A YEAR TO SOLVE THE CLIMATE PROBLEM

BY PAUL A. T. HIGGINS

Working for Congress a scientist confronts several pervasive but surmountable political hurdles to protecting the climate system.

For each of the last five years the American Meteorological Society (AMS) and the University Corporation for Atmospheric Research (UCAR) have teamed up to sponsor one scientist's placement in a congressional office. Each fellow spends a year working on the staff of a member of Congress or a congressional committee. This provides a unique opportunity for members of the research community to inform federal policy and to learn how to navigate the policy-making process. For the 2005/06 year, I was that fellow.

The fellowship year. The application process begins in January (those interested should see information online at www.ametsoc.org/csf for more detail) and culminates in the early spring with the selection of the next fellow. The fellowship year starts in September when the AMS–UCAR fellow joins other scientists under the umbrella of the American Association for the Advancement of Science's (AAAS's) Science and Technology Policy Fellows program (see http://fellowships.aaas.org for more details). Since 1973 AAAS has provided a means for members of the research community to learn about and improve upon the policy-making process. The program has grown from a small handful of scientists working exclusively in Congress, to over 130 fellows spread across the executive and legislative branches of our government.

The year begins with a two-week orientation during which all fellows get intensive training on the federal policy process. For Congressional fellows, a three-week placement process follows orientation, in which fellows test out both Senate and House offices seeking a good mutual fit of interests and needs. During the year fellows are entirely independent of their sponsoring society and AAAS.

As with the year itself, the placement process is highly unique for each fellow. I interviewed with 15 offices, including the personal staff of members in both the Senate and the House, along with several potential committee staff placements. In the end, I chose to join the office of a senator from Ohio, where I was able to focus, almost exclusively, on climate policy.

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Working for an Ohio senator presented interesting opportunities and challenges because the state has coal mining, coal-fired electricity generation, and heavy manufacturing. This means that the residents and businesses of the state could be hurt by climate policy that does not recognize and account for the economic risks to existing greenhouse gas emitters. On the other hand, by getting out in front of the problem the state might be able to lead in the development of cleaner technologies and more efficient energy use practices. That would help society as a whole deal with the transition ahead, and might help the state in particular. Of course, reducing greenhouse gas emissions would also benefit the state by reducing the risks posed by climate change.

These state-level considerations put the senator in a more complicated position than that of many other elected representatives, but it was a position that was also particularly influential because he was on the border between championing meaningful climate policy and having to oppose it. That made my year extremely interesting as I sought ways to protect the climate system in a way that would also help, or at least not hurt, the state's economy. It was a fabulous opportunity, because if we can figure out how to make climate policy work well for places like Ohio, we will solve the climate change problem.

OBSTACLES TO CLIMATE POLICY AND POSSIBLE SOLUTIONS. Three pervasive problems block meaningful climate legislation: 1) there is a persistent gap in understanding between policy makers and the research community, 2) there is a small group of powerful interests that will feel the costs of climate policy acutely while the benefits of climate policy will be distributed diffusely among society as a whole, and 3) there is concern—legitimate and misplaced—over the economic consequences of unilateral U.S. action and the genuine need for international cooperation.

While these three obstacles have prevented the passage of meaningful climate legislation, each problem can be addressed effectively and eliminated.

The knowledge gap. Scientific knowledge alone is not sufficient for policy formulation because decision makers must also balance that knowledge with ethical considerations, competing economic interests, and the policy implications for a broad range of constituents. Nevertheless, scientific understanding constitutes a basic ingredient for the creation of informed policy. In order to ground policy in the best-available knowledge, however, major improvements at the interface between science and policy are necessary. Scientists generally struggle to convey their knowledge beyond the scientific community, and decision makers often overlook the scientific insights that could improve their policies. In some cases politicians and interest groups misrepresent science, either deliberately or through ignorance, by using a biased selection of results to further narrow personal, political, or business interests.

The problem is particularly severe for climate change because the science is complicated and easy to misrepresent in ways that seem credible to less-informed audiences. Furthermore, the impacts of climate change are necessarily characterized by deep uncertainty, and the policy options include potentially severe consequences for some entrenched and powerful interests. Even as scientific questions get resolved, basic misunderstandings remain that often create major hurdles to the advancement of climate policy. Even when policy makers themselves have a solid grasp of climate science, misinformed constituents present a major political obstacle to climate legislation because elected officials depend upon and remain accountable to those constituents.

Gaps in understanding between the research and policy communities permeate all aspects of the climate problem from physical and natural climate phenomena through impact assessment and economic analysis. From the policy perspective, one of the most persistent and problematic misconceptions is the widely held belief that reducing greenhouse gas emissions will harm the economy. As with many misunderstandings, there is an underlying basis for it. It is possible to implement economically harmful climate policies. It is true, for example, that paying to reduce emissions might be costly and that public expenditures might be better used for other things like health care, tax cuts, education, or reducing the debt; but, the range of policy options is far broader than government spending alone, and most policy discussion focuses on market-based approaches that would reduce emissions by charging a fee to those who pollute (requiring a tradable permit to pollute is similar to charging a fee). It turns out that implementing a pollution fee would likely improve the economy.

