

## UNCERTAINTY AS *DEUS EX MACHINA* IN CLIMATE POLICY

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### Introduction

The Australian, United States of America (USA), and United Kingdom (UK) governments' approach to the myriad uncertainties that surrounded not only the existence of Iraqi weapons of mass destruction (WMD), but also the threat they posed, contrasts sharply with the much more cautious policy position each government adopted in response to potential climate change threats, where a dearth of clear, uncontested evidence in support of their cause and possible impacts was cited as good reason for *not* immediately reducing emissions, or, in the case of Australia's and the USA's questioning, whether emission cuts were even necessary. Instead, the high levels of 'uncertainty' in the policy advice given about the threat posed by Iraq created a very different policy reaction from these governments. And, it was one in which considerable uncertainty over not only the nature but also the existence of the perceived threat was not an impediment to acting against it. Moreover, unlike the position adopted on global warming, the rationale used for interpreting the available evidence about the Iraqi threat was in effect precautionary due to its clear employment of the 'absence of evidence of harm should not be regarded as evidence of an absence of harm' approach to interpreting such uncertainty.

By the time of the IPCC's Third Report in 2001, international scientific opinion was largely in agreement that anthropogenic generated greenhouse gas emissions were exerting a warming influence on the so-called 'global climate'.<sup>1</sup> But, despite claims of a growing consensus around the IPCC's findings, debate and controversy continued to grow, especially over the scale, nature, and likelihood of future climate change impacts. Numerous disagreements over the reliability of the global warming scenarios produced by Global Circulation Models (GCMs), and in particular the data and assumptions fed into these models, have continued to rage, thereby allowing differing interpretations of the available evidence and the many uncertainties it involves to be used by governments and various groups to substantiate either their support for or opposition to calls for immediate emission reductions. The Howard Government and the Bush Administration, and various industry groups, initially chose to amplify the uncertainties in climate change science and its predictions as a means of justifying their opposition to emission reductions, while also arguing that the levels of uncertainty—over future emissions levels, their environmental impacts, and the effectiveness of the Kyoto Protocol approach—did not warrant the significant economic costs that they believed implementation of the Kyoto agreement would 'certainly incur'.

Shortly before taking office in 2001, the then Governor George W. Bush already had made his doubts over the conclusions of global warming science, and the need for more certainty, clear during his presidential campaign:

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<sup>1</sup> The notion of a 'global climate' is an abstract derived from the concept of a 'global average temperature'. Climate behaviour and temperature are regional phenomena that vary significantly and can be influenced by a very broad range of both local and more global factors. Reliable modelling of regional climate behaviour remains beyond the capability of contemporary climate models and our understanding of the climate system.

I—of course there's a lot—look, global warming needs to be taken very seriously, and I take it seriously. But science, there's a lot—there's differing opinions. And before we react, I think it's best to have the full accounting, a full understanding of what's taking place.<sup>2</sup>

Then, in 2001, in a letter to Republican Senators, President Bush highlighted both energy security and the economy in explaining his rejection of mandatory emission reductions:

At a time when California has already experienced energy shortages, and other Western states are worried about price and availability of energy this summer, we must be very careful not to take actions that could harm consumers. This is especially true given the incomplete state of scientific knowledge of the causes of, and solutions to, global climate change....<sup>3</sup>

Still focused on energy and the economy, Bush later informed reporters that:

We are now in an energy crisis. And that's why I decided to not have mandatory caps on CO<sub>2</sub>, because in order to meet those caps, our nation would have had to have had a lot of natural gas immediately flow into the system, which is impossible. ... We'll be working with our allies to reduce greenhouse gases, but I will not accept a plan that will harm our economy and hurt American workers.<sup>4</sup>

In December 2003, Prime Minister John Howard explained his ongoing opposition to the Kyoto Protocol, having informed the Australian Parliament in 2002 of his government's intention not to ratify the Kyoto Protocol, by saying: 'I'm not going to be a party to something that destroys jobs and destroys the competitiveness of Australian industry'.<sup>5</sup> Three years later, in August 2006, Howard continued to downplay the risks of climate change relative to the economic risks of reducing emissions. In an interview with the Australian Broadcasting Corporation's *Four Corners* program, the Prime Minister stated that:

I accept that climate change is a challenge. I accept the broad theory about global warming. I am sceptical about a lot of the more gloomy predictions. I also recognise that a country like Australia has got to balance a concern for greenhouse gas emissions with a concern for the enormous burden to be carried by consumers through much higher electricity prices, higher petrol prices, falls in GDP of too dramatic an imposition of what you might call an anti-greenhouse policy. It's a question of balance.<sup>6</sup>

The 'prudent, and rational, response' was, therefore, according to President Bush and Prime Minister Howard, to resolve the uncertainties through more research before committing to any particular policy response—especially one likely to affect economic and energy security. Underpinning such a course of action, or in this case non-action, was the Rationalist policy model and its faith in science's ability to inform policy decisions by producing reliable knowledge, which in turn will be used to arrive at legitimate policy decisions based on science. This approach to uncertainty has remained bipartisan, with the only real difference being disagreement over various policy issues on how much certainty is needed (or how much

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<sup>2</sup> Commission on Presidential Debates Transcript, 11 October 2000.

<sup>3</sup> Jim Fuller, "US Officials Cite Serious Energy Shortage", *Washington File*, US Department of State, 2 April 2001. <http://usinfo.org/wf-archive/2001/010402/epf111.htm>

<sup>4</sup> Quoted in "Bush and the Environment", *Online NewsHour*, 29 March 2001, [http://www.pbs.org/newshour/bb/environment/jan-june01/bushenv\\_3-29.html](http://www.pbs.org/newshour/bb/environment/jan-june01/bushenv_3-29.html)

<sup>5</sup> *The Age*, 2 December 2003.

<sup>6</sup> 'What Price Global warming?', *Four Corners*, Australian Broadcasting Corporation, broadcast on 28 August 2006, (transcript available at <http://www.abc.net.au/4corners/content/2006s1726376.htm>).

uncertainty can be tolerated) before acting on the specialist advice and evidence at hand. The US Global Change Research Program, for example, has spent billions of USD in government funding since 1989 on research that, according to then Senator Al Gore's justification of the program, has been aimed at building political consensus on environmental challenges through the reduction of uncertainty. In Gore's view, the solution to complex policy problems is obvious: 'More research and better research and better targeted research is absolutely essential if we are to eliminate the remaining areas of uncertainty and build the broader and stronger political consensus.'<sup>7</sup>

But, as already indicated, the Rationalist model can also legitimise decisions *not* to act, that is, to wait and see until the evidence is in—which is precisely what the Bush and Howard governments were advocating despite their acknowledgement of global warming as an important policy issue. For those wanting a policy response sooner rather than later, the obvious strategy is to downplay the uncertainties involved by arguing that failing to act introduces unacceptable risk; rising oceans, increasingly frequent and extreme weather events, and depleted bio-diversity are, after all, more fundamental challenges to human societies and their economies than price increases, unemployment, and energy shortages—even if they are in the distant future. Global warming's credentials as a major security issue deserving of the same kinds of policy action taken to protect against terrorism, external military threats, and economic recession thus are imbued with a sense of urgency—vis-à-vis the logic of the precautionary principle—that makes taking a 'wait and see approach' that is more difficult to justify. Such a precautionary approach, however, suffers from the same challenge faced by proponents of the Iraq invasion—that is, how to demonstrate that currently imagined future threats will, or are, at least likely to occur. Policy debates, framed in these terms, become dominated by competing perceptions of future outcomes and the nightmares invoked to illustrate them, and provide only a choice between either a 'look before you leap' (or, wait until we *know* more) or a 'he who hesitates is lost' (or, take preventative action before it is too late) approach to managing uncertainty and its associated risks.

