

## Climate Science, Economics, and Policy

Majority opinion and official policies on climate change are over-presumptive, and the expert advisory process that governments have put their trust in is flawed.

by David Henderson

I am an economist, and a relative newcomer to climate change issues. I became involved with the subject by accident rather than design. To begin with, my main involvement was limited to some economic and statistical aspects of this huge and complex array of topics.

Over time, however, my interests and concerns have broadened in ways that I had neither planned nor expected. Increasingly, I have become critical of the way in which the issues of climate change are being viewed and treated by governments across the world, with widespread support from public opinion. I am now a non-subscriber to positions, arguments, and policies that find general and often unquestioning support. Today I will outline the minority views—you might well think, the heretical views—that I have come to hold, and my reasons for holding them.

Those views now extend to the subject as a whole, not just the economic aspects. In fact, I shall say little about economics as such.

Rather, I shall focus more on what economists and others have said or assumed about climate science, where I am out of step with majority thinking.

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diagnosis and prescription, a body of *received opinion* shared by the great majority of governments and by many of their citizens. Predictably, however, it is not universally shared. Both diagnosis and prescription remain subject to challenge by a varied collection of doubters, skeptics, questioners, critics, non-subscribers, nonconformists—in a word, *dissenters*. Against them, and greatly outnumbering them, are arrayed what I term the *upholders* of received opinion.

Within both groups, again predictably, there are different schools of thought: A whole spectrum of opinions can be identified. At one end, there are what may be termed *strong* or *full-blown* upholders, the dark greens so to speak. Promi-

nent among these are my fellow-economist Nicholas (now Lord) Stern and the team of authors that worked under him to produce the *Stern Review on the Economics of Climate Change*. The *Review* takes the position that global warming arising from

human activities “presents very serious global risks and ... demands an urgent global response.”

At the other end of the spectrum, strong dissenters—the dark blues—argue that such warming, if indeed its extent can be shown to be significant, is not a cause for alarm or concern. Hence mitigation measures designed to curb emissions of (so-called) greenhouse gases should be eschewed—or discontinued, where they are now in place. In between these two far removed positions, there are upholders and dissenters who hold more *limited* or *qualified* beliefs. In the middle there is often common ground, so that the distinction between the two groups becomes blurred.

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Within both broad groups, there are insiders and outsiders. The insiders are qualified to make informed judgments on scientific aspects, while the outsiders are not. I count as an interested outsider.

**R**eceived opinion is reflected in an *official policy consensus*. With few exceptions, governments across the world are committed to the view that anthropogenic global warming—from now on, AGW—constitutes a serious problem which requires official action at both national and international level.

This official consensus is not new. Climate change issues, and the extent and possible consequences of AGW, have been on the international agenda for 20 years or more. It is now 17 years since governments decided, collectively and almost unanimously, that determined steps should be taken to deal with what they agreed was a major problem. The decisive collective commitment was made in 1992, through the United Nations Framework Convention on Climate Change.

The Convention specifies that its ultimate objective is to achieve "... stabilization of greenhouse gas emissions in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." That agreed objective remains in place today.

Since 1992, many governments have acted, through what is now a wide range of measures and programs, to curb emissions of CO<sub>2</sub>. On the international scene, through the Kyoto Protocol, Annex I countries have undertaken to meet specific targets for emissions reductions. And at the December 2009 international gathering in Copenhagen, the governments of the world will be considering what further measures, possibly extending to developing countries also, might succeed the Protocol after it

expires in 2012.

In taking this course, governments have met with widespread political and public approval. I can think of only one current political leader who is a convinced and open dissenter, namely, the president of the Czech Republic, Vaclav Klaus: he has brought out a short book on the subject, entitled *Blue Planet in Green Shackles*, and he has taken it as the theme for public presentations. However, he does not speak for his government.

