The Political Economy of Climate Change Science

A Discernible Human Influence on Climate Documents?

by Roger Bate

Summary

Global warming is a political issue. Information provided by scientists is used to inform policy. Decisions about whether and how to act are taken in the public arena. Such decisions are political; they are subject to the pressures of international diplomacy and the democratic process. Public choice theory recognises that participants in this process cannot help but bring with them their own, private aims and incentives. This is an unavoidable, but not unassailable, problem, except when it is forgotten; when it is assumed that political action is altruistic. In this way, policies have been adopted in the name of averting damage to the planet from global warming, which will not have the desired effect, even if society complies fully, because the aims of those influencing and deciding policy were not those stated.

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Series Foreword

The Environment Unit Briefing Papers focus on contemporary policy issues. Because of their nature, these papers are subject to a less rigorous peer review and editorial procedure than are papers in the Studies in the Environment series. As with all Environment Unit publications, the views expressed in this paper are those of the author, not of the Unit itself, which has no view as such.

Foreword

In this first Environment Unit Briefing Paper, Roger Bate shows how and why sound science has been crowded out of the global warming debate. This is an extremely disturbing problem because policies based upon unsound science may cause more harm than good. Consider the consequences of a policy designed to reduce human emissions of greenhouse gases. This would almost certainly require a significant reduction in the consumption of fossil fuel, which, in turn, would mean a significant increase in the prices of the most carbonous fuels, coal and oil. Such a policy would harm the world's poor - both directly, because of increases in the cost of heating and transport, and indirectly, because many energy-intensive firms would go out of business, thereby increasing the ranks of the unemployed. In contrast, the wealthy elite would isolate themselves from the effects of any such policy by acquiring the support of the state, through subsidies and regulation.

Some economists have argued that action should be taken regardless of the uncertainties, the *terra infirma*, of the science of climate change. The precautionary principle inveighs against taking actions now which might harm future generations. Invoking this principle here, it could be argued that until the scientific evidence suggests that the harm to future generations caused by man-made global climate change would be greater than the harm to future generations caused by policies which reduce emissions of greenhouse gases, such policies should not be enacted. Indeed, as Roger Bate argues, the only

political actions which are justified are those which would be economically sound in and of themselves, such as eliminating the subsidies to fossil fuel extraction and consumption. Ironically, however, these may be the most difficult policies to enact because the groups they affect are politically powerful.

Julian Morris

Introduction

This briefing paper analyses the behaviour of the various participants in the global warming debate within the context of public choice theory.

The most important idea in public choice theory is that individuals act in their own interest, whether in the public arena or as private consumers[1]. This is contrary to the conventional wisdom that political actors change moral hats between work and private life; that public servants apply their professional training and expertise in the public interest, not in their own; that government works on behalf of the people, for the people.

Public choice theorists argue that this view is naïve. Evidence suggests that most people, most of the time, find it impossible to act against their own interests for a sustained period. Although one's self interest may include family interests and even the interests of one's community, it rarely goes any further. As Mitchell and Simmons conclude: "People may join civic organisations, churches, youth sports programs, or even run for local elected office out of a sense of community, but there is little evidence that a sense of community is what drives political participation outside the local community. There is, however, strong evidence that much political participation is based on a calculation of personal advantage" (1994, pp.24-5).[2]

Public choice theory takes as the basic unit of analysis the individual and the incentives he faces. Unlike much of political science it does not assume that organisations, especially governments, can be treated as having special social mores. So, when the media reports that "the government attempted to implement global warming measures by imposing taxation on fuel", readers should be aware that what is really meant is that an individual or group of individuals made a particular decision. Neither governments nor nations think.[3]

A typical public choice model of political decision-making divides society into four groups: voters, politicians, bureaucrats and interest groups. All these actors are assumed to want something from the system: voters want better government; politicians want votes; bureaucrats want job security and enlarged budgets; interest groups want transfer payments. On any issue, all parties to the bargaining process (in this case in the global warming process) are likely to have both shared and competing interests.

Politicians, bureaucrats and interest groups tend to be better informed on politically relevant issues than do voters because the potential benefits of holding this information are greater for those who are likely to gain or lose directly from a change in policy. Clearly, the cost to the ordinary voter of obtaining accurate and relevant information on the panoply of policy issues that exist is greater than the benefits that might accrue to him or her. Thus, voters remain "rationally ignorant" of much of the political process. As a result, the benefits of the political process tend to accrue primarily to politicians, bureaucrats and certain interest groups, whilst costs are dispersed amongst the much larger, but less well informed and less well organised voting public. Since these concentrated benefits are worth fighting for, articulate, well informed interest groups dominate the policy arena, receiving political favours.

