

Climate change made easy – it's the Sun

by Bob Foster¹

8 November 2004

1. Urgent action – or billions die

First, a word from King Canute²: "... we can defeat climate change if we want to."

If you believe that, you will believe anything.

The Sun has not resigned from the climate-change game; and it remains the dominant driver of our Ice Age climate: right from the 100,000-year cycle of long (about 90,000-year) Glacials and short (say, 10,000-year) Interglacials, down to El Niño/La Niña upwelling episodes within a single decade.

PM Blair's flight from reason (above) stems from the "human-caused 'greenhouse effect' hypothesis" of global climate change. The potentially-catastrophic consequences of increasing greenhouse gas (GHG) emissions – largely carbon-dioxide (CO₂) from the burning of fossil fuels - are promoted by the Intergovernmental Panel on Climate Change (IPCC) as the consensus view of 2,500 of the world's top climate scientists. IPCC's ill-founded catastrophism is accepted as truth by the governments of over 150 countries including, it appears, that of Australia.

As an attention-getter, catastrophism *works*; and opinion-formers around the world have rallied to the cause. You will all have heard The Mantra by now (quoting Greenpeace energy spokesman Robin Oakley from *The Times* of 25 July 2004):

"Global warming, climate change and the impact it will bring is very much the biggest threat we are facing."

Oakley elaborates (*The Times*, 27 July 2004):

"Climate change is the greatest threat facing the planet today. It is already killing 160,000 people every year and billions of the world's poorest and most vulnerable will be killed without urgent action."

But, it is too early to say whether these unfortunates will freeze or fry.

1. Bob Foster is a director of the Lavoisier Group (visit www.lavoisier.com.au) which is putting to Australians a view on climate change contrary to that of the UN's IPCC. Supporting material for the contrarian case is available at www.john-daly.com. Bob's email address is fosbob@bigpond.com.

Neither his decade-long collation and analysis of the public record on climate change, nor the preparation of this and other papers, received outside financial support.

This paper is based on a presentation made at Canberra Skeptics' *Environment Forum* on 21 August. The *Forum* was as a contribution to Australia's 2004 Science Week.

2. Canute was a Dane who took the English throne 1,000 years ago, and famously failed to repel the waves. However, my quote is from a speech by his modern protégé, British PM Tony Blair. It was delivered in Mozambique on 1 September 2002, when he spoke in support of the UN's World Summit on Sustainable Development in Johannesburg.

The scientific adviser to the UK government, Sir David King, tells us³:

“Antarctica is likely to be the world’s only habitable continent by the end of this century if global warming remains unchecked, the Government’s chief scientist Professor Sir David King said last week. He said the Earth was entering the ‘first hot period’ for 60 million years, when there was no ice on the planet and ‘the rest of the globe could not sustain human life’.”

and

“Sir David said that levels of carbon dioxide in the atmosphere – the main ‘greenhouse gas’ causing climate change – were already 50 percent higher than at any time in the past 420,000 years. The last time they were at this level – 379 parts per million – was 60 million years ago during a rapid period of global warming, he said. Levels soared to 1,000 parts per million, causing a massive reduction of life. ‘No ice was left on Earth, Antarctica was the best place for mammals to live, and the rest of the world would not sustain human life’, he said. Sir David warned that if the world did not curb its burning of fossil fuels ‘we will reach that level by 2100’.”

Four months earlier, the same journal had proffered up a very different story: an abrupt switch to the climate of Labrador will bring to the UK “a nightmare scenario where farmland turns to tundra”. Happily, while both these catastrophes lie just around the corner, they appear to be mutually exclusive. We won’t have to die twice.

But in reality, no amount of “urgent action” can prevent the climate from changing. The concept of a stable pre-industrial climate, disturbed only now by human interference, is ludicrous. So is the belief that by ‘doing the right thing’ about greenhouse gas emissions, humans can regain the climatic perfection of those halcyon days.

Humans can’t defeat climate change. By chasing this chimera, IPCC is diverting policy-makers from today’s urgent regional and local, often irreversible, environmental threats - while invoking the environment. The long-term, intangible, and global nature of the greenhouse scare allows governments to fiddle while Rome burns.

2. Decarbonise to prevent climate change

IPCC describes a relatively stable pre-industrial climate during 1,000-1,900AD, prior to an abrupt 0.6 °C warming across the 20th Century (**Figure 1**). This warming is said to be largely the result of CO₂ emissions from the burning of fossil fuels; and, depending on the degree of success in limiting anthropogenic GHG emissions, it “projects” 1990-2100 warming of between a concerning 1.4 °C and a frightening 5.8 °C. (Projections are just ‘what-ifs’ without attributed probabilities; they are not predictions – and IPCC doesn’t say they are. But others have adopted and applied them as though they *were* predictions - be very careful.)

3. “Why Antarctica will soon be the *only* place to live - literally”, by Geoffrey Lean, Environment Editor, in the *Independent* of 2 May 2004. But on 25 January, Lean’s piece was headlined: “Global warming will plunge Britain into new ice age ‘within decades’ ”.