Beyond political circles, backing for the policy consensus has come from media commentators, representative scientific bodies including the Royal Society, environmental advocacy groups (the "NGOs"), and, increasingly, large business enterprises. Further, there is considerable support for the official consensus

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position among economists. As usual, our profession is far from being of one mind, but I believe that within it upholders outnumber dissenters.

**A**s to the basis for consensus, the main influence on governments' perceptions of climate change issues has been, and still is, *the scientific advice provided to them*.

That advice can and does come from many sources; but the main single channel for it, indeed the only channel of advice for governments *collectively*, has been the series of massive and wide-ranging Assessment Reports produced by the Intergovernmental Panel on Climate Change (IPCC). The most recent of these, referred to for short as AR4, was completed and published in the course of 2007. It chiefly comprises

the massive separate volumes issued by each of the Panel's three Working Groups: WGI deals with issues of climate science, WGII with the prospective impacts of possible global warming, and WGIII with mitigation measures. The various documents that make up AR4 come to around 3,000 pages, and some 2,500 experts—authors, contributors, and reviewers—were directly involved in preparing them.

The IPCC does not itself undertake or commission research: The Assessment Reports review and draw on already published work. The Panel's own contribution thus forms only one element in the advisory process. All the same, the IPCC is influential and important in its own right. Its reports carry substantial weight, with public opinion as well as its member gov-

ernments, because of their wide-ranging coverage of the issues and their extensive and ordered scientific participation. The Panel's work received further and conspicuous recognition through the award of the 2007 Nobel Peace Prize, which it shared

with Al Gore.

Through its three working groups, the IPCC covers the whole range of topics relating to climate change, including economic aspects. However, what has chiefly carried weight throughout has been its presentation of climate science in the reports from WGI. For example, the citation for the Nobel award focuses on the way in which the Panel "has created an ever-broader informed consensus about the connection between human activities and global warming."

Support for the IPCC's message, and praise for its work, have come from scientists outside the field of climate science and from leading scientific academies across the world. It is often claimed that there now exists a worldwide scientific consensus on climate change issues,

sometimes described as “overwhelming.” For me, such language goes too far. However, I think it is fair to say that alongside the official policy consensus (which *is* a reality), and providing much of its rationale and support, there exists a body of what I term *prevailing scientific opinion*. Those who subscribe to it can all be classed as upholders, though as I will note later there are different shades of opinion among them.

In recent years the scope of the official advisory process has been extended. Governments have sponsored major studies on the economics of climate change, with coverage and results that go well beyond what can be found in AR4. Leading examples are the 700-page *Stern Review* in the UK, the recent 600-page *Garnaut Climate Change Review* in Australia, and published work that has emerged from the IMF.

These various officially sponsored economic studies count as significant further contributions. In one key respect, however, they have not broken new ground. All of them treat the core of received opinion as their point of departure. In taking that course, they have confirmed and reinforced the policy consensus.

Economists have taken differing positions on the economic aspects of climate change. Superimposed on these differences is the broad dividing line between upholders and dissenters, and this falls outside the accepted bounds of our subject. It concerns the choice of a point of departure; and that choice depends on a judgment as to what conclusions it is appropriate to draw from arguments and evidence that are scientific rather than economic. Received opinion among economists takes as given what it sees as firm scientific conclusions. Thus the *Stern Review* says at the start that “The scientific evidence that climate change is a serious and urgent issue is now compelling,” and the Garnaut report takes a similar line.

For me, such unqualified as-

sertions presume too much. They present as established truth what are in fact no more than arguable propositions that have found expert support. Some of these propositions relate to possible developments decades or even centuries into the future.

Some of my colleagues are apt to view this reaction of mine with a mixture of wonderment and exasperation. Among these is a distinguished professor who wrote to me, with manifest signs of incredulity, that:

You have formed the clear and strong view that what is overwhelmingly the opinion of the relevant scientific community in all of the leading countries is wrong. I do not see that there is a rational basis for an outsider to the science taking the view that the weight of established scientific opinion is probably wrong.

