The Days after Tomorrow:
It's Time to Radically Rethink Climate Policies

Original English Version of:
Pielke, Jr., R. A. 2004. L'Apocalisse Prossima Ventura, Darwin, May, pp. 55-59.

ROGER PIELKE, JR.

With the release of the upcoming disaster movie The Day After Tomorrow at the end of May, 2004, the battle over global warming will get a promotional boost from Hollywood. In fact, months before the movie was released advocates arrayed on various sides of the global warming debate had already used the movie to reinforce their own positions and tear down that of their opponents. These early reactions to the movie echo everything that is wrong with the climate policy debate and reinforce why it's time to radically rethink climate policies.

Contemporary climate policy debate is dominated by two issues: the Kyoto Protocol and climate science. This is problematic for several reasons. First, no matter how debate over the Kyoto Protocol is resolved – either in its failure or in its implementation – the subsequent challenge of reducing greenhouse emissions will remain much the same under either scenario. And second, as debate over climate policy often takes place under the guise of science, the scientific debate on climate change has become irrevocably politicized, even as a scientific consensus has emerged that human activity does indeed affect the climate. Both the politicization and the existing scientific consensus suggest that a political consensus is unlikely to emerge from new scientific findings.

If we are to improve policies in the context of climate change, this means that our thinking about climate change necessarily needs to evolve. Evolution in our thinking is difficult because all sides of the current climate debate have become very comfortable with the familiarity of debating the Kyoto Protocol and debating the science. As in a long-running stage production, the participants know their roles, they are familiar with their rhetoric, and their opponents are predictable and play to their stereotypes. And more troubling, many of the current participants also benefit mightily from the status quo, whether they are advocates or scientists. Consequently, change is uncomfortable. It is no exaggeration to observe that in the status quo of contemporary debate over climate policy a consensus already exists. But if the issue is to become more than symbolic, then change we must, because today's climate policy debate is going nowhere soon.

The Evolution of Gridlock

The story by now is very familiar. Human activities, primarily the use of fossil fuels, contributes carbon dioxide to the atmosphere that have for more than a century been leading to elevated levels of carbon dioxide and other "greenhouse gases" in the atmosphere. Greenhouse gases are important because they affect the amount of the sun's energy from the sun captured by the Earth. Changes to the energy balance of the Earth system can affect the climate system in ways that subsequently affect life on earth, perhaps with undesirable outcomes. Several decades ago the main focus of climate scientists was on possible changes in temperature and warming in particular, hence the origin of the term "global warming."

While the media in particular continues to use the phrase "global warming," the scientific community prefers the more general term "climate change" to reflect their understanding that changes in the climate systems can result in changes not only to temperature, but all aspects of climate, including rain, snow, drought, storms, and so on. Thus, the United Nations named its organization responsible for periodically assessing the science of this issue the "Intergovernmental Panel on Climate Change" (or IPCC) and not the "Intergovernmental Panel on Global Warming."

Whether you call it global warming or climate change, if the problem is caused by increasing greenhouse gases, then the appropriate response seems inescapably obvious: Stop increasing greenhouse gas emissions. And indeed for several decades now advocates seeking a response to global warming have focused their attention of developing a global regime to regulate the human emissions of greenhouse gases.

The most familiar part of the regime is the Kyoto Protocol which was first negotiated in 1997 under the 1992 Framework Convention on Climate Change. The Kyoto Protocol proposes that a group of developed countries reduce their greenhouse gases to a level slightly less than their collected emissions in 1990. The latest attempt to move climate policy forward was a meeting of the Framework Convention held December 1-12, 2003 in Milan, Italy, which took place amid uncertainty as to

whether the Kyoto Protocol, negotiated under the FCCC in 1997, would ever come into force. The Protocol requires ratification from countries whose 1990 greenhouse gas emissions total 55% of the global total. This level will not be reached so long as countries with significant emissions -- including the United States and, thus far, Russia – refuse to ratify the Protocol. Under this uncertainty debated has intensified within Europe on the merits of unilateral implementation of the Kyoto Protocol.