The alternative suggested here is to further develop and adopt a 'post-normal science' approach to uncertainty and policy making, and the specialist advice that informs decision makers' perspectives on both—as has been pioneered by Jerry Ravetz and others.<sup>8</sup> We should accept that, for a variety of compelling epistemological reasons (that are certainly not new), the uncertainties surrounding major policy issues, including climate change, are not reducible beyond a certain point. Maintaining that certainty, or something resembling it, is attainable provides, as is argued herein, nothing other than the opportunity for policy protagonists to use uncertainty and competing knowledge claims as a disguise for the interests that underlie the policies they support. But, if we accept from the outset that certainty is not available, and that it

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<sup>7</sup> Quoted in Pielke and Sarewitz, 'Wanted: Scientific Leadership on Climate', *Issues in Science and Technology*, vol. 19, no. 2, Winter 2002/2003, p. 27. By 2002, the USA had spent more than USD20 billion on funding research under this project.

<sup>8</sup> For post-positivist related perspectives on science and technology and the role of expert advice in policy making, see Silvio Funtowicz & Jerome Ravetz, 'Science For The Post-Normal Age', *Futures*, September 1993, pp. 739-55; Silvio Funtowicz & Jerome Ravetz, 'The Good, The True, And The Post-Modern', *Futures*, December 1992, pp. 963-76; Jerome Ravetz, 'What is Post-Normal Science?', *Futures*, 31, 1999, pp. 647-53; Lorraine Daston, 'Scientific Error and the Ethos of Belief', *Social Research*, 72(1), Spring 2005, pp. 1-168; Maarten Hajer, 'Policy without polity? Policy analysis and the institutional void', *Policy Sciences*, 36, 2003, pp. 175-95; Maya Goldenberg, 'On evidence and evidence-based medicine: Lessons from the philosophy of science', *Social Science and Medicine*, 62, 2006, pp. 2621-632.

is competing political agendas rather than simply objective knowledge that set the parameters of policy making and debate, it may be possible to produce debates that, rather than being sidetracked by disputes over who has 'the real science', focus instead on the *actual* political and interest-based obstacles to agreement and compromise. Doing so would produce more transparent, credible, and consistent policy decisions and, therefore, also better international policy coordination and cooperation. As Daniel Sarewitz has argued:

No longer able to hide behind scientific controversy, politics would have to engage in processes of persuasion, reframing, disaggregation, and devolution, to locate areas of value consensus, overlapping interests, or low-stakes operations (e.g., "no regrets" strategies) that can enable action in the absence of a comprehensive political solution or scientific understanding. In particular, the abandonment of a political quest for definitive, predictable knowledge ought to encourage, or at least be compatible with, more modest, iterative, incremental approaches to decision making that can facilitate consensus and action.<sup>9</sup>

### **Scientising politics: climate change and the 'power of nightmares'**

The executive elites of governments elected to three or four year terms before facing re-election are necessarily more focused on the short term, as are the majority of voters striving to manage today's financial and family related pressures and concerns. Thus, it is hardly surprising for national governments and societies to be less concerned with speculation over threats in the distant future than with those they feel are much more likely to occur in the shorter term. This point has been supported by a 2009 Gallup Poll in the USA showing higher levels of concern for the economy than the environment in the wake of the so-called global financial crisis. For the first time since the 1980s, levels of environmental concern fell below a sharply increased level of concern for the economy in the USA and elsewhere, indicating the extent to which environmental priorities may be a product of economic good times.<sup>10</sup> In the case of global warming, adopting a strong precautionary approach today as protection against future (and unknown) warming impacts will not guarantee a safer future but will guarantee a politically difficult, perhaps even fatal, set of problems for governments that must be addressed in the short term. From a policy perspective, such calculations are unavoidable; but they are seldom, if ever, made explicit in contemporary policy discourses where values prioritising the importance of maintaining biological diversity and an unchanged natural environment often compete against human-centric priorities such as development and economic growth. As Sarewitz has noted, governments seeking to justify or delay policy in the public sphere choose to avoid

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<sup>9</sup> Daniel Sarewitz, 'How science makes environmental controversies worse', *Environmental Science and Policy*, 7, 2004, p. 400. Sarewitz's call for more 'incremental approaches to decision making' on the basis of consensus being achieved, not on scientific or knowledge disputes but on values and interests, invokes Lindblom's ideas about the need to abandon the quest for 'synoptic' or complete knowledge as the basis of policy and instead to face up to our inability to know very much at all about complex policy issues, or even to reach shared understandings of policy goals. Lindblom's famous description of policy making and analysis as 'a science of muddling through', made necessary by the sheer complexity of policy problems, represents what he later stated 'is and ought to be the usual method of policy making.' See Charles Lindblom, 'The Science of Muddling Through', *Public Administration Review*, vol. 19, 1959, p. 517.

<sup>10</sup> Lydia Saad, 'Increased Number think global warming is "exaggerated"', 11 March 2009. [http://www.gallup.com/poll/116590/Increased-Number-Think-Gl ...](http://www.gallup.com/poll/116590/Increased-Number-Think-Gl...); Frank Newport, 'Americans: Economy takes precedence over environment', 19 March 2009. [http://www.gallup.com/poll/116962/Americans-Economy-Takes ...](http://www.gallup.com/poll/116962/Americans-Economy-Takes...)

the politics of competing values and interests where possible, preferring instead to rely on the credibility of 'scientific authority' and invoking it as the source of objective rationality behind the decision taken:

If you were a policy maker, would you rather participate in a debate about the scientific aspects of a controversy, or about the interests and values that underlie the controversy? Arguing about science is a relatively risk free business; in fact, one can simply mobilise the appropriate expert to do the talking, and hide behind the assertion of objectivity. But talking openly about values is much more dangerous, because it reveals what is truly at stake.<sup>11</sup>

On the other side of the political equation, we see alternative policy positions supported by groups with very different interests who in turn derive and put forward very different scientific interpretations of the data and evidence in order to objectify and rationalize their own particular policy preference. Environmental groups, alternative fuel lobbies (including the nuclear lobby),<sup>12</sup> and segments of the media, for example, are unrestrained by electoral accountability and view global warming through an entirely different prism of values and interests. For these players, the short term political and economic consequences of taking action today are of little concern in comparison to the long term risks they invoke as justification for a precautionary policy response. Moreover, the debate over competing knowledge claims has spilled over from climate-related science into the realm of economics where very different arguments have been made over both the current cost of acting against climate change and the future cost of not acting. The Bush and Howard governments cited sometimes sparse or incomplete economic analysis<sup>13</sup> warning of the high costs emission reductions will impose on their respective economies while other analyses, most notably the Stern Report, warn that the potentially high future costs of not reducing emissions can be avoided if we accept the relatively small cost of reductions now. Stern's approach, which controversially values future benefits and consumption equally with the present as a means of undermining the economic dangers of action today, clearly illustrates the normative dimension of climate change debate. As one economist noted, 'the strong, immediate action on climate change advocated by the authors [of the Stern Report] is an implication of their views on intergenerational equity; it isn't driven so much by the new climatic facts the authors have stressed.'<sup>14</sup> The kinds of risks cited both by Nicholas Stern and the IPCC were indeed extreme enough to

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<sup>11</sup> Daniel Sarewitz, 'Science and Environmental Policy: An Excess of Objectivity', Center for Science, Policy, and Outcomes, Columbia University, <http://www.cspo.org/products/articles/excess.objectivity.html>

<sup>12</sup> The argument put forward by Howard and others that nuclear energy should be an option for reducing greenhouse gas emissions also serves as an example of the precautionary principle dilemma. Is the risk of a nuclear accident more or less acceptable than the still unknown but possible risks posed by greenhouse gas emissions? Who decides and on what basis?

