problems allow very precise solutions to be devised. In other words adaptation deals with real and not hypothetical problems leading to less costly, more effective remedial action.

Furthermore, if the IPCC is already indicating that global warming will continue for centuries, adaptation will certainly be required. Adaptation is not an unusual circumstance in human

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[73] Witness the Australian Government's decision to site a $175 million solar powered generator outside Mildura.

[74] Car makers in the EU have a voluntary CO_2 emission target of 140 gms/km driven averaged across their product ranges to be achieved by 2008. They will not meet it and the reason is the public switching their preference to larger cars including four wheel drive cars. Typical emissions for petrol driven cars are: petrol hybrid 104 (Toyoto Prius); 141 small car (Toyoto Yaris); medium car 175-185 (Mazda 6, Honda Accord), large car 210 (BMW 5 series), small four wheel off road 217, large 4 wheel off road 264 (Nissan Pathfinder). Diesel engines reduce emissions by up to 20% and manual gear boxes a further 5%.

history given past crises - failure of crops, decimation of peoples through warfare, plague and the like. This leads naturally to the conclusion that in the long run adaptation rather than mitigation will be the most suitable long term approach to current climate change concerns.

Concluding Remarks

In contradiction to every expression of anxiety resulting from the portrayal of imagined catastrophic global warming, as Christians we affirm that God is committed to his creation and though through man's folly the world has become "subjected to futility", in "bondage to decay", yet God in His mercy will not forsake the works of his hands (Psalm 138:8).

Christians, it is to be hoped, will always support initiatives that roll back the deleterious effects of mankind's rebellion and sin in order to maintain, enhance and beautify God's creation as something that should be offered back to Him with praise and thanksgiving. The Biblical portrayal of a life pleasing to God is not one focussed on material possessions (as much as Christians may be attracted to them) but rather one of service and the quiet enjoyment of the beautiful world God has given us as our home.

Christians, again it is to be hoped, because of their professed commitment to the poor, would be disappointed if a preoccupation with combating global warming and its effects meant that the issues confronting the developing world, not so much melting glaciers and rising sea levels, but rather malnutrition, disease, clean water and better sanitation were ignored.

The importance of energy to both improve the standard of living of all people, including the poor, as well as to alleviate many of the developing world's problems[75] that result in poverty and early death means that *remedial actions for global warming need to be broadly based and carefully considered so that the cure is not worse than the condition*. Nothing less should be considered an adequate Christian response.

On a different tangent, global warming provides the developed world with the opportunity to reduce its dependence upon Middle Eastern oil and gas especially when it is realised that the revenues received are used to fund terrorism and the spread of Islam in the West in its purest form. Indeed, it must be admitted that global warming does provide a useful distraction to the encroachments of Islam – but that is a topic for another day.

DJ Palmer BE MBA
In the year of our Lord, Wednesday, 14th February 2007

[75] A simple example. The failure to provide electricity to the towns and villages of the developing world means that forests are logged and wood and dung burnt for cooking and eating, all considerably adding to greenhouse gas emissions.

