

## ALIGNMENT OF POLICY FRAMEWORKS AND GOALS

**P**olicy refers to particular courses of action that are proposed or implemented. *Politics* is the messy process through which we debate those courses of action and make decisions.

Political obstacles make climate change risk management extremely challenging. However, the policy responses available to society are relatively straightforward. The key to understanding climate policy, in my view, is to identify a broad range of options and then assess the strengths and weaknesses of each option as objectively as possible.

In general, there are four basic approaches to climate change risk management. Policy responses could seek to: 1) reduce emissions, 2) build resilience to climate changes, 3) develop countervailing measures (i.e., geoengineering), and 4) build the knowledge base. These four options sometimes overlap, and they aren't mutually exclusive. Each approach can also be divided into a wide range of more specific choices—an entire family of policy options. Taken together, they define the broad range of approaches we might consider.

Regular readers of this column know that the AMS Policy Program conducts research and analysis to expand the knowledge base needed for societal decision making. One area of focus for me is climate change risk management, particularly efforts to reduce emissions through market-based approaches that add a price to emitting.

Adding a price to greenhouse gas emissions, like virtually any policy option, has potential advantages and disadvantages (see Higgins 2010 for greater depth). For example, emissions pricing is generally cost effective: it is likely the cheapest way to reduce emissions. It can also be expected to bring overall economic benefits to society: the total benefits very likely outweigh the total costs. However, those costs and benefits would be distributed unevenly such that some would likely bear a heavy brunt of the burden. Pricing also likely can't address the full range of market failures that contribute to emissions.

In general, there are four approaches to consider for adding a price to emissions. It turns out that the different approaches to pricing emissions also have different advantages and disadvantages (see Higgins 2013, on which this is largely based).

One option is cap-and-trade, through which poli-

cymakers set a limit on the *quantity* of emissions and allow polluters to buy and sell permits to emit. This helps achieve the cap at least cost. A second option is an emission fee (often called a carbon tax). With a fee, policymakers set the price polluters must pay for every ton they emit but the market determines the quantity of emissions that result. A third option starts with cap-and-trade but includes an upper-limit permit price (a price ceiling at which additional permits are always available). A fourth option starts with an emission fee but includes an upper limit on the amount of emissions.

At their core, the four frameworks are all similar because each is a market mechanism designed to bring the societal costs of climate change into the price paid by emitters of greenhouse gases. All make sense if you favor emission pricing and none make sense if you don't. However, each approach is more or less suited to particular policy goals.

For example, cap-and-trade with a price ceiling minimizes price increases for emitting activities in all cases, relative to the other approaches. For those most concerned about the costs of energy and transportation, the framework has clear advantages. In contrast, an emission fee with a quantity ceiling maximizes emissions reductions in all cases, relative to the other frameworks. For those most concerned about damage to the climate system, the approach has clear advantages.

Whether pursuing one potential policy goal serves society's interests best is uncertain because we don't know how serious the consequences of climate change (or emissions pricing) will be. Because of that uncertainty, the "best" framework for emissions pricing depends on subjective preferences, most notably whether one is more risk averse to climate damages or emissions price increases.

Climate change is challenging, in part, because politicians, members of the media, and the public do not agree on a common basis of facts. The incentives and motivations of elected officials, particularly in a two-party system like the one in the United States, is to emphasize differences whenever possible. That contributes to the divergence over facts. Furthermore, the benefits of climate change risk management are broadly distributed across everyone. Most of us are unaware, disengaged, and focused on other priorities. In

contrast, the costs of climate change risk management will be borne most heavily by a select few. Political power is partly concentrated in that select few, and they recognize the risks they face from climate policy. This all contributes to an extremely difficult political landscape for climate change risk management.

Nevertheless, there is great opportunity in separating the complex political challenges of climate change risk management from the potential policy responses. That starts with an open and objective exploration of policy options and the identification of the advantages and disadvantages of each option. That's the kind of analysis the scientific community

knows how to do and can do well. If we provide that service, maybe the political obstacles to thoughtful risk management can be overcome.

—PAUL HIGGINS, AMS POLICY PROGRAM DIRECTOR

#### FOR FURTHER READING

Higgins, P. A. T., 2010: Design principles and remaining needs for U.S. federal climate policy: Emission fees. *Bull. Amer. Meteor. Soc.*, **91**, 601–609, doi:10.1175/2009BAMS2885.1

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