Climate Interest Groups

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[1] This concept is far from new, but rigorous analysis began with Professor James Buchanan who received the Nobel prize for economics in 1986 for his work on public choice. See Buchanan, J and Tullock G, (1962). There was significant early work by many political theorists such as Downs and Black, which there is no room to discuss here.

[2] This may appear a cynical analytical technique, but I contend that it explains the actions of various groups in the climate change debate.

[3] "The higher the political and economic stakes in international negotiations, the more likely are **nations to think** and act in terms of relative gains and losses", Leiv Lunde in Grubb and Anderson (1995) "Greenhouse burden-sharing after Berlin: economic ideals and political realities" (p. 52) (my emphasis).

"In the context of the FCCC process, as in general in the arena of international relations, independent, **selfish nations pursue their own self-interest** without the aid of a central authority to force them to co-operate with each other", Pascale D. Morand-Francis in Grubb and Anderson (1995) "Lateral thinking and common measures" (p.68) (my emphasis).

The sheer number and diversity of interest groups leads one to suspect that, despite their rhetoric or initial good intentions, many groups "form for the sole purpose of increasing their members' welfare and will strive to do so knowing full well that it comes at a cost to others. Because billions ... can be redistributed, interest groups are only too willing to make political investments of a substantial magnitude.... And although interest groups work on behalf of their members, their staffs have even greater interests to advance – their own" (Mitchell & Simmons p.62).

The result is a political process in which individuals rationally pursue their own ends within an institutional setting that is riddled with perverse incentives. Hence, politicians "find it highly rational to engage in obfuscation, play-acting, myth-making,[4] ritual, the suppression and distortion of information, stimulation of hatred and envy, and the promotion of excessive hopes" (op cit. pp.63-4)[5].

In as much as the emission of carbon dioxide is linked to climate change (and this is still a contentious issue), it affects everyone on the planet, however most individuals are not, nor can they be, directly involved in the policy debate.[6] Many individuals and groups have a direct interest in the debate: companies which produce large quantities of CO_2 and are obviously concerned that they may be regulated or taxed out of existence; companies, such as those in the insurance and banking sectors, which might be adversely affected if the world's climate became more volatile; companies, such as those in the transport sector, which would be adversely affected by an increase in the cost of energy; organisations whose entire *raison d'être* is to lobby for increased protection of the natural environment; and, finally, individuals and groups with less overt incentives, including scientists, science-led bureaucracies and political entrepreneurs. These last actors have often received a less critical press than have those with more overt interests, so their influence is likely to be proportionally more significant. In part, this paper seeks to redress the balance by bringing a critical eye to the activities of the climate scientists and their support systems. However, to begin, a more detailed analysis of the activities and incentives of the various groups is offered.

Business Interests

At first sight, the incentives of the energy converters and related industries may appear obvious. They are seen as being the cause of the majority of CO_2 emissions, so their 'first best' strategy is to argue against any restriction of emissions, since such a restriction would almost certainly lead to a reduction in profits,[7] (and profits, after all, are the *raison d'être* of any industrial concern). Thus, everything about this group appears to be manifest. However, the incentives of shareholders often diverge from those of the employees. Shareholders clearly care for little else than the profitability of a firm, whilst managers may be more interested in job security, corporate advancement, empire building and the type of company car they drive. However, individuals' actions will be constrained by the company's legal obligation to the shareholders.

Companies are also accountable for their actions in other respects. For example, when a company makes an exaggerated claim, the adverse publicity generated may reduce its credibility in the eyes of the consumer and thereby lead to a fall in sales. Moreover, false claims may lead to expensive litigation. Companies are, therefore, generally careful of what they say and do.

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[4] German Environment Minister, Angela Merkel, alarmingly stated in her opening speech at the Berlin Conference 1995: "The Greenhouse Effect is Capable of Destroying Humanity".

[5] A satirical explanation is given by David Friedman:

"Special interest politics is a simple game. A hundred people sit in a circle, each with his pocket full of pennies. A politician walks around the outside of the circle, taking a penny from each person. No one minds; who cares about a penny? When he has gotten all the way round the circle, the politician throws fifty cents down in front of one person, who is overjoyed at the unexpected windfall. The process is repeated, ending with a different person. After a hundred rounds, everyone is a hundred cents poorer, fifty cents richer, and happy. Friedman, D, (1989) The Machinery of Freedom, 2nd ed. (La Salle, Ill.: Open Court, p.107)

[6] Most voters remain rationally ignorant because they are unlikely to benefit from any policy on global warming, and the cost to them of any policy will be minor relative to their other concerns.

[7] However, this is not always the case. For example several large chemical companies gained from the phaseout of ozone depleting substances. These companies had near monopolies over the replacement chemicals and gained significant profits from the sales of the new products and the temporary increase in price of the old ones before their use was banned.