General Critique of Draconian view of Climate Change	"The truth about the environment" by Bjorn Lomborg, *The Economist* print edition, Aug 2nd 2001 http://www.economist.com/science/displayStory.cfm?Story_ID=718860	An important essay in which Lomborg argues that while environmentalists (of which he was once one) tend to believe that, ecologically speaking, things are getting worse and worse, they are in fact wrong in almost every particular. Lomborg on Kyoto and cutting CO_2 emissions: "Radically cutting carbon-dioxide emissions will be far more expensive than adapting to higher temperatures Yet a false perception of risk may be about to lead to errors more expensive even than controlling the emission of benzene at tyre plants. Carbon-dioxide emissions are causing the planet to warm. The best estimates are that the temperature will rise by some 2°-3°C in this century, causing considerable problems, almost exclusively in the developing world, at a total cost of $5,000 billion. Getting rid of global warming would thus seem to be a good idea. The question is whether the cure will actually be more costly than the ailment. Despite the intuition that something drastic needs to be done about such a costly problem, economic analyses clearly show that it will be far more expensive to cut carbon-dioxide emissions radically than to pay the costs of adaptation to the increased temperatures. The effect of the Kyoto Protocol on the climate would be minuscule, even if it were implemented in full….. The Kyoto agreement merely buys the world six years … Yet, the cost of Kyoto, for the United States alone, will be higher than the cost of solving the world's single most pressing health problem: providing universal access to clean drinking water and sanitation. Such measures would avoid 2m deaths every year, and prevent half a billion people from becoming seriously ill. And that is the best case. If the treaty were implemented inefficiently, the cost of Kyoto could approach $1 trillion, or more than five times the cost of worldwide water and sanitation coverage. For comparison, the total global-aid budget today is about $50 billion a year.
General Critique of Draconian view of Climate Change	"Middle Ages were warmer than today, says scientists" by Robert Matthews, 6th April 2003 http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2003/04/06/nclim06.xml&sSheet=/news/2003/04/06/ixhome.html	This is a summary of an important paper which argues of basis of review of 240 scientific studies that within the last 1,000 years a Little Ice Age (ca 1300) and a Medieval Warm period (9th to 14th centuries) both occurred and "(f)urthermore, thermometer warming of the 20th century across the world seems neither unusual nor unprecedented within the more extended view of the last 1000 years. Overall, the 20th century does not contain the warmest or most extreme anomaly of the past millennium in most of the proxy records." They also claim that human activity has "shaped almost every aspect of past environmental and climatic changes on local and regional spatial scales". They also draw attention to early 20th century global warming when CO_2 in the air was 20% below current levels and conclude such warming "must be largely dissociated from anthropogenic CO_2 emissions". Philip Stott quoted on what a good time for people the medieval warm period was and what a bad time the little ice age was. "Reconstructing Climatic and Environmental Changes of the past 1000 years: A Reappraisal" by Willie Soon, Sallie Baliunas, Craig Idso, Sherwood Idso and David R. Legates, May 2003 http://www.marshall.org/pdf/materials/132.pdf
General Critique of Draconian view of Climate Change	"Climate Change and civilisation collapse" by Benny Peiser in K. Okonski (ed), *Adapt or Die: The science, politics and economics of climate change*, London: Profile Books, (2003) 191-201 http://www.policynetwork.net/uploaded/pdf/peiser_ch_10.pdf	Peiser elaborates on the origin of environmental gloominess and cultural pessimism in this way: "The mutation of age-old, religious end-time prophecies into secular predictions of natural cataclysms and societal collapse – in short, the emergence of environmental apocalypticism – is perhaps the most significant ideological development in the western world since the demise of Marxism. Marxist doctrine… crumbled because its predicted, and eagerly anticipated, disintegration of free market economies never transpired, but communist economies and totalitarian dictatorships have mostly come to sticky ends. Deeply infuriated by the failure of their predictions and the unremitting vibrancy of capitalism, many disillusioned believers turned to ecological pessimism and environmental determinism. Not for the first time in the long history of apocalyptic movements, new wine was poured into old bottles. Many ideologues replaced their old beliefs in economic decline and breakdown with the new principle of ecological decay and disaster. There is no shortage of physical factors that can produce natural disasters and social deterioration. These could include catastrophes due to asteroid and comet impact, the failure of global agriculture due to volcanic super-eruptions, the reappearance of a new ice age, epidemic diseases, etc. However, none of these horror scenarios has alarmed the public as much as the alleged peril of human-caused global warming." Peisner goes on to assess the case advanced that "climate change" would be implicated in the disintegration of