A similar line of argument is to be found on the opening page of the introduction to the Garnaut report.

Not so: My colleague and the Garnaut report share with many others a misconception. There is a well-recognized difference between questioning and denial, between being an agnostic and being an atheist, and the spectrum of dissenters includes both categories. Personally, I count myself as an agnostic, and I have never thought, said or written that “the mainstream science is wrong.” Among fellow-dissenters, Nigel (Lord) Lawson, takes much the same position. In his recent book on climate change issues, he takes as his starting point only that “the science of global warming is far from settled,” while noting that there is “a majority view ... which can loosely be called the conventional wisdom.”

Unlike the full-blown dissenters, then, I do not reject or dismiss mainstream science. My case against generally received opinion is that much of it is seriously over-presumptive.

There are three distinct but inter-

related forms of over-presumption. The first is that the alarm-oriented views to be found today, in a range of high level official and unofficial statements, mirror prevailing scientific opinion and go no further than that opinion clearly warrants. The second is that prevailing scientific opinion must now be viewed as no longer open to serious question. And the third is that the process of review and inquiry from which prevailing scientific opinion has emerged, and in particular the IPCC process as its leading element, are professionally above reproach.

In my view, all these mutually reinforcing beliefs are unfounded. They reveal a lack of awareness of today’s prevailing overstatement, over-confidence, and ingrained bias.

First, overstatement. Here are some recent and representative high-level specimens of what I call the *sexed-up policy consensus*.

- Tony Blair, as British prime minister, together with his Dutch counterpart, in a joint letter of October 2006 to other EU leaders: “We have a window of only 10–15 years to take the steps we need to avoid crossing a catastrophic tipping point.”
- The Secretary-General of the UN, Ban Ki-moon, in 2007: “Climate change threatens the whole human family.”
- Some 150 business leaders, in a double full-page advertisement in the *Financial Times* before the 2007 Bali conference: “There is no doubt that the fate of our civilisation hangs in the balance.”
- President Nicholas Sarkozy of France, in a speech made in July 2008: “We now know that we are the last generation that can prevent catastrophe.”
- The International Energy Agency, in its *World Energy Outlook, 2008*: “Preventing catastrophic and irreversible

damage to the global climate ultimately requires a major decarbonisation of the world energy sources.”

These assertions, and many others of their kind, go too far. They are put forward as statements of established fact, but in reality they are no more than strongly held beliefs. They do not accurately mirror prevailing scientific opinion, and they go well beyond the more guarded language of AR4.

A leading British climate scientist, Mike Hulme, has described statements such as these as constituting “a discourse of catastrophe [which] is a political and rhetorical device.” Hulme, who is no dissenter, added that: “The language of catastrophe is not the language of science. It will not be visible in next year’s global assessment [AR4] from the world authority of [the IPCC].” He went on to contrast the respective positions of catastrophists and climate scientists.

I think that Hulme was right about the more cautious wording of AR4. But the contrast that he drew does not hold good. The fact is that there is no clear dividing line between catastrophists and climate scientists. It is influential climate scientists, taking a more somber view than Hulme, who write, or tacitly approve, or provide the inspiration for, the catastrophist scripts and beliefs of leading lay figures. It was on the basis of views directly conveyed to them by climate scientists that both Lord Stern and Professor Garnaut chose their respective points of departure.

The moral to be drawn is twofold. First, the alarm-oriented positions widely taken today by influential persons and organizations do not mirror the more considered and qualified language of AR4: They go well beyond it.

Second, in relation to scientific aspects, there is—as one would

expect—a range of insider views, even among the upholders, concerning the evidence and the conclusions to be drawn from it.

**T**his last observation brings me to my second category of over-presumption – the over-confident view that prevailing scientific opinion is no longer open to question.

In their 2007 Summit Declaration, the leaders of the G8 countries referred, in a section on climate change, to “the scientific knowledge as represented in the recent IPCC reports...” Had I been a pre-Summit Sherpa, involved in the drafting of the Declaration, I would have argued strongly, though doubtless in vain, for changing “scientific knowledge” to “the weight of scientific opinion.”

