Submission

to the Australian Senate Environment, Communications, Information Technology and Arts Legislation Committee

on the

# Inquiry into the Kyoto Protocol Ratification Bill 2003 [No. 2]

**by**

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# Submission

I oppose ratification by Australia of the Kyoto Protocol, or the imposition of constraints on our nation which mimic those which this treaty is intended to impose. I therefore oppose the Kyoto Protocol Ratification Bill.

This Bill is fundamentally flawed, because it is founded on the spurious assumption that by 'doing the right thing about greenhouse gas emissions' humans can stabilise global climate. They can't. The Ancients believed that the Heavenly Bodies controlled their destiny; and even today, almost nobody disputes that the Sun (more-precisely, solar/planetary/galactic influences) drove Earth's ever-changing climate up until the 20th Century. Sacrificing the future living-standards of Australians, or of people elsewhere in this energy-dependent world, will not and cannot 'defeat climate change'—because the Sun never resigned from the climate game.

Much new information, unavailable during the data-gathering process leading to the Reference Committee's report of November 2000, indicates that the Sun did, and still does, drive climate. *'Stabilising' climate exceeds the bounds of human power.*

Mitigation of human misery and environmental degradation consequent to climate change offers the only realistic option. Instead of wasting resources in the name of the environment, as would be the effect of passing the Bill, I propose that money be spent directly on the most pressing of environmental needs. In our region, I believe these to be curtailment of the destruction of natural habitat—now proceeding apace in Sumatra, Kalimantan, the Melanesian islands and Queensland.

I am a director of the Lavoisier Group;[1] although this submission (and my earlier submission to the References Committee) is made in my private capacity. I would welcome the opportunity to appear before the Legislation Committee. My work on climate change gets no outside funding.

1 The Lavoisier Group at www.lavoisier.com.au is putting to Australians a view on climate change contrary to that of the UN's IPCC and our own CSIRO. Like-minded Australian sites are www.webace.com.au/~wsh and the comprehensive www.john-daly.com.

# Contents

# 1. Why the Proposed Legislation is Bad for Australia

## 1.1 Damaging economically

Australia has vast coal reserves,[2] amounting to 8.3 per cent of the world total. Compare this to only 0.3 and 1.6 per cent for oil and gas, respectively. Furthermore, Australian coal is low in sulphur; and much is near-surface and can be mined at low cost. These advantages, plus the proximity of large deposits to the population centres on our SE seaboard, have enabled us to enjoy very inexpensive electricity in our homes and industries. Australia is also the world's largest coal exporter.

The foundation of Australia's prosperity is the ready availability of affordable energy and, in particular, it is low-cost coal which underpins our enviably high standard of living. In the 12 years from 1990 (the base-year for the Kyoto Protocol), Australia's consumption of primary energy grew by 27 per cent. The proportion of (carbon-rich) coal on a heat-value basis was a high 44 per cent in 1990, and almost unchanged in 2002. Most of our coal usage was for power generation.

Enactment of this Bill would set in train the decarbonisation of Australia; and one of our nation's greatest competitive advantages—cheap electricity—would be given up. The outcome would be lost jobs, reduced living standards and therefore less discretionary funding available.

Victoria's Latrobe Valley contains an enormous resource of easily-won, low-ash and low-sulphur, brown coal. Provided the timely development of new power stations and their attendant open-cut coal mines is not inhibited by government action, Victorians can expect a continued supply of reliable and low-cost electricity for as far ahead as they may care to look.

However, as-mined Latrobe Valley coal is about 70 per cent water, much energy is consumed in its de-watering prior to combustion. Consequently, while brown-coal-fired electricity is cheap and reliable, it comes with extra $CO_2$ emissions. In Australia, any serious attempt to decarbonise our economy would have to start with carbon-intensive power generation in the Valley.

## 1.2 Damaging environmentally

The decarbonisation effort would divert zeal and money from known and pressing environmental needs. Hence, it can be justified on environmental grounds only if the carbon dioxide emissions arising from the combustion of fossil fuels are an overriding environmental threat.

But $CO_2$ is neither 'dirty' nor a 'pollutant'—although some choose to give the dog a bad name. Many of our plant genera evolved when the concentration of this natural atmospheric constituent was five times or more that of today. In fact, $CO_2$ is a vital plant food; and growers enrich greenhouses with this colourless, odourless, non-toxic gas in order to make

2 The largest holder of coal reserves at the end of 2002 was the US with 25.4 per cent of the world total, followed by Russia 15.9 per cent, China 11.6 per cent, India 8.6 per cent and then Australia. None of these countries, with the possible exception of Russia, will be subject to the rigours of the Kyoto Protocol. (These and all similar numbers in my submission are from *BP Statistical Review of World Energy*, of June 2003 and earlier years.)

their plants grow better. Unless $CO_2$ emissions drive climate (see below for much evidence to the contrary), limiting the use of fossil fuels is a futile diversion of money which could be spent directly on the environment.

## 2. Big Changes in Understanding Since 1999/2000

If the Senate's Reference Committee had collected its information today, rather than back in 1999/2000, there is a good chance that its report 'The Heat Is On: Australia's Greenhouse Future' (November 2000) would have come to significantly different conclusions. My submission reviews developments in the interim.

* In 2000, imminent activation of the Kyoto Protocol appeared a near-certainty. But this is now uncertain because, without US participation, Russian ratification becomes essential—and it might not ratify. Furthermore, only two of the 15 European Union member-states (already bound by a collective ratification) are on-track to meet their agreed shares of the EU's 'umbrella' commitment. The Protocol appears to be moribund—with or without Australian ratification.

* Russia has raised in public its doubts about the quality of the science underpinning Kyoto. Therefore, this treaty's partisans can no longer assert that 'the time for debating the science is over'. Thanks to Russia, scientific debate lives again; and now it can be recognised that:

- At the conceptual level, much new material supports the un-amazing hypothesis that the Sun was the main driver of 20th Century climate change.
- At the detailed level, the satellite-derived record, beginning in 1979 and extending year by year, provides a comprehensive temperature record for the lower atmosphere.
- This indicates that most of the 20th Century surface warming, at least since 1979, is because of something other than the 'human-caused greenhouse effect'—mitigation of which is the sole objective of the Protocol.

* The scientific underpinning for the Senate Reference Committee's report was IPCC's *Second Assessment Report* (SAR) Working Group I volume 'Climate Change 1995: the science of climate change' (Cambridge University Press). The equivalent *Third Assessment Report* (TAR) volume, 'Climate Change 2001; the scientific basis' (CUP), post-dates the Senate report. Misleadingly, the *Summary for Policymakers* for TAR asserts that:

> There is new and stronger evidence that most of the warming observed over the past 50 years is attributable to human activities.

Since publication, however, it has been confirmed that the Sun was much more active during this same period than at any other time in the past millennium and more. But there were already doubts among scientists at the time of writing—not flagged by the 'official' authors/reviewers of the TAR *Summary*. IPCC's *scientists* said in Chapter 1 (page 97) something very different indeed:

> The fact that the global mean temperature has increased since the late 19th century and that other trends have been observed does not necessarily mean that an anthropogenic effect on the climate has been identified. Climate has always varied on all time-scales, so the observed change may be natural.