<sup>13</sup> See, for example, Richard Baker, 'PM feels the heat', *The Age*, 25 February 2007, and William Nordhaus, 'The *Stern Review* on the Economics of Climate Change', 17 November 2006, <http://qed.econ.queensu.ca/pub/faculty/milne/872/SternReviewD2.pdf>

<sup>14</sup> Partha Dasgupta, 'Comments on the Stern Review's Economics of Climate Change', 11 November 2006, <http://www.econ.cam.ac.uk/faculty/dasgupta/STERN.pdf>. Nicholas Stern's cost-benefit analysis of the present versus future costs of acting and not acting to mitigate anthropogenic climate change attracted criticism from many economists due to 1) its employment of a pure rate of time preference or social discount rate of almost zero (0.1%) and an overall discount rate of only 1.4% as opposed to the 4-6% realm normally used when discounting future costs and benefits; 2) the report allegedly downplaying the real cost of spending 1% of annual world GDP on mitigation and the sacrifice this will require, particularly among developed countries where it will more likely amount to 1.8% of *each* economy's GDP annually; and 3) Stern's 'cherry picking' of worst case scenarios and damage estimates as the basis of his cost-benefit analysis. See also, for example, Eric Neumayer, 'A missed opportunity: The Stern review on climate change fails to tackle the issue of non-substitutable loss of natural capital', *Global Environmental Change*, vol. 17, 2007, pp. 297-301; Nordhaus, 'The *Stern Review* on the Economics of Climate Change'; and Roger Pielke Jr, 'Stern's Cherry Picking on Disasters and Climate Change',

capture the public imagination, despite their place in the more distant future, and compete for priority against the short term social and economic costs of emission reductions that governments and other groups (e.g., business and industry) have advocated avoiding. Climate science and its many associated uncertainties then, as Stephen Bocking argues, have become 'deeply embedded in political debates',<sup>15</sup> and are regularly invoked in the service of specific interests:

[T]hose opposed to action on climate view it as more effective to question the science than to defend their interests directly. On the other hand, those advocating climate action tend to minimise scientific uncertainties .... In effect science serves as a surrogate for political and economic conflict, imparting authority to positions on either side, but at the expense of becoming fully embroiled in these conflicts.<sup>16</sup>

The interpretation of uncertainty in political debate then is mostly about values, particularly in big issues like climate change where uncertainty is high (preventing science from providing the kinds of specific information policy requires) and values are hotly disputed (which are more important, jobs or polar bears?).<sup>17</sup> But because the rationalist model still survives, despite the sustained scholarly criticism it has received over the years,<sup>18</sup> people still think in terms of good policy simply being based on the best knowledge, as demonstrated by the ongoing faith of politicians in so-called 'evidenced based' policy making, which of course means 'scientifically derived' knowledge. So what happens when science can't give us definitive, testable answers? Policy elites and people in general nevertheless claim that the science is on their side in order to make their values and priorities seem more legitimate than other people's (who are using different scientific opinion to do the same thing), which causes what Sarewitz calls the 'scientisation of politics'<sup>19</sup> (an inversion of what rationalists call the 'politicisation of science'): dead-end debates over who has the 'real' science that obscure the values actually in dispute.

The fundamental conflict in values underpinning the distinction between short-term economic and energy security and long term 'climate security' becomes, as a consequence, obscured as protagonists use competing scientific claims to gain advantage in what are actually political disputes over competing values

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*Prometheus*, 30 October 2006,  
[http://sciencepolicy.colorado.edu/prometheus/archives/climate\\_change/000973sterns\\_cherry\\_pick.html](http://sciencepolicy.colorado.edu/prometheus/archives/climate_change/000973sterns_cherry_pick.html)

<sup>15</sup> Stephen Bocking, *Nature's Experts: science, politics, and the environment* (New Jersey: Rutgers University Press, 2004), p. 118.

<sup>16</sup> Bocking, *Nature's Experts*, p. 126

<sup>17</sup> Princeton physicist and climate sceptic Freeman Dyson also sees conflicts over fundamental values as underpinning the competing scientific arguments over global warming's causes. Nicholas Dawidoff writes that: 'Beyond the specific points of factual dispute [over global warming science], Dyson has said that it all boils down to "a deeper disagreement about values" between those who think "nature knows best" and that any gross human disruption of the natural environment is "evil", and "humanists", like himself, who contend that protecting the existing biosphere is not as important as fighting more repugnant evils like war, poverty and unemployment.' Nicholas Dawidoff, 'The Lonely Prophet', *The Courier Mail Weekend*, 18-19 April 2009, p. 23.

<sup>18</sup> One of the best known critiques of the rationalist model is Charles Lindblom's 'science of muddling through'. See works by Charles E. Lindblom, 'The Science of Muddling Through', *Public Administration Review*, vol. 19, 1959, pp. 79-99; and 'Still Muddling, Not Yet Through', *Public Administration Review*, vol. 19, 1979, pp. 517-26. More contemporary examples include Sheila Jasanoff, *The Fifth Branch: Science Advisers As Policy Makers* (Massachusetts: Harvard University Press, 1990); Deborah Stone's *Policy Paradox* (New York: W.W. Norton & Company, 2002); Roger Pielke, Jr, *The Honest Broker: Making Sense of Science in Policy and Politics* (New York: Cambridge University Press, 2007); and Max Nieman and Stephen Stambough, 'Rational Choice Theory and the Evaluation of Public Policy', *Policy Studies Journal*, vol. 26, number 3, 1998.

<sup>19</sup> Sarewitz, 'Science and Environmental Policy: An Excess of Objectivity'.

(what Sarewitz also has referred to as ‘an excess of objectivity’<sup>20</sup>). And as the scientific disputes, fuelled by uncertainties, intensify, political debate is subsumed into what soon becomes a zero-sum contest for the mantle of scientific objectivity and the policy legitimacy it provides. The result is highly polarised debate that: i) excludes all but the more extreme policy options (future risk warrants drastically reducing emissions versus economic consequences of reductions and uncertainties over future impacts too great to justify any significant short term reductions); and ii) employs scientific advice and uncertainty as a smoke screen to hide the core values and interests actually driving disagreement between the various actors. In contrast to the Rationalist complaint of politics distorting what otherwise could be rational policy making informed by science—popularly referred to as the ‘politicisation of science’—highly complex, or ‘wicked’,<sup>21</sup> policy problems like climate change most often create debates where the ‘scientisation of politics’ becomes the main obstacle to not only the development of any broadly supported policy, but also to policy responses made *rational* by their attempt to manage rather than vanquish uncertainty issues.