What is under review here is

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a climate system of extraordinary complexity, which is far from being well understood. The IPCC itself, in its Third Assessment Report of 2001, observed:

In climate research and modeling, we should recognize that we are dealing with a coupled non-linear chaotic system, and therefore that the long-term prediction of future climate states is not possible.

The same report contained an instructive diagram showing what it described as “the cascade of uncertainties.” All of those uncertainties remain today, alongside others which, quite properly, were not shown in the cascade diagram. I would add, as a further aspect, that since 2001 serious questions have been raised about evidence that the Panel has drawn on concerning past temperature changes.

The extent of continuing uncertainty and sheer lack of knowledge about the properties of the climate system, and the wide range of expert views today, form the subject matter of a notable document brought out in revised form at the end of 2008 by the office of the Republican ranking member of the Environment and Public Works Committee of the U.S. Senate. This report is a kind of dissenting anthology. It presents, through summary direct quotation, views of some 660 professionals from different relevant subject areas, all of whom question one or more aspects of prevailing views on climate change.

Two main themes emerge from the dossier. First, the causes of climate change are far from completely understood, so that it is difficult—some would say

impossible—to isolate the effects of human activity. Second, natural influences on the climate, as opposed to the consequences of human activity, have continued to predominate. A number of the scientists

quoted place special emphasis on solar influences.

I believe that statements to the effect that the science is settled, that the scientific evidence is now overwhelming, and that the scientific debate is now over, are unfounded, and not only unfounded but also damaging to the cause of free inquiry. Such strong assertions are not drawn direct from the text of AR4. However, they could not have gained such widespread acceptance were it not for the uncritical reliance that is placed on the established official process of review and inquiry, and within it, on the work and role of the IPCC.

**T**his leads to my third aspect of over-presumption—the disregard of endemic bias.

Over the past 20 years governments everywhere, and a great many outside observers too, have

put their trust in the expert advisory process as a whole and the IPCC process in particular. I have come to believe that this widespread trust is unwarranted.

Why do people and governments have so much faith in the IPCC process? I think it is because of the wide and structured expert participation that it provides. People visualize an array of technically competent persons whose knowledge and wisdom are effectively brought to bear through an independent, objective, and thoroughly professional inquiry. Indeed, many outside observers identify the Panel with the expert network, as though well-qualified and disinterested experts were the only people involved.

The reality is both more complex and less reassuring. A basic distinction has to be made between the IPCC *Panel*, and the IPCC *process*. The two are not the same, and the process involves three distinct groups.

The first comprises the *Panel* itself, along with its two subsidiary bodies. The Panel effectively comprises those officials whom governments choose to send to Panel meetings. They include scientists as well as laymen. Working directly for the Panel is the small IPCC *Secretariat*. A more influential body is the 30-strong IPCC *Bureau*, comprising high-level experts in various disciplines from across the world, chosen by the Panel. The Bureau acts in a managing and coordinating role under the Panel's direction.

A second group is made up of the now 2,500-strong *expert network*, the persons who put together the draft Assessment Reports. This network is separate and distinct from the Panel itself. There is little or no overlap between the two bodies.

Last but far from least, there are the government departments and agencies to which the Panel reports. It is here, and not in the Panel itself, that the ultimate policy makers are to be found. The relevant political leaders and senior officials within these departments and agencies

make up the core of what I call the *environmental policy milieu*.

The IPCC as such has been formally instructed by its member governments, in the principles governing IPCC work, that its reports should be neutral with respect to policy. However, this instruction can only refer to the contribution made by the expert network through the reporting process. It does not, *and could not*, apply to the other two participating groups. The official Panel members, as also the policy milieu which they report to, are almost without exception far from neutral. They are committed, *inevitably and rightly*, to the official policy consensus. They stand by the objective set out in the Framework Convention and the resulting policy decisions. As officials, they are bound by what their governments have decided. That is the context within which the three successive IPCC Assessment Reports prepared since 1992 have been put together by the expert network and reviewed by member governments.