But if the logic of responding to global warming is inescapably obvious, why then are their difficulties in securing commitments to policies that would reduce greenhouse gas emissions? The answer is equally inescapably obvious: Over the past century society's use of fossil fuels has been a necessary factor underlying economic development and is the lifeblood of modern society. Efforts to regulate greenhouse gas emissions have run up against a powerful opposition, and contrary to glib stereotypes of opposition located only in the board rooms of multinational oil companies and in the Administration of George Bush, the issue is difficult because everyone on planet Earth uses energy from fossil fuels and ever more energy is sought to maintain and increase standards of living.

More Alike Than Different

Much has been made about the apparent differences between the United States and Europe on the issue of climate change. A close look reveals that from a practical standpoint these differences, while real and significant, may be more symbolic than substantive. Consider, for example, a December 2003 report of the European Environment Agency (EEA) on the performance of European Union countries with respect to their commitments under the Kyoto Protocol. The EEA reported that while Great Britain and Sweden were on target to meet their Kyoto targets, "all other Member States, including Germany, the EU's biggest emitter, would miss their Kyoto targets. Denmark, Spain, Ireland, Austria and Belgium would all exceed theirs by more than 20 %." By contrast, consider that if the United States were participating in the Kyoto Protocol with a goal of returning to its 1990 emissions levels, its actual performance with respect to the Protocol would be close to that of Denmark's.

The point here is not simply that Europe is struggling to meet its Kyoto commitments or that the United States is a profligate emitter of greenhouse gases, but that under the current approach to climate policy the stated intentions of policy makers and the general populace do not appear to make a large difference in policy outcomes with respect to actual greenhouse gas emissions. In short, with very few exceptions industrialized countries that have signed on to Kyoto have seen their emissions increase and so too have countries that have turned down Kyoto.

This point is made even more strongly when placed into the context of the level of emissions reductions that are required to stabilize concentrations of greenhouse gas emissions at a level as low as twice pre-industrial values: The Kyoto Protocol even fully implemented is but a tiny step. And consider that developing countries, where most of the growth in greenhouse gas emissions is projected to occur over the coming decades, are not even part of the Kyoto Protocol. Imagine for a moment a world in which the United States and Russia decided to fully conform to the requirements of the Kyoto Protocol. What would newspaper headlines read? You would be wrong if you think something like "U.S., Russia Adopt Kyoto, Climate Problem Solved." You'd be closer to reality if you thought "U.S., Russia Adopt Kyoto, Climate Problem Remains Much the Same as Yesterday."

The limited possible effect of the Kyoto Protocol on climate has been widely recognized by its supporters and opponents alike. Its opponents say that its insignificance implies that it should be abandoned, while its supporters argue that a long journey begins with a single step. And of course the Protocol now has importance well beyond the issue of climate change. It has been implicated in Russian entry to the World Trade Organization and used as an example of the split between the United States and Europe on issues as diverse as trade and Iraq. As debate over the Kyoto Protocol has taken on a larger symbolic and substantive importance, largely missed is that even if fully implemented, the problem of climate change will remain essentially the same as before its implementation. No matter what each of us thinks about Kyoto, it is clear that we have some additional thinking to do on climate policy.

A Devil in the Details

Believe it or not, the Framework Convention on Climate Change (FCCC), focused on international policy, and the Intergovernmental Panel on Climate Change (IPCC), focused on scientific assessments in support of the FCCC, use different definitions of climate change. The Framework Convention defines climate change narrowly as only those changes resulting from human emissions of greenhouse gases, while the IPCC defines climate changes more broadly as the result of any casual factor. The two definitions are not compatible, certainly not politically, and perhaps not even scientifically. This lack of coherence has contributed to the current international stalemate on climate policy.