Environmental Interests

The explicit agenda of any business is to make money, whereas the explicit agenda of any environmental pressure group is to 'save the planet'. Perhaps this is why opinion surveys suggest that the public is more inclined to believe scientists from environmental groups than scientists from business.[8] However, just as the incentives of the owners and managers of a conventional firm typically diverge as the firm expands, the incentives of the managers and supporters of an environmental organisation often diverge from one another as that organisation grows. Indeed, the incentives of the managers of environmental organisations are often difficult to differentiate from those of conventional businesses: the emphasis being placed firmly on raising revenue and expanding individual departments, with little interest being taken in the actual environmental impact of any policy demanded by the organisation.

Moreover, in many respects environmental groups are less accountable to their members than are companies to their shareholders. This is because, whilst the shareholder is able to observe with some degree of accuracy the relative profitability of a conventional company, the supporter of an environmental organisation has no objective criterion by which to gauge its success. Thus, environmental organisations are able to benefit from making irrefutable claims, without the attendant costs that might be borne by a company which, for example, misled its shareholders about the expected size of future profits[9]. Having said this, most environmental organisations probably have honest and earnest missions. Nevertheless, most will provide misleading information 'if the ends justify the means'.

Bureaucratic And Political Interests

Lobbying for international environmental agreements has become an attractive option to many groups, especially those for whom access to the national political bargaining process has been obstructed by the dominance of certain entrenched interest groups and by the voluminous extant statute book. By contrast, the international political arena is a virtual *tabula rasa*.

Whilst it is the politicians who sponsor a new international treaty or convention who enjoy the spotlight, it is the people within the signatory nations who must bear the cost of implementing that treaty. And whilst politicians may come and go, international treaties and their accompanying institutions are never so transient - their costs being spread across the reign of many governments. Moreover, as Boehmer-Christiansen (1996) shows, 'environmental protection' is beginning to overtake security as the dominant occupation of the international bureaucracy.

At the Berlin Conference of the Parties to the United Nations Framework Convention on Climate Change (COP1) in April 1995 (the first intergovernmental meeting on climate change since the Rio summit in 1992), no new commitments were agreed. However, the 'Berlin Mandate' that was adopted[10] will lead to an increase in the size of the climate change bureaucracy. Clearly, bureaucrats at international agencies have an incentive to encourage the collection and dissemination of evidence which supports the claim that action to combat climate change is required, since this is likely to result in an increase in the extent of their responsibilities and, hence, their budgets and non-pecuniary benefits.

The extent of the bureaucrats' influence is difficult to determine, since they keep a low profile (compared to business and environmental interests). However, it is sometimes easier to see their interest manifest itself when the efficacy of any programme is up for evaluation, rather than when it is established. For example, The World Bank's Global Environment Facility (GEF) was originally due to cease functioning in 1994 but it has been granted a new lease of life as the interim funding agency (no

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[8] That doesn't mean they are well-informed or on a noble mission.

[9] The Brent Spar oil rig fiasco provides an interesting case study of where even when it was shown that Greenpeace had made a mistake it hardly suffered any lasting adverse publicity.

[10] The Berlin Mandate concluded that the UNFCCC commitments were "inadequate" and that in 1997 parties to the convention would set targets for emissions reductions of greenhouse gases. Crucially these targets would only be for ANNEX 1 (OECD) countries; there was no commitment required for the developing world for the years 2005 and up to 2020.

longer on probation) for the climate change secretariat.[11] The threat of its dissolution led to a fast and effectual defence by its beneficiaries: any UN delegate, who may have vaguely supported dissolution of the programme, would be surprised, and maybe even overwhelmed, by the defence and realise that, whilst he might have little to gain, he would have less to lose by changing his mind. Thus was the new role of the GEF assured - and so it marches on[12].

History has shown that old programmes rarely die, they merely adapt. In fact, as the GEF case demonstrates, they are often expanded as their beneficiaries devise new justifications for their existence and hence broaden their remit (see Sowell, 1995, Buchanan & Tullock, 1962 and Mitchell & Simmons, 1994 for examples). One could paint similar pictures for many of the projects undertaken by international environmental bureaucracies, whose incentives become more obvious as research is conducted.

The IPCC was founded by the United Nations Environment Programme (UNEP) and the World Meteorological Organisation (WMO). Both these organisations, like so many offshoots of the United Nations, continually search for new funding possibilities, always looking for new scientific theories to justify their actions. Of course, scientific theories come and go, so it is no surprise that the activities of UNEP and the WMO follow these fashions. The sometimes bizarre consequences of this *modus operandum* are exemplified by the dramatic shift in the opinion of WMO officials since 1975:

> "The cooling since 1940 has been large enough and consistent enough that it will not soon be reversed, and we are unlikely to quickly regain the 'very extraordinary period of warmth' that preceded it. Even this mild diagnosis can have 'fantastic implications' for present-day humanity" (*Science* editorial, March 1, 1975, quoting CC Wallen, then of the World Meteorological Organisation).