The United Nations Framework Convention on Climate Change (UNFCCC), for example, frames climate change in the positivist, human-centric language of anthropogenic global warming and betrays an ongoing subscription to the linear good science equals good policy orthodoxy of the rationalist model. By doing so, the convention has effectively encouraged the scientisation of policy debate from the outset. The UNFCCC, unlike the much broader IPCC definition, defines climate change as an issue of policy and decision making *only* in terms of human activity having a ‘dangerous’ influence on climate and by doing so automatically excludes natural climate change or variation as irrelevant in addition to causing confusion over what is or is not conclusively known about current climate change’s causes.<sup>22</sup> Making such a distinction, however, assumes that not only is the distinction between human and naturally caused climate change knowable on the basis of science, but also that the question of what constitutes ‘dangerous climate change’ can be resolved scientifically.<sup>23</sup> Thus, according to the UNFCCC, climate change can only qualify as a policy issue if it can be shown to be both human induced and dangerous. As a consequence, the climate change debate has become extremely narrow in its scope, limited to unresolvable disagreement over one set of potential causes and outcomes (greenhouse gases, or GHGs, in particular carbon, emissions are the primary cause of future climate change threats), and one set of unimplementable policy proposals in response to those highly uncertain outcomes and causes (global reduction of carbon emissions is necessary to mitigate future climate change threats).

This narrow framing of the climate debate to date is well illustrated by the 2009 announcement of a conference convened by University of Oxford, the Tyndall Centre for Climate Change Research, and the UK

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<sup>20</sup> Ibid.

<sup>21</sup> Wicked policy problems are broadly understood as policy issues of great complexity involving systems within systems, which not only defy any uniform definition but also are highly resistant to analysis and resolution due to the numerous system uncertainties (epistemic and variability) and multi-causal factors involved.

<sup>22</sup> Former Australian delegate to the IPCC John Zillman writes that: ‘According to the [UNFCCC] Convention, “climate change” is that which is due to human activity and is in addition to natural variability. The IPCC WG I, on the other hand, regards “climate change” as including natural variations. Thus, when the IPCC says “climate has changed over the past century,” it is simply saying the climate now is not the same as it was a century ago (whatever the cause) whereas the FCCC listener will reasonably interpret such a statement as the scientific community affirming that human influence has changed climate over the past century.’ John Zillman, ‘The IPCC: A View from the Inside’, Australian APEC Study Centre, August, 1997, <http://www.apec.org.au/docs/zillman.pdf>.

<sup>23</sup> Roger Pielke Jr., ‘Misdefining “climate change”’: consequences for science and action.’ *Environmental Science and Policy*, vol. 8, 2005, pp. 553-55.

Met Office entitled '4 Degrees and Beyond: Implications for people, ecosystems, and the earth system'. Ignoring ongoing uncertainties over climate sensitivity, feedback mechanisms, and future human behaviour that so far have prevented the IPCC from asserting anything more than a *possible* temperature range over this century, adjusted in 2007 to between 1.1°C and 6.4°C, the conference's call for participants asserts that global temperature will increase 'well beyond' 4°C and limits its focus only to the consequences and policy options relevant to such a major increase:

Despite 17 years of political negotiations since the Rio Earth Summit, global greenhouse gas emissions have continued to rise, which presents the global community with a stark challenge: Either instigate an immediate and radical reversal in existing emission trends or accept global temperature rises well beyond 4°C.<sup>24</sup>

Thus, according to the conference organisers, societies and policy makers alike are confronted only with a simple choice between accepting the costs of radical action to dramatically reduce emissions immediately or accepting the implied catastrophic consequences of an extreme increase in global temperatures somewhere beyond 4°C. Such framings of the climate change/global warming issue, relying as they do on a misrepresentation of the complexities and uncertainties involved in order to invoke future nightmare scenarios as the cost of not following one particular course of action (and indeed with no regard for the costs of following that course of action), serve only to further delay policy responses and cooperation. The choice presented here is for the vast majority of people and no doubt all governments completely unacceptable without a good deal more certainty that such a 'stark' proposition is what we must now face, which is of course not available. So rather than discussing what kind of policies may be adopted and implemented, given the different values, interests, and unknowns, debate remains locked within an all or nothing conflict driven by political competition over values but fought in the language of science.

### **The climate consensus and policy-making: new rhetoric but no paradigm shift**

Through the selective use and interpretation of sometimes vague or unsubstantiated tactical intelligence, proponents of the 2003 Iraq war were able to introduce a range of difficult to dismiss potential threats as justification for military action while also obscuring the partisan values and policy priorities that actually informed the decision to go to war. Investigations into the intelligence assessments and evidence used to justify the US-led invasion of Iraq in the US, the UK, and Australia—in addition to the failure of coalition forces and the Iraq Survey Group to uncover any evidence of chemical, biological, or nuclear weapons in Iraq—indicate that the coalition case for going to war largely was based mostly on speculative thinking in an environment where, as a joint Australian parliamentary investigation concluded in 2004, 'policy was running strong'.<sup>25</sup> Moreover, the largely speculative conclusions drawn concerning Iraq's threat capability and potential often reflected only some of the many intelligence assessments available during the lead up to the

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<sup>24</sup> Email call for conference participants received April 3, 2009 from Mary Mansfield via the Climate Change Info Mailing List; sent by bounce-875604-330596@lists.iisd.ca

<sup>25</sup> Parliamentary Joint Committee on ASIO, ASIS and DSD, *Intelligence on Iraq's Weapons of Mass Destruction*, The Parliament of the Commonwealth of Australia, 2004. See also *Intelligence on Iraq's Weapons of Mass Destruction; Report on Whether Public Statements Regarding Iraq By U.S. Government Officials were Substantiated By Intelligence Information*; and *Postwar Findings About Iraq's WMD Programs And Links To Terrorism And How They Compare With Pre-War Assessments*, Select Committee on Intelligence, United States Senate, 109<sup>th</sup> Congress, 8 September 2006.

Iraq invasion—much of which was based on dubious sources and occurred largely in isolation from the strategic assessments on offer. *Jane's Intelligence Digest*, for example, noted that much of 'the often flawed intelligence cited by both the USA and UK' came from 'outside the usual channels', in particular the US State Department funded Iraqi National Congress.<sup>26</sup>

In understanding the Bush and Howard governments' opposition to the Kyoto Protocol and the Blair government's contrary support for it, it is necessary to look again at the already existing policy priorities, political circumstances, and values base from which the executive policy elite (i.e., those with the executive authority to publicly state what is or is not government policy)<sup>27</sup> in each government made calculations of the 'national interest' and the Kyoto Protocol's potential for either helping or hindering the pursuit of established policy goals. Among all three governments, policy was again 'running strong' in the treatment of specialist advice, and again the policy debate became dominated by competing knowledge claims and assertions as protagonists arguing for and against the implementation of the Kyoto Protocol looked to specialist advice and uncertainty for evidence and arguments that would 'legitimise' their policy preference. When comparing the treatment of uncertainty issues in the global warming/climate change debate with their role in the arguments and specialist advice used by Bush, Blair, and Howard to justify military action in Iraq, the most obvious difference is that uncertainty was used as a basis *for* acting, or as insufficient reason for *not* acting, in one case (Iraq) but then interpreted as a basis *for not* acting, or as insufficient reason for immediate action *beyond* existing policy, in the other (the Kyoto Protocol). A less apparent distinction concerns changes in policy settings and instruments versus a more fundamental paradigm shift in policy goals and priorities as per Peter Hall's often cited analysis of the UK government's shift from a Keynesian economic philosophy to what has since become known as neo-liberalism under Margaret Thatcher in the early 1980s.<sup>28</sup>