Consider the following thought experiment. Let's begin with the conventional understanding of the climate problem. From this perspective the human use of fossil fuels leads to emissions of greenhouse gases, which lead to changes in the climate, which in turn result in undesirable effects on people and the environment. Let's call this Greenhouse World. Now imagine an alternative world. In this alternative world everything is exactly as it is in Greenhouse World, but with one important difference. In this world instead of the human use of fossil fuels leading to changes in climate, the source of change is instead a small strengthening of the intensity of the Sun. In Bright Sun World the changes in climate and effects on people and the environment are identical to Greenhouse World; the two worlds differ only in the source underlying changes in climate.

In my courses on policy related to climate change, I introduce this thought experiment and then ask the students to discuss how their policy recommendations might differ between Greenhouse World and Bright Sun World. Someone in every class starts out by saying that in Bright Sun World we wouldn't need any policy beyond business-as-usual because the source of change is natural, coming from the Sun. This is quickly overturned when someone else points out that we would still want to adopt policies to respond to the effects – for instance, if you live on the coast you will still want to buy storm insurance in either scenario.

This typically leads someone to claim that in Bright Sun World adaptation policies would be preferred and in Greenhouse World mitigation focused on energy policy would be preferred. A whole set of Socratic questions then follows: If expect to modulate the Earth system in desirable ways if the cause of change is anthropogenic, then why would we not wish to modulate the system if the cause is natural (We dam rivers after all)? If we would focus on adaptation in Bright Sun World why wouldn't we also focus on adaptation in Greenhouse World? Is changing the energy habits of 6 billion people really more tractable than modulating the global earth system via carbon sequestration or other strategies of geoengineering? Such questions quickly reveal many assumptions that underlie approaches to dealing with global climate change, assumptions that are rarely discussed, much less evaluated. One of these assumptions focuses on organizing policy around the source of the forcing of the climate system, which is implicitly the approach under the Framework Convention and the Kyoto Protocol using the narrow definition of "climate change."

Blurring Politics and Science

The Framework Convention's definition of climate change helps to explain why the current climate debate focuses so much attention to "certainty" (or apparent lack thereof) in climate science as a justification for or against the Kyoto Protocol. For example, a February 2003 article in The Guardian relates details of climate policy debate in Russia illustrates the politicization of climate science. The article reports that several Russian scientists "believe global warming might pep up cold regions and allow more grain and potatoes to be grown, making the country wealthier. They argue that from the Russian perspective nothing needs to be done to stop climate change." As a result, "To try to counter establishment scientists who believe climate change could be good for Russia, a report on how the country will suffer will be circulated in the coming weeks."

In this context, any scientific result that suggests that Russia might benefit from climate change stands in opposition to Russia's ratification. Science that shows the opposite supports Russia's participation. Of this situation, one supporter of the Kyoto Protocol observed, "Russia's ratification [of the Protocol] is vitally important. If she doesn't go ahead, years of hard-won agreements will be placed in jeopardy, and meanwhile the climate continues to change." So as political advocates look to selectively use those scientific findings that best support their political agendas, science becomes irrevocably politicized, and the scientific debate becomes indistinguishable from the political debate.

Of course, climate change is only an issue because the scientific community brought it to the attention of policy makers. Not surprisingly, policy makers have turned to scientists to also provide solutions. More research is politically expedient in two respects: First, it places the onus of "solving" the climate issue onto the shoulders of scientists, and second, it is accompanied by billions of dollars in research funding desired by a voracious scientific community. Much of the thinking behind support for climate research is that scientific results will lead to political consensus on climate policies. Paradoxically, the opposite may be true.

