

U.S. Climate Policy: Toward a Sensible Center

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Excerpt: Donald Kennedy, Editor in Chief, *Science*

MR. SANDALOW: Thank you, Eileen, for those very thoughtful remarks and for your long record of leadership on this issue.

Our next three speakers are Don Kennedy, Jim Woolsey, and Fred Bergsten, a very distinguished and knowledgeable group. They will each deliver 20-minute remarks. We'll hold all questions until the end. Unfortunately for us, Jim Woolsey has been called to testify up on the Hill at the last minute, and so will need to leave before the question-and-answer period. But we're delighted that Jim is able to stay with us for his scheduled remarks.

I hope our plan for the next 90 minutes is clear, and it's now my very pleasant responsibility to introduce Dr. Don Kennedy. Dr. Kennedy started his distinguished career as a neurobiologist. He then served as Commissioner of the FDA and then for 12 years as President of Stanford University. Today, he conducts his research through the Institute for International Studies, focusing on transboundary environmental problems, and is a member of the National Academy of Sciences and editor in chief of *Science*, the journal of the American Association for the Advancement of Science. At the AAAS, Dr. Kennedy has shown enormous leadership on global warming, among other things sponsoring a superb conference on this topic just last week. It is an enormous pleasure to welcome Dr. Don Kennedy to the Brookings Institution.

[Applause.]

DR. KENNEDY: Well, I'm grateful not only to David for that kind introduction, but for Strobe's and Eileen's efforts in organizing an important meeting on a vital subject that ought to be of serious interest to all of us.

I want to begin with a proposition. The proposition is that we have a great many pressing problems in the world. There's a population growth problem associated with economic development and pressure on resources. There's a continuing global security crisis augmented by the rise in terrorism. There is the chronically inequitable distribution in resources between the rich nations of the North and the poorer nations of the South. And, finally, there is the steadily growing body of evidence that we're about to undertake a major reorganization of the global climate regime.

The proposition is simple. It is that the last issue of great concern to us because it's directly relevant to the future of our children and our grandchildren, but it's also important because it relates in an indirect way and a very powerful way to every single one of the other problems I've just listed.

Let me begin with the science underlying what we now understand about climate change. Last week, as David mentioned, I helped organize a symposium at AAAS and a briefing session for policy and press people here on climate science. We had ten of the most distinguished climate scientists in the United States, led off by Sherry Rowland, the Nobel Laureate in chemistry. And the purpose was to make a careful assessment of the science and be pretty candid about what we know for sure of what we think may be true and what is merely a plausible but unproven possibility. So here is a short summary of what I think the consensus is on each of those categories.

First, what we know. General circulation models, climate models that take into account variations in the Sun's energy, volcanic events, other events that are important in managing the Earth's greenhouse, application of those models to the past thousand years explained

fluctuations in average global temperature very well indeed, up until the last hundred years. Over the last hundred years, they failed miserably unless you add into the models' calculations the addition of the greenhouse gases--carbon dioxide, methane, chlorofluorocarbons--that are the results of human economic activity. That's why the average temperature of the globe has increased by just about a Fahrenheit degree over the past century, accompanied by a rise in sea level somewhere between 10 and 20 centimeters.

The primary causative agent is carbon dioxide, which in pre-industrial times was about 280 parts per million by volume, and now is at 380 and rising steadily as we continue business as usual.

I think since someone mentioned Kyoto and all of its symbolism, there is a certain respect in which Kyoto is a dual failure. It was a failure both because the initial targets were inadequate to take us out of this problem; and, second, because they were unattainable by many of the participating nations. Thus, Kyoto and Kyoto's failure to date has left us without any basis for meeting the goals of the 1992 Framework Convention on Climate Change. And lest we all forget, the United States is not only a signatory but a party to that agreement, and under that agreement we are committed to limit atmospheric concentration of greenhouse gases to avoid--and I quote from the framework--"dangerous anthropogenic interference with the climate system."

Well, why, a dozen years later, is there some doubt about the dangers of this interference? The carbon dioxide we add to the atmosphere will stay there. Its average residence time in the atmosphere is a century. There's no disagreement about whether average global temperature will continue to rise. It will. The scientific dispute is about how much and why the disagreement about how much.

It's reassuring about those general circulation models that when they're applied to past climate in backcasting efforts, like the instance I described at the beginning, they give a reasonably accurate prediction of climate history. Perhaps more interesting, they regularly somewhat understate the magnitude of the real climate change; that is, nature regularly turns out to be a little harsher than the models suggest. So as we project into the future, it would be wise to look at the outside rather than the low side of where they might take us.