* From SAR in 1995 to TAR in 2001, IPCC increased its projections of human-caused average global surface warming, between 1990 and 2100, from 1.0–3.5 $^0$C to 1.4–5.8 $^0$C. (CSIRO adopted and adapted them for Australia; thus, by 2070, the 'inland' jumped from 0.7–3.8 $^0$C to 1.0–6.8 $^0$C.) IPCC's new high-end case allots an almost-unimaginable average per capita GDP growth to the Third World of x65 by 2100; even the low-end has it implausibly high. Both ends are artefacts of IPCC's worthy desire for world social equity—*ie*. wishful thinking, not science.

# 3. Current Equivocal Status of the Kyoto Protocol

### 3.1 News from the Russian Federation

President Vladimir Putin was expected (including by me) to use his address when opening the World Climate Change Conference in Moscow on 29 September 2003, as an opportunity to tell the world of Russia's intention to ratify the Kyoto Protocol. Instead, he said:

> The Government is thoroughly considering and studying this issue … and, of course, it will take into account the national interests of the Russian Federation.

Presidential science adviser (and also Co-Chair of IPCC Working Group II) Yuri Izrael provided some timely clarification of these enigmatic words, by adding that:

> … all the evidence seems to support the general conclusions that the Kyoto Protocol is overly expensive, ineffective and based on bad science.

Furthermore, on the last day (3 October), presidential economic adviser, Andrei Illarionov, delivered a direct assault (see below) on the underpinnings of the Protocol. He concluded:

> Considering that the Kyoto Protocol is restricting economic growth, we must say it straight that it means dooming the country to poverty, backwardness and weakness.

*Moscow Times* of 18 December revisited the question on its front page, by quoting an Illarionov press conference at which he claimed to speak for President Putin. He said that ratification would contradict the President's stated goal of doubling Russian GDP by 2010:

> It will slow down economic growth. Even a 1 per cent slowdown in economic growth is a huge amount for us. The president's position is that the Kyoto protocol cannot be ratified in its current form, because it is discriminatory, ineffective and not universal.
>
> In those countries we analysed, each per cent of GDP growth is accompanied by an increase of carbon dioxide emissions by 2 per cent. Starting in 2012, the need for carbon dioxide would exceed those limits set by the Kyoto Protocol, even by the most conservative scenario set by the Economic Development and Trade Ministry.
>
> Russia can't earn anything from quota mechanisms. This is a myth. [Russia] will be in a position where it has to buy quotas to continue economic growth. This is well known to us and to our [negotiating] partners, who do not deny this fact.

The same report quotes Ksenia Yudayeva of the Carnegie Moscow Centre as saying:

> The Russian economy is growing quite fast. I would not exclude the possibility that by 2008, Russia would reach the point where the emissions are at 1990 levels.

Will Russia ratify? It is hard to say. Russia was granted a seemingly undemanding target for 2008-12 of 100 per cent of its base-year (1990) emissions. Because of Russia's

economic problems since the regime-change, it was anticipated (at Kyoto in 1997) that its greenhouse gas emissions in 2008–12 might be as little as 70-80 per cent of those in 1990.[3]

Thus, Russia's surplus 'hot air' is (theoretically) still available for trading as emission credits to Western Europe or Japan, in order to avoid the need for them to meet their own targets in any physical sense—hence providing Russia with a substantial economic windfall.

However, this may not be how the Russian Federation sees the issue. Its energy resources are vast: with coal and gas reserves at 15.9 and 30.5 per cent, respectively, of the world total. Why not use well-situated (carbon-rich) coal for Kyoto-free domestic electricity generation where convenient, while exporting carbon-poor gas at top prices to the Kyoto-captives of Western Europe?

The European Union is already half-expecting the worst. Under the heading 'EU questions its Kyoto policy due to Russia delay', Reuters reported from Brussels on 15 December 2003:

> 'We are following a strategy (of respecting the Kyoto Protocol) at the moment, but we need to look at other possible scenarios', EU Energy Commissioner Loyola de Palacio told a news conference after a meeting of EU energy ministers.
>
> She said failure by Russia to ratify the accord would mean it would it would not come into force in 2008 as planned and the EU had to have a strategy to deal with this eventuality. 'I am not calling Kyoto into question myself, but if we are looking at this situation, we have to bear in mind all possible scenarios, including the most dangerous', de Palacio said.

### 3.2 Disarray in the European Union

At the Framework Convention on Climate Change (FCCC) Conference of Parties 9th meeting (COP9) in Milan in early December 2003, there was more bad news. Margot Wallstrom, the EU's commissioner for the environment was reported as having said that only two of the EU's 15 member 'provinces' (UK, Sweden) were on track to meet their Kyoto targets.[4]

Those who say that 'it really doesn't matter whether Kyoto is ratified or not, just so long as all nations stick to their agreed targets', are being undermined by the EU. The enormity of the EU's back-sliding will be appreciated by historians as much as scientists. In a world where the Soviet threat no longer supplies the glue for holding the Atlantic Alliance together, the Kyoto Protocol provided the means by which the Lilliputians of Europe could tie down the economic behemoth from across the ocean.

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3 Russian primary energy consumption was lowest in 1997, at 72 per cent of the 1990 level. By 2002, it had grown only little—because of more efficient energy use in this strongly growing economy.

4 At Kyoto in 1997, an umbrella target of 92 per cent of 1990 emissions in 2008–12 was agreed for the EU; and ratified by it on 31 May 2002. Choice of base-year was crucial, because it just predated closure of the UK coal industry after the Thatcher/Scargill confrontation; and it also predated closure of energy-inefficient industries in East Germany following re-unification—giving both UK and Germany much slack. Sweden has found its slack in a completely different way—by deferring the planned early retirement of its nuclear power stations

Things have gone badly for Europe lately. First, the US declined to have the Kyoto noose placed around its neck. Second, the Russians might also allow national self-interest to intrude on policy. Third, and most remarkably, the EU emperor has begun to take off his own clothes! We are in for some interesting years; and now is not the time for Australia to ratify this treaty.

### 3.3 Where Australia fits in

Australia's is a modestly-sized, and heavily coal-reliant, economy. Where we fit into the world of tradeable primary energy is illustrated by Table 1, below.

**Table 1**
**Emissions Targets, 1990-2002 Energy Growth, and Coal-Intensity**
(Energy consumption totals on a heat-value basis, in million tonnes oil equivalent [MTOE])[5]

| | | 1990 | | 2002 | |
|---|---|---|---|---|---|
| | Kyoto Target | Energy Total | Coal share | Total *cf* 1990 | Coal Share |
| | % of 1990 | MTOE | % | % | % |
| **European Union** | | | | | |
| Germany | 79 | 352 | 37 | 94 | 26 |
| United Kingdom | 88 | 213 | 30 | 104 | 17 |
| France | 100 | 221 | 10 | 117 | 5 |
| Sweden | 104 | 43 | 5 | 113 | 5 |
| Spain | 115 | 89 | 22 | 151 | 16 |
| Greece | 125 | 24 | 33 | 142 | 29 |
| Portugal | 127 | 15 | 20 | 164 | 21 |
| **Other nations with a target** | | | | | |
| United States | 93 | 1932 | 25 | 119 | 24 |
| Japan | 94 | 428 | 18 | 119 | 21 |
| Canada | 94 | 202 | 13 | 143 | 11 |
| Poland | 94 | 105 | 77 | 83 | 65 |
| Russia[6] | 100 | 853 | 20 | 75 | 15 |
| Australia | 108 | 89 | 44 | 127 | 44 |
| **Nations with no Kyoto target** | | | | | |
| China | | 668 | 79 | 149 | 66 |
| India | | 183 | 57 | 178 | 56 |
| Mexico | | 99 | 7 | 135 | 5 |
| South Korea | | 91 | 27 | 226 | 24 |
| Brazil | | 90 | 10 | 198 | 7 |
| South Africa | | 90 | NA | 121 | 75 |

5 Source: *BP Statistical Review of World Energy*. The *Review* covers oil, gas, coal and, through the conceptual saving of fossil fuel in power generation, also hydro and nuclear. Solar, biomass, and wind are minor contributors, and excluded here. (One tonne of oil equivalent approximates 10 million kilocalories, 42 gigajoules, 40 million Btu and 1.5 tonnes of hard coal.)