		ancient societies and concludes, "(t)omorrow's hyper-complex societies will be able to withstand prolonged droughts thanks to technological advances and economic efficiency. While self-reliant, agricultural societies are essentially rigid and extremely vulnerable to climatic stress factors, inter-connected high-technology cultures are much better sheltered from possible catastrophes, because of modern technologies and mitigation strategies"
In favour of Nuclear Energy	"Why The Planet Needs Nuclear Energy" by Hugh Montefiore, The Tablet, Oct. 23, 2004 http://www.thetablet.co.uk/articles/1963/	One of a number of prominent environmentalists who support nuclear energy as the way to answer the call to reduce greenhouse gas emissions (see http://www.nei.org/index.asp?catnum=2&catid=322? with a good argument on issues of safety, terrorism and nuclear waste
Critique of Kyoto	"Kyoto? Mamma Mia!" by Antonio Martino, Wall Street Journal, 7th October 2005 http://www.sepp.org/Archive/NewSEPP/Kyoto-Martino.htm	Italy's former defence minister argues "(t)hat the EU would still insist on implementing the protocol must be seen as an institutional form of collective self-flagellation. Kyoto will severely penalize the European economy without bringing any real progress toward (abatement of global warming…. most important, while a scientific consensus about the true nature of climate change is still lacking, we know for certain that the impact of Kyoto on the average global temperature will be negligible at best. The U.N.'s Intergovernmental Panel on Climate Change forecasts that without the ratification of Kyoto, the average global temperature will rise about one degree Celsius by 2050. The same panel predicts that after the implementation of Kyoto, the temperature will still rise 0.94 degrees".
Critique of Kyoto	"Open Kyoto to debate", an open letter to Canada's PM in the National Post, 6th April 2006 http://www.canada.com/nationalpost/news/story.html?id=3711460e-bd5a-475d-a6be-4db87559d605	This is a letter by 60 accredited experts in climate and related scientific disciplines who argue that observational evidence does not support the computer climate models used by IPCC and so little reason to trust model predictions of the future. The mantra that a climate catastrophe is looming and humanity is the cause is not justified. Let the Canadian government act to reduce air, land and water pollution but allocating funds to "stopping climate change" would be irrational.
Critique of *Time* cover story, 3rd April 2006, "Global Warming: Be Worried. Be Very Worried"	"Scare of the Century" by Jason Lee Steorts, 5th June 2006 http://nrd.nationalreview.com/article/?q=NjAxNzZjNTU4OGIyZWYxYTgwMzZhOTFiNmYwZTUyZmU	The Time story (found here http://www.time.com/time/magazine/article/0,9171,1176980,00.html) based on IPCC sourced data about melting ice and rising sea levels. Steorts quotes various scientific sources disputing these findings, eg whilst fringes of glaciers melting, interiors continue to pile up ice. Makes the point that the hysteria generated by environmentalists over global warming means the funding process for scientific study gives an incentive toward pessimism.
General Critique of Draconian view of Climate Change	"Heat Wave or Big Freeze, we just learn to adapt" by Benny Peiser, Daily Post, 25 July 2006 http://ff.org/centers/csspp/library/co2weekly/20060823/20060823_12.html	Agrees climate is getting hotter, as in the past; it is an illusion to think we can reverse that trend, the best thing is to adapt to hot(ter) summers.
General Critique of Draconian view of Climate Change	"On global forces of nature driving the Earth's climate. Are humans involved?" by L. F. Khilyuk and G. V. Chilingar in *Environmental Geology* Volume 50, Number 6 / August, 2006 http://www.springerlink.com/content/t341350850360302/	The authors identify and describe the following global forces of nature driving the Earth's climate: (1) solar radiation as a dominant external energy supplier to the Earth, (2) out-gassing as a major supplier of gases to the World Ocean and the atmosphere, and, possibly, (3) microbial activities generating and consuming atmospheric gases at the interface of lithosphere and atmosphere. The authors conclude: "The human-induced climatic changes are negligible The global warming observed during the latest 150 years is just a short episode in the geologic history. The current global warming is most likely a combined effect of increased solar and tectonic activities and cannot be attributed to the increased anthropogenic impact on the atmosphere. - - - Humans may be responsible for less than 0.01°C of approximately 0.56°C (1°F) total average atmospheric heating during the last century". On the question of policies for mitigating climate change, the paper says: "Any attempts to mitigate undesirable climatic changes using restrictive regulations are condemned to failure…. Thus, the Kyoto Protocol is a good example of how to achieve the minimum results with the maximum efforts (and sacrifices). Impact of available human controls will be negligible in comparison with the global forces of nature.