Following IPCC's lead, the World Energy Council warns us (*Reflections on Energy and Climate Change*, July 2004) that "the 'decarbonizing' of national and regional economies must be sought wherever it is possible and consistent with other objectives" to prevent the acceleration of human-caused warming in the century ahead. (Decarbonise means 'impoverish' – most particularly for the likes of coal-rich Australia⁴.)

3. Stable pre-industrial climate

IPCC has found a paper on Northern Hemisphere palaeoclimate which contradicts the hundreds written over past decades, documenting various aspects of the Little Ice Age (LIA) - so much for peer-reviewed scientific literature. Instead of a Mediaeval Warm Period (MWP) from the turn of the previous millennium, followed by a prominently twin-troughed LIA (**Figure 2**), IPCC adopts the "Mann Hockeystick" – with 1000-1900AD as its pre-industrial handle (**Figure 3**). The Spörer (roughly 1420-1530), and Maunder (1620-1720) minima have vanished.

Much proxy climatic evidence demonstrates that IPCC's stable pre-industrial climate is a myth. The LIA minima comprised a discontinuous series of very cold winters; and in the particularly severe 1708/9 winter for instance, January and February over large parts of Europe and Western Russia are estimated at 7 °C below the average for 1901-95. Anecdotal evidence is also abundant. During the Great Winter of 1683/84, 11 inches of ice formed on the River; and diarist John Evelyn tells us:

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

The Hockeystick handle is largely derived from the varying width of annual growth-rings in trees at high latitudes or high altitudes. But these trees grow in the growing season (spring and early summer), when the inter-annual temperature contrast was less than in winter. This may be one reason why the handle looks so straight.

4. IPCC's spurious account of the Century just past

The rising 'blade' of the Hockeystick is in striking contrast to its handle. But observed warming in the second half of the 20th Century (**Figure 4**) is greatest in the persistent and intensely-cold high pressure cells located over Siberia and Alaska/Yukon in *winter*.

IPCC has embraced (Figures 1, 3) the scientific equivalent of a schoolboy howler. This influential analysis demotes its growing-season-dependent tree-ring proxies from 1900, and promotes thermometer measurements instead. It begins with unresponsive 'apples', and ends with winter-temperature-responsive 'oranges'. The Hockeystick is an artefact

4. *Climate Change: Solutions for Australia*, published in June 2004 (35 p.) by The Australian Climate Group, supports The Cause; and it quantifies The Solution:

"1. REDUCE: Australia's political leaders must work with business and the community to take immediate action to cut our greenhouse gas emissions by 60% by 2050." (This Group was convened in late 2003 by WWF Australia and the Insurance Australia Group.)

But, the allegation that the Hockeystick blade is largely anthropogenic does not bear examination (**Figure 5**). About 2/3 of the 20th Century warming had already taken place by mid-century, and yet the rate of fossil-fuel consumption – the supposed cause of the warming, remember – had not yet attained ¼ of the century’s growth. Much warming *anticipated* the GHG emissions said to be its cause. This is empirical disproof.

If IPCC’s assertion that 1998 was “the warmest year of the millennium” is correct (and it has absolutely no way of knowing that), Figure 5 indicates it was probably not *our* fault.

5. Economic growth driving climate in the century ahead

IPCC uses marker “storylines” for projecting 1990-2100 world economic growth. Its end-case (Figure 1) assumes higher economic growth than *any* case in a similar study done only two years earlier by the same team (at the International Institute for Applied Systems Analysis, Laxenburg, Austria) – but when contracted to a different client. No, I am not referring to the high-end case here. IPCC’s low-end growth projection (yielding ‘only’ 1.4 °C warming over 1990-2100) is already implausibly high. (Here following Ian Castles, former Australian Statistician and now an ANU Research Fellow.)

To compound IPCC’s disinformation, economic growth in the high-end case (with 5.8 °C warming) is almost-unimaginably high. Here, average per-capita GDP for the LDC’s grows x65 by 2100. By comparison, whole-world growth in the last century was x5 – and the Japanese ‘economic miracle’ was only x20. None other came close.

At the individual-country level (see **Attachment 1**), IPCC’s *Special Report on Emissions Scenarios* (SRES) makes some remarkable assumptions. Australia’s per-capita GDP (in US\$ thousands) grows from 17.3 in the 1990 base-year, to a high-end/low-end 61/55 by 2100 (still in 1990 dollars). Not bad, you say? Wrong! From Afghanistan (78/69) to Zimbabwe (87/68), the Third World climbs right past sleepy Australia. South Africa is projected as doing notably well – going from 2.8 in 1990 to 474/364 in 2100.

6. Plucking CO₂ out of the high-end air

Why was South Africa singled-out for such amazing growth? I think I have the answer. IPCC’s extreme (5.8 °C) outcome demands an exceedingly high rate of growth in CO₂ emissions - in order to attain the necessary atmospheric concentration. South Africa has the world’s most coal-intensive economy, because (at Sasol) it makes synthetic liquid fuels from coal; in 2003, (carbon-rich) coal provided 76% of its primary energy. South Africa chose itself.