The decision to invade Iraq essentially represented a change first in policy settings (more frequent UN inspections and stronger warnings of 'dire consequences' for Iraqi non-compliance) and then a shift in the policy instruments used (military force and occupation rather than containment). The use of military force to topple Saddam Hussein from power was a change in the choice of policy instruments rather than a paradigm shift in policy thinking since the need to remove Saddam from power had been part of publicly

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<sup>26</sup> 'Iraq: a war without intelligence', *Jane's Intelligence Digest*, 30 October 2003, [http://www.janes.com/security/international\\_security/news/jid/jid031030\\_1\\_n.shtml](http://www.janes.com/security/international_security/news/jid/jid031030_1_n.shtml)

<sup>27</sup> Whether or not executive decision makers are reacting to a policy challenge or proactively pursuing ideological preferences, justified in the 'national interest', the imperative that they publicly state what they intend to do, and how they intend doing it, and why is a major determinant of the policy process; it is an aspect of policy making that, in addition to defining policy, clearly reflects the strong link between policy and its justification. According to former US Secretary of State Warren Christopher, 'in any given week as Secretary, I received dozens of memoranda advocating various particular policy directions. However persuasive their contents, they did not constitute U.S. policy unless they were incorporated into a speech, public statement or formal government document. The challenge of articulating a position publicly compels leaders to make policy choices. Often decisions on what to do and what to say publicly are made simultaneously.' Quoted in Derek H. Chollet and James M. Goldgeier, "The Scholarship of Decision-Making: Do We Know How We Decide?," in Richard Snyder, H.W. Bruck, Burton Sapin, Valerie M. Hudson, Derek H. Chollet, James M. Goldgeier (eds), *Foreign Policy Decision-Making (Revisited)* (New York: Palgrave Macmillan, 2002), p.170.

<sup>28</sup> Peter Hall, 'Policy paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain,' *Comparative Politics*, 25(3), April 1993.

stated US policy since at least 1997.<sup>29</sup> And although this particular outcome did not become ‘policy’ in the UK or Australia until after 9/11, when the Bush administration made its intention to remove Saddam sooner rather than later clear, their respective commitments to US foreign policy and goals—upheld in the interests of strengthening their security and economic relations with the US—were longstanding, bipartisan pillars of nationalist interest perceptions in both countries. The Iraq debate then was not over the question of whether Saddam should go, but rather the question of by what means and how quickly he should go and in particular whether the alleged risks his regime posed justified the kind of change in policy instrument advocated by the US and its allies (i.e., from containment to invasion). In contrast, the climate change debate quickly became polarised over more than simply questions of the appropriate settings and instruments. The response mandated by the Kyoto agreement effectively required, in the eyes of the US and Australian governments at least, a paradigm shift in policy priorities and goals within an area of policy where policy makers are highly risk averse: the economy.

Because the policy elites within the US, UK, and Australian governments saw military action against Iraq as fitting within their existing policy paradigm—either in terms of Saddam’s removal or the importance of security relations with the US—they downplayed uncertainties over the need for, and outcomes of, using military force. In the case of the Kyoto Protocol, however, only the Blair government regarded this agreement’s mandatory carbon emission reductions, and the changes they would require in fossil fuel usage and cost, as being compatible enough with existing policy to allow their implementation through further adjustment of policy settings and instruments. For George W. Bush and John Howard, no such accommodation within existing policy and calculations of the national interest was possible—even under Australia’s entitlement under Kyoto to a limited increase in emissions until 2012<sup>30</sup>—and a policy shift in economic and energy thinking of the scale required by the Kyoto agreement was unacceptable. For Bush and Howard, it was the implementation of the Kyoto Protocol’s emission reductions and the paradigmatic shift in policy priorities and thinking required, rather than the unknown potential for long term climate change consequences cited by the protocol’s supporters, that represented the clearest and most immediate threat to the security of their countries—despite the efforts by some scientists, economists, NGOs, and governments to make anthropogenic global warming a more compelling ‘security’ issue than traditional state-centric notions of threats to the economy or the integrity of the state. Furthermore, support for the Kyoto Protocol among even its most vocal government supporters like the UK government ultimately proved

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<sup>29</sup> Speaking at Georgetown University in March 1997, Secretary of State Madeleine Albright made future US policy on Iraq contingent on Saddam’s removal from power: ‘We do not agree with the nations who argue that if Iraq complies with its obligations concerning weapons of mass destruction, sanctions should be lifted. Our view, which is unshakeable, is that Iraq must prove its peaceful intentions. It can only do that by complying with all of the Security Council Resolutions to which it is subject. Is it possible to conceive of such a government under Saddam Hussein?... The evidence is overwhelming that Saddam Hussein’s intentions will never be peaceful.... Clearly, a change in Iraq’s government could lead to a change in U.S. policy. Should that occur, we would stand ready, in coordination with our allies and friends, to enter rapidly into a dialogue with the successor regime.’ ‘Preserving Principle and Safeguarding Stability: United States Policy Towards Iraq’, Speech by U.S. Secretary of State Madeleine Albright, at Georgetown University, Washington D.C. 26 March 1997. Quoted in ‘The Iraq Crisis’, House of Commons Parliamentary Research Paper 98/28, February 1998, p. 8. <http://www.parliament.uk/commons/lib/research/rp98/rp98-028.pdf>

<sup>30</sup> The Howard government attracted considerable criticism, especially from the EU, when it demanded and received an 8 percent *increase* on its 1990 emission levels during negotiations for the Kyoto Protocol. Prime Minister Howard later announced Australia would not ratify the Kyoto agreement in 2003.

to be dependent on the extent to which emission reductions could be reconciled within established policy priorities and objectives.

Opposition to the emission reductions called for in Kyoto on the grounds of the harm it would cause to the US economy was made clear in the Republican dominated US Senate as early as 1997 by the 95-0 vote supporting the Byrd-Hagel Resolution's rejection of US participation in any emissions reduction agreement that excluded developing countries.<sup>31</sup> In addition to concerns expressed by both the Bush administration and Howard government over the uncertainties surrounding claims of anthropogenic climate forcing and its future impacts, the other major reason cited by both governments was that the Kyoto agreement did not require emission reductions or limits from developing economies as well, in particular China and India. This often cited source of opposition to ratifying the Kyoto Protocol's planned emission reductions illustrated the kind of state pre-occupation with self interest and concerns about international cooperation creating the kinds of unequal benefits that realist theorists had long warned of as an obstacle to international agreements. But given the increasing domestic pressure within both countries—encouraged by the IPCC and various media reports and NGOs—for their governments to recognise global warming as a serious threat, it was also becoming clear by late 2005 that if Kyoto was off the list of policy options, then some kind of surrogate response was needed to show that the issue at least had the government's attention. Thus, President Bush and Prime Minister Howard found themselves in the kind of bind described by Robert Putnam's 'two level game'<sup>32</sup> depiction of how policy elites are forced to reconcile tensions between foreign policy ambitions shaped by their own notions of the national interest and the international system on the one hand, and the domestic plurality of competing interests that elected governments are ultimately accountable to on the other hand. The solution Bush and Howard adopted for their two level game dilemma over how to appear engaged with global warming as a policy issue while minimising any risks to their fossil fuel dependent economies was to propose a new international forum with a very different strategy, technology based strategy for controlling emissions: the Asia Pacific Partnership Group (AP6).