Does that fact in itself put in question the objectivity of the expert reporting process and the draft Reports? As a former national and international official, I would say: No, not necessarily. Policy commitment on the part of member governments could in principle go together with ensuring that the reporting process remained open, thorough, objective, and policy-neutral. Many people believe, or presume, that this is the actual situation.

I have come to believe that this picture is not accurate, and that the expert reporting process is flawed. Despite the numbers of persons involved, and the lengthy formal review procedures, the preparation of the IPCC Assessment Reports is far from being a model of rigor, inclusiveness, and impartiality.

In July 2005 the House of Lords Select Committee on Economic Affairs, in a unanimous report, expressed "concerns about the objectivity of the IPCC process." The re-

port was dismissed by Her Majesty's Government, and it finds no place among the 1,100 or so references in the *Stern Review*. However, both before and since its publication, critics have drawn attention, in my opinion with good reason, to flaws in the conduct of the process.

The main heads of criticism have been:

- Over-reliance on peer review procedures that do not serve as a guarantee of quality and do not ensure due disclosure of sources, data, and procedures followed in the treatment of data.
- Serious failures of due disclosure in relation to studies that the IPCC has drawn on.
- Basic errors in the handling of data, through failure to consult or involve trained statisticians.
- Failure to take due account of relevant published work and evidence.
- Failure to take due note of comments from dissenting critics who took part in the preparation of the AR4 WGI report.
- Resisting the disclosure of pertinent documents, despite the formal instruction of member governments that the Panel's proceedings should be open and transparent.
- Failure on the part of the Panel and the IPCC directing circle to acknowledge and deal with the above deficiencies.

These basic flaws are spelled out, with a range of supporting references, in two recent and notable published papers. The first, by David Holland, entitled "Bias and Concealment in the IPCC Process" appeared in 2007 in *Energy and Environment*. The second, by Ross McKittrick, was published in 2008 by the American Institute for Economic Research in *The Global Warming Debate: Science, Economics and Policy*.

So far as I know not a single government department or

international agency has taken due note of the work of the various critics and faced up to the issues they have raised. This worrying omission appears to reflect the combined influence of prejudice and inadvertence, in widely varying blends.

I have now come to think—and the thought was not in my mind when I first became involved with climate change issues—that the official expert advisory process, and the IPCC process within it, are not professionally up to the mark. I believe that the flaws in these twin processes can be largely accounted for by a pervasive bias on the part of the people and organizations that direct and control them.

By way of illustration, here are three high-level public statements made in February 2007, following the publication of the draft AR4 WGI report.

- Dr R. K. Pachauri, chair of the IPCC: “I hope this report will shock people [and] governments into taking more serious action.”
- Achim Steiner, the director-general of the United Nations Environmental Programme: “In the light of the report’s findings, it would be ‘irresponsible’ to resist or seek to delay actions on mandatory emissions cuts.”
- Yvo de Boer, executive secretary of the Framework Convention: “The findings leave no doubt as to the dangers that mankind is facing and must be acted on without delay.”

These are strong assertions. All three top officials went beyond the actual WGI text, to draw their own personal conclusions as to the implications for policy. While they were fully entitled to form and air such opinions, their statements were not just summaries of the science, nor of course were they policy neutral.

These officials were conform-

ing to an established pattern. Like their various predecessors in office, they are committed persons. Had this not been the case, and known to be the case, *they would not have attained their leading positions within the environmental policy milieu*. They would not have sought their respective posts, nor would they have been seen by UN agencies and member governments as eligible to hold them, had they not been identified as fully committed to the view that human activities are putting the planet at risk. The advisory process is run today, as it has been from the start, by true believers.