Support for my sceptical view comes from IPCC’s treatment of two other (much larger) coal-intensive economies (**Table 1**). India and China were also awarded preferential per-capita economic growth - of x100 and x250 respectively, to add to x168 for South Africa. (Although using coal to meet only a quarter of its energy needs, South Korea was also allocated x100 growth.) When SRES’s high-end storyline has per-capita GDP for these nations growing at x100 or more by 2100, you can guess from which hat IPCC pulled its CO₂ rabbit. (In pathetic Australia, IPCC has high-end growth at x3.5.)

Table 1
EMISSIONS TARGETS, 1990-2003 ENERGY GROWTH & COAL-INTENSITY
 (Energy consumption totals on a heat-value basis, in million tonnes oil equivalent⁵)

	<u>Kyoto Target</u>	<u>1990</u>	<u>2003</u>		
	% of 1990	Energy Total	New Total	Growth	Coal Share
		MTOE	MTOE	%	%
<u>European Union</u>					
Germany	79	352	332	(6)	26
United Kingdom	87.5	213	223	5	18
France	100	221	261	18	5
Sweden	104	43	46	7	5
Spain	115	89	142	60	15
Greece	125	24	34	42	30
Portugal	127	15	27	80	15
<u>Other nations with a target</u>					
United States	93	1932	2297	19	25
Japan	94	428	504	18	22
Canada	94	202	291	44	11
Poland	94	105	91	(13)	64
Russia	100	853	671	(21)	17
Australia	108	89	116	30	43
<u>Nations with no Kyoto target</u>					
China		668	1178	76	68
India		183	345	89	54
Mexico		99	138	39	6
South Korea		91	212	148	24
Brazil		90	181	101	6
South Africa		90	117	30	76
<u>World</u>					
		7732	9741	26	26

Historically, world per-capita carbon emissions peaked at 1.23 tonnes in 1979, before declining slowly to 1.09 tonnes by 2000 – in line with the deterrent effect of higher energy prices, plus improving technical efficiency. But IPCC's high-end (most carbon-intensive) "scenario" reverses this trend, and has them at over 4 tonnes by 2100.

But no matter, the high-end case is doomed; because it assumes that world coal consumption would rise by an incredible 31% over the 1990-2000 decade. In reality, it grew a less-remarkable 14% in the 13 years to 2003 (86% of the increase was in China).

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, hydro and nuclear. Solar, biomass, and wind are all ignored. (One tonne of oil equivalent approximates 10 million kilocalories, 42 gigajoules, 40 million Btu and 1.5 tonnes of hard coal.)

7. Have we seen a genuine low-end case?

Since the spread of the Industrial Revolution, and our concurrent emergence from the LIA, the atmospheric CO₂ concentration has risen from some 280 to nearly 380 ppm.

IPCC's high-end storyline is the basis for a scenario which assumes unfettered use of the lowest-cost source of primary energy for power generation – coal – in supporting this almost-unimaginable growth of world wealth. The result is 970 ppm in 2100. (If IPCC adopted the demonstrable mean residence time of 55 years for CO₂ in the atmosphere, it wouldn't make it; so it assumes a much higher number.) On the other hand, the scenario which delivers the low-end 540 ppm, invokes “a high level of environmental and social consciousness”, ie. ‘decarbonisation’. But this socially-admirable scenario is built on a storyline which still has an implausibly-high rate of economic growth.

Crucially, IPCC has not provided a genuine low-end case – where ‘consciousness’ is coupled with a believable rate of Third World economic growth.

8. How much warming would you like?

The theoretical warming caused by a doubling of the atmospheric CO₂ concentration is about 0.7 °C. To this must be added/subtracted any resultant feedbacks. IPCC has adopted a 1.5–4.5 °C range of doubling sensitivities, to allow for feedbacks it has neither measured nor calculated. When the sensitivity extremes are applied to the extremes of projected CO₂ concentration (540-970 ppm), global warming of 1.4-5.8 °C is the result.

We have just completed a half-century of rapid human-caused CO₂ emissions growth, and we know its atmospheric concentration at beginning and end. If *all* the 1950-2000 warming were caused by GHGs (most was not - see Figure 5 and below), the calculated doubling sensitivity so revealed, is at about the low-end of IPCC's assumed range. Furthermore, when I checked the low-end conjunction of 1.5 °C doubling sensitivity, and 540 ppm concentration, I discovered a warming of only 1.0 °C. IPCC has ‘rounded up’ a bland result by 40% in order to produce a more-menacing 1.4 °C.

9. Creative catastrophism

IPCC has compiled a self-serving sequence of spurious selections in order to assemble an entirely implausible end-product. Naively, this creative catastrophism has been adopted by governments around the world; and their own expert advisers have used its results as the basis for constructing projections of climate change in their individual regions. But, when we devolve from the high abstraction of global averages down to specific localities, real-life intrudes.

For instance, CSIRO, in conjunction with the Australian Greenhouse Office, has distributed a poster entitled “Future Climate Change in Australia”. I promise I am not making this up: this preposterous poster shows my birth-place, Darwin, going from an average of one December-February day per year over 35 °C now, to a whopping 5-79 days by 2070. This is a good example of what happens when the human race, in its arrogance, tampers with Nature - or is it just a good example of wanton scaremongering?