Buttressing the need for an alternative approach to global warming were the numerous critics of the Kyoto Protocol that had emerged by this time. In addition to the now regularly cited issue of the Kyoto agreement's failure to require any emission reductions in the developing world, some argued that the Kyoto strategies were undermined by too many questionable assumptions in relation to the likely costs involved. Meanwhile debate raged—even among those supporting the anthropogenic global warming consensus—over how effective, if at all, the protocol's reductions would be even if full international co-operation and implementation were possible, which was by now looking increasingly unlikely. Indeed, by late 2005 even Tony Blair was becoming critical of the approach drawn up in Kyoto, drawing accusations that he was again falling into line with Washington, as he had in Iraq. At a climate change conference convened by former US president Bill Clinton, Blair's criticism of the Kyoto agreement and endorsement of the technology focused response to global warming proposed by his allies in Washington and Canberra attracted a storm of protests and accusations of backtracking on his formerly strong pro-Kyoto rhetoric:

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<sup>31</sup> Byrd-Hagel Resolution, 105<sup>th</sup> Congress, 1<sup>st</sup> Session, S.Res. 98, United States Senate, 25 July 1997.

<sup>32</sup> See Robert Putnam, 'Diplomacy and Domestic Politics: The Logic of Two Level Games,' *International Organization*, vol. 42, no. 3, 1988, pp. 427-60.

I'm changing my mind about this ... no country is going to cut its growth or consumption substantially in the light of a long term environmental problem. To be honest, I don't think people are going, at least in the short term, to start negotiating another major treaty like Kyoto.... How do we move forward and ensure that, post-Kyoto, we do try to get agreement? I think that can only be done by the major players in this coming together and finding a way for pooling their resources, their information, their science and technology.<sup>33</sup>

Interestingly, Tony Blair's publicly stated reluctance to sacrifice economic security in the pursuit of 'climate security' and emphasis on a 'market-based' response prefaced a softening of climate policy in Washington and Canberra the following year in late 2006. The Bush and Howard governments had been gradually toning down their sceptical position on global warming impacts since 2002 as public fears in both countries over climate change intensified, especially in the wake of the release of Al Gore's documentary *An Inconvenient Truth* and *The Stern Review Report on the Economics of Climate Change*. Prime Minister Howard made his new found enthusiasm for acting against climate change clear at the Asia Pacific Economic Co-operation (APEC) summit in Hanoi in November 2006, where he actively promoted discussions on regional measures against climate change, giving it the same priority as Iraq and global trade.<sup>34</sup> The Howard government, however, continued to reject policy it claimed would harm Australia's economy and fossil fuel interests, but, nonetheless, made global warming a government priority, particularly in relation to the energy debate that was emerging at home over his government's calls to end Australia's long running ban on nuclear power. President Bush, too, was undergoing a Gestalt switch of sorts on global warming policy that was remarkably similar to the new line of thinking espoused by his Australian ally, as demonstrated by the softening of the Bush administration's position on the need for international policy action on global warming witnessed at both the APEC meeting and later at the 2007 United Nations Climate Change Conference in Bali. In his 2007 State of the Union speech, President Bush already had indicated a shift in his position on climate change, and in particular America's oil dependency, was underway when he said:

America's on the verge of technological breakthroughs that will enable us to live our lives less dependent on oil. And these technologies will help us become better stewards of the environment, and they will help us to confront the serious challenge of climate change.<sup>35</sup>

Howard's and Bush's rhetorical shift on global warming most likely was motivated by increasing public concern and the greater weight anthropogenic global warming had acquired as a policy issue, particularly with federal elections looming in both countries, since no new or more compelling evidence on the likelihood of global warming's most serious threats being realised appeared prior to either government adopting a less sceptical position. But despite the greater acknowledgement by both leaders of global warming's importance and potential consequences, their priorities were still very much about avoiding any economic disruption at home.

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<sup>33</sup> Quoted in 'Blair falls into line with Bush view on global warming', *The Independent*, 25 September 2005. <http://www.independent.co.uk/environment/blair-falls-into-line-with-bush-view-on-global-warming-508336.html>

<sup>34</sup> 'Howard talks up breakaway climate group at summit', *The Sydney Morning Herald*, 17 November 2006.

<sup>35</sup> 'President Bush's 2007 State of the Union Address (as delivered in the House Chamber)', 23 January 2007, *The Washington Post* <http://www.washingtonpost.com/wp/dyn/content/article/2007/01/23/AR2007012301075.html>

At the inaugural meeting of the AP6 in January 2006, George W. Bush and John Howard, two of the Kyoto Protocol's biggest critics, talked up the importance of developing renewable energy sources as a way of combating global warming threats without incurring potentially crippling economic penalties; little actually had changed, however, in terms of the policy priority given to short term economic growth over the longer term and still largely speculative challenges posed by global warming. Prime Minister Howard, for example, also made it quite clear the Australian government remained committed to fossil fuels with his endorsement of the AP6 view that fossil fuels 'will be an enduring reality for our lifetime and beyond'.<sup>36</sup> According to figures reported in *The Australian*, of the A\$100 million the Howard government had dedicated to the partnership over the next five years, only A\$5 million per year was for developing renewable energy projects. This, according to a government AP6 press release, was in addition to the A\$200 million the Howard government claimed it already had invested in developing renewable energy (A\$500 million meanwhile had been 'invested' in so-called 'low emission technologies' such as carbon sequestration). For its part, the US government, which spends more than US\$350 billion on its military each year, committed a meagre US\$52 million from its 2007 budget, subject to approval by Congress ('expected' to grow to US\$260 million by 2011).<sup>37</sup> Moreover, both governments essentially used the AP6 as a cover for dodging the global warming issue entirely by announcing their intention to hand the job of developing and implementing new energy technology over to the private sector.

The ongoing focus in climate change policy discussion on often vague and complex market-based responses to climate change, such as the various carbon trading scheme models, is perhaps the clearest indication that it still is not regarded as a 'security' issue by many governments, despite efforts and claims to the contrary within the European Union. The UK government in 2007, for example, attempted to promote climate change as a security issue in the UN Security Council<sup>38</sup> while the European Commission has sought to use climate change as a catalyst for new energy security measures and targets for renewable energy among member states.<sup>39</sup> But even among governments supportive of emission reductions and targets, there has been no direct government policy response of the kind normally seen when an area of 'national security' has been at risk. Put simply, the policy rhetoric on climate change and its threat potential has not been matched by the kinds of measures and policy shifts (e.g., the rapid introduction of carbon taxes by governments) one would expect to see if such threats were indeed being taken seriously:

Whether someone is serious about tackling the global-warming problem can be readily gauged by listening to what he or she says about the carbon price. Suppose you hear a public figure who speaks eloquently of the perils of global warming and proposes that the nation should move urgently to slow climate change. Suppose that person proposes regulating the fuel efficiency of cars, or requiring high-efficiency light bulbs, or subsidizing ethanol, or providing research support for solar power – but nowhere does the proposal

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<sup>36</sup> Stephanie Peatling and Wendy Frew, 'Greenhouse battle handed to industry', *The Sydney Morning Herald*, 13 January 2006.

