POLICY FORUM: CLIMATE CHANGE

Managing Carbon from the Bottom Up

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The world needs to get serious about managing the exponential growth of atmospheric carbon dioxide (CO_2). However, because uncertainties about climate science provide convenient political cover for economic interests that favor delay, the United States is unlikely to sign any comprehensive international agreement in the near future. Whether Europe and others can muster the political will to unilaterally implement the Kyoto protocol is an open question. Even if they do, the Kyoto agreement is at best a modest first step toward the essential goal of stabilizing atmospheric concentrations. Although they may be prepared to take symbolic steps, China, India, Brazil, and other large industrializing states will certainly not agree to serious constraints on their emissions in the near future. Diplomats will put a good face on things, but for at least the next decade, it is unlikely that all the world's major states will simultaneously agree to a serious program to curtail emissions of CO_2 and other greenhouse gases (*1*, *2*).

Fortunately, a universal top-down framework is not the only route to a global regime for managing CO_2. Norway (*3*), the Netherlands (*4*), and others have begun to take unilateral action. Although dismissed by some as limited and self-serving, such efforts reflect genuine moral and political commitment by the citizens of these states. The history of international environmental protection shows that effective regimes start slowly. The diplomatic community should work to encourage the growth of local and regional regimes and to promote their coordination, so that they can ultimately coalesce into a comprehensive set of global arrangements.