It is not only within the official environmental policy milieu that this ingrained bias is to be found. Elements within the international scientific establishment appear as strongly committed, rather than

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neutral and objective, in relation to climate change issues. One aspect of this strong commitment has been a readiness to treat any form of criticism or dissent as undermining established science, while non-subscribers have been portrayed as members of a “denial lobby.” They are treated (to use George Orwell’s term) as Thought Criminals.

When it comes to policy, upholders of the accepted view of climate change are apt to lose patience with dissenters. They view dissenters as persons who deny the science, favor inaction or delay on curbing emissions, and perversely refuse to see how eminently reasonable it is to pay a modest premium now to avert what expert opinion has identified as a serious long-term threat to the planet.

Not surprisingly, dissenters give different responses to this challenge,

and my own response has led some of my non-subscriber friends to feel that, in Margaret Thatcher’s memorable phrase, I have been “going wobbly.”

The difference of opinion largely relates to scientific aspects. As an agnostic outsider, I take the view that prevailing scientific opinion remains open to question. But I do not subscribe to the stronger position, held by some full-blown dissenters, that it has been shown to be ill-founded. This is a judgment that most of us outsiders are not well qualified to make. Recognizing the over-presumptions and endemic bias of the advisory process for what they are does not entail saying that the official policy consensus should be ignored, rejected, or overturned.

In any case, the world is not starting from scratch. Governments everywhere have signed up to the Framework Convention and continued to adhere to it. Many of them have taken action, entered into commitments and created expectations accordingly. They have done so on considered expert advice that they themselves commissioned and reviewed, with strong public support and in the belief that they were acting rightly. All this cannot just be set aside overnight.

Against this background, I have two proposals for action.

Proposal Number 1 is familiar, and has a good deal of support among economists. Given the combination of continuing uncertainties, possible risks, past history, and the present situation, I am personally inclined to favor the widespread introduction of a moderate carbon tax (or a carbon charge, if you prefer), provided—and these are strong conditions—it can be made to work and is kept revenue-neutral.

As I see it, the case for such a tax (or charge) rests on a number of related grounds. First, as things are, and unlike the strong dis-

senters, I give some weight to the precautionary case for action to curb emissions. Second, and in contrast to other forms of action, a carbon tax is transparent. Third, there is something to be said for a tax that (as it appears) a significant number of people would actually view with favor. Fourth, a uniform pricing instrument minimizes the cost of any given reduction in emissions.

Last and not least, its adoption might serve to undermine the rationale for the various costly and intrusive forms of intervention—subsidies, tax concessions, targets, prohibitions and regulations—that many governments have already introduced and are keen on taking further. Given a tax rate that was judged adequate to the situation, people and enterprises could be left to make their own decisions, without undue prescriptive interference.

In accepting this qualified case for a carbon charge, I am in line with a good many of my fellow-economists who count as upholders. But there remain wide differences between us in both diagnosis and prescription.

**I**n that context, let me now make two comments which lead to a conclusion which forms the basis for my Proposal Number 2.

The first comment relates to the risks of mistaken policy choices. Upholders characteristically stress the dangers that could arise from AGW and the resulting need for strong, immediate, and continuing action to curb emissions. But the risks are not on one side only. The stronger and more immediate the actions taken, the greater the dangers that they give rise to. Radical programs could impose heavy and increasing costs on people and enterprises, and there is an obvious risk that such programs will increasingly give rise to intrusive restrictions on both freedom of action and freedom of expression.

What is more, the measures that entail these risks might prove to have served no useful purpose. Contrary to received opinion, it could still emerge, in the light of further evidence and experience, that AGW is not in fact a threat.

It is altogether possible that governments will now engage in a speculative, hugely ambitious, and potentially damaging world-wide experiment in social engineering on the basis of what in time will be revealed as over-presumptive beliefs uncritically accepted.