Environmental programmes are flourishing. Indeed, a hearty acronym soup has been cooked up over the past few years, with ingredients running the gamut of the alphabet, from ACYS (the Arctic Climate System Study) to WOCE (the World Ocean Circulation Experiment) via TOGA (Tropical Oceans and Global Atmosphere Programme)[13].

Science Interests

Much 'big science' requires vast sums of money, and competition for funding is intense. A high profile and apparent policy relevance help in the scramble for funds; 'climate change' has both. As a result of their success in capturing funding, the careers of many climate scientists now depend on global warming. As one journalist put it, "Imagine that you have been toiling away at atmospheric physics for 30 years and suddenly along comes global warming. Next thing you know the United Nations is paying you hundreds of pounds a day to sit in Madrid sampling room service and appearing on *Newsnight.* Would you admit that the whole thing was nothing to worry about?" [14]

This analysis of the incentives faced by climate scientists and international bureaucrats is not meant to imply that the IPCC lead authors do not believe what they write or that officials at WMO and UNEP are not genuinely concerned that a climate apocalypse is upon us. Rather, it is simply intended to

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[11] This Secretariat is still located in Geneva, but is supposed to be moved to Bonn, to aid those bureaucrats who didn't want to move to Berlin with Germany's change of capital – at least that was the justification for housing it in Bonn.

[12] 90% of the desired funding for a Climate Change Secretariat was forthcoming. In addition two subsidiary bodies were formed: one for Scientific and Technological Advice (SBSTA), the other on Implementation (SBI). The SBSTA will be the main link between the scientific world and the Convention Process.

[13] The EC's Fourth Framework Programme on Research and Technological Development 1994-98 has a total value of 12.3bn ECUs. The Environment and Climate programme is worth 532m ECU over a five-year period. Climate Change is a big part of this. 47% is split between "Climate Change and impact on natural resources and, physics and chemistry of the atmosphere; biosphere processes and their effects. 7.5% goes to "the human dimensions of climate change" and "the purpose of this research is to investigate the interaction between social behaviour, economic behaviour and environmental change". Space studies including Earth Observation gets 20.5% of the budget.

[14] Ridley, M, Sunday Telegraph 10 Dec. 1995.

highlight that the way in which information is presented[15] and the research which receives governmental funding is likely to be influenced by these incentives[16].

Scientific or Political Review?

The credibility of the source of scientific information is important. Most commentators assume that scientific documents are based on science, not politics, and, hence, are objective. Often, this is not the case.

The IPCC is seen as providing a politically relevant consensus view. In part, this is because it relies upon a scientific peer-review process. Each chapter of its report is read, discussed, modified and approved by a panel of experts. The IPCC's reputation hangs on this critical approach and its adherence to strict governmental review procedures. However, the peer-review process has been perverted and the governmental review procedures have been flouted on many occasions.

In 1994, there was a meeting in Maastricht at which the final chapters of Scientific Assessment Working Group I were discussed. Before the meeting took place, the IPCC released a statement saying that the "scientific consensus established in 1990 still holds". However, by the time of the meeting the text of the report was not complete and the assembled scientists were asked to approve a summary. The implication was that the underlying science would be made to conform to the summary (the next section shows how prophetic this was).

The same 'scientific process' occurred at the IPCC Second Scientific Assessment meeting in Madrid in November 1995. The following month, a Climate Summit was convened in Rome to approve the synthesis report of all the different IPCC Working Groups. It was constantly rewritten under powerful lobbying and, again, approval for the summary documents was completed only after negotiations with government officials.

Perhaps the most telling comment about this whole process comes from an IPCC lead author:

> "We (the scientists) produce a draft, and then the policymakers go through it line by line and change the way its presented....They don't change the data, but the way it's represented. It is peculiar that they have the final say in what goes into a scientists' report." (Dr. Keith Shine of Reading University, Reuters, 20th December 1995.)

But if, as another lead author of the IPCC states, the Policy Makers' Summary (PMS) is a "painstakingly negotiated statement of what governments officially accept as a balanced account of the state of knowledge and reasoned judgement based on the chapters" (Michael Grubb, Nature 379, p. 108), then it should not be presented to the world as a scientific document.

