

How Big Can Global Carbon Markets Get?

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I begin with a disclaimer.

My disclaimer is the same as Nicholas Stern's when last month he addressed the National Press Club in Canberra. Stern then declared he was not a scientist but then proceeded not only to accept the so-called consensus but to use it to call for urgent policy action globally to reduce CO₂ emissions.¹ As (like Stern) a former senior Treasury officer, I also declare that I am not a scientist but, by contrast, I take a position similar to the Dual Critique of the Stern Review by 14 well-qualified scientists and economists. Their conclusion was that the Review is "flawed to a degree that makes it unsuitable ... for use in setting policy".² I also agree with the not dissimilar conclusion on the IPCC's February report³ by ten qualified economists and scientists, including Australian meteorologist, William Kininmouth, in a February 2007 publication by Canada's Fraser Institute.⁴

One reason for my view is related to that given in the CSIRO's 2001 publication on Climate Change Projections for Australia. It was there correctly acknowledged that, as projections based on results from computer models "involve simplifications of real physical processes that are not fully understood", no responsibility can be inferred for conclusions reliant on the results.⁵ This gels with my experience of formulating policies in the world of economic modelling. That taught me that modelling of possible outcomes reflect assumptions that are not necessarily correct about the weightings given to possible influences, or about the simplifications of highly complex human relationships. My analyses of past scientific predictions also suggest to me that, when looking to the future, science faces modelling problems similar to economics and has made as many if not more erroneous predictions.⁶

¹ In the opening sentence of the Executive Summary of the Stern Review: The Economics of Climate Change, 30 October 2006 it is asserted that "The scientific evidence is now overwhelming: climate change presents very serious global risks, and it demands an urgent global response".

² "The Stern Review: A Dual Critique", World Economics, Vol 7, No 4, p168, October-December 2006.

³ Climate Change 2007: The Physical Science Basis, Summary for Policymakers, approved at the 10th Session of Working Group 1 of the IPCC, Paris, February 2007. IPCC Secretariat, Geneva.

⁴ Titled: "Independent Summary for Policymakers". Some of the authors of this publication also signed the 10 January letter by 61 prominent international scientists calling on the Canadian Prime Minister to hold public-consultation sessions "to examine the scientific foundation of the federal government's climate-change plans" and noting that "observational evidence does not support today's computer climate models, so there is little reason to trust predictions of the future".

⁵ "Climate Change Projections for Australia", CSIRO 2001, Disclaimer p8. This disclaimer was repeated in a similar publication in 2002 but seems subsequently to have disappeared and been replaced by claims of improvements in models.

⁶ In "What is the Greatest Threat – Global Warming or Terrorism?" I briefly outline some of these on pp 2-3 www.ipe.net.au

But what you may ask has this got to do with assessing the possible size of the global carbon market?

Quite a lot, I suggest. If there is uncertainty about the underlying analysis behind the IPCC type predictions of increased temperatures, and the associated causes of recent global warmings and what action governments might take in response, that is likely to make sensible individual governments cautious about the severity of policies adopted to reduce emissions. I mentioned one or two groups who disown the claimed consensus but there are many other groups and individuals, both in Australia and overseas, who express varying degrees of uncertainty about either the scientific or the economic analysis – or both.

Amongst those is our highly respected Productivity Commission. In the Commission's Key Points of its recent submission on Emissions Trading it stated the following:

"There is a growing consensus that the anthropogenic contribution to climate change could pose serious risks to future generations and that coordinated action is needed to manage these risks. However, uncertainty continues to pervade the science and geopolitics and, notwithstanding the Stern Review, the economics. This is leading to divergent views about when and how much abatement effort should be undertaken".⁷

Another example comes from New Zealand where the Executive Director of the Business Roundtable made the following statement accompanying the BR's submission in response to discussion documents issued by that country's government:

"New Zealand should move cautiously and in line with key trading partners ... It should not proceed with ill-considered actions that could involve large costs for firms and households, seriously damage the New Zealand economy, and have no discernible impact on global warming".⁸

These and other analyses raise a question as to whether the conclusion reached by the IPCC in its February presentation of The Physical Science Basis does actually provide a satisfactory basis for *major* policy action to reduce emissions. That body then concluded that it is 90 per cent certain that *most* of the recent warming is due to increased human activity. However, as two Australian economists have pointed out, 90 per cent certainty is the weakest acceptable level of confidence in a hypothesis test.⁹ Moreover, the Summary for Policy Makers published by the IPCC on 6 April

⁷ "Submission to the Prime Ministerial Task Group on Emissions Trading", Productivity Commission, March 2007. In the Key Points the Commission also says "Independent action by Australia to substantially reduce GHG emissions, in itself, would deliver barely discernible climate benefits, but could be nationally very costly. Such action would therefore need to rest on other rationales".