Happily, a plot of the over-35 °C days since the Darwin recording station was moved out to the RAAF 'drome in the early 1940s, shows no sign of an emerging upward trend (**Figure 6**). The Fosters may not die out, after all.

10. Pollution or plant food?

Figure 5 shows it to be exceedingly unlikely that fossil fuel consumption caused a large proportion of 20th Century warming; and analysis (above) of the economic assumptions underpinning IPCC's temperature projections shows them to be implausible at best. But why not reduce CO₂ emissions anyway? Surely, all pollutants are bad.

In reality, CO₂ is a natural atmospheric constituent – colourless, odourless and non-toxic – and not a 'pollutant'. Furthermore its atmospheric concentration in the early Cenozoic was five times or more that of today (**Figure 7**). Many of our land-plant families evolved in that high-CO₂ environment. Hence, there appears little to be feared from the larger CO₂ emissions as we consume Earth's remaining economically-producible carbon-based fuels. In terms of atmospheric CO₂ concentrations, we have been there, done that. Indeed, many commercial growers enrich the atmosphere in their greenhouses with CO₂ to about double the ambient level - to make their vegetables grow better.

We have a 24-year record of satellite observations - showing pronounced continental greening (called 'thickening' in Australia). Increasing atmospheric CO₂ concentration is likely to be one of the main stimulants; this would work in two ways: photosynthesis is promoted, and available water is utilised more effectively.

11. Omnipotent Sun: a matter of belief

When Akhenaten (1352-36BC) came to power in the 18th Dynasty, he proclaimed the Sun to be the dominant influence on the well-being of the Nation. Although this was a giant step forward for human comprehension, it was still religious belief - not science. Intellectually, the job was but half-done.

Egypt's 'heretic pharaoh' changed his name from Amenhotep ("Amun is content") IV to "It goes well with Aten". He built a new and remote capital, Akhetaten, in order to escape Amun, Ra, and the rest of the pantheon – and, more particularly, to escape the attentions of the priestly caste which served and promoted them. Only he and Nefertiti were permitted to deal personally with the solar disc – the Aten. No priests, please.

But veneration of the Sun was short-lived. After the remarkable pair died, Tutankhaten undid their work entirely. This recidivist changed his name to Tutankhamun, moved the capital back to Memphis, and re-instated the gods. Is it not time to try again?

12. Variable Sun/Earth connection

Even an invariant Sun can be influential. We live in the Pleistocene Ice Age of long Glacials and short Interglacials (including the Holocene, whose warmth we have enjoyed for the past 10,000 years), driven at least in part by orbital geometry – not requiring the Sun to vary. Likewise, the Sun neither dims in winter nor switch off at night.

A variable Sun/Earth connection implies a variable Sun; but variation in solar irradiance is already known to be very small. Instead, the Sun/Earth-connection hypothesis depends on other, and larger, solar/planetary/galactic influences – I here use “Sun” as shorthand.

The sunspot count since 1610 provides a crucial record of past activity. (Dense tangles of magnetism during periods of strong magnetic/electrical activity block escaping solar heat, and create cooler/darker patches, ie. sunspots.) Proxies can now extend the sunspot record; and an analysis (**Figure 8**) finds that the Sun has been more active since the 1940s, than at any other time since 850AD. Although IPCC would have the opposite⁶.

13. Astronomy meets astrology – planets in control

Most of the solar system’s angular momentum is held by the four giant planets; and they drive the Sun’s irregular motion (**Figure 9**) around its centre-of-rotation. Changes in solar torque drive eruptive activity - and they can be calculated⁷. The largest energetic solar event is a coronal mass ejection (CME) – such as on 4 November 2003. These CMEs can propel clouds of magnetised plasma (electrically-charged protons/neutrons), with a mass of up to 10^{11} tonnes, into the heliosphere at up to 2600 km/s. When correctly directed, they will strongly influence the near-Earth magnetic field.

A hind-cast of solar-torque variation correlates with known climatic fluctuations over the past millennium (**Figure 10**). Correlation is not proof, of course; but absent a sworn statement from the Sun, correlations will have to suffice. Notably, save intervention by factors as yet unrecognised, we can expect the Landscheidt Minimum at about 2030.

14. Solar magnetic/electrical influence on climate

Solar eruptive activity is the main influence on the interplanetary magnetic field (the flux has increased x2.3 since 1901); and it controls near-Earth magnetic activity, as recorded by the aa index. As shown in **Figure 11**, there is a (lagged) correlation between the aa index and climate over the past century and more. (Compare it with the *faux* correlation between fossil-fuel use and climate in Figure 5.) Landscheidt confirms the unsurprising correlation (**Figure 12**) between solar eruptions and the aa index of geomagnetic activity.

The Sun/climate link appears to be mediated by variable cloudiness: a more-eruptive Sun induces a stronger geomagnetic field; gives better shielding from the ionising effect of galactic cosmic rays (charged protons at near the speed of light); reduces nucleation for low-level cloud formation; and ultimately, yields a less-reflective Earth (**Figure 13, 14**).

6. The *Summary for Policymakers* of IPCC’s Third Assessment Report vol. I “Climate Change 2001: the scientific basis” (881 p.) says that “most of the warming observed over the last 50 years is attributable to human activities”. But its Figure 4(a) compounds the misinformation, showing “natural” warming over the past half-century as *less* than in 1860-80. More than all warming in the last 50 years is thus claimed to be anthropogenic.

