

SCIENCE IN THE POLICY PROCESS

Rational Decision-Making or Faustian Bargain?

BY PAUL A. T. HIGGINS

As a scientist who often writes about policy, my mantra is “public policy advances the interests of society most effectively when it is grounded in the best available knowledge.” It is, in my view, a logical philosophy for someone trained in science and committed to the advancement of science in society. Science provides us with an understanding of the universe and can thereby underpin rational and informed decision making. Without a rational basis, our choices are left to rely on superstition, guesses, or narrow interests—key ingredients to outcomes that are suboptimal.

Yet colleagues from both the science and policy communities often seem to challenge this view—at least implicitly—when confronted with the most contentious and challenging issues facing society. Most recently, several have questioned my efforts to develop an AMS Policy Program workshop series on federal climate policy—and thereby contribute to a more fully informed policy discussion—because the series will include some contentious topics (e.g., carbon fees and geoengineering) that, if implemented rashly, could pose dangers to society.

Such objections are not necessarily irrational. At least in federal climate policy, there may be risks to pursuing a more fully informed policy process.

To date, policy makers interested in dealing with climate change have focused the vast majority of their attention on cap-and-trade approaches for reducing greenhouse gas emissions. Cap-and-trade is a powerful tool for mitigation because it sets a limit on the quantity of allowable greenhouse gas emissions (the cap), and relies on the economic efficiency of markets (through trading of emission permits) to achieve that cap at the lowest price for polluters.

By establishing a price on greenhouse gas emissions, cap-and-trade creates a strong incentive for polluters to reduce their emissions. So the attention the approach has received is appropriate and largely beneficial, in my view. However, there are additional policy options that could also have an enormous positive impact on our efforts to reduce the risks we

face from climate change. Our elected leaders and their appointees have done a remarkably poor job in considering this broader range of options. As a result, we’re almost certainly overlooking important strategies for navigating the danger society faces from climate change.

In the broadest sense, society has three proactive options for managing the risks our greenhouse gas emissions pose. One, we could mitigate, or reduce, our emissions, and thereby reduce the magnitude of future climate change. The cap-and-trade approach is one of several possible tools for mitigation. Two, we could increase our ability to cope with climate changes by building our adaptive capacity. Three, we could geoengineer—that is, develop and deploy additional global-scale changes to the Earth system in the hope of counteracting the worst impacts of our greenhouse gas emissions. Geoengineering is an option that raises the potential for unintended, unpleasant, and uncontrollable side effects, but that could possibly serve as an important desperation strategy.

These three broad risk management strategies are generally not mutually exclusive—we could mitigate, adapt, and geoengineer simultaneously and in a wide range of different combinations. Furthermore, each broad category contains further, and more specific, policy options. Among the specific policy choices, some are substitutes. For example, we would likely choose either a cap-and-trade or a carbon fee approach to price greenhouse gas emissions—with each approach possessing different relative strengths and weaknesses—but probably not both simultaneously. Other policies are inherently more complimentary: mitigation and adaptation are different, noncompeting approaches to risk reduction and management that can be used in concert. Even so, complimentary policy options could inadvertently act as substitutes in the policy processes. For example, stronger efforts to mitigate may translate into weaker efforts to build adaptive capacity, or vice versa, if policy makers’ attention to climate change—which is necessarily limited given the vast range of policy issues they

must contend with—is expended entirely on any one element of the solution.

Therein resides one of the potential dangers in raising alternative policy options for consideration. Does exploring carbon fees, the alternative cost-effective approach for putting a price on greenhouse gas emissions, undermine the progress policy makers have made with cap-and-trade, thereby reducing the chances that we will begin a serious effort to reduce our emissions? If so, we may be better off with a more narrowly focused discussion that produces faster societal responses. Likewise, does writing about building adaptive capacity reduce the likelihood of aggressive mitigation? If so, a broad and more informed discussion could ultimately hinder efforts to reduce societal risks.