6 For the Russian Federation, the earliest available split into contributions by individual energy forms is for 1991. In that year, total energy consumption was 862 MTOE.

The problem facing Australia is clear. The EU fifteen collectively relied on (carbon-intensive) coal for only 15 per cent of its primary energy needs in 2002. For Australia, the proportion was 44 per cent. Even for the OECD as a whole (including Australia), coal provided only 21 per cent of primary energy. Meeting its Kyoto target (an average of 108 per cent of 1990 greenhouse gas emissions for 2008-12) would be virtually impossible for Australia without curtailing coal-fired power generation.

# 4. Spurious Economic Basis for CSIRO'S Projections

### 4.1 CSIRO's temperature projections for Australia

CSIRO's website www.dar.csiro.au/impacts/future warns citizens that: 'by 2070, annual average temperatures are increased by 1.0 to 6.0 $^0$C over most of Australia' … *because of human-caused greenhouse gas emissions*. For the 'inland', the last (1996) report gave 'only' 0.7–3.8 $^0$C; but CSIRO's new (8 May 2001) projection is vastly increased to 1.0–6.8 $^0$C.

Subsequently, CSIRO distributed a poster entitled 'Future Climate Change in Australia'. It tells of a 'greater fire risk for forests and urban areas' in Southern South Australia, Tasmania, Victoria and Eastern New South Wales. Under 'Climate Data', the poster explains:

- Values for **Now** come from the Bureau of Meteorology www.bom.gov.au/climate/averages
- Values for **2030** and **2070** come from CSIRO's assessment of nine climate models driven by a range of projected increases in greenhouse gases www.dar.csiro.au/publications/projections2001.pdf

Boxes in the poster tell us that 'Dec–Feb days over 35 $^0$C' in Sydney, Melbourne and Adelaide now number 2, 8 and 10 respectively; and by 2070, they will rise to a range of 3–11, 10–20 and 14–28. I promise I am not making this up: it also shows my birth-place, Darwin, going from one Dec–Feb day per year over 35 $^0$C on average now, to a whopping 5–79 days by 2070!

CSIRO's catastrophism could turn out to be quite right, of course; but it has absolutely no way of knowing that now. Wisely, CSIRO includes a caveat:

> This poster is based on results from computer models that involve simplifications of biophysical processes that are not fully understood. Accordingly, no responsibility will be accepted by CSIRO for the accuracy of the assessments inferred from this poster or actions in reliance on this information.

### 4.2 All the way with IPCC

Why then did CSIRO in 2001 project such an increase in the high-end of its warming range for Australia, compared to its 1996 number? The short answer is: because it adopted, as starting point for its regional modelling, the new global averages projected by the United Nations-sponsored Intergovernmental Panel on Climate Change (IPCC).

Between its Second (1996) and Third (2001) Assessment Reports, IPCC increased the high-end of its range for 2100 from 3.5 to 5.8 $^0$C. In response, CSIRO increased its high-end global rise for 2070 on a pro-rata basis, from 2.1 to 4.0 $^0$C.

Misleadingly, CSIRO explains away the jump as follows:

> This faster rate of warming was mainly due to changes in the emissions of sulphate aerosols between the two sets of scenarios. Emissions of sulphate aerosols, which have a cooling effect on climate, were projected to increase strongly in the (IPCC 1996) scenarios, but these increases were much reduced in the (IPCC 2001) scenarios.

This explanation is implausible. The first draft of IPCC's 'Climate Change 2001: the scientific basis', prepared way back in 1999, already included the changed assumptions for cooling aerosols, and the high-end projection for 2100 rose then only from 3.5 to 4.0 $^0$C.

In any case, the aerosol explanation is contradicted by the observed pattern of warming. Roughly 90 per cent of these short-lived aerosols are emitted in the Northern Hemisphere—where most fossil fuels are burned. But most of the warming to date is in the *same* hemisphere. (Indeed, Australia emits negligible 'cooling' sulphates—whose future elimination might otherwise have enabled IPCC's supposed global-warming boost to be shared by CSIRO's projected regional warming.)

IPCC's global 5.8 $^0$C 'high-end' did not surface until the TAR final draft of October 2000—after review by government representatives. The key *post-science* changes are—relying largely on Vincent Gray's 2002 book *The Greenhouse Delusion* (Multi-Science Publishing Co.):

- Addition of a high-end scenario (A1F1) which incorporates an extraordinarily high use of fossil fuels;
- Substitution of the single model (incorporating IPCC's 'best-estimate' for the sensitivity of climate to increasing $CO_2$ concentration) by a suite of seven models having a wide range of sensitivities—including one with a particularly high sensitivity.

And also, at the 'low-end':

- Cosmetic 'rounding up' of the calculated number from 1.0 to 1.4 $^0$C, thus serving to lift it clear of the 1.0 $^0$C low-end for the previous (1996) range.

IPCC's explanation, repeated by CSIRO, that the jump from 1.0–3.5 $^0$C to 1.4–5.8 $^0$C results from assuming lower sulphur dioxide emissions in the future, doesn't wash.

### 4.3 *SRES* basis for IPCC's economic projections

'Climate Change 2001: the scientific basis', the Working Group 1 contribution to IPCC's *Third Assessment Report*, has these words in its *Summary for Policymakers*:

> **Global average temperature and sea level are projected to rise under all IPCC SRES scenarios.**

The first bullet-point under this emboldened heading continues:

> The globally averaged surface temperature is projected to increase by 1.4 to 5.8 $^0$C over the period 1990 to 2100. These results are for the full range of 35 SRES scenarios based on a number of climate models.

But caution is needed. The lay reader may not notice that IPCC is talking of 'projections' (not predictions) of increasing temperature; and that these projections are underpinned by 'scenarios' (not forecasts) for future greenhouse gas emissions. The scenarios are based in turn on several alternative 'storylines' envisaging the world's future economic and social development.

The outcome is no more than an un-weighted assortment of 'what-ifs', without any attribution of individual probabilities or any claim to comprehensiveness. All outcomes, even including the extremes, are supposed to be plausible i.e. 'all should be considered equally sound'. IPCC never says its numbers are a 'range' *per se*. (Yet, when CSIRO tells us it expects Darwin's annual days over 35 $^0$C to rise from one now to '42 ± 37' in 2070, this *looks* like a range.)