My second comment is that dissenters in general, including me, view the policy prescriptions of even limited upholders as over-confident. We do not take it as established that emissions control holds the key to

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regulating climate. We question whether enough is known about the relationships involved and the ways in which these could change for governments to decide today on lines of action, and even supposedly binding targets, that are seen as holding good into the indefinite future.

From these dissenting arguments a clear implication emerges. Given that the stakes appear so high and that so much remains uncertain, unsettled, or unknown, policies should be evolutionary and adaptive, rather than presumptive. If, for example, a regime of carbon taxes is brought in, it should not be regarded as necessarily permanent. Both the appropriate rates of taxation and the case for maintaining the regime should be seen as dependent on unfolding evidence and experience. The evolution of policy should thus be linked to a continuing process of

inquiry and review.

**T**his brings me to my Proposal Number 2 for actions to be taken. The actions would be directed towards creating an official process of review and inquiry that is more thorough, balanced, open, and objective than that which now exists or is in prospect.

Specifically, governments could and should take prompt steps to improve on present practice. For example, they should insist on proper archiving and full disclosure as a pre-condition for published work to count; ensure independent expert audit of key results and the evidence and procedures underlying them; and see to it that the IPCC review process actually conforms to the official requirement that it should be objective, open, and transparent.

More broadly, neither the official policy consensus nor the advice on which it rests should be treated as authoritative or final. Both should be seen, not as established doctrine, but rather as a body of working assumptions. As such, they should be made subject to rigorous testing and review; it should be a leading concern of policy to ensure that such testing and review takes place. The whole notion of a now-settled consensus should be discarded. Governments should promote open exchanges of view and contrasting informed assessments. It should not be presumed either that the debate is over or that the present official advisory process is fully adequate to its task.

I believe that in relation to climate change issues *a whole new framework of thinking is called for—less presumptive, more inclusive, more professionally watertight, and more attuned to the huge uncertainties that remain.* A leading task of policy should be to establish such a framework and procedures that give effect to it.

# Global Warming

## Discern Fact from Fiction

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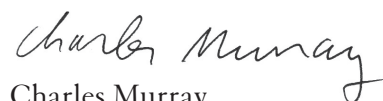
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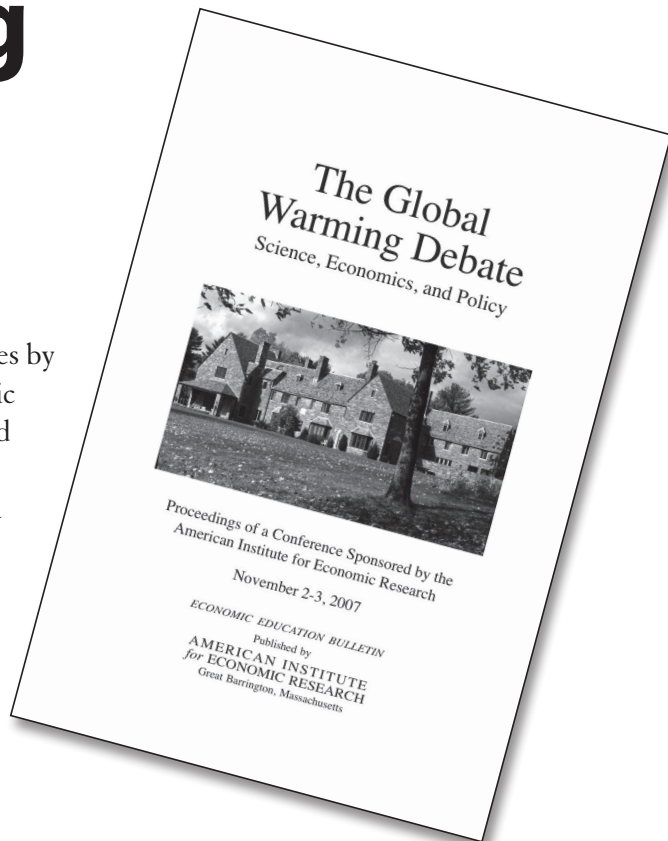
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