<sup>37</sup> Amanda Hodge and Samantha Maiden, 'Ferguson splits Left on Kyoto', *The Australian*, 13 January 2006.

<sup>38</sup> 'Energy, Security, and Climate', UK Mission to the UN, UK Concept Paper, 23 April 2007.

<sup>39</sup> Maria Julia Trombetta, 'Environmental security and climate change: analysing the discourse', *Cambridge Review of International Affairs*, vol. 21, no. 4, 2008, pp. 585-602.

raise the price of carbon. You should conclude that the proposal is not really serious and does not recognise the central economic message about how to slow climate change.<sup>40</sup>

Unlike the transnational threats posed by terrorism, failing states, pandemics, and the ongoing economic fall-out from the sub-prime mortgage meltdown in the US, for example, where governments have directly intervened using state resources on the grounds of national security, policy responses to climate change have relied almost entirely on market mechanisms and the private sector for their implementation and funding. And, in so far that governments have taken the lead in implementing climate change responses, these measures have focused much more on the issue of energy security than climate security. Moreover, they are motivated and informed primarily by traditional state-centric notions of security and relative gains in contrast to the more multi-lateral, 'global public good' framing of 'climate security' characterising both domestic and international policy debates.<sup>41</sup> And for the economies of Australia and the US, and many developing states, the cure may well represent a bigger threat than the disease. Thus, the Janus-like nature of emission reductions as either a threat or threat response, depending on one's circumstances, perceptions, and priorities, is the main obstacle to anthropogenic climate change becoming securitised to the extent that its potential threats are directly linked by states to their own national security.

Bush's and Howard's change in policy rhetoric indicated their acceptance of global warming as a 'political fact' that no longer could be ignored or downplayed, regardless of the many uncertainties that still surrounded its causes and possible impacts, but only in terms that maintained the economy as the *central* referent of security. Bush and Howard also shared very similar views and values on security and the economy as the fundamentals of the 'national interest', and in particular on the need to avoid sacrificing any aspect of the national interest on the altar of multi-lateral engagement and commitment.<sup>42</sup> The economic costs that both governments believed major emission cuts would have in their respective societies, despite the public mood towards the potential dangers of global warming, remained the dominant influence on the kind of specialist advice the policy elites in these two governments were prepared to accept as the basis of policy. In contrast, the positions on the need for an international response to global warming, especially on the kind of role their countries should play in that response, taken by Bush's and Howard's Democratic and Labor Party predecessors stemmed from a national interest perspective more accepting of the potential for environmental threats and also far more supportive of engagement with international institutions as a response to international issues and threats. It is, however, unlikely that the economic costs of implementing Kyoto would have remained without influence for very long under either side of politics in Australia and the US given the ongoing fossil fuel dependence both economies share.

One conclusion to draw from the apparent about-face on climate change by President Bush and Prime Minister Howard is that a combination of expert consensus, international pressure, and domestic public opinion finally proved effective in influencing US and Australian policy, giving some weight to Rationalist

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<sup>40</sup> William Nordhaus, *A Question of Balance: Weighing the Options on Global warming Policies* (New Haven: Yale University Press, 2008), p. 22. It is also worth noting that UK emissions began increasing in the late 1990s under the Blair government.

<sup>41</sup> Trombetta, 'Environmental security and climate change: analysing the discourse', pp. 599-601.

<sup>42</sup> See Lorraine Elliot, 'Pragmatism, prosperity, and environmental challenges in Australia's foreign policy', in Jamees Cotton and John Ravenhill (eds), *Trading on Alliance Security: Australia in World Affairs 2001-2005* (South Melbourne: Oxford University Press, 2007), pp. 214-16.

notions about how knowledge can and does play a significant role in policy decisions and also pluralist claims over the ability of the 'truth' to finally win out in the course of public debate and then, on the basis of its validation in the marketplace of ideas, become accepted by governments as the legitimate basis of policy. Constructivists and Liberal Institutionalists interested in the ability of international regimes and emerging norms to influence the policies of member governments and facilitate cooperation among states on international issues also might point to the US and Australian policy shifts as evidence that new norms can evolve and influence state notions of national interest and that cooperation in international politics need not be hamstrung by fears of unequal relative gains and an unwavering commitment to state self interest. According to these perspectives, the case of Iraq would be an aberration in policy terms; a blatant example of political manipulation or ideology perverting the idealised rationalist policy making schema and further proof of the need, therefore, to get politics *out* of policy making.

The explanation presented here, however, paints a very different picture of the role specialist advice and uncertainty played in the policies adopted by the Bush, Blair, and Howard governments—one that looks not only to how established policy priorities and the world views of policy elites shape the interpretation of uncertainties in policy advice, but also to the role such interpretations play in justifying the adoption of some specialist advice over other specialist advice. Moreover, this perspective also questions the extent to which the kinds of explanations outlined above are useful in understanding the pro-Kyoto policies adopted by some governments. In contrast to the Australian and US positions, it also seems clear that those governments that supported the Kyoto Protocol, such as the Blair government, had judged that the political benefits of doing so (e.g., a positive commitment to environment values) could be realised without incurring unacceptable levels of job losses, price increases, and GDP impact.<sup>43</sup> In the UK significant emission reductions had already been achieved during the 1990s due to the phasing out of Britain's coal-fired power plants in favour of cheaper and cleaner natural gas powered generators. And in contrast to Australia and the US, climate change already had a history of bi-partisan support as a major policy issue—due in no small part to the complementary role climate change threats played within ongoing government plans for privatising the UK's electrical providers and making the country more energy secure—which dated back to a mix of energy and pro-market reform policies that began with Margaret Thatcher's confrontation with Britain's coal miners and her goal of expanding Britain's supply of nuclear generated electricity.

For some governments, like the Blair government and many of its EU partners, the implications of such a paradigm shift had largely been minimised by already implemented industry and energy reforms that had, rather ironically, been deemed necessary for reasons of economic security and growth. In the UK, the move away from high coal and oil dependency towards cleaner options in the form of natural gas and 'renewables' had been underway since the early 1980s. UK emissions had been falling since the late 1980s thanks largely to the 'dash for gas' and increased emissions regulation that followed Margaret Thatcher's liberalisation of the UK's energy industry, at the expense of the country's coal mines, and the

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<sup>43</sup> Some critics of the science and economic advice used to support the Kyoto reductions even went so far as to suggest that European governments initially supported the protocol's implementation only because they believed that it would never come into force due to the opposition of the US and other likeminded governments. See, for example, S. Fred Singer, *Climate Policy—From Rio To Kyoto: A Political Issue for 2000 and Beyond* (Stanford University: Hoover Institution on War Revolution and Peace, 2000).

discovery of large oil and gas deposits in the North Sea.<sup>44</sup> Moreover, these domestic energy reforms meant that the timing of the UK's reductions meshed nicely with the Kyoto agreement's 1990s baseline for emission reductions. As John Howard remarked in a 2006 interview: '... with very great respect to my good friend Tony Blair, Kyoto was in a sense designed to suit the Europeans because of the starting date and which happened to coincide fairly neatly with some very significant emission-reducing events that took place in Europe.'<sup>45</sup> But for the still coal- and oil-dependent economies of the US and Australia, where emission levels steadily had been increasing, emission reductions of the scale and nature being called for by the Kyoto Protocol and its supporters represented a shift in policy thinking that not only would be difficult to implement but also would certainly involve significant short term economic risk and pain with no more than the prospect of highly uncertain long term benefit in return.