The origin of the economic and social assumptions underlying IPCC's six marker 'storylines' is its *Special Report on Emissions Scenarios* (*SRES*). The assumptions therein give rise to the 1.4 (or 1.0) and 5.8 $^0$C projections, and to intermediate projections not discussed here.

**4.4 Castles: implausible IPCC/IIASA growth projections**

The lead author of *SRES* was Professor Nebojsa Nakicenovic from the International Institute of Applied Systems Analysis (IIASA), at Laxenburg in Austria.

*SRES's* A1 'marker' storyline, setting the high end of IPCC's range (5.8 $^0$C by 2100), achieves a notable catch-up of living standards in the LDCs to those of the developed world. The result is a wonderful world where nearly everyone is rich. There is absolutely nothing wrong with that, of course. But it does require an almost-unimaginable increase in Third World per capita GDP. Hence, the driver for A1 is not rational economics; instead, it appears to be a yearning in the hearts of the IIASA/*SRES* economists for world-wide social equity.

The *SRES* analysts calculated that, back in 1990, developed nations had an average per-capita GDP some 16.7 times that of the LDCs. Their laudable wish that the ratio be reduced to x1.8 demanded a projected increase of average GDP in the 'have-not' regions by an incredible 65 times[7] between 1990 and 2100—so high because, obviously, GDP in the 'have' nations keeps growing as well. (Japan barely achieved x20 per-capita growth in the 20$^{th}$ Century. No others came close.) Table 2 provides outcomes for selected individual countries.

7 Ian Castles (former Australian Statistician, and now Visiting Fellow at the National Centre for Development Studies at the Australian National University in Canberra) found that the SRES analysts used market-exchange rates to compare inter-country GDPs in 1990. In his expert opinion, they should have used purchasing power parities. Correct analysis would have revealed that the 1990 gap was not 16.7 times but x6.2. Thus, the GDP increase necessary to shrink the gap to x1.8 would have been x24.5 rather than x65. If IPCC should surprise us by re-working its flawed economics, policymakers may still have to wait until its Fourth Assessment Report (due in 2007) for the results. In the interim, I rely on IPCC's dodgy current numbers.

**Table 2**
**Economic Basis For IPCC's Highest & Lowest Emissions Scenarios**
(National GDP in thousands of 1990 US dollars per-capita—using market exchange rates)

| | 1990 actual | 2100 high-end (A1) | 2100 low-end (B1) |
|---|---|---|---|
| United States | 23.2 | 114 | 79 |
| Australia | 17.0 | 61 | 55 |
| Argentina | 6.5 | 152 | 90 |
| South Africa | 4.0 | 470 | 364 |
| China (PRC) | 1.9 | 78 | 39 |
| India | 1.3 | 36 | 32 |

(Source: Ian Castles at www.ipa.org.au/pubs/special/climate/castlespaper)

(Coal-intensity of energy use in the Table 2 countries for 1990 and 2002 is given in Table 1, except for that of gas-rich Argentina—which was 3 and 1 per cent, respectively.)

The A1 storyline invokes phenomenal growth in Third World economic output.[8] In the US, per-capita 1990 GDP was $23,000 but it was only $4,000 in South Africa. In 2100 (still in terms of 1990 US dollars), A1 puts it at $114,000 in the US and $470,000 in South Africa. Australia fares even worse by comparison with a rampant Third World; and by 2100 our per capita GDP will be surpassed by Afghanistan, Algeria, Argentina—and Zimbabwe. Will the flow of economic refugees *reverse*?

The low end of IPCC's range (1.4 $^0$C by 2100) is based on the somewhat less-fantastic, but still implausible, B1 storyline (again see Table 2)—where 'the emphasis is on global solutions to economic, social and environmental sustainability, including improved equity'.

### 4.5 Plausible WEC/IIASA growth projections

Professor Nakicenovic and IIASA have tilled this ground before. I here quote from one of Ian Castles' several critical analyses of the *SRES* work; in this case, 'Forecasting global output and emissions', presented at the Institute of Public Affairs *Climate Change Conference* in Melbourne on 28 February 2003:

> The extreme optimism of the growth assumptions in most of the [SRES] scenarios can be illustrated by means of another comparison.
>
> In 1998, IIASA published a study of future energy usage and options in association with the World Energy Council (WEC), under the title Global Energy Perspectives. Professor Nakicenovic was the lead editor of the book.

8 IPCC's 'catch-up' storylines (Table 2) make extraordinary reading. But there is a **caveat**: for approval/publication, IPCC divided the world into four large economic units only. Thus, its down-scaling to country-level is unofficial; and furthermore, web access to these numbers now has been withdrawn. But, the country-by-country projections are still real in the sense that totals for the four larger units comprise them. Individually approved or not, reducing one country's quite incredible GDP growth would imply increasing that for another. Hard to imagine, I know; but CSIRO appears to have taken IPCC's economic modelling on trust. Crucially, it did not obtain corroboration from Australians expert in that field—although, according to Castles, none of the '53 authors and 75 reviewers' for the *SRES* projections is Australia-based.

And

> There is, however, a striking difference. **All** of the IIASA/IPCC scenarios in the A1 family—which yield the highest cumulative emissions across the century—and the B1 family—which yield the lowest cumulative emissions—assume much higher rates of growth in GDP between 1990 and 2050 … than **any** of the IIASA/WEC scenarios.

And further

> It is difficult to understand why the range of assumed rates of growth in GDP in scenarios developed for the purpose of projecting emissions should be so much higher than the range assumed for the purpose of projecting energy use and alternatives. In particular, there is no obvious reason to believe that a scenario that assumes much faster growth than the 'ambitiously high rates of growth' postulated in the IIASA/WEC Case A should be accepted as marking the lower bound of possible outcomes in the IPCC context. Yet this is what governments and IPCC scientists appear to have done.

# 5. IPCC'S Spurious Projected $CO_2$ Concentrations

### 5.1 High-end scenario

The A1F1 (high-end) scenario has the extreme economic growth of the A1 storyline sustained to the maximum degree with coal-derived (*ie*. high carbon-intensity) energy in order to achieve the maximum projection of greenhouse gas emissions.

Global $CO_2$ emissions from fossil-fuel use (plus from industrial processes) were about 6.1 billion tonnes in 1990, on a contained-carbon basis. Coal-intensive A1F1 has them rising steeply to 24 BT in 2050 and then to 30 BT in 2100.

Human-caused carbon emissions peaked at 1.23 tonnes per-capita in 1979, and fell slowly to 1.09 tonnes by 2000. A1F1 has them at over 4 tonnes by 2100; and this assumes cumulative coal use by then reaching beyond the exhaustion of currently-known reserves. A1F1 has atmospheric $CO_2$ concentration building to 970 ppm in 2100 (only achieved by assuming for calculation purposes a very long effective mean residence time for atmospheric $CO_2$).

But the writing is on the wall for A1F1 and its 970 ppm catastrophism, because it has world coal consumption growing 31 per cent in the decade between 1990 and 2000. The *BP Statistical Review of World Energy* shows that it grew at a very much more-plausible 5.6 per cent in the 12 years to 2002.