And where they might take us first, according to the Intergovernmental Panel on Climate Change, and also to an evaluation by the National Academies following President Bush's request that it undertake such an evaluation, the increase in average global temperature by the end of this century will reach between 1.5 and 5.8 degrees Centigrade, not Fahrenheit.

Well, that's a big range, and so obviously one must ask why the range. These models, like most, contain some uncertainties. Some of these are scientific: how increased cloud cover is going to affect the projections. Some clouds cool the climate by reflecting sunlight from above. Some warm it by trapping heat that is leaving from below. Another uncertainty is how changes in the Earth's reflectiveness, its albedo, may come about due to melting ice and how that might accelerate heating.

So these various feedbacks impose a set of uncertainties of their own. Others are economic and social. We don't know how national policies and international agreements that we undertake between now and the end of the century might serve to constrain the amount of greenhouse gases that we're adding.

So these uncertainties--probably about half of them due to differences or unpredicted feedbacks in the models themselves, and the rest to social and economic unknowns--have provided arguments for those who would prefer to postpone economically difficult choices

for controlling and mitigating our emissions. But it's important that even at the very lowest estimates there will be substantial changes in the nature of human life on the only planet we currently occupy. The rather modest impacts of the past century have already produced profound changes in regional climate dynamics, and we need to be conscious of those. Substantial ice sheet melting and retreat is taking place on both the Arctic and on the west Antarctic ice sheet.

In the Arctic, where climate warming has been extreme, sea ice has sharply diminished and rivers become ice-free much earlier. Low-latitude mountain glaciers, investigated in a very adventurous way by my colleague Lonnie Thompson at Ohio State, are shrinking. The famous snow-capped summit of Kilimanjaro, by the way, will be bare within 15 years, converting hundreds of old African safari shots into priceless historic treasures.

Biological cycles are experiencing the effects of warming, with upward extensions in the range of Alpine flora and advances in the time of flowering or first instances of bird breeding, by an average of five days per decade.

The models have all predicted more frequent and severe weather events, and we have had heat waves in the upper Midwest and Paris, accelerated beach erosion on coasts all over the world, and disastrous floods and landslides in Central America.

Well, that's now, considerable effects and much to worry about. But, of course, we're more interested in the future. What the models tell us unambiguously is that the climate system is headed for further disruption.

Now, the standard scenario foresees a slow ramp of global warming, and our projections are based on taking that out essentially indefinitely. But there's another possibility, and the past climate tells us to watch out for it because the past climate is riddled with sudden events that models applied retrospectively failed to predict well.

One possible alternative, especially in the North Atlantic, invokes a change in the basic ocean circulation gyre that brings warm water from equatorial regions up through the Gulf Stream, crosses eastward in the North, and the possibility is that as melt water from glaciers or added precipitation dilutes that water in the course of its trip across the North Atlantic, it will now fail to sink, and the return current that must match the upward current of the warm water in the Gulf Stream would be blocked.

Well, that scenario, elaborately extended, is the basis for that movie that Eileen told you about, which you should see only for amusement. Beyond the silliness does lie a prospect that is worth taking fairly seriously, and that is that a gradual change in average global temperature may intercept the threshold for some nonlinear dynamic process triggering abrupt change in a direction that we can't now accurately predict.

The bottom line from this concern, it seems to me, is, of course, there is uncertainty. The uncertainty comes because we are engaged in a large-scale, uncontrolled experiment on the only planet we have.

I want to turn briefly to some impacts that what we know about climate is likely to have on other important global problems. Jim Woolsey is going to talk about security, and I will mention only one aspect of that because it happens to have something to do with how I got interested in the climate problem in the first place. I didn't know very much about climate until the Carnegie Commission on Preventing Deadly Conflict asked a group of us at Stanford to look at environmental change and its possible impacts on regional security in the world.

One of the things that we looked at was what might happen in places like the delta of the Ganges and Brahmaputra Rivers, where storm surges now regularly displace large

numbers of people and where huge numbers of people, 15 million or so, live within the first meter or two of normal sea level. Some combination of sea level rise and storm surge from more extreme weather events is likely to produce much larger displacements. We know they will have to go somewhere. In the past, they have fled in much smaller numbers to Bengal, where friendly relationships have not followed. The security problems arising from a massive influx of a traditionally hostile population combined with an almost certainly high level of cholera infection does not present a very optimistic picture.