7. The remainder of this analysis depends crucially on the work of Theodor Landscheidt, particularly on his ground-breaking 2003 paper “New Little Ice Age instead of global warming?”, *Energy & Environment* v.14 no.2&3, pp.327-350.

Greater penetration of (relatively-unvarying) insolation is one result of less cloud; and after an appropriate lag comes consequent surface warming. Crucially, IPCC finds only $2\frac{1}{2}$ W/m² of human-caused GHG forcing since 1850; whereas Figure 14 shows more than twice as much new forcing during 1985-95 – just from reduced cloudiness.

A key element of the Sun/Earth connection is variable solar magnetic/electrical activity; and it provides a compelling explanation (Figure 8) for the 300-year warming trend from the Maunder Minimum to the present. But it cannot be the full story; because Figure 5 shows a cyclic (ca. 60-year) climatic variability overprinted on the solar-related trend.

15. Inertial influence on climate

Variation in Earth's rotation rate has two components (**Figure 15**). One is a monotonic deceleration; and this may well be a composite of lunar influences, and the increase in Earth's radius of gyration as continental ice enters the sea at high latitudes, eg. from the West Antarctic Ice Sheet. Another is cyclic variation in spin-rate at time-scales relevant to humans. Crucially, length-of-day (LOD) varies in concert with solar torque.

When both LOD and Northern Hemisphere temperature are detrended (**Figure 16**), a second climate-related correlation is revealed. The shorter-term LOD variations, presumably, reflect interchanges of angular momentum between the stony Earth and its mobile overcoat of ocean and atmosphere. The variable Sun/Earth connection imposes *two* recognisable climatic influences – magnetic and inertial.

16. Global Climate Shift

A step-change in climatic regime took place at 1976/77. The Global Climate Shift had a wide-ranging influence and a multi-decadal persistence (**Figure 17**). Between the early 1970s and the '90s, the upwelling quantity of deep water in the equatorial eastern Pacific diminished from 47 to 35 Sv (one Sievert = one million cubic metres per second) – thus reversing a similar event in the mid '40s. If all the 20th Century sea level rise were caused by transfer of fresh water from continents to oceans, it would amount to a flow of only about 0.02 Sv. There were momentum changes on a vast scale in the 20th Century oceanic circulatory system. Clearly, humans didn't cause them.

The Pacific Decadal Oscillation (PDO) index encapsulates the variability of sea-surface temperature (SST) in the eastern Pacific (**Figure 18**). A concurrent change in the atmospheric angular momentum (AAM) regime, also shown in the Figure, supports the conclusion that the '76/7 Shift was inertia-related. Landscheidt considers that the current PDO warm-phase, in force since the '70s, is already fading (**Figure 19**).

17. Two very different solar influences

The message of my last several sections is that solar-related magnetic variation causes Earth to warm or cool on a global basis; but solar-inertial effects only vary the manner in which the already-available heat is distributed. In terms of climatic variability at human time-scales, both are important. These disparate influences march to the same drummer – that which controls solar variability. In both cases, the planets are implicated.

18. Can intra-decadal climate variability be predicted?

Correlations demonstrate that variation in solar eruptive activity matches climate/weather in two different ways; and according to Landscheidt, the Sun's variability is amenable to calculation. He (Figures 10, 19) forecasts the next LIA-type minimum at 2030, and the return of the PDO warm-phase⁸ at 2016. But these events are far too distant to provide a timely validation of the 'variable Sun/Earth connection' hypothesis⁹. El Niño/Southern Oscillation (ENSO) events (upwelling-related SST variations in the equatorial Pacific, provide the opportunity - because ENSO warm/cool extrema dominate weather/climate-systems around the Globe at the inter-annual time-scale, and are immediately verifiable.

ENSO cyclicity is captured by the Southern Oscillation Index (SOI), which reflects the see-saw of atmospheric pressure between Tahiti and Darwin. **Figure 20** portrays the sequence of warm/cool ENSO phases over the past half-century¹⁰. (Note: the SOI scale is reversed so the warm El Niño events appear above the line.) A greater proportion of cool La Niña events occurred before the PDO warm phase began at '76/7 (see also Figure 18). Prominent in the record are powerful El Niño events at '82/3 and '97/8. The timing of ENSO-related upwelling, and variation in SST, appears also to be inertially driven, as shown by solar eruptive maxima and their harmonics plotted on the SOI graph.

Figure 21 shows a correlation between AAM (Figures 17, 18) and the solar eruptive cycle; and **Figure 22** compares (inverted) SOI with AAM. They mostly move together – I have marked obvious discrepancies with arrows. Finally, **Figure 23** illustrates the close linkage between SOI and climate. This linkage suggest that the Sun provides a means of predicting ENSO events. However, as shown by temperature variation in the lower troposphere, there are mismatches between SOI and the atmospheric record. First, climatic response is delayed (note '97/8 El Niño); second, the cooling effect of explosive volcanic activity can temporarily mask the Sun/Earth relationship.