### 5.2 History of atmospheric $CO_2$ concentration

Atmospheric $CO_2$ concentration at Mauna Loa has been recorded ever since 1958, when it was 315 ppm. By 1990, it had attained 354 ppm; and in 2002, an annual increase of 2 ppm brought it to 373 ppm. Over the last 44 years, the average increase was 1.3 ppm/year from all causes, both natural and anthropogenic. But to attain 970 ppm by 2100, an average annual increase of 6 ppm/year is needed from now on—right through the century ahead.

Since the 18th Century, rebound from the depths of the Little Ice Age, and the advent (in, say, 1750) of the Industrial Revolution, have coincided with an atmospheric $CO_2$ concentration increase from some 280 to the present-day 373 ppm. At least since detailed records began in 1958, it appears that Pacific sea-surface temperature has been a key factor. Following the Great Pacific Climate Shift of 1976/77 (see below), the rate of increase stepped up to a new plateau—albeit still averaging well below 2 ppm/year—with a dip after the Mt Pinatubo eruption, and a spike coincident with the Kalimantan peat fires. Crucially, there is no apparent acceleration in the current rate of increase. The projected concentration of 970 ppm by 2100 appears ridiculous.

### 5.3 Low-end scenario

The low-end B1 marker storyline still assumes implausibly high economic growth in the Third World (see Table 2)—although not as high as A1. We are told that 'the central elements of the B1 future are a high level of environmental and social consciousness combined with a more globally coherent approach to a more sustainable development'. The resulting economic projections are then powered between 1990 and 2100 to the maximum degree with non-fossil forms of energy—to achieve the substantially-reduced greenhouse gas emissions of the low-end B1T MESSAGE scenario. The outcome is an atmospheric $CO_2$ concentration in 2100 of a relatively modest 540 ppm.

### 5.4 How NOT to achieve a range

IPCC has achieved its 'range' by assuming large or small contributions by coal to the satisfaction of energy demand in its best of all possible worlds. It records global coal production as being 84 exajoules in its 1990 base-year (about 3.3 billion tonnes on a hard-coal heating-equivalent basis), rising to 600 eJ in the coal-powered A1F1 scenario, and falling to 40 eJ in the 'more sustainable' B1 scenario-family.

But, how can two implausibly high projections of Third World economic growth provide bounds to the plausible range of $CO_2$ emissions? They can't, of course.

Crucially, no believable level of future economic growth has had applied to it decarbonisation initiatives such as those which dominate the B1 family. Instead, *both* ends of the 'range' follow directly from the much-desired achievement of a large measure of world social equity. The range of $CO_2$ concentrations projected for 2100 (540–970 ppm) has been shifted upward from that which might appear plausible—based on yearnings rather than analysis.

## 6. IPCC'S Spurious 'Range' Of Temperature Increases

IPCC's model inputs stem from six storylines containing demographic and economic projections, leading to 35 scenarios for human-caused greenhouse gas emissions and onward to atmospheric $CO_2$ concentrations.

The end result is 245 temperature projections, arising from runs in seven (CSIRO says nine) numerical models covering a wide range of sensitivities. Here, IPCC has given us the key to its Black Box. All we need is graph-paper. The *Summary for Policymakers* of 'Climate Change 2001: the scientific basis' tells us that:

> Complex physically based climate models are the main tool for projecting future climate change. In order to explore the full range of scenarios, these are complemented by simple climate models calibrated to yield an equivalent response in temperature … to complex climate models. These projections are obtained using a simple climate model whose climate sensitivity … (is) calibrated to each of seven complex climate models. The climate sensitivity used in the simple model ranges from 1.7 to 4.2 $^0$C which is comparable to the commonly accepted range of 1.5 to 4.5 $^0$C.

In this context, 'sensitivity' is: sensitivity to a doubling of atmospheric $CO_2$ concentration.

Take the high-end case first. We now have three points on a graph (but not a straight line on natural graph-paper). The 1990 concentration (354 ppm) gives us our zero, 708 ppm gives us a warming of 4.2 $^0$C, and 1416 ppm brings the warming up to 8.4 $^0$C. (This is a *very* simple model, remember.) When we mark in 970 ppm on the graph, we expect to read off 5.8 $^0$C. Actually, I got 6.0 $^0$C; a little puzzling, perhaps—but less than 5 per cent too high. Near enough is good enough, I suppose.

The low-end case is different. Zero is still 354 ppm, of course; but 708 ppm gives 1.7 $^0$C, and a further doubling brings us to 3.4 $^0$C. However, when we mark in 540 ppm, we read off 1.0 not 1.4 $^0$C of warming—a shortfall of nearly 30 per cent. It turns out that this result is not only based on implausibly-high per-capita GDP growth; the result has been fudged to make it even higher.

CSIRO's projected range of warming for most of Australia (of 1.0 to 6.0 $^0$C by 2070) follows on directly from the deeply-flawed *economic* modelling done by IPCC.

But another, and very different, flaw also afflicts the model-based warming projections of IPCC, and hence of CSIRO. This is the assumption that human-caused greenhouse gas emissions were the principal driver of 20$^{th}$ Century climate. The remainder of my submission deals with this *scientific* issue.

## 7. Did Humans *Really* Cause 20$^{th}$ Century Climate Change?

### 7.1 Yes! Submission by ANU's Research School of Earth Sciences

The dominant climate-change paradigm is clearly enunciated in a submission of 1 September 2000, by the Australian National University's Research School of Earth Sciences (RSES) to the Joint Standing Committee on Treaties for its Inquiry into the Kyoto Protocol. (So far as I know, the report has never been handed down.) The six signatories were Dr. M. Bird, Prof. J.M.A. Chappell, Dr. M. Gagan, Prof. D.H. Green, Prof. R. Grün and Prof. K. Lambeck.

The last paragraph of the submission's 'Concluding Statement' says it all:

> The Research School of Earth Sciences devotes considerable resources of manpower and facilities to the measurement and understanding of global change, including climate change and the carbon cycle. From the 'authority' of our published and unpublished research at RSES on natural variability of climate, on the carbon cycle, on past sea-levels and on past fauna and flora, we are of the firm view that 20$^{th}$ Century global warming and sea-level rise are observed, and on

> scientific grounds, attributable to changes in the Earth's atmospheric composition caused by human activities.

The six RSES signatories *really* do believe that in 1900 the Sun relinquished its time-honoured role as principal driver of Earth's ever-changing climate—of that there can be no doubt at all. Apparently, we have taken over the job ourselves.

### 7.2 Observed 20th Century warming is in *two* tranches

IPCC's 2001 TAR *Summary for Policymakers* includes a graph (Figure 1a) of 'Variations of the Earth's surface temperature for the past 140 years'. Under the graph, it says that over the last 100 years, 'the best estimate is that the global average surface temperature has increased by 0.6±0.2 $^{0}$C'. What it *doesn't* say is that this graph of global temperature correlates very poorly indeed with the consumption of fossil fuels said to be its driver. The observed warming is in two roughly equal tranches:

- From a little after 1910 to about 1945;

And (separated by an interval of slight cooling);

- From 1976/77 to the present.

We all know the 20th Century energy story. Fossil fuel consumption was about 1.5 billion tonnes in 1900, and rose only slowly to some 4 billion tonnes by the mid-1940s. But then, it soared in virtually monotonic fashion—reaching some 13 billion tonnes per year by 2000. The warming in the first half of the century *anticipated* the fuel use which ANU's RSES experts identified as its cause!