Water is a desperately important resource in most parts of the world. Drought is often followed by famine or emigration. Here in the United States, warmer winters threaten mountain snowpacks and will soon demand a revision of interstate and even international water allocation agreements. Maritime rivers are already undertaking management steps to deal with saline intrusions due to sea level rise or storm surges. In Great Britain, the barrier that protects London from occasional flooding of the Thames estuary is now being used six times a year compared to less than once a year in the 1980s.

I could mention a couple of others. Agriculture obviously is one of the most vital of human activities. The regional distribution of global warming impacts might provide some temporary help to some kinds of temperate zone agriculture. But surely in the tropics, where the people are poorest and least able to adapt, and where many food crops are near the limit of their physiological tolerance for temperature, the consequence of even a modest warming event could be far more serious.

So my point is that climate change is not a problem that can be isolated and talked about as though it were all alone. Instead, it's likely to interact with most of the other problems humans face all over the world. So I hope that this meeting will help encourage us to prepare a sound portfolio of risk-reducing measures.

These will not, I must tell you, bring us out of the woods. Our destiny is partly built in. It's built in through significantly increased heat storage locked into our oceans. It's built in in the greenhouse gases that are already in our atmosphere and will increase by another 50 percent or more, no matter what we do. And it's built in to the justified economic aspirations for development in the developing world.

So what we will be talking about, it should be clear, are ways of limiting the damage to manageable levels, not preserving the status quo. We lost that years ago.

So the contemporary policy challenge, it seems to me, amounts to a bet about risk. Are the consequences of business as usual likely to entail costs greater than those of beginning to mitigate those consequences now? Other nations--the U.K., several EU countries, and Japan--are making substantial commitments now. Some industries--British Petroleum, Royal Dutch Shell, Swiss Re, for example--have undertaken steps of their own. The insurance burden from the exploding rates of coastal erosion and storm damage has pushed the insurance industry into a lead here. If companies fail to participate in emissions reduction and join with others to resist such measures, questions might well be raised. If you believe so strongly that climate change is a myth, Swiss Re might say: Then surely you won't mind a climate-related event's exclusion from your directors and officers' insurance policy.

But we can't count on voluntary actions, and the United States so far has only announced a long-range research program that, although it looks reasonable, makes no current commitments to mitigate our contribution, which is about a quarter of the world's, to the global warming problem. I think we must have a more aggressive national policy to purchase insurance against this risk. It won't be cheap. It will involve some subsidies for conversion of old and dirty plants to new and cleaner ones. It will require, as Eileen has

suggested, some serious efforts at technologies of sequestration. It will involve an expanded role for alternative energy sources, although that role is necessarily limited. And it will finally involve a lot of determination on the part of people to do things themselves.

All of us, I think, are encouraged by the prospect, convincingly shown to be reasonable in the 1990 Clean Air Act Amendments, that we could have a cap and trade program here that could be made workable, as in the bill proposed by Senators McCain and Lieberman.

I think we're in a position of natural leadership here. We're the world's most powerful nation, the world's leading producer of greenhouse gases. Plainly, it's in our national interest in multiple ways to reduce our consumption of fossil fuels. And to see the nation failing in this most vital and globally sensitive matter, it seems to me, is a national embarrassment.

Thank you very much.

[Applause.]

MR. PURVIS: Good morning. My name is Nigel Purvis. It's my pleasure to introduce Jim Woolsey. I'm going to make that introduction short because Jim is no stranger here at Brookings or to the Washington policy community. And as David Sandalow said earlier, he needs to depart shortly to testify in Congress.

Let me just mention to those of you who are standing in the back that we do have seats available in an overflow room. It is just across the lobby, about 50 feet from here. The proceedings are projected on a large screen. You're certainly welcome to stand, but there are seats available for those who would like to sit, and there are a couple of seats scattered around as well.

Jim Woolsey is currently the Vice President at Booz Allen Hamilton, a consulting firm in Washington and across the country. He is a Commissioner of the National Commission on Energy Policy, a bipartisan group exploring solutions to U.S. energy challenges. He's known to most of us as a former Director of the Central Intelligence Agency, and he has also had a distinguished career as a partner at the law firm of Shane Gardener across the street, where I first met him because my wife practiced law with him.

I know that Jim is a true believer when it comes to addressing U.S. security challenges. He walks the walk on climate change. He announced here at Brookings when he was here in March that he had a Prius on order. I know that he spends his weekends sailing in a zero emissions vehicle on the Chesapeake. He is an author with Senator Lugar of a very interesting article in Foreign Affairs advocating that we reduce our dependence on petroleum and that we engage in a massive effort to develop alternative fuels, particularly biomass. Always informative, always entertaining and provocative, let me present to you Jim Woolsey.

[Applause.]