– Facilitating transition to an impending lower emissions economy is the strongest rationale for independent action, but it is contingent on the imminent emergence of an extensive international response".

⁸ Business Roundtable Media Release, 30 March 2007.

⁹ In "Certainty Clouds the IPCC" in the latest IPA Review two economists, Sinclair Davidson and Alex Robson, point out that, statistically, 90 per cent is the weakest acceptable level of confidence in a hypothesis test. The IPCC report itself indicates (footnote 6 on page 4) that there are two higher

claims only an 80 per cent chance that warming has caused many of the perceived adverse environmental affects.¹⁰

Caution about policy action is enhanced to the extent there is a wide range of possible temperature outcomes and/or of costs of mitigation or business as usual policies. For example, Stern claims a mitigation cost of only 1 per cent of GDP a year for reducing emissions by 60-90 per cent in industrial countries by 2050. That estimate is derived, however, as an average of “most” of the estimates stated to be “clustered in the range of -2% of GDP to 5% of GDP”.¹¹ But it is also stated that estimates outside this cluster range from - 4% to +15% of GDP. Perhaps times have changed but when I was in Treasury an average derived from such a wide range of possibilities would have provided only limited confidence for recommending major policy action. There are similar reservations about Stern’s claim that business as usual would cost 5-20 per cent of GDP a year.¹²

Individual governments will be additionally cautious if there is doubt about support by major emitting countries for policy reducing measures. At present there is no sign of developing countries joining the emission-reducers league in any substantive way. On a business as usual basis emissions of CO₂ by China and India alone are projected to increase from 18 per cent of the world total in 2003 to about 30 per cent by 2030¹³ and, surprisingly in view of his advocacy of urgent global action, Stern himself appears readily to accept that those two countries are unlikely to adopt a national cap on emissions before 2020.¹⁴ With emissions of CO₂ by all non-OECD countries projected to increase from 48 per cent of the world total in 2003 to 60 per cent in 2030¹⁵, individual governments have every reason to proceed cautiously unless a global agreement emerges.

ratings. Davidson and Robson also raise major questions about how even the 90 per cent assessment was reached.

¹⁰ “Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability”, pp 2-3. As regards the causes of warming, this report simply repeats the conclusion of Working Group 1. As with the February report, the full report of this Working Group 11 was not released with the Summary. Working Group 111 is also still to report on Mitigation and a Synthesis report is scheduled for December.

¹¹ Op Cit, p xv.

¹² Even leaving aside whether the underlying basis of calculating that range of possible GDP costs is appropriate (about which there must be serious questions), the discounting of that cost by only 2 per cent effectively shifts a major part of the cost away from the next generation when it would be much better placed economically to deal with it.

¹³ International Energy Outlook 2006, Table A10, Energy Information Administration (Official Energy Statistics from the US Government (www.eia.doe.gov/oiaf/ieo/ieorefcase.html)). These are emissions of CO₂ itself not of CO₂ carbon equivalent. In the US case, the emission data include CO₂ emissions attributable to renewable energy sources.

¹⁴ “Green Guru says cuts won’t hurt”, AFR 28 March 2007. One report about Stern’s attitude is that he suggests that China in particular is dealing with the problem through use of more efficient energy production and resulting reductions in energy use per unit of output. However, improvements in energy efficiency, which are happening world-wide, do not reduce total output (and may increase it). More generally, Stern seems to take the view that, as the cost of mitigation is only 1 per cent of GDP, developed countries can afford to proceed with emission reductions but developing countries should be allowed to catch up economically. But, if the cost is so low, fast growing developing countries such as China and India could still catch up if they adopted mitigation measures costing 1 per cent of GDP. Stern’s attitude on this seems to contradict his general call for urgent action.

¹⁵ If South Korea and Mexico are counted as non-OECD countries (on the basis that they are not Annex 1 countries under the United Nations Framework Convention on Climate Change), those countries would account for 64 per cent of CO₂ emissions in 2030.