### 7.3 No! Fresh eyes in the Russian Federation

This contradiction has not gone unnoticed. On the last day of the World Climate Change Conference in Moscow (see above), presidential economic adviser Andrei Illarionov noted that 20th Century climate change did not correlate with fossil-fuel use:

> … from the mid 1970s to 2000—it was possible to speak about some link between the emission of anthropogenic carbon dioxide with a rise in temperature; here there seems to be a certain similarity observed although one cannot say whether there is a link or not, if there is a cause-effect connection or not.

And

> As for the period from the middle of the 1940s to the middle of the 1970s, it remains a big mystery because anyone who knows the history of mankind since the middle of the 20th century knows that it was a period, that it was a golden period … of the highest economic growth of the world economy, and it was an era of cheap oil, when oil, coal and gas were extracted and burned at an incredible rate. During these 30 years the extraction and consumption of oil increased six-fold. And we can only imagine how much carbon dioxide emissions increased.

And further

> … in the period from 1913 to 1944-1945, a period when two world wars, the Great Depression, several global economic crises occurred, a period when the biggest portion of the world economy was stagnating, carbon dioxide emissions caused by human factors increased very slowly. At the same time, now the temperature is growing as fast as it did in the last 25 years.

The scientific monopoly of those such as CSIRO and (ANU's) RSES, is over. The expected correlation between global warming and fossil-fuel consumption during the 20th century is just not there.

In my opinion, it is much more likely that the Sun didn't resign from the climate change game in 1900, after all. As is discussed below, it is solar/planetary/galactic influences which still drive climate.

# 8. Alternative Hypothesis for 20th Century Climate Change

### 8.1 The contrarian view

Contrarians like me find compelling the hypothesis favouring the continuance of a solar-driven climate right through the 20th Century. The available evidence comprises both measurements, and derivations from proxies where direct observation is not feasible. (While good correlation between data-sets is no proof, it much better supports a hypothesis than would poor correlation.)

Crucially, the 'firm view that 20th Century global warming (is) attributable to changes in the Earth's atmospheric composition caused by human activities' lacks the support of convincing correlations. (Its support largely derives from model-based analyses.)

In my 'firm view', the forcefully-expressed hypothesis of the ANU's Research School of Earth Sciences is almost certainly wrong.

### 8.2 The 'hockeystick' as evidence

Figure 1b of IPCC's *Summary for Policymakers*, showing 'Variations of the Earth's surface temperature for the past 1000 years', does appear to support the ANU Research School's experts. This graph (the famous/infamous 'Mann hockeystick') represents only the Northern Hemisphere, because so little data is available from the South. The explanation under the graph tells us that:

> … variations of the average surface temperature of the Northern Hemisphere have been reconstructed from 'proxy' data. … The rate and duration of warming of the 20th century has been much greater than in any of the previous nine centuries. Similarly, it is likely that the 1990s have been the warmest decade and 1998 the warmest year of the millennium.

What we see in the 'Hockeystick' is a long, somewhat-wavy, 'handle' declining slowly across nine centuries to a low-point at about 1900. Then, it makes an abrupt upward turn as the 20th Century 'blade' heads skyward. Indeed, it does appear that the 1990s were the warmest decade, and 1998 the warmest year, of the millennium. But there is much more to this picture than meets the casual eye.

The largest contributor to the 900-year proxy record is tree-rings from high latitudes and high altitudes in North America. However, the record for the 1990s decade, as also for the 1998 year, has nothing to do with tree rings; it is based instead on direct measurements by thermometer. The trees used in the comparison would have grown in the growing season—of about six weeks centred on June. However, the thermometer record shows that 20th Century warming occurred predominantly in winter—a time when the trees whose rings were analysed, didn't grow.

IPCC has compared apples with oranges here—thus committing the scientific equivalent of a schoolboy howler. To proclaim that it is likely 1998 was 'the warmest year of the millennium' on the basis of this kind of evidence, sounds more like scare-mongering than science to me.

**8.3 Solar variability**

Sunspots provide a proxy for variations in solar activity. European observatories have recorded sunspot numbers back to around 1600; and it has been long known that the Maunder (sunspot) Minimum coincided with the coldest episode of the Little Ice Age at about 1650-1710. Warming since then has correlated well with strengthening insolation, ie. radiative heat from the Sun.

Recently, another proxy has extended the record of solar activity much further into the past—the cosmogenic isotopes $^{14}C$ and $^{10}Be$ produced in the atmosphere, and preserved in tree-rings, ice-cores and cave-deposits. Presence of these nuclides describes solar magnetic activity (greater abundance = a quieter Sun) which appears to vary much in line with sunspot numbers, and hence with insolation.

The solar magnetic field modulates the extent to which high-energy galactic cosmic rays are able to reach our atmosphere, where their bombardment causes both transmutation and ionisation. Ion-induced nucleation, subsequent particle growth, and condensation of water vapour on the thus-created particles, creates clouds.

It is hypothesised that more galactic cosmic rays mean more nuclei available, less water vapour condensing on each, smaller droplets, and hence longer-lasting and more reflective (cooling) low-level clouds. Thus, a quieter Sun means a cooler Earth.

Both insolation and magnetic flux impact on climate, although their relative importance is still a matter of debate. However, it is already known that there is a general relationship between solar activity (based on the $^{10}Be$ proxy) and climate over the past 100,000 years and more. Analyses from the northern Atlantic and Pacific regions over the past 10,000 years, during the current (Holocene) Interglacial, also find a correlation between solar magnetic activity and the prominent climate cycle (at least in the Northern Hemisphere) at a variable period of about 1,500 years.

More-detailed studies are now becoming available.[9, 10]

On the Djebel Akhdar plateau, in northern Oman, the Indian Ocean monsoon *is* climate. Comparison of the $\delta^{18}O$ record from stalagmites in caves on the djebel (a proxy for varying tropical circulation, and hence monsoonal rainfall) with the well-known $\Delta^{14}C$ record from tree-rings (which largely reflects changes in solar activity), by Neff *et al* reveals a striking correlation over the 3,000-year period studied. Indeed, for the 400 years analysed in greater detail, the proxies for climate and solar activity march in virtual lockstep. (Implausibly, IPCC's numerical-modellers have instead forced current climate to march in lockstep with human-caused changes to the composition of the atmosphere.)

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9 Neff, U. *et al*., 2001, 'Strong coherence between solar variability and the monsoon in Oman between 9 and 6 kyr ago', *Nature*, v 411, pages 290–3.

10 Usoskin, Ilya G. *et al.*, 2003, 'A millennium scale sunspot number reconstruction: evidence for an unusually active Sun since the 1940's', *Physical Review Letters* (in press).

A reconstruction of sunspot numbers backward, far beyond the long-recognised low in solar activity during the depths of the Little Ice Age at the Maunder Minimum, is newly available. The crucial finding[11] is that the Sun was far more active in the second half of the 20th Century than at any time since this record began—more so than in the Mediaeval Warm Period (nominally, about AD900-1200), and even more so than in the depths of the Little Ice Age.

Thus, there is now no necessity to invoke human-caused changes to the composition of the atmosphere as the only plausible cause of global warming in the 20th Century. There is also no need whatever for IPCC's seriously-flawed 'hockeystick'.