		Attempts to alter the occurring global climatic changes (and drastic measures prescribed by the Kyoto Protocol) have to be abandoned as meaningless and harmful."
General Critique of Draconian view of Climate Change	Copenhagen Consensus http://www.copenhagenconsensus.com/Default.aspx?ID=675	This was a joint initiative of Bjorn Lomborg and the Economist magazine that produced its first report in 2004, now updated in October 2006. Participants were drawn from UN Ambassadors and other senior diplomats from 24 mainly poor countries, but including Australia and the USA (and representing 54% of the world's population), who were asked to rank the 10 key challenges facing developing countries with the key question "if you had $50 billion extras to put it to good use, which problems should be solved first. In a consolidated list of 40, top priority was given to communicable diseases, sanitation and water, malnutrition and education. The Kyoto protocol came in at 23 and specific measures for climate control came last.
Critique of Stern Report	"Do I detect the first tiny rumblings of a paradigm shift in climate-change science?" by Prof Philip Stott, 5th October 2006 http://greenspin.blogspot.com/	Draws attention to research appearing in the Proceedings of the Royal Society and other related research implicating cosmic rays and water vapour, rather than CO_2, as the main drivers of climate change, indeed 75% of climate change due to these drivers. Stott also has a critique of Stern with comment on the politics behind Stern, failure of Kyoto (Europe falling so badly behind -8% fall (actual -0.6% and rising again), a comment that "Climate is the most complex, coupled, non linear, chaotic system know, and it is intrinsically unlikely that climate change can be predicted on a single variable, or factor, however politically convenient".
General Critique of Draconian view of Climate Change	"The real climate change catastrophe" by Paul Driessen, 21st October 2006 http://www.townhall.com/columnists/PaulDriessen/2006/10/21/the_real_climate_change_catastrophe	An excellent critique raising issues of cost and ineffectiveness of Kyoto, past global history of climate change, higher priorities for aiding the world's poor, the failure to recognise man's success in meeting challenges (ie Lord Lawson's "learn to adapt" argument).
Critique of Stern Report	"Stern Review" by Bjorn Lomborg, 2nd November 2006 http://www.opinionjournal.com/extra/?id=110009182	Broad ranging attack on assumptions. Noting Stern's estimate of a 1% annual GDP ($US450 billion) spend to stabilise carbon emissions, Lomborg highlights the UN's estimate of a $US75 billion spend to solve all the world's basic problems (clean drinking water, sanitation, basic health care and education) and asks, "is that not better"?
Critique of Stern report	"The Stern Review of the Economics of Climate Change: a Comment" by Richard S.J. Tol, Economic and Social Research Institute, Hamburg, Vrije and Carnegie Mellon Universities 2nd November, 2006 http://www.fnu.zmaw.de/fileadmin/fnu-files/reports/sternreview.pdf	This is an important technical/economic assessment of Stern's report. The author's conclusion is as follows: "In sum, the Stern Review is very selective in the studies it quotes on the impacts of climate change. The selection bias is not random, but emphasizes the most pessimistic studies. In this sense, the Stern Review reminds one of Lomborg (2001). The discount rate used is lower than the official recommendations by HM Treasury. Results are occasionally misinterpreted. The report claims that a cost-benefit analysis was done, but none was carried out. The Stern Review can therefore be dismissed as alarmist and incompetent. This is not to say that climate change is not a problem, nor that greenhouse gas emissions should not be reduced. There are sound arguments for emission reduction. However, unsound analyses like the Stern Review only provide fodder for those skeptical of climate change and climate policy – and may well further polarize the debate. Climate policy is for the long-term. It will only be successful if a broad coalition – of countries and of stakeholders within countries – supports climate policy and continues to support climate policy. To my mind, this calls for a sober analysis, rather than hyperbole."
General Critique of Draconian view of Climate Change	"Chaotic world of climate truth" by Mike Hulme, BBC, 4 November 2006 http://news.bbc.co.uk/2/hi/science/nature/6115644.stm Hulme is Professor of Environmental Sciences at the University of East Anglia, and Director of the Tyndall Centre for Climate Change Research. He is one of the lead climate change modellers.	In this article, Hulme who supports the consensus view on climate change (ie 1.4°C to 5.8°C rise in global temperature by 2100) with human activities "heavily implicated in this change", has written a piece bemoaning the new language of "catastrophic" ("chaotic", "irreversible" etc). He asks the question, "Why is it not just campaigners, but politicians and scientists too, who are openly confusing the language of fear, terror and disaster with the observable physical reality of climate change, actively ignoring the careful hedging which surrounds science's predictions?". He basically sees it related to influencing the negotiations "around what happens when the Kyoto Protocol runs out after 2012", in the context of "failing … Kyoto Protocol targets to reduce emissions of carbon dioxide – (t)he signatories to this UN protocol will not deliver on their obligations". He sees the language of fear and terror as being counter productive. "I believe climate change is real, must be faced and action taken. But the discourse of catastrophe is in danger of tipping society onto a negative, depressive and reactionary trajectory".