CO₂ produced in developing countries can, of course, still be part of a carbon trading market if businesses in developed countries invest either directly or indirectly in developing countries in ways that make them eligible for obtaining carbon credits. However, the scope for genuine trade-offs of such a nature seems relatively limited unless developing countries set emission limits themselves. Media reports of increased carbon-trading with developing countries such as China and India suggest that a significant proportion of the credits currently being obtained may involve emission reductions that are either limited or that relate to more energy efficient investment that represents current state of the art technology.¹⁶

Even so, the availability of such trading for Australian businesses – and of potential trading with businesses in countries that operate trading systems – does raise the question of whether Australia itself actually needs an officially organised trading market. The setting of official emission limits for certain Australian businesses would quickly lead financial institutions to develop the market without official involvement. Indeed, the adoption by some businesses of carbon neutral policies in Australia is already involving purchases of carbon credits overseas.

Doubts over the possible extent of policy action by the United States are also relevant to policy determinations by individual developed countries such as Australia. Although recent changes in the United States political and judicial situations foreshadow more politically serious attempts to reduce emissions in that country, it must remain doubtful that the US will move in the foreseeable future to an actual *carbon-withdrawal* position.

A major component of any emission reduction program for the US (and for countries such as Australia and Canada) would likely involve the replacement of coal burning electricity power stations with nuclear power that could double electricity costs and would presumably need to be spread over a considerable period of time. Taking account of such possible adjustment processes, if the US about halved the current BAU projected rate of growth (1.1% pa) of CO₂ emissions over the period to 2030, it would then still be the second biggest emitter (after China) and emissions by non-OECD countries plus the US would have increased by 87 per cent since 2003.

One projection of the outlook for total world emissions to 2030 might arguably be to assume that OECD Europe would by then have *cut* its emissions of CO₂ by 30 per cent (compared with 1990), that developing countries would *continue on a BAU*, and that OECD North America and OECD Asia would have *halved their current projected rates of growth*. In that event the world total in 2030 would still be over 50 per cent higher than in 2003.

All this suggests that, for international competitiveness reasons alone, most individual countries which decide to adopt or further pursue policies to reduce their own emissions are likely to set any overall targets at relatively low levels and increase them slowly over a period.¹⁷ The Productivity Commission has specified this and

¹⁶ In his “Cleaning Up in the Carbon Game” (AFR 10 April), Stephen Wyatt suggests the carbon trade with China is exposing some serious flaws in the Kyoto Clean Development Mechanism under which such trade is taking place. Wyatt notes that the Stern report is highly critical of the CDM.

¹⁷ Countries where energy supplies already come importantly from nuclear power are, however, more likely to set relatively high targets for reducing fossil fuel use as the use of such fuel is relatively much

other reasons for adopting such an approach¹⁸ and the terms of reference of the joint government-business Task Group state specifically that, in assessing Australia's further contribution to reducing greenhouse gas emissions, Australia's "major competitive advantage through the possession of large reserves of fossil fuels and uranium ... must be preserved".¹⁹ If this is the case it will be another reason for expecting the potential size of any carbon market to be limited. In this context, the announcement of targets set to be reached in say 2050, such as the 60 per cent reduction postulated by Stern and others, seem largely irrelevant. The issue that existing political leaders have to face is what targets might be set now and over the next few years because they will determine reactions from the electorate.

Possible adverse electorate reactions to higher electricity and petrol prices may also limit the overt use of carbon pricing through either trading or higher taxes. Notwithstanding advice from economists that market pricing of carbon is a more efficient method of reducing emissions, governments may well decide to obtain a significant proportion of such reductions by further increasing subsidies for renewables through government budgets. That would in turn also limit the size of any carbon trading market. However, if experience with wind power is any guide, the cost of such subsidies is likely to be substantial.

A further reason for expecting limited carbon trading, at least initially, is that if the reduction target is set too high, there will be nobody who would want to sell any credits, and lots of firms who would want to buy. That means that the permit price (effectively an indirect carbon tax)²⁰ would settle at a very high level, and many firms would simply shut down.