# 9. Inertial Influences on 20th Century Climate

### 9.1 Cyclic climate since AD 1700

Global climate is cyclic (warmer/cooler) at many time-scales—although IPCC's modellers admit only to warming in the future. Since the Dalton Minimum, the final cold-snap of the Little Ice Age from 1800 (the last of the Great Frost Fairs on the Thames was in 1813/14), we have experienced rebound in the 1820s and warming peaks in the 1870s, 1930s and 1990s.

These warmings are overprinted on a longer warming trend which goes back to the Maunder Minimum, when sunspot numbers were virtually zero. During the Great Winter of 1683/4, when 11 inches of ice formed on the River, diarist John Evelyn wrote:

> Streetes of Boothes were set up upon the Thames, which were like a Citty or Continental faire, all sorts of Trades and shops furnished, and full of Commodities, even to a Printing presse …

The long-running (for at least 200,000 years) *ca*. 1500-year cold/warm cycle, of which the Roman Empire Warm Period, Dark Ages, Mediaeval Warm Period and Little Ice Age are the latest manifestations, can be correlated with both solar influences and the amount of continental ice entering the North Atlantic as icebergs. (These two may also be linked in some way.)

But the overprinted 50/60-year cycle of global temperatures appears related in the first instance to inertial factors, as evidenced by cyclic changes in length-of-day which display a strikingly similar period; and the same period applies to the cycle of change in the movement of atmospheric and oceanic mass—and hence in heat transportation and climate. Again, the Sun (and giant planets) are probably implicated *via* solar system gravitational

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11 The abstract of this not-yet-published paper by Usoskin *et al.* is:
The extension of the sunspot number series backward in time is of considerable interest for dynamo theory, solar, stellar, and climate research. We have used records of the $^{10}$Be concentration in polar ice to reconstruct the average sunspot activity level for the period between the year 850 to the present. Our method uses physical models for processes connecting the $^{10}$Be concentration with the sunspot number. The reconstruction shows reliably that the period of high solar activity during the last 60 years is unique throughout the past 1150 years. This nearly triples the time interval for which such a statement could be made previously.

dynamics and associated resonances—although we don't yet know how. But there is no 'greenhouse effect' signature in evidence.

**9.2 Great Pacific Climate Shift**

The Great Pacific Climate Shift of 1976/77 was *the climatic event of the century*, with a widespread physical and biological impact extending far beyond the Pacific. The Shift coincided with an abrupt reduction in the upwelling of cold water in the eastern Pacific, as recorded by the Pacific Decadal Oscillation (PDO) index—which recognises episodes of warmer sea-surface temperature (SST) during the 1920s–40s, and again at 1977–98. During the late 1940s to mid-1970s, the PDO was in its negative (cooler) phase.

In practice, what we see is a greater incidence of positive ENSO events (called El Niño, where reduced upwelling in the eastern Pacific leads on to a warmer SST in that most-expansive of all oceans) building up the warm PDO phase. El Niño and its La Niña opposite are further discussed below.

Since the early 1970s, average annual upwelling quantity in the equatorial eastern Pacific has declined from 47 to 35 Sv (one Sievert is one million cubic metres/second), with a corresponding increase in SST of 0.8 $^{0}$C. This is a very large change in oceanic circulation, and hence in oceanic heat transportation. That the change in upwelling was inertia-related is indicated by coincident changes in the rate of change of length-of-day, and in atmospheric angular momentum.

It is hard to believe that a monotonic increase in the human-caused atmospheric concentration of greenhouse gases caused the prominent step-change in oceanic and atmospheric momentum which was associated with the Great Pacific Climate Shift of 1976/77.

Equally hard to believe is the fact that IPCC's 2001 *Summary for Policymakers* failed to mention the Shift. At best, this is would seem to be careless science.

**9.3 Short-term El Niño/La Niña changes**

El Niño and La Niña are intra-decadal warm/cool events in the region (the eastern Pacific) that is the epicentre of the longer-lasting Great Pacific Climate Shift. These upwelling-related events are mimicked by temperature changes in the lower atmosphere—as derived from observations (see http://www.ghcc.msfc.nasa.gov/MSU/msusci.html) by NASA weather satellites.

The satellite record, continuous since 1979, is crucial to testing the human-caused 'greenhouse effect' hypothesis. Increasing concentrations of greenhouse gases are supposed to trap more out-going heat in the lower atmosphere, and some of this extra heat is subsequently returned to warm the surface. As a consequence of this return, less heat should now be escaping from the top of the atmosphere to Space. It is the increase in surface temperature *resulting* from the increase in atmospheric temperature which is called the 'greenhouse effect'.

However, there appears to have been little warming of the lower atmosphere during the past 24 years, particularly in the Southern Hemisphere; and more, not less, heat is escaping to

Space. The simplest conclusion is that most surface warming, at least since 1979, is something other than greenhouse-effect warming.

Furthermore, the shape of the NASA derivation for lower atmospheric temperature shows no correlation with increased fossil fuel consumption during that period (see above). Also, there is no persistency in the warming excursions of this record; and if the steadily-rising atmospheric concentration of human-caused greenhouse gases is the major driver of global atmospheric (and hence, surface) warming, one should be able to see it.

On the other hand, temperature in the lower atmosphere clearly reflects the cold/warm upwelling variations of La Niña/El Niño in the eastern Pacific; although one warm (El Niño) event was partly masked by the El Chichón volcanic eruption in 1983, and another was obscured by the Mount Pinatubo eruption in 1992. The satellite-derived temperature record is quite unlike the response to human-caused changes in atmospheric composition expected by IPCC.

What might have caused the intra-decadal upwelling variations in the Pacific? The atmospheric record looks like hunting and/or resonance effects—reflecting the momentum exchanges driving ENSO upwelling variations, and affecting the temperature of the upper ocean. The underlying cause of these upwelling changes could be (but we don't yet know, of course) solar/planetary inertial effects.

This question is important; because it is La Niña/El Niño event sequences which appear to be the principal driver of Pacific Basin—and even global—climate on the intra-decadal time-scale.

**9.4 Landscheidt: climate is predictable after all**

Theodor Landscheidt offers a completely new way of predicting climate change. He sees the four giant planets (together possessing most of the system's angular momentum) as joggling the Sun around the centre-of-rotation of the solar system—and thus forcing the Sun's variable eruptive activity. Solar activity correlates with climatic variability on earth. He places the next La Niña at April 2004 to April 2005; and further ahead, he sees the return of El Niño from about July 2006 until at least May 2007.

The latest of Landscheid's papers 'New ENSO forecasts based on solar model' is posted at www.john-daly.com/theodor/new-enso. As an introduction to his work, I quote from it:

> Anomalous warming (El Niño) or cooling (La Niña) of surface water in the eastern equatorial Pacific occurs at irregular intervals (2 to 7 years) in conjunction with the Southern Oscillation, a massive seesawing of atmospheric pressure between the south-eastern and western tropical Pacific. The co-ordinated El Niño/Southern Oscillation phenomenon (ENSO), also including La Niña, is the strongest source of natural variability in the global climate system. Anomalies in the global temperature are primarily driven by ENSO events.
>
> At present, there exist no physical or statistical models that can skilfully predict ENSO events at lead times longer than 12 months. Landsea and Knaff,[12] who employed a statistical tool to evaluate the skill of twelve state-of-the-art climate

12 Landsea, C.W. and J.A. Knaff, 2000, 'How much skill was there in forecasting the very strong 1997-98 El Niño?', *Bull. American Meteorological Society*, v 81, pages 2107–19.