The seasonal variation in upwelling in the equatorial eastern Pacific Nino 3 region (5⁰N to 5⁰S by 90 to 1150⁰W) is illustrated in **Figure 24**. A step in upwelling-season SST minima coincides with the 1976/7 Climate Shift (see Figures 17-19). Also visible are the SST maximum associated with the '82/3 El Niño, and the minimum with the '88 La Niña. At the end of the record, the '97/8 El Niño can be seen brewing-up.

If Landscheidt is correct in saying that ENSO is solar-related, it becomes possible to make intra-decadal climatic predictions.

8. Landscheidt, Theodor 2001, "Trends in Pacific Decadal Oscillation subjected to solar forcing", www.john-daly.com/theodor/pdotrend

9. The Sun/Earth connection has been the subject of at least two centuries of vigorous scientific debate, as described and annotated by Willie Wei-Hock Soon and Steven H. Yaskell in their new (2004) book "The Maunder Minimum and the variable Sun-Earth connection", *World Scientific Publishing Co*, 296 p.

10. Landscheidt, Theodor 2003, "New ENSO forecasts based on solar model", www.john-daly.com/theodor/new-enso

19. Very close to ‘Proof in the Pacific’

An opportunity to test for a Sun/Earth connection, is provided by the abrupt change from El Niño to La Niña conditions in 1998; because metering buoys now give us a continuous SST record. A phenomenal 8 °C drop in May/June was reported by McPhaden¹¹ (**Figure 25**) at the 125 °W equatorial buoy. This spectacular local event is momentum-related, because there is a large intra-annual LOD fluctuation in ‘97/8 compared to the adjacent years (**Figure 26** – reversed cf. Figure 15). But this event was not just local; **Figure 27** shows an average SST drop at this time of more than 4 °C over the vast Niño 3 region.

The transition from El Niño to La Niña in mid 1998 represents the resumption of (cold) upwelling on a grand scale. Correlation – no matter how good - is not proof; but surely, this massive inertial event is outside the scope of any conceivable human intervention.

Theodor Landscheidt has enjoyed success in El Niño/La Niña prediction, based solely on a solar model. But (see Figure 3), IPCC’s consensus of the world’s top climate scientists accepted the 1997/8 El Niño (and presumably, rebound to La Niña) as human-caused. McPhaden sees El Niño as caused by “dynamical feedbacks between the upper ocean and the overlying atmosphere”. The remarkable 1998 step-down to La Niña, in particular, is “triggered by a rapid and relatively unpredictable strengthening of the trade winds”; but, neither he nor IPCC recognised its driver as global-scale and momentum-related. Forty-love to Landscheidt (see Figure 20 for an alignment with solar-torque indicators).

20. Scientific mainstream misinforming policymakers

Humans can’t stabilise climate. The consensus of the world’s top climate scientists – a stable pre-industrial climate, which can be regained by decarbonising the global economy - is nonsense. And global, regional or local climatic projections based on flawed science, and invoking unimaginably-high economic growth in the LDCs, are worthless to policy-makers.

However, we are told¹² that:

“Today, all but the terminally uninformed realize that ... (t)he science is no longer an issue. How best and soonest to stabilize the climate is the new debate.”

Why has the mainstream been able to play so fast and louche with the evidence?

It’s easy. Science has become democratic. “Individualistic” insights, such as those of Theodor Landscheidt, can no longer outweigh claims “focussed and mediated” by the “sponsors and consumers of scientific work”, and “established as scientific knowledge through socially constituted processes of negotiation and consensus” (Naomi Oreskes 2004, *Nature* v.305 p.1241). Wow! The advancement of scientific understanding is now a matter of voting. IPCC provides an exquisite example of the new ‘scientific method’.

11. McPhaden, Michael J. 2002, “El Niño, La Niña, and the climate swings of 1997-98” in Michael H. Glantz (Ed) *La Niña and Its Impacts*, UN University Press 271 p.

12. How times have changed! Amory Lovins’ Rocky Mountain Institute talks the lingo of the mainstream now. (Cameron M. Burns, staff editor at RMI; “Time for a Switch” in *Readers Forum* of “Solar Today”, 2002, v.16 no.3 p.78.)

IPCC's catastrophism-by-consensus encourages governments to act ostentatiously in the name of the *global* environment – by mandating consumer-subsidised windfactors, and promoting pointless carbon sequestration, for instance – rather than confront complex, hard-to-resolve (often urgent and irreversible) local and regional threats.

We all have our own particular concerns, of course; mine include the destruction on a vast scale of habitat in the intensely-biodiverse regions of the Asia/Pacific: Sumatra, Borneo, Melanesia and Queensland. Many genuine needs will not be met in timely fashion while greenhouse rent-seekers are allowed to set the green agenda.