Few journalists or policymakers have either the time or the inclination to wade through 2,000 pages of turgid prose. Recognising this, certain procedural rules have been developed in order to ensure that policymakers' summaries are consistent with the factual material contained in the full scientific and technical assessment report. In particular, such summaries must be subjected to "line-by-line approval". However, as the discussion above indicates, considerable debate has raged over the credibility of the

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[15] Commentators have noticed a tendency among impact practitioners to take a negative view of the effects of climate change. Models that predict a region may have more rainfall would be interpreted as more likely to have floods, and a dryer projection would lead to more droughts. (See Tucker, 1994). Criticism of their statements has also come from other quarters. Professor Richard Lindzen, a well-respected climatologist, at the Massachusetts Institute of Technology was very outspoken. He was quoted as saying: "The IPCC produces waffle statements which don't say anything, which nobody can disagree with". He said science was resorting in a "very unseemly" manner to the language of the advertising industry. Prof. Lindzen maintained, "I think in the long run the IPCC statement will be an embarrassment to the scientific community". By that time, however, he said, the leaders of the IPCC would long since have gone into retirement.

"The IPCC got agreement between its computer models and the actual behaviour of the climate only by including the effect of aerosols in the atmosphere, he said. But the panel had included ' an arbitrary amount of aerosols', and so it was not surprising that it had obtained correlation." (Wilkie, T, The Independent, 1/12/95)

[16] The global-warming panic has spawned a growth industry in peripheral fields, most notably among public health academics who recently have unearthed a connection between warming and worrisome trends in epidemic diseases (see McMichael 1994). Also "related research" has examined the likely effect of climatic change on the frequency of food poisoning.

policymakers' summary of the IPCC report. Indeed, the PMS is seen by many as the least scientifically credible part of the whole IPCC report, which is disturbing since, both politically and in terms of public perception, it is clearly the most important.

By far the most contentious part of the debate surrounding the IPCC report concerned the policymakers' summary of Chapter 8: "Detection of Climate Change and Attribution of Causes". The famous line: "The balance of the evidence suggests that there is a discernible human influence on global climate" came from this summary. Those contributors who felt that the underlying report did not support this conclusion were consoled by the factual evidence and caveats that were present in the report itself.

Scientific "Cleansing"?

However, this PMS showed little of the uncertainty expressed in the draft SAR. Sir John Houghton, the Chairman of the IPCC's scientific assessment working group said: "A significant part of the debate at Madrid centred around whether the [summary] was in full agreement with Chapter 8.....As a result of the debate the Chapter 8 authors agreed to **clarify** some parts of their chapter" (my emphasis). (Cited in Jefferson, M, 1996, Climate Change 1995, THE IPCC SAR Reviewed, Report No.5, World Energy Council). As the meeting was closing he announced that the lead authors would "conform" the underlying report to the PMS[17].

No doubt few people would have suspected that making the report consistent with the policymakers summary would entail wholesale changes . The report itself had, after all, been approved by the Worlds' governments. Nevertheless, this is what happened. In November 1995, the underlying report did not state that human-induced climate change had occurred; now, despite the absence of new data, it does; gone is any meaningful mention of uncertainty about man-made climate change; gone are the concerns about unwarranted conclusions being drawn from the studies.

Sentences, such as the following, were deleted from the report: "None of the studies has shown clear evidence that we can attribute the observed changes to the specific cause of increases in greenhouse gases". Others replaced them: "If the observed global mean changes over the last 20 to 50 years cannot be fully explained by natural climate variability, some (unknown) fraction of the changes must be due to human influences". Also, the conclusion to the report was completely deleted.

Some scientists are absolutely outraged at these alterations and an altercation has ensued in the journals *Science* and *Nature*. Dr. Frederick Seitz, former head of the US National Academy of Sciences considers that: "In more than 60 years as a member of the American scientific community.....I have never witnessed a more disturbing corruption of the peer-review process than the events that led to this IPCC report." (Wall Street Journal, 12/6/1996)

Seitz directs most of his criticisms at the chapter on the attribution of causes of climate change, written by Dr. Ben Santer of the Lawrence Livermore Laboratory in California. He claims that the chapter has been doctored and that uncertainties have been removed. Seitz's criticisms are echoed by the industrial lobbying group the Global Climate Coalition. Santer considers that the claims are "dangerous and absurd", that Seitz is "ignorant of the IPCC process", and that he, Santer, "was required to make the changes by the IPCC procedures". Sir John Houghton, co-Chairman of the IPCC's scientific working group called the allegations "scurrilous". (Nature, vol. 381, 13/6/1996, p.546). Dr. Seitz is unrepentant: "Whatever the intent was of those who made the changes, their effect is to deceive policymakers and the public into believing that scientific evidence shows human activities are causing global warming." (ibid.).

It is unclear whether the IPCC rules have actually been broken by this re-writing, even though the changes were substantial. The IPCC rules state that their process is comprehensive, balanced, open and transparent. The deletion of important scientific information from the underlying report, in order to link climate change to human activities, results in a document that is neither comprehensive nor balanced. When these changes are made to a report, which was approved and accepted by governments, with no

[17] His points were nt debated as it was past midnight and the delegates were all leaving, but if that instruction does constitute pressure to revise a scientific document for political purposes - remember the PMS is a politically agreed statement not a scientific document - I don't know what would.

opportunity for further review before publication, then the rewritten product is neither open nor transparent.