The European Union realized this and the limits they initially set on emissions turned out to be higher than actual emissions, effectively creating a lot of carbon credits for businesses with emissions below the set limit. However, although this created a market, it caused the initial price to fall to such a low level that it would not have induced the affected businesses to adopt emission-reducing technology.²¹ While tighter limits have now been set for next year, the consequent jump in the forward price has led to many complaints from adversely affected businesses.²² This illustrates the difficulty all governments face in trying to establish an artificial market that sets a

smaller. The UK, for example, which derives about a fifth of its energy from nuclear power, has announced a target of cutting emissions by 30 per cent by 2020.

¹⁸ Op cit, p39.

¹⁹ Terms of Reference for the Task Group on Emissions Trading announced by the Prime Minister on 10 December 2006.

²⁰ As the permit price is effectively a tax, the economic cost (deadweight loss) is proportional to the "square" of the price.

²¹ In such circumstances the businesses may also be more able to pass on to consumers the tax they are effectively paying without significantly reducing demand for their product.

²² For an analysis of some of the problems, see "Europe's Problems Color US Plans To Curb Carbon Gas" by Steven Mufson, The Washington Post, 9 April 2007. According to Mufson, US officials and politicians examining possible legislative emission limits in the US are examining how they might learn from Europe's mistakes. Open Europe, an independent think-tank established by some UK businesses, has issued an analysis, entitled "The high price of hot air: Why the EU Emissions Trading Scheme is an environmental and economic failure", suggesting that the system has a number of serious problems and that it has effectively functioned as a tax on power stations which has then been handed on to consumers in the form of higher energy prices. It suggests it would be better to have a tax on energy.

carbon price that allows businesses time to adjust and at the same time encourages them to do so.

A further significant difficulty is the problem of determining what actually constitutes a genuine reduction in emissions and/or a carbon credit and what institutional process would exist for certifying claims in that regard. The obvious scope for cheating could itself limit the resort to an international trading scheme.

Overall, then, my assessment is that the various difficulties involved, not least being measurement and certification, make it unlikely that an international emissions trading scheme can be developed and that such trading as does develop is likely to be small and to play a limited role in any policy actions taken to reduce emissions. The difficulties involved in trying to achieve major emission reductions through a carbon trading system suggest that other approaches are likely to be adopted.

These could include the imposition of higher taxes on emissions which, the Productivity Commission suggests, “could provide advantages in terms of ...simplicity of administration and compliance ...more flexible dynamic properties ... reduced incentives for regulatory gaming ... and little concern about sovereign risk”.²³ Indeed, given that any emission reduction program necessarily involves government intervention to deal with perceived market failure, there is much to be said for requiring governments to accept direct responsibility for the pricing of carbon emissions, including which types of emissions that should be targeted.

I have already suggested that there is uncertainty about the science and economics behind temperature predictions and about the costs of mitigation and business as usual. Let me conclude by briefly mentioning some of the more important points that contribute to that uncertainty.

First, although there has been an increase in average global temperatures of about 0.6 a degree over the past 100 years, historical evidence suggests that temperature levels have been as high if not higher in periods in the past and that this did not then have adverse effects on societies. Indeed, rather to the contrary: significant economic and other advances seem to have occurred in past warm periods.²⁴

Second, contrary to Gore mythology, scientific records actually suggest that the overall size of the ice sheets of Antarctica and Greenland is, if anything, stable. Further, any warming of the Arctic would have no significant effect on sea levels as, unlike the other two, the sea ice is already floating.

²³ Op cit, p40.

²⁴ In the so-called Medieval Warm Period (roughly, 800-1,100 AD), the Norsemen were growing crops and grazing cattle in what they then accurately called Greenland. In the Roman Warm period (from 250 to 0 BC) grapes were planted and wine produced in Scotland – doubtless before the Scots were “forced” to drink whisky! A report in the New York Times on 13 March 2007 (“From a Rapt Audience, a Call to Col the Hype”) stated that, in an address to a ‘crowded’ US Geological Society meeting in October 2006, an emeritus Professor of Geology, Dr Don. J. Easterbrook, identified ten past periods that have experienced swings in temperature that were 20 times greater than the warming over the past century. This provides a marked contrast with various alarmist predictions of adverse effects from temperature increases.