The American Association for the Advancement of Science (AAAS) is a pillar of the scientific establishment; and its journal is very 'mainstream' indeed. *Science* of 25 June 2004 contains "AAAS NEWS AND NOTES" including "SCIENCE AND POLICY - Facing the impact of global warming" (v. 304, pp. 1921, 2). AAAS tells us that:

"It should go without saying that the vulnerability of the world's poor will be multiplied manyfold if global warming causes significant melting of one or both of the polar ice sheets", *Science* Editor-in Chief Donald Kennedy said before a 15 June conference on climate change at the AAAS building in Washington. ... Authoritative studies have shown that between 1990 and 2100, temperatures will rise between 1.4 and 5.8 °C. Temperatures in the past century have increased between 0.4 and 0.8 °C, with most of the warming happening over the most recent decades. ... The conference marked a step ... toward responding to a 9 January 2004 *Science* article by Sir David King, the United Kingdom's Chief Scientific Adviser, which challenged America to better control greenhouse gases."

David Bellamy is far from mainstream. Headed "Global warming: It's a load of rubbish says Professor David Bellamy", *The Sunday Mail* of 18 July 2004 reports:

"Global warming – at least the modern nightmare version – is a myth. I am sure of it and so are a growing number of scientists. ... For a start, carbon dioxide is not the dreaded killer greenhouse gas that the 1992 Earth Summit in Rio de Janeiro and the subsequent Kyoto Protocol ... cracked it up to be. It is, in fact, the most important airborne fertiliser in the world, and without it there would be no green plants. Increase the amount of carbon dioxide in the atmosphere, double it even, and this would produce a rise in plant productivity. Call me a biased old plant lover, but this doesn't sound like much of a killer gas to me. ... Hooray for global warming, I say, and so do a lot of fellow scientists. ... And yet we still have public figures such as Sir David King making preposterous statements ..."

I just wish Bellamy had added: *it is the Sun which drives our ever-changing climate.*

21. Scientific conclusions – evidence, not consensus

Figure 5 shows most 20th Century warming preceded the fuel use said to be its cause - providing empirical disproof of IPCC's greenhouse hypothesis. **Figure 28** shows a more active Sun in the past half-century than at any time in the last 8,000 years - the 300-year warming trend since the Maunder Minimum is solar-driven. **Figure 29** shows cooling in the eastern equatorial Pacific in the 1940s, and warming in the '70s – cyclic upwelling changes drive climate at decadal scales.

Attachment 1

GDP IN YEAR 2100 FOR IPCC'S HIGHEST & LOWEST EMISSIONS SCENARIOS

(Thousands of 1990 US dollars per-capita calculated on a market-exchange-rate basis)

	<u>High-end (A1) Marker</u>	<u>Low-end (B1) Marker</u>
South Korea*	653	201
South Africa*	470	364
Malaysia	208	64
Italy*	177	110
Russian Federation	170	103
Germany*	168	105
Thailand*	165	51
Argentina*	152	90
Japan*	132	93
United States*	114	79
Brazil*	112	68
Mexico	104	62
Canada	88	73
Zimbabwe*	87	68
Cameroon*	82	64
China (PRC)*	78	39
Afghanistan	78	69
Algeria	75	158
Venezuela	71	42
Indonesia*	68	21
Philippines	66	20
Australia*	61	55
Peru	38	23
India*	36	32
Pakistan	25	23
Bangladesh	23	21
Turkey*	12	87

* **1990 GDP** in US\$ thousands per-capita on an MER basis was approximately:

Japan 27, US 22, Italy 20, Germany 20, Australia 17, S. Korea 6.5, Argentina 5.8, South Africa 2.8, Brazil 2.7, Turkey 1.9, Thailand 1.8, Cameroon 1.0, Zimbabwe 0.62, Indonesia 0.62, China 0.32, India 0.29.

Source: Down-loaded from SRES website <http://sres.ciesin.columbia.edu/tgcia/> by Ian Castles. The numbers remain available at www.ipa.org.au/pubs/special/climate/castlespaper although the IPCC Task Group on Climate Impacts Assessment has withdrawn public access to its site.

Warning: The per-capita GDP data for individual countries (above) has been down-scaled by SRES from collective totals for the four regions comprising the world. However, it is only GDP for the regions which has IPCC approval; and therefore, the individual-country projections are without official standing. It seems obvious, though, that any country for which GDP (or indeed, the consequent coal consumption) might be revised down in future must then be matched by revising another country up. Otherwise the already-approved regional GDP totals (or the end-point of the analysis - GHG emissions) would surely change.

Climate change made easy – it’s the Sun

by Bob Foster

SUMMARY

8 November 2004

Consensus is not science, but politics; and the advancement of scientific understanding is not a matter of voting. The scientific consensus invoking a stable pre-industrial climate, disturbed only now by human intervention, is nonsense. Scientists seeking to regain the (imaginary) stability of those halcyon days must first stabilise the Sun.

The 300-year warming trend since the Maunder Minimum has followed the Sun, because its energetic eruptions drive our ever-changing climate. Global warming occurs at times of increasing solar activity; and the resulting magnetically-modulated reduction in Earth’s cloudiness leads to reduced reflectance, increased penetration of the Sun’s little-varying irradiance, and more solar heat reaching Earth’s surface. Calculated eruptive variability matches climatic history during the Mediaeval Maximum and subsequent Little Ice Age; and since 1940, the Sun has been more active than at any time in the past millennium. Similar calculation predicts the Landscheidt Minimum at 2030.