The revised version now contains an attempt to convince policymakers that they need not wait for rigorous scientific analysis before they conclude that human-induced climate change is occurring. Chapter 8 has become an exercise in political dialectic; it is not a scientific assessment[18].

Unless the management of the IPCC promptly undertakes to review its procedures, its scientific credibility will have been lost[19]. Moreover, unless the procedurally dubious and scientifically unjustifiable changes made to Chapter 8 are undone and the PMS adjusted accordingly, it seems likely that government officials the world over will negotiate swingeing restrictions on the use of fossil fuels at next years United Nations Climate meeting in Japan. This would be the most expensive policy decision ever made; it would also be based on a false impression of current scientific knowledge.

The impact of the false impression created by the latest PMS can already be seen. In May 1996, at the United Nations Conference on Insurance and the Environment, Mr John Gummer, the UK Environment Secretary, said that insurers should recognise the "certainties of climate change and other environmental realities". Launching the latest study of climate change impacts for the UK Department of the Environment he said that "A recent report, from the IPCC, confirms that man's activities have had an impact on climate" (his emphasis) [what emphasis? J].

Coalitions

Pressures on the IPCC to present a consensus view that climate change was resulting from man's actions come from many quarters, some of which may seem surprising, even counter-intuitive, at first sight. However, one of the consistent features of special interest politics is that coalitions develop between groups whose interests diverge on most issues but who believe they will benefit from a particular policy. These coalitions are especially important for environmental conventions because the scientific evidence upon which decisions are made is often far from conclusive, so decisions are based to an even greater degree on the extent of support from lobbyists, rather than on what is 'rational' (since this cannot be known). Perhaps the most intriguing coalition of the past year or so in climate change politics is that between reinsurance companies and environmental lobby groups. Many reinsurance companies now promote the IPCC consensus view of potentially catastrophic anthropogenic climate change.

This development is important because some have claimed it shows that the belief in man-made climate change is becoming increasingly widespread. At the Berlin conference, one senior underwriter said that, "insurers fear that global warming is accelerating the trend towards costlier natural catastrophes". According to another, "The speed of global warming is a problem" and is causing "the growing number and intensity of storms". The world's largest reinsurers met in Monaco in September 1995 and they concluded that private industry could not be expected to cover losses caused by "natural

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[18] On a separate point it is worth noting whether IPCC procedures on matters such as peer-review are in accord with accepted scientific standards. Using a colleague as a referee is not normal practice. The Nature article (13/6/96) points out that "the integrity of the reviewing and approval process is...an essential element in assuring the credibility of the resulting conclusions". The IPCC assigned the role of convening lead author to Ben Santer, who then based much of the conclusion of Chapter 8 on two of his own papers that had not yet appeared in peer-reviewed journals.

[19] Dr Santer , the lead author of Chapter 8, in letters to the Wall Street Journal, The Energy Daily and Nature has argued that he was obliged to make the changes to the report. This is extremely misleading. Whilst syntax changes are always welcome to clarify documents no substantive changes to the text should have been made. All comments for the underlying chapters of the report should have been received by July 7 1995. So that full reviews could be made, and approval for the document could be agreed at Madrid in November 1995. Comments on the PMS could be delivered later, even up to and including the Madrid meeting. Every proposal was debated at that meeting. There were no requests to change any of chapter 8 in these proposals. The IPCC rules stipulate that significant textual changes in a final document must be formally proposed to the IPCC plenary and also must be approved by the Plenary. This requirement was by-passed by Dr Santer. The IPCC plenary had no knowledge of the changes contemplated and had no opportunity to debate or approve them. Dr Santer is the lead author and perhaps felt that he should be able to make the changes he made or condoned. But country officials rely on the exact wording of the report they sign their names to, hence reports should be finished, when they are final drafts. It should be clear that post plenary alterations actually undermine the entire IPCC negotiating process. Government officials will be less likely to approve documents in the future if they are under the impression that it will be tampered with later.

forces" if they regularly affected the same region. In effect the insurers want governments to provide subsidised payments in, as one of them put it, "Armageddon scenarios".

According to leading reinsurers, the insured cost of natural disasters is some 14 times greater now than in the 1960s. But this is not because climate change is making the world a much more dangerous place[20]. Several more plausible reasons can be offered to explain the increase in payouts on natural disasters. First, the value of property has increased many times. Second, much of the world's most valuable property is located in precarious regions. In Japan and California, both of which have always been susceptible to earthquakes, property values have increased dramatically since the 1960s. Finally, more property is insured today than ever before because individuals and firms have become wealthier, so they have more to protect and a greater interest in and ability to protect it.[21]

The insurance business, like the rest of the financial services sector, was very lucrative during the 1980s boom. As a result, many less prudent firms entered the market. These firms (and possibly some of the more established firms as well) put less emphasis on the assessment of insurance risk and offering lower premiums. Then disaster struck: over a relatively short period, several events - mostly winter floods and hurricanes - led to big payouts and massive losses for the cowboy insurers. Of course, from the insurance companies' point of view, it makes sense to blame these disasters on climate change; then, perhaps, the taxpayer will foot the bill.