General Critique of Draconian view of Climate Change	**"**A march of middle-class miserabilists" Brendan O'Neill, 7 November 2006 "The use and abuse of the poor" by Sadhavi Sharma http://ff.org/centers/csspp/library/co2weekly/20061213/20061213_06.html	Two reports on a 20,000 strong demonstration organised in London on 6th November 2006 by the Stop Climate Chaos coalition. The writer is scathing: "This was no political march backed up by scientific facts, but an outburst of shrill middle-class disgust with the greedy masses and their bad habits", "What united them all … was a petty authoritarianism. Strip away the dashes of colour, the dancing, the hymn-singing and the big bright animals, and this was in essence a demo demanding less debate and more stringent measures outlining what people can do and consume. .. this was the first demo I've seen that effectively called on the authorities to punish us; not that they should leave us alone or give us more jobs, rights, welfare, whatever, but that they should actively intervene in our lives and stop us from driving too much, holidaying too much, eating too much and living it up too much.". O'Neill buttresses his report with interesting quotes from John Stuart Mill. "On Liberty". Sharma took a very bleak view of the march, "The all-purpose and patronising use of developing countries for the benefit of Western campaigning on the environment has the effect of stifling real debate about the causes of underdevelopment in Third World countries. Instead, every problem – poverty, famine, the fact that people are still at the mercy of nature – is re-interpreted to fit Western campaigners' agendas…. At the rally, discussion of real development was off the agenda. Instead, we were called upon to assume responsibility – or guilt, rather – for the fate of the hapless and the poor. This is not real solidarity with people in Africa, Asia, Latin America, but more like guilt-tripping pity that does little to help people in the developing world devise solutions to their problems.".
General Critique of Draconian view of Climate Change	"Can we go on building roads and runways and save the planet?" by Andrew Forster, Local Transport Today, 30 November 2006 http://ff.org/centers/csspp/library/co2weekly/20061213/20061213_10.html	An interview with Benny Peiser. Peisner is an important critic and this article rates highly. The position he advances is a) global warming is occurring and man is contributing via greenhouse gas emissions, but is "agnostic" on question of whether warming is mainly driven by man; b) the issue for policy makers is not so much the issue of science but the economic and political approach to climate change; c) Kyoto targets are not going to be met; d) economies will continue to burn fossil fuels as the cheapest form of energy to power economic growth - CO_2 is a proxy for economic growth; e) the only way to achieve dramatic reductions is with technology – clean coal, nuclear, solar (forget wind), and in long term H_2, perhaps fusion, but this will take a long time – two generations at least; f) immediate problem is the lack of any short term practical solution, meaning that policymakers should be trying to tone down the rhetoric and prepare the citizens for the long haul and this is not made easy by g) the appearance of environmental apocalypticism, not helped in turn by politicians stirring the pot in their efforts to capture the "green" vote.; h) politicians need to commit resources to the longer term science and technology developments and in response to the "Armageddon now" environmentalist push be honest enough to say to those for including annual CO_2 reductions a la Kyoto, "'You want to save the planet? Okay, but don't come and complain about unemployment, rising energy prices and industries simply relocating to other parts of the world where they are taking a different approach'."".
General Critique of Draconian view of Climate Change	"A conversation with Bjorn Lomborg", by Jason Miks, 30th Nov 2006 http://www.tcsdaily.com/article.aspx?id=112806D	A must read interview. Comments on a) current hysteria over climate change; b) makes point that climate change comes third after lack of clean drinking water and lack of sanitation, indoor air pollution for people are too poor to use good fuels and end up using dung or cardboard or whatever, as environmental problems; c) current hysteria ignores the good that will come from climate change – eg fewer cold related deaths; d) comments on Gore's movie, "there is a dramatic difference between what we're being told (e.g. if Greenland melts seas rise 6-7m), and what we're actually seeing (IPCC says a 0.3m rise by 2100)". Lomborg puts the hysteria down to a general perception "that for some reason we have come to believe that it is almost crucial to believe that things are going in the wrong direction, otherwise we don't feel comfortable…. I think what is happening now is that we are increasingly seeing a tailspin into hysteria over the global warming discussion, where it is almost commonplace to say things are worse than we thought".
General Critique of Draconian view of Climate Change	"Cow 'emissions' more damaging to planet than CO_2 from cars" by Geoffrey Lean, The Independent, 10th December 2006 http://news.independent.co.uk/environment/article2062484.ece	Comments on an UN report entitled "Livestock's Long Shadow" on the environmental damage done by livestock, mainly cattle. Says, "Livestock are responsible for 18 per cent of the greenhouse gases that cause global warming, more than cars, planes and all other forms of transport put together. Burning fuel to produce fertiliser to grow feed, to produce meat and to transport it - and clearing vegetation for grazing - produces 9 per cent of all emissions of carbon dioxide, the most common greenhouse gas. And their