Those who emit greenhouse gases get nearly all the benefits from their polluting activities but do not pay for the social costs of the resulting climate change. Those costs are widely distributed among all the people who end up suffering the consequences of climate damage. This poses a problem for the economy as a whole because individual polluters

make the decision to emit greenhouse gases based on the benefits that they receive and the costs that they must pay. As a consequence, the damage of pollution does not directly influence the incentives of polluters even though those costs still affect the overall economy. That is a bad situation for the economy because it means that even when the economy-wide costs of engaging in a polluting activity exceed the benefits of that activity, individuals may still feel an incentive to do it (Kolstad 2000).

Policy approaches that incorporate the social costs of pollution into the costs paid by those who make the decision to pollute can reduce this economic problem and thereby increase the overall strength of the economy. In other words, the economy can be made stronger by charging polluters a fee when they emit greenhouse gases (Kolstad 2000). Therefore, the belief that economic harm must accompany efforts to reduce greenhouse gas emissions is misplaced. Basic economic principles suggest the opposite: our current failure to include the social costs of emitting greenhouse gases imposes avoidable and unnecessary economic costs on society

Solution 1: Filling the knowledge gap. Reducing the knowledge gap between researchers and policy makers depends on civic engagement by scientists. Civic engagement does not always come easily to members of the scientific community, who are not trained to have a public presence and who are generally not rewarded professionally for it when they do (Chan et al. 2005; Higgins et al. 2006). Nevertheless, individual researchers dedicate considerable amounts of time and effort to public outreach activities that include writing articles, letters, and opinion/editorial pieces for nonscientific audiences, public speaking, conducting interviews with journalists, and engaging the public through electronic media, such as Web commentary sites like www.ClimatePolicy.org and www.realclimate.org. These forms of outreach are widely available to most scientists irrespective of their research programs and preferred career trajectories. Similarly, much progress has been made through the efforts of expert advisory panels and public statements from scientific societies such as the National Academy of Sciences and the Intergovernmental Panel on Climate Change (IPCC), whose assessments inform policy makers and the public about scientific understanding.

More substantial commitments and opportunities also exist, such as the AMS–UCAR Congressional Fellowship and the AAAS Science and Technology Policy Fellowship Program within which it operates. These provide valuable opportunities for scientists to actively engage in the federal policy-making process and to help reduce the gap in understanding between the research and policy communities.

As a result of all of these efforts, policy makers, members of the media, and the general public increasingly seem to grasp at least some components of climate science. This constitutes a legitimate and noteworthy success. Nevertheless, much remains to be done because the knowledge gap between the research community and the decision-making process remains sobering given the magnitude of the risks resulting from climate change and the long-term challenge of reducing greenhouse gas emissions.

Hard distributional consequences: Powerful losers and weak winners. As described above, policies that internalize the societal costs of pollution will generally benefit the overall economy by protecting the climate system, promoting greater efficiency among existing businesses, and creating new business opportunities. Internalizing costs will still create winners and losers, however. Heavy emitters would be hurt by having to pay a larger share of the pollution fee, while those who emit less would benefit disproportionately from climate protection.

Those most likely to be hurt include the fossil fuel producers (especially coal), coal-fired electricity generators, and heavy energy consumers (e.g., manufacturers). These groups know that they may be hurt by climate legislation. They are also powerful, well organized, and focused on a relatively small number of other issues. In contrast, those who will benefit from climate legislation (e.g., the public as a whole, and the companies that will thrive when climate pollution is curbed) often do not fully realize it, are interested in a wide-range of other issues, are not well organized, and wield less political power.

These differences between the winners and losers of climate legislation create a major asymmetry in the policy process. The message from those who may be hurt is strong and the political consequences of opposing their interests are potentially severe. In contrast, the message from those who will benefit from climate policy is relatively weak, and the political benefits of championing their interests are fairly mild. This asymmetry does not prevent politicians from championing policies that reduce greenhouse gas emissions, particularly as they become more aware of the risks of climate change, but it does make it considerably more difficult to build sufficient support. Only politicians who are either 1) deeply concerned about the climate change problem, or 2) relatively

insensitive to the political power that the losers of climate legislation can wield (e.g., because that power is already mobilized in opposition to them or because constituent support is sufficiently strong to negate it) will champion climate legislation; so far there have not been enough policy makers in those two categories for the United State to adopt meaningful climate policy.

Solution 2: Ease distributional consequence and build a constituency. With the potential to enact climate policy that benefits the economy overall (described above) it becomes possible to distribute some of those economy-wide gains to those who suffer large losses. For a cap-and-trade approach, this is accomplished by giving some permits freely to disaffected groups. For a pollution fee, some of the revenue collected can be spent to ease any burdens acutely felt. Economic analysis suggests that less than 20% of the permits or revenues are needed to compensate those who will be acutely hurt by climate legislation (Burtraw et al. 2002). While it is impossible to eliminate the distributional consequences that will create winners and losers entirely, much can be done to reduce this problem.