Environmental NGOs have been quick to support the insurance companies' view of climate change. After all, the refrain goes, if *business* believes global warming is happening then it must be true. Insurers have garnered support from environmental pressure groups and have advanced their green credentials, while raising premiums and reducing cover (of course, these last two actions may simply be commercial prudence - a response to the underpricing which occurred in the 1980's).

Recent Developments

With the support of a certain vociferous NGO, reinsurers have pushed for governments to provide insurance against climate change damage on the grounds that the private sector would be incapable of coping with the losses. Indeed, UNEP's Insurance Sector Initiative on Environment and Sustainable Development already has many large companies who are committed to incorporating environmental considerations into their risk-management strategies. The insurance industry is now firmly linked to the process. (Obviously, bureaucratic interests backed this process as a new sub-organisation, and new employment opportunities and budgets were spawned).

As more industries are shown the benefits of joining the global warming cause, so the pressures on the IPCC scientists to produce a dramatic summary will increase. Indeed, following the July 1996 Geneva meeting, the energy coalition, which has held firmly in its demand for better scientific knowledge before substantial policies are proposed, is beginning to crack. The "cleaner" gas companies, the nuclear industry (who produce CO_2 -free electricity) and electric utilities (who can purchase energy from any source) have suggested that, even though they may not believe in man-made climate change, they may have to act as if they do, otherwise they will be "punished". In particular, they are concerned that they may be lumped with the "dirtier" (i.e. more carbon-intensive) fuels of oil and coal, especially given the fact that some policies might even be beneficial to them (for example, a carbon tax might benefit low-CO_2 energy providers; in the short-run, it might be an absolute benefit, whilst in the long-run it would at least benefit them in comparison to the high- CO_2 providers).

As I witnessed in Geneva, it is now easy to identify those individual groups and country representatives who are still holding out for greater scientific knowledge: The oil and coal companies of the USA, the delegates of Russia and Australia (which each have vast coal exporting industries) and most of the OPEC countries. Strategically, offering the OPEC countries a high producer tax, and the coal producers massive grants to transfer clean technologies to China and India would go a long way to reduce the demands for any improvement in scientific knowledge. The consensus could become overwhelming,

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[20] See "Changing Weather? Facts and Fallacies About Climate Change and Weather Extremes", produced by Accu-weather (1995), which challenges the widely held belief that weather is becoming more extreme.

[21] Insurance is a luxury good: at low levels of wealth people rarely bother to insure their belongings because there is little to lose and the cost of insurance is relatively high (especially when most income is spent on essential items) but, as wealth increases, the larger potential losses make insurance seem relatively more worthwhile.

the producers would be relatively safe, at least in the short run, and the consumer would suffer in ignorance of the reality, perhaps even thinking that they are "doing their bit" by paying to save the planet.

Economic Measures

Curtailing economic activity by limiting energy use will have many adverse consequences. More than half the people in the world are still struggling to escape from poverty, and poverty restricts one's ability to respond to problems. So, even if man-made climate change does occur and even if this does, for example, make certain areas more arid, it is not clear that reducing the world's consumption of energy would benefit the poor, since their ability to cope with the effects of the warming would be diminished by their more impoverished state. Given that the science of climate change is still so uncertain, the prudent course is to enact economically sensible policies. In particular, subsidies (both explicit and implicit) to the extraction and consumption of fossil fuels should be eliminated. However, for such policies to be successfully implemented, entrenched interests must be overcome.

The IPCC synthesis report, approved at the Rome meeting in December 1995, contains many truths concerning what we can and cannot know about economic life. In section 7.14 (p.29) there is the statement that "the world economy and indeed some individual economies suffer from a number of price distortions which increase greenhouse gas emissions, such as some agricultural and fuel subsidies and distortions in transport pricing."

The report then cites several studies which indicate that global emissions reductions of 4 to 18%, together with increases in real incomes, are possible from phasing out fuel subsidies. Removal of subsidies makes economic sense anyway; the fact that it may benefit the global environment surely makes it imperative. However, it is unlikely that action will be taken on the removal of subsidies until **all** interests are acknowledged and investigated, including the bureaucracies which implement those subsidies (which will lose out if the subsidies are abandoned).