## Conclusions

What has become apparent since the Kyoto Protocol, and its attempt to compel societies and their governments to prioritise 'climate security' over economic and energy security, is that the 'scientific' consensus, plagued as it is by un-testable assumptions and knowledge gaps, is not on its own a sufficient basis for 'political' consensus when important or entrenched values and interests are at stake. The 'science informing policy and making it rational depiction' of how policy should be made relies on science being able to provide certainty, or something very close to it, in its explanations of phenomena and cause and effect—at least to the point where all are sufficiently compelled by logic and reason to choose only the 'right' response as illuminated by science. But science is seldom able to provide such guarantees and guidance in issues of policy where complexity and uncertainty abound and the making of one decision rather than another can result in heavy losses and consequences, both known and unknown. In post-normal policy issues, Rationalist expectations of science encourage political disagreements to be played out under the guise of scientific debate (since in post-normal issue areas no-one can claim a decisive victory on the basis of science) until one set of values finally becomes dominant and further debate becomes untenable. The scientific advice aligned with the most widely embraced values (e.g., save the whale, anti-smoking, anti-GMF) subsequently becomes the 'consensus view' (read 'only scientific' view), while all remaining dissenting scientists become contrarians and are tainted by suspicion (e.g., self-interested links with industry and/or government). Thus, the process becomes self-perpetuating since all the while the values that actually drive the debate remain out of the spot light and are therefore never explicitly debated outside the realm of competing knowledge claims. And because a scientific consensus is ultimately declared in support of those values (even though the values are likely to be informing the science, rather than vice-versa), science is seen to have one the day by producing the rational policy!

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<sup>44</sup> Michael Grubb notes that approximately half of the UK's emissions reduction in the 1990s can be attributed to the switch from coal to natural gas electrical generation. See Michael Grubb, 'Britannia waives the rules', *New Economy*, 2002, p. 142.

<sup>45</sup> John Howard interview with *Four Corners*, Australian Broadcasting Corporation, 12 September 2006, <http://www.abc.net.au/4corners/content/2006/s1738726.htm>. William Nordhaus makes a similar point in criticising the use of base year emission targets: 'Base year emissions have become increasingly obsolete as the economic and political fortunes of different countries have changed. The 1990 base year penalizes efficient countries (like Sweden) or rapidly growing countries (such as Korea and the United States). It also gives a premium to countries with slow growth or with historically high carbon-energy use (such as Britain, Russia, and Ukraine).' William Nordhaus, 'Life After Kyoto: Alternative Approaches to Global Warming Policies', Yale University, 9 December 2005, [http://www.econ.yale.edu/~nordhaus/kyoto\\_long\\_2005.pdf](http://www.econ.yale.edu/~nordhaus/kyoto_long_2005.pdf)

It is also worth noting that while it is often regular, normal scientific endeavour that identifies the potential problem or risk (as with climate change or ozone depletion for example), the issue then becomes open to being more or less hijacked by whoever has an interest in pursuing it. At this point the pressure for scientific consensus begins to build depending on how well the issue bites politically, causing the normal practice of science, particularly when it is forced to operate in the post-normal realm, to produce ongoing controversy rather than 'consensus'. There exist, then, fundamental tensions and incompatibilities between what science can actually do and what policy makers, interest groups, the general public want it do (i.e., prove to everyone else that the policy response that supports and reflects their values is the appropriate one!). And therein lies the rub: policy making is necessarily about the future whereas science is restricted to the present and the past for the evidence it relies on to theorise and test knowledge claims. The business of determining policy responses to climate change impacts, for mitigation and adaptation strategies alike, is an entirely political process that must manage competing values, choices, and preferences. And although some scientists appear to think otherwise, policy advocacy is beyond the realm of scientific expertise. While most physical scientists no doubt believe their task is about uncovering the realities of the natural world, policy is about the reality of what is acceptable and therefore achievable in the political world. Even if, for example, everyone accepted the consensus on human induced 'global warming' as the most compelling explanation for what is happening today, as most governments now have, we would be no closer to understanding either what global warming means in terms of what will happen tomorrow or reaching agreement on how best to respond to it.

So what should acceptance or rejection of one or another of the various global warming scenarios (the IPCC has produced some forty 'scenarios', not 'predictions'), which range from minor to catastrophic climate change consequences, be based upon? Hard evidence, guess-work, ideology, faith, or all of the above? And, most importantly, how does our confidence in such scenarios actually occurring stack up against the costs of taking precautions today against the possible (but unknown) costs of global warming tomorrow? Given the numerous uncertainties that characterise our understanding of the global climate and the effects of our interaction with it,<sup>46</sup> it is not surprising that many governments, especially those in developing countries, are unwilling to accept a high risk of significant economic cost and hardship today—despite the Stern Report's relatively optimistic assessment on this point<sup>47</sup>—in order to limit only one of the many variables that may or may not cause future global warming catastrophes. The central policy question then should not be all about who has got it right; we should also be thinking about how we can develop a strategy that best manages the risks involved with getting the causes and potential effects of climate change wrong, at least until we are in a position to more confidently discuss what may or may not happen and adjust our policy responses accordingly.

Talks on the framework to replace the Kyoto Protocol when it expires in 2012 are already underway, and the early indications are that the Kyoto blueprint is now firmly out of favour and likely to be shelved altogether. Among the possible alternatives raised at early meetings was the idea of replacing the existing focus on crude emission cuts with targets for the development and implementation of renewable energy targets, an encouraging sign that some governments at least are beginning to understand that the options

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<sup>46</sup> Not to mention our inability to *know* what either the climate or we might be doing in fifty or one hundred years time.

<sup>47</sup> See Note 14.

for climate change policy need not be limited to emission reductions. There are many policy initiatives that not only would contribute directly to managing the potential for future climate change impacts but could be justified independent of climate change science. Reframing climate change mitigation to focus on phasing out fossil fuel use rather than reducing carbon emissions, for example, would make uncertainty over human influence on the climate largely redundant in policy terms since eliminating industrial carbon output would, in addition to *certainly* reducing carbon levels, also help address a number of other uncontroversial, broadly recognised policy challenges ranging from energy security concerns over future energy supply and competition to the health and environmental impacts of air pollution. Adaptation measures such as more energy efficient buildings and infrastructure implemented alongside more careful planning of where and how they are built offer numerous benefits that would apply regardless of whether carbon emissions will cause sea levels to rise or breed more destructive weather events. And, because the benefits of such measures are not dependent on the accuracy of climate science and its predictions, adopting such a change in focus also would provide us with some insurance against being wrong in our current assessment of how and the extent to which human activity alters climate behaviour. Climate change research in the meantime should continue—not as a justification for delaying policy action until the ‘facts are in’ or in the belief that the certainty policy makers demand can be achieved—but rather in the hope that it will at least explain how some of the many uncertainties we necessarily face in policy making might be better managed.