It is also necessary, however, to build new constituencies that will directly experience the benefits of climate legislation. The allocation of pollution permits or the revenues generated by a pollution fee can create a powerful lever to accomplish this. For example, a substantial fraction of permits or revenue could be allocated to states based on their historical greenhouse gas emissions. These funds could be designated for related purposes (e.g., improved energy efficiency or the development of new technology) or an otherwise broadly beneficial policy, like education and job training.

This would help the states that are most prone to being hard hit (states with coal, oil, and heavy manufacturing) make the transition to a lower-emitting economy. That is both fair and politically expedient because the transfer of permits/revenue would flip the political incentives for some of the staunchest opponents of climate legislation, because the states with the highest greenhouse gas emissions would stand to receive substantial compensatory revenue.

Unilateral action. There are also perceived risks, real and misplaced, from unilateral U.S. action to reduce greenhouse gas emissions. Acting both strongly and alone could reduce U.S. competitiveness by asymmetrically increasing the costs of the electricity and transportation needed to produce and distribute the goods we manufacture. It is also true that greenhouse gas emissions are a global problem and so unilateral action is less likely to solve the problem (though it is possible that technological innovations that result within the United States may subsequently spread).

This implies that the level of U.S. action at which the economic benefits exceed the costs does depend on the level of international cooperation that results. Furthermore, the economic risks of unilateral U.S. action are often used, extremely effectively, to argue against meaningful climate legislation. In many cases the argument has clearly been exaggerated to create a politically expedient means of stopping climate legislation by those who oppose it for other reasons. Nevertheless, without international cooperation it is likely that U.S. climate legislation will face stiff political resistance and less likely that U.S. actions will prove effective in protecting the climate system.

Solution 3: Conditional unilateral action and border tax adjustments. There are two provisions that could create powerful incentives for similar international efforts: 1) to impose trade penalties on countries that maintain subsidies for greenhouse gas emissions, and 2) to make our level of effort partly responsive to international cooperation. Each approach, or both together, would help reduce the political, economical, and rhetorical obstacles to climate legislation while simultaneously increasing climate protection.

Target responsiveness involves building into our actions periodic assessments of international efforts and adjusting our level of action accordingly. In a cap-and-trade permit system the United States could initially set a cap (e.g., year 2005 emissions) and then adjust that cap based on the level of international cooperation. For example, if less than 55% of worldwide greenhouse gas emissions are covered by a similar approach, we would emit 5% more. If less than 40% of global emissions are covered, then we would add 10% of our target cap. Likewise, if 70% of worldwide emissions are covered by a similar approach then we would emit 5% less and we could reduce our target by 10% if more than 85% of world emissions are covered. The use of this type of symmetrical responsiveness could also be applied to a pollution fee approach, with the level of the fee increasing or decreasing with international cooperation. This form of responsiveness creates a powerful incentive for other nations to cooperate and accounts for our own unwillingness to risk economic competitiveness.

The second tool, which can be used simultaneously with target responsiveness, is to use border tax adjustments on noncompliant nations. In this case, all exports from all countries that fail to institute a similar cap-and-trade or pollution fee approach will face border tax adjustments equivalent to the total amount of pollution released during the manufacture and shipment of that product multiplied by the current U.S. pollution fee (or permit price). At the same time, all U.S. exports to countries that lack similar approaches would receive border tax subsidies equivalent to the pollution fees previously imposed. This provision can be made to work with a cap-and-trade system but is easier to implement with a pollution fee approach.

Currently, it is unclear whether such adjustments would sustain a challenge from the World Trade Organization (WTO). Nevertheless, the border tax adjustment approach is completely consistent with free trade because unpaid damages for climate pollution is one type of subsidy. To ensure WTO acceptance, Congress could instruct the president to negotiate WTO agreements that designate unmitigated greenhouse gas emissions as a subsidy and violation. Of course, other countries could then impose similar tariffs on the United States as well, but tariffs would tend to be highest against countries that use energy inefficiently.

CONCLUSIONS. Public policy advances the interests of society most effectively when it is grounded in the best-available knowledge. The AMS–UCAR Congressional Fellowship and the AAAS Science and Technology Policy Fellowships within which it fits provide valuable opportunities for scientists to actively engage in the federal policy-making process and to help reduce the gap in understanding between the research and policy communities. During my fellowship year, I tried to address two of the major obstacles to climate legislation by working to develop incentives to encourage international cooperation and provisions to ease acute distributional impacts that could arise from reducing greenhouse gas emissions. Based on these experiences in the U.S. Senate and despite remaining hurdles, I conclude that we have the capacity to overcome the biggest remaining obstacles to climate legislation and to begin reducing our greenhouse gas emissions.

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