The Global Climate Shift of 1976/7 is the most influential climatic event for 50 years; and is the latest warming step in a 60-yr warm/cold cycle overprinted on the longer-term warming trend. The last cooling step was in the 1940s; and both are associated with vast changes in upwelling quantity of cold, deep water in the equatorial eastern Pacific. While oceanic heat transportation and its variability are “redistribution” not “warming”, the consequent changes in sea-surface temperature drive global climate on decadal scales. At the intra-decadal level, El Niño/La Niña upwelling events in the Pacific influence climate in similar fashion. All involve exchange of angular momentum between stony Earth and its fluid overcoat of oceans and atmosphere. These are inertial events, as confirmed by changes in Earth’s rotation rate. Humans can’t do that.

The *Summary for Policymakers* of IPCC’s *Third Assessment Report* volume “Climate Change 2001: the scientific basis” ignores two prominent clues: variable eruptive activity on the Sun, and variable length-of-day on Earth. IPCC’s *Summary* forsakes science in favour of catastrophism; in particular, it:

- * Portrays (Figure 1b) a stable pre-industrial climate during 1000-1900AD – despite hundreds of peer-reviewed papers to the contrary in reputable scientific journals.
- * Opines “it is likely that the 1990s have been the warmest decade and 1998 the warmest year of the millennium”. This guess may be right, but no-one has the detail to know.
- * Asserts that “most of the warming observed over the past 50 years is attributable to human activities”. But 2/3 of the 20th Century’s 0.6 °C rise was in the first half, thus anticipating the fuel-use supposed to be its cause. This absence of coherence in timing is convincing empirical disproof of IPCC’s greenhouse hypothesis.
- * Makes (Figure 4a) “natural forcings” higher in 1860-80 than in the latest 50 years. Thus, more than all the 20th Century warming must be anthropogenic - and without the uncaring profligacy of we humans, Earth would be cooler and better now than in 1880. Wrong! Solar activity has been greater since 1940 than at any time since 6000BC.

* Projects warming of 1.4-5.8 °C by 2100AD, based on sequential dubious assumptions about: economic growth; resultant emissions of carbon dioxide (the principal human-caused greenhouse gas); mean atmospheric residence time for the CO₂; and finally, the sensitivity of global climate to increasing CO₂ concentration.

IPCC's high-end case has CO₂ growing from 380 now to an amazing 970 ppm by 2100 = 5.8 °C warming. Not implausibly, it has US per-capita GDP growing x5, from 22 in the 1990 base year to 114 in 2100 (all in 1990 US\$ thousands); but it grants LDCs an almost-unimaginable average of x65. Last century, the Japanese economic miracle was x20; no others came close. IPCC favours South Africa - the most carbon-intensive economy (coal 76% of primary energy use) - with x170 from 2.8 to 474; and awards China/India (also carbon-intensive - coal 68/54%) a healthy x240/120. From such hats it pulled its CO₂ rabbit; an average annual increase of 1 1/2 since 1960, becomes 6 ppm from now on.

IPCC's authoritative-sounding analysis is worthless as a guide to policymakers; but it has triggered a blizzard of ill-founded assertion by mainstream opinion-formers:

- * "We can defeat climate change if we want to." (British PM Tony Blair.)
- * "Climate change is the greatest threat facing the planet today ... billions of the world's poorest and most vulnerable will be killed without urgent action." (Greenpeace UK.)
- * "Global warming is causing the corals of the Great Barrier Reef to bleach and die. The only hope we have ... lies in massively reducing heat-trapping emissions and stabilizing the earth's climate within two degrees Celsius of pre-industrial levels." (Professor Ove Hoegh-Guldberg, for WWF Australia and Queensland Tourism Industry Council.)
- * "Australia's political leaders must work with business and the community to take immediate action to cut our greenhouse gas emissions by 60% by 2050." (*Climate Change: Solutions for Australia*, for WWF Australia and Insurance Australia Group.)
- * "The science is no longer an issue. How best and soonest to stabilize the climate is the new debate." (Cameron Burns at Amory Lovins' Rocky Mountain Institute, USA.)
- * "Antarctica is likely to be the world's only habitable continent by the end of this century if global warming remains unchecked." (Sir David King, UK Chief Scientist.)
- * "There is a broad consensus among climate scientists that humankind must urgently develop legal, institutional and financial mechanisms for regulating climate". (Georgii Alexandrov, Academician at the Institute of Atmospheric Physics, Moscow.)

Why not reduce CO₂ pollution anyway? Because this gas is no 'pollutant', but a natural atmospheric constituent and vital plant food. Its concentration in the early Cenozoic was x5 that of now, and many of our land-plant families evolved in a high-CO₂ environment. Commercial growers enrich greenhouses with it, so vegetables grow better; and satellite observations during 24 years of atmospheric CO₂ increase see continental greening.

The mainstream offers a bogus choice: decarbonise the global economy ("decarbonise" means impoverish), or face climatic retribution - only by giving alms to the greenhouse industry shall we be saved. But the intangible, distant, and global nature of 'greenhouse catastrophe' enables policymakers to ignore irreversible regional and local environmental threats. Genuine current threats will remain unaddressed for so long as the growing army of greenhouse rent-seekers controls the green agenda.