As more research has led to greater understanding of the global climate system, the political debate over climate policy has become more and more entrenched. For example, even as the Bush Administration and the Russian government note the economic disruption that would be caused by participating in the Kyoto Protocol, they continue to point to scientific uncertainty as a basis for their decisions, setting the stage for their opponents argue certainty as the basis for their opposition. Justifying the decisions not to participate in the Kyoto Protocol, a senior Russian official explained, "A number of questions have been raised about the link between carbon dioxide and

climate change, which do not appear convincing. And clearly it sets very serious brakes on economic growth which do not look justified." The Bush Administration used a similar logic to explain its March, 2001 decision to withdrawal from the Kyoto Protocol, "…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."

Ironically, both the Bush Administration and the Russian government appear applying their own particularly version of the precautionary principle: when uncertainty exists, act in ways that preserve the economy. In this context, debating climate policy in terms of "science" encourages the mapping of established political interests onto science.

Because the Framework Convention requires detection and attribution of climate change resulting from greenhouse gas emissions it focuses attention on the science of climate change as the trigger for action, and directs attention away from discussion of energy and climate policies that make sense irrespective of the actual or perceived state of climate science. The longer the present gridlock persists, the more important such "no-regrets" policies will be for efforts to decarbonize the energy system and reduce human and environmental vulnerability to climate.

The Days after Tomorrow: New Options on Climate Policy

Thinking about new alternatives on climate policy must begin with recognition that the effects of climate change on people and ecosystems are not the result of a linear process in which a change in climate disrupts an otherwise stable society or environment. The real world is much more complex.

First, society and the environment undergo constant and dramatic change as a result of human activities. People build on exposed coastlines, in floodplains and in deserts. Development, demographics, wealth, policies, and political leadership change over time, sometimes significantly and unexpectedly. These factors and many more contribute to the vulnerability of populations and ecosystems to the impacts of climate-related phenomena. Different levels of vulnerability help to explain, for example, why a tropical cyclone that makes landfall in the United States has profoundly different effects than a similar storm that makes landfall in Central America. There are many reasons why a particular community or ecosystem may experience adverse climate effects under conditions of climate stability. For example, a flood in an unoccupied floodplain may be noteworthy, but a similar flood in a heavily populated floodplain is a disaster. In this example, the development of the floodplain is the "interference" that makes the flood dangerous. Under the Framework Convention, any such societal change would not be cause for action, even though serious and adverse effects on people and ecosystems may result.

Second, climate changes at all time scales and for many reasons, not all of which are fully understood or quantified. Policy should be robust to an uncertain climate future, irrespective of the cause of particular climate changes. Consider abrupt climate change, the focus of the upcoming disaster movie. A 2003 review paper (of which I was a coauthor) in Science on abrupt climate change observes that "such abrupt changes could have natural causes, or could be triggered by humans and be among the 'dangerous anthropogenic interferences' referred to in the [FCCC]. Thus, abrupt climate change is relevant to, but broader than, the FCCC and consequently requires a broader scientific and policy foundation."

An implication of this line of thinking is that to better serve the needs of policy makers the scientific community should consider balancing its efforts to reduce and quantify uncertainty about the causes and consequences of climate change with an increase in its efforts to help develop policy alternatives that are robust irrespective of the specific degree of uncertainty about the future.

From all indications, the upcoming movie, The Day After Tomorrow looks to be visually stunning and an enjoyable early summer escape. And if its creators are successful according to their own expectations, the move will also stimulate further debate about climate change and possible actions in response. But unless debate over climate policy moves beyond the status quo then, regrettably, the movie may simply contribute to an ever-louder and ever more insignificant debate over a small set of ineffective options.

Our current thinking frames climate change as a single, linear problem requiring a linear solution—reduction of greenhouse gas emissions under a global regime. Years of experience, science, and policy research on climate suggest that climate change is not a single problem, but many, inter-related problems requiring a diversity of complementary mitigation and adaptation policies at local, regional, national, and international levels in the public, private, and nongovernmental sectors. New alternatives for climate policy need to accommodate such complexity and uncertainty. Today's debate over climate policy is impoverished due to a dearth of policy alternatives.

Roger Pielke, Jr.
CIRES
University of Colorado, Boulder