Third, although carbon dioxide emissions have grown strongly since the 1960s as industrialization and economic growth generally have spread around the globe, since the mid-nineteenth century there appears to be little or no direct connection between emission and temperature increases (see attached graph on Fossil-Fuel vs Temperature).²⁵ Thus:

- Even though the world experienced probably its fastest rate of economic growth ever between 1940 and 1975, average temperatures then fell slightly²⁶, contributing at the time to predictions of an imminent ice age by some scientists;²⁷
- Recent scientific analyses (including by acknowledged leading meteorological scientist, Professor Richard Lindzen of MIT)²⁸ suggest that any warming effect from carbon dioxide emissions *diminishes* progressively and that this is already happening to a significant extent ;
- Authoritative scientists interviewed in the “The Great Global Warming Swindle” film point out that historical analyses of ice cores show that past temperature increases *preceded* increases in carbon dioxide by 800 years or so;
- A number of leading scientists have pointed out that variations in sunspot activity are closely co-related with variations in temperature²⁹ and that the sun, in recent years, has been more active than for several centuries (see attached graph showing the variations in temperature –in black – and variations in the length of the solar cycle).

Fourth, the claim that there is a “scientific consensus” on human activity being the principal cause of global warming has no credibility.³⁰ In addition to the authoritative

²⁵ By contrast, the February 2007 report of the IPCC focuses on the last 50-60 years and asserts that “most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations”.

²⁶ Those scientists who are global warming believers argue that there were temporary influences in the atmosphere, such as aerosols, that stopped or reduced the warming. However, there is dispute as to the extent, if any, of such influences.

²⁷ Including one, Dr Stephen Schneider, who switched with remarkable success from predictions of an ice age to that of a prominent global warming protagonist.

²⁸ In an article entitled “There’s No Such Thing As a Perfect Temperature” in Newsweek (April 16, 2007), Professor Lindzen poses the question of why temperatures aren’t higher given the increase that has occurred in CO₂ emissions. He points out that “researchers have been unable to explain” why warming has (only) “largely occurred during the periods from 1919 to 1940 and from 1976 to 1998”.

²⁹ This is based on analyses by several scientists and covers analyses extending over varying periods of time. Of particular interest, however, is the account by a Dr Corbyn of his use of variations in sunspot activity to make better predictions of the weather in recent years than the British Meteorological Office. It should be noted that one scientist interviewed in this film, Professor Carl Wunsch of MIT, has claimed subsequently that his views were taken out of context and their meaning distorted. However, an analysis by Lawrence Solomon of the Toronto National Post (14 March 2007) of what Wunsch *actually* said suggests that he was not misrepresented in the film to any significant extent. Such claims of misrepresentation have, of course, also been made by scientists who have contributed to IPCC reports.

³⁰ The very idea of a scientific consensus runs counter to the intrinsic basis of scientific analysis, which should be prepared to examine and test possible different explanations of changes in climate or other

dissenting scientists and economist already mentioned, dissenters include those interviewed in the Swindle film – at least 15 on my count – and those participating in sixteen in-depth interviews by a senior Canadian journalist with prominent scientists with varying degrees of dissenting opinions.³¹ Although a little dated, it is worth recalling that in 1998 over 17,000 scientists signed a petition in the US declaring that “there is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gases is causing or will, in the foreseeable future, cause catastrophic heating of the Earth’s atmosphere and disruption of the Earth’s climate”.³²

Fifth, even if it is judged that we should accept the possibility that human activity *might* be a major contributor to temperature increases, the serious questions and lack of agreement amongst scientist (and others) should rule out the adoption by governments of urgent and dramatic action to reduce emissions. The reality is that the certainty thesis has no substantive basis³³. Even if increases in temperature were to continue at about the same rate as in the past century, the normal operations of market economies and governments should be able to handle problems that might emerge.

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matters influencing the environment in which humans live. Over time many consensuses that have been thought to exist have disappeared.

³¹ “The Deniers” by Lawrence Solomon, National Post, Canada.

(<http://www.canada.com/nationalpost/news/story.html?id=c6a32614-f906-4597-993>)

³² Initiated by the then immediate past President of the US National Academy of Sciences, Professor Frederick Seitz.

³³ The argument that increased certainty reflects improved modelling cuts no ice: the outcomes from models are only as good as the weightings given by the modellers to the various possible influences. As pointed out by one of the scientists in the Swindle film, all the models used by the IPCC *assume* human influence (but presumably to differing extents). However, if the modelling has improved so much why is there a need to use so many different models, why do they all produce different results, and why do they all have to be tuned (ie adjusted) to make them more “realistic”?

Fossil Fuel vs Temperature