		wind and manure emit more than one third of emissions of another, methane, which warms the world 20 times faster than carbon dioxide".
General Critique of Draconian view of Climate Change	"Uphold Free Speech or Resign", an Open Letter from Lord Monckton to two Senators, 11th December 2006 http://ff.org/centers/csspp/pdf/20061212_monckton.pdf	Lord Monckton, former policy adviser to Prime Minister Margaret Thatcher, has sent an open letter to Senators Rockefeller (D-WV) and Snowe (R-Maine) in an extraordinarily strongly and cogently argued response to their recent rather intemperate open letter (27th October 2006 telling the CEO of ExxonMobil to cease funding climate-sceptic scientists. Both letters are important and worthy of careful consideration. The Senators' letter is found here: http://www.planet2025news.net/ntext.rxml?id=3832&photo Lord Monckton lists a number of claimed climate change outcomes (eg rising sea level) and on the basis of specified observational and or scientific data demonstrates exaggeration, he asks the rhetorical question, "Why should ExxonMobil, or anyone, place the slightest credence in a body (IPCC) that, in the three examples cited above, has manipulated or ignored the truth, has suppressed the participation of dissenters, has failed to address scientists' legitimate concerns about the declared bias of its lead authors, and has failed to apologize even for its most blatant errors?" He makes the helpful point, "Sceptics and those who have the courage to support them are actually helpful in getting the science right. They do not, as you improperly suggest, "obfuscate" the issue: they assist in clarifying it by challenging weaknesses in the "consensus" argument, and they compel necessary corrections…". He summarises his own position on climate change as follows, "There is a consensus that there is more CO_2 in the air than there was; that humankind may be to blame; and that some warming may result. That is all. There is no consensus on how fast the world will warm, or when or even whether any "disastrous" consequences will ensue."
Critique of Stern Report	"Recalculating the Costs of Global Climate Change" by Hal R Varian, 14th December 2006 http://www.nytimes.com/2006/12/14/business/14scene.html?_r=2	A report on work done by two leading economists, undertaken independently to try to explain why Stern's cost of global warming are so much greater than any previous estimates. The answer turns out to be the assumptions used in the economic modelling and specifically "the social rate of time discount", ie the rate used to compare the well being of future generations to the well being of those alive today. Stern effectively uses a zero rate, which is certainly arguable.
Critique of Kyoto	"Europe v. America on CO_2" The Wall Street Journal Online, 14th December, 2006 http://online.wsj.com/article/SB116606091947649743.html	Points out that CO_2 emissions growth in US half that of Europe since 2000. Apparently those responsible for EU's carbon trading scheme have issued more permits than there were emissions for 2007 keeping permit prices low, undermining the entire system. Article speculates tightening the market for permits will increase outflow of manufacturing to China and India whilst the rising cost of compliance at home will eat into the money available for developing the next generation of clean technology.
Critique of Kyoto	"Winds of climate change becalmed" by James Button, The Age 18th December 2006 http://www.theage.com.au/news/opinion/winds-of-climate-change-becalmed/2006/12/17/1166290407255.html	Actually, more bemoaning the lack of action on combating climate change noting the various national failures to ratify and to negate Kyoto. Notes proposal from UK minister for environment to impose personal carbon allowances for UK citizens(!)
Critique of Climate Warming alarmists	"Climate change a 'questionable truth'" by Margaret Wente, Globe and Mail, 27th January 2007 http://www.theglobeandmail.com/servlet/story/RTGAM.20070126.cover271/BNStory/ClimateChange/?pageRequested=all	An illuminating series of interviews with a number of scientists broadly in agreement with the consensus view but critical of the climate change alarmists, particularly some of the proposed actions