> models in real time predictions of the development of the 1997-1998 El Niño, have shown that the models exhibited essentially no skill in forecasting the event at lead times ranging from zero to eight months.
>
> I correctly predicted the last three El Niños, years before the respective events, and also the course of the last La Niña, though the forecast was exclusively based on the Sun's eruptive activity. Meanwhile, I have been working on this solar model to improve it.

Lanscheidt's most-recent (22 December 2003) predictions are:

- Neutral conditions from December 2003 to at least April 2004 (probability 85 per cent).
- La Niña (cooler) conditions after April 2004 at least till April 2005 (90 per cent).

The forecast for the rest of the year 2005 is more difficult than at other times.

- Slight El Niño conditions from May 2005 to at least April 2006 (75 per cent).
- El Niño (warmer) conditions from July 2006 to at least May 2007 (80 per cent).

If Landscheidt can repeat his earlier successes, it will become almost impossible for IPCC to maintain its implausible assertion that human profligacy now drives global climate. Put simply, if his new paper is found to provide a reasonable account of climate change as it unfolds over the next several years, it will blow IPCC's 'Scientific Basis' out of the water. The Sun would be rehabilitated; and IPCC would be revealed as an expensive and dangerous irrelevance.

Here is another good reason for not now putting the Kyoto Protocol Ratification Bill. It might mean picking a fight with the Sun.

# 10. Conclusions

**10. 1 Flawed economics = spurious temperature projections**

CSIRO's range of Australian temperatures in 2070 stem from naive acceptance of the 1990–2100 warming projections published by the Intergovernmental Panel on Climate Change. Ian Castles tells us that IPCC's projections of human-caused warming in the new century are, in their turn, based on implausibly-high projections of economic growth in the LDCs. IPCC applied these economic projections in order to attain equally spurious projections of a globally-averaged surface temperature increasing by 1.4 to 5.8 $^{0}$C between 1990 and 2100.

An extreme example of IPCC's bizarre thinking is this revealing comparison (here expressed in thousands of 1990 US dollars per-capita): Australia enjoyed a GDP of 17 in 1990—rising, IPCC informs us, to 55–61 in 2100. But South Africa had a minuscule GDP of 4 in 1990; and IPCC sees this skyrocketing to an amazing 364–470 in 2100 (see Table 2 for more examples).

CSIRO's 'high-end' warming projection flows directly from IPCC's assumption of an almost-unimaginable increase for real per-capita GDP in the LDCs of 65 times between 1990 and 2100; and its 'low-end' assumes a somewhat lower, but still implausibly-high,

average rate of Third World economic growth. Hence, its 1.0-6.0 $^0$C of warming by 2070 is no 'range'.

Similarly, CSIRO's view that Darwin will go from one December-February day over 35 $^0$C on average now, to a whopping 5-79 days by 2070, provides no range. This is just the difference between IPCC's 'implausibly high' and 'unimaginably high' end-points.

CSIRO warns us that Australia could warm by up to ten times as much by 2070—from the human-caused greenhouse effect alone—as the global-average warming from all causes (natural, plus land-use change, heat-island effect *and* greenhouse) over the past 100 years. This wanton catastrophism has no plausible economic foundation.

CSIRO's warming projections, based as they are on outlandish assumptions, have zero value as a guide to Australia's policymakers—or to this Committee.

**10.2 Physical processes must remain inviolate**

If someone tells me that the reason Londoners can no longer roast oxen on the Thames in winter is human interference with the composition of the atmosphere, I remind them of the Sun. Solar activity is now much higher than at any time in the last millennium and very much higher than in the depths of the Little Ice Age only 300 years ago. The Sun is the main cause.

In reality, almost no-one today seriously disputes that the Sun was principal driver of Earth's ever-changing climate prior to 1900. But the quite-implausible belief that it resigned from the climate-change game in the 20th Century, is inherent in IPCC's temperature projections; these (and CSIRO's) assume that human actions drive global climate—now, and for the century ahead.

It is reasonable to assume that the physical laws governing the Universe remain inviolate. Hence, if solar/planetary/galactic influences dictated climate in the past, it is not reasonable to assume that they no longer play any significant role.

IPCC has proffered up no convincing evidence in support of its presumption of natural-law breaking. Nevertheless, I admit, it is still not clear *how* solar activity controls climate.

A correlation has been established[13] between small fluctuations in solar irradiation (measured by satellites) and unexpectedly large fluctuations in the temperature of the lower troposphere. An explanation for the enhanced impact contemporaneous with these small insolation changes is emerging.[14] The Sun's magnetic output also varies, and the heliosphere modulates the extent to which Earth is shielded from galactic cosmic rays and their nucleation effects in the atmosphere. Greater magnetic flux means fewer clouds.

Hence, two separate manifestations of solar activity have already been identified—irradiance and magnetic flux. But even together, they still may not be enough to drive Earth's climate.

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13 Douglass, David H., and B. David Clader, 2002, 'Climate sensitivity of the Earth to solar irradiance', *Geophysical Research Letters*, v 29, no 16, pages 33-1 to 33-4.

14 Carslaw, K.S., R.G. Harrison and J. Kirkby, 2002, 'Cosmic rays, clouds and climate', *Science*, v 298, pages 1732–7.

Exciting work by Theodor Landscheidt finds that the solar-torque cycle (presumably driven by the giant planets—Jupiter, Saturn, Uranus and Neptune) can be predicted. He further recognises that variations in solar eruptive activity correlate with intra-decadal climatic events on Earth.

His successful predictions of El Niño and La Niña events several years ahead, are obviously a giant step forward. Nevertheless, they only represent a correlation—so far, albeit, very good—between events on the Sun and events on Earth. We all know that correlation is not proof. Science now needs demonstrable mechanisms linking solar eruptions to earthly events.

It is but a small step in logic to accept that the same solar/planetary gravitational interactions which drive the Sun's eruptive cycle, also involve Earth directly—thereby causing the observed changes in the rate-of-change of length-of-day, and the prominent associated momentum-related oceanic/atmospheric events such as the 1976/77 Great Pacific Climate Shift. Individual El Niño and la Niña events, although transitory, also have an inertial basis (large upwelling-quantity changes). An understanding of the Sun/Earth climatic linkage may not be far away.

Be that as it may, Landscheidt has now provided (22 December 2003) purely-solar-based predictions which put the next (cool) La Niña at April 2004 to April 2005, and the subsequent (warm) El Niño at July 2006 to May 2007. If he can repeat his earlier successes, he will have provided an even-more convincing demonstration that climate is indeed predictable—but by correlation with solar activity, and certainly not with the activities of humans.

It would be a gamble for big stakes, with little upside and much downside, to pass into law the Kyoto Protocol Ratification Bill. It stands a good chance of impoverishing Australia, but offers only a negligible chance of conferring environmental benefit; and it can't take precedence over natural laws. We must face facts: the Sun, not legislation, will control climate.