A second danger arises from the potential for making dangerous options appear more benign and palatable. Does writing about geoengineering, even objectively, cautiously, and responsibly, increase the potential for policies that recklessly or dangerously alter the Earth system? If so, keeping ignorant of the full range of policy options may lead to better societal outcomes.

In some cases a little knowledge may prove dangerous, especially when combined with a lack of humility and a desire for decisive action. But I find it hard to believe that ignorance leads to good policy choices. Indeed, if ignorance is a necessary ingredient to establishing the best policies, then I think we are sunk. The problems we face are growing ever more complex, and the scope of our activities increasingly leaves us with fewer second chances. Against this backdrop, relying on ignorance would seem to ensure that our policy choices become less and less capable of addressing our needs or ensuring our continuing prosperity.

Fortunately, the alternative—responding to uninformed or irrational policy making by seeking to add ever more knowledge—would have the opposite effect: society becomes better able to deal with complex problems and is more likely to select options that confer benefits broadly. Toward that end, I'm deeply optimistic that our community can contribute a great deal.

The recent AMS federal climate policy workshop on carbon fees provides a terrific case in point. We brought together a group of experts who had a wide range of perspectives on emission fees, including both proponents and opponents of the approach. This

allowed us to delve deeply into the advantages (e.g., clear price signal, minimal rent-seeking, low price volatility, etc.) and disadvantages (e.g., emissions uncertainty, political framing, potential for regressive distributional consequences, etc.) of emission fees, along with a thorough exploration of the key design principles for federal policy.

This gave policy makers a much richer understanding of the approach than they could have gained from a more one-sided discussion.

Two subsequent workshops are now in development. One will explore federal policy options for promoting the nation's adaptive capacity. The other will identify policy options for responsibly considering (and limiting) geoengineering.

I believe that society should seek to avoid geoengineering with all due diligence, and not just because of the risk of nasty, unintended, uncontrollable consequences. Mitigation and adaptation offer considerably more upside potential both in their own right and through co-benefits they may provide, such as improved economic and national security, better resilience to existing hazards, and improved public health.

Nevertheless, I see a real need to explore federal climate policy options that relate to geoengineering. Geoengineering may prove a critical desperation strategy in the event that our efforts to mitigate and adapt come up short. Furthermore, federal policies can—and in my view should—go beyond promoting the research and development needed for the geoengineering strategies themselves to also include efforts to assess potential impacts and to establish punitive measures that discourage unilateral or poorly conceived manipulation of the Earth system.

These workshops, though critical, cannot match the potential impact that the larger scientific community could have through broader civic engagement, as I've promoted before in the pages of *BAMS*. This active participation, be it through outreach to policy makers, speaking with the public, or writing articles and letters for a broad audience, can help ensure that policy makers have access to, and understand the implications of, the best scientific information.

Of course, how we engage with policy makers and the public will be critical for our effectiveness. Here, a dose of humility is just as much in order for our community as it is for those policy makers

who know just enough to be dangerous. Sometimes scientists fail to fully appreciate the knowledge or values that reside outside of the scientific community. Although critical, scientific knowledge alone is not sufficient for policy formulation. Decision makers must take into account ethical considerations, economic interests, and the distributional consequences of policy choices among a broad range of constituents. Failing to recognize this broader range of considerations limits the potential effectiveness of scientists. Most of us also need some help learning to communicate what we know beyond the scientific community, as few scientists are trained to engage with decision makers. As a result, grounding policy in the best available knowledge will require major improvements from both sides of the interface between science and policy.

It is critical that we continue to improve this interface, however. Grounding our policy choices in the best available knowledge will advance the interests of society most effectively.

Paul A. T. Higgins is a senior policy fellow with the AMS Policy Program. His efforts are geared primarily toward helping society figure out how to deal with climate change.

FOR FURTHER READING

- Higgins, P. A. T., 2007: The creation of well-informed climate policy: How you can influence Congress. *Bull. Amer. Meteor. Soc.*, **88**, 98–99.
- , 2008: Federal climate policy: Design principles and remaining needs. *Bull. Amer. Meteor. Soc.*, **89**, 102–103.