This leads to a further point: the estimated range of 4 to 18% is very broad. Considering the fact that the energy market is probably the best understood market in the world, this surely reinforces the sceptics point that there remain massive gaps in our knowledge of how the world works and should make us wary of even the most modest predictions of the very near future.

As Dr. Boehmer-Christiansen has explained (1996), it is those who offer interdisciplinary advice that demand scientific consensus. They do this because they need firm foundations on which to make their own predictions. For economists to model the future, it is necessary to make fantastic assumptions about growth patterns, discount rates,[22] substitutions between factors of production (which are simply guessed), and expected changes in the energy sector as a result of turnover of fixed capital. Such economic forecasts are notoriously inaccurate. The IPCC model builders assume that there will be massive increases in energy use over the course of the next century but, as Grubb and Anderson (1995) point out, economists have a 30-year track record of significantly over-predicting short-term changes in energy use in Europe[23] (and American economists have fared little better), so why on earth should we trust them to predict the very long-term?

In the absence of any reliable prediction of the economic future (and, as the discussion above suggests, none is likely to be forthcoming), what meaning can we assign to policy options presented by the IPCC? They are based on highly contentious science and they cannot be defended on economic grounds, so it seems that their only function is as a rhetorical tool: to encourage policymakers to do what they do best: to tax and regulate and to divide the spoils amongst the politically favoured elite (including the scientists and social scientists who support the climate change catastrophe theory).

Prudent Policy

The planet has so far responded with low sensitivity to a 50% increase in the concentration of greenhouse gases. To say the least, this does not suggest that immediate action for significant

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[22] Choosing 2% rather than 5% means that damages which occur in a century receive twenty times the weight.

[23] Also, CO_2 emissions today in the UK are lower than they were in 1965 and OECD emissions as a whole in 1993 were only 6% higher than in 1973, and have declined in per capita terms.

limitations on energy consumption is urgently required. Energy producers might be wise to investigate new production technologies and fuel-switching possibilities, but until the science of climate change is better understood, no government action should be taken beyond the elimination of subsidies and other distortions to the market[24].

Public choice theory can help us to understand interactions between academics, funding agencies, environmental advocacy groups and politicians. The American political commentator, H.L. Mencken, explained that: "the whole aim of practical politics is to keep the populace alarmed – and hence clamorous to be led to safety – by menacing it with endless series of hobgoblins, all of them imaginary". Global warming may not be an imaginary hobgoblin, but catastrophe scenarios probably are.

Science thrives on vigorous debate - until evidence is produced which falsifies all but the most robust theories. The fact that there can be irrefutable evidence is what makes science different from politics or economics. The measure of good science is neither the politics of the scientist nor the people with whom the scientist associates. Most scientists working within the IPCC inner circle have been saying what they have for a long time – far longer than the relatively recent increase in their budgets. Similarly, most of the 'sceptical' scientists have maintained their arguments for a long time[25].

Only those with other agendas will stifle this interesting debate.

Public choice analysis explains why the representatives of the world's nations have signed a treaty obliging them to meet unattainable carbon dioxide emission targets, why they are likely to make these unattainable targets yet stricter, and why they will impose poverty-inducing restrictions on their citizens for an issue which can be characterised thus:

- We don't know that the world is definitely warming, given recent satellite data.
- If the world is warming, we don't know what is causing this change – man or nature.
- We don't know whether a warmer world would be a good or a bad thing.

So far, science has played second fiddle to environmentalism in the global warming issue. Following the underhand way in which the IPCC document has been changed, environmentalism may give way to power politics. Sound science relies on a peer-review process which ensures that good theories tend to drive out bad. If this disappears - and, given the recent changes to Chapter 8 of the IPCC SAR, it seems that in the area of IPCC-sponsored climate science this has happened - bad science may drive out good[26].

Policy cannot be based upon science alone; the world cannot be run as a rational machine. But if policy is to be based upon science at all, then this science must be sound. The IPCC report is not sound science and the policies recommended are not sound policies.

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[24] "The prospect of high damages in itself does not justify substantial emissions reductions today. If the damages are far enough in the future, there would still be time for an economical turnover of existing plants and equipment and for developing the technologies needed for low-cost emissions abatement." (Manne and Richels, 1995, p.35).

[25] Economic theory predicts that there will be considerable resistance to publication of results which might staunch the flow of funds for research. One would therefore expect less peer-reviewed research from global warming sceptics.

[26] Indeed climate scientists may now have a reduced role at future climate meetings. As far as most politicians are concerned, the science is now settled. There is really no need for further research, and certainly not for any results that might cast doubt on the "scientific consensus". The climate scientists are now simply a liability in the negotiating process as they could discover something that may scupper the delicate negotiating process. It will be interesting to see whether the climate specialists will simply "go" quietly. Having said this science budgets are likely to increase for analysing impacts and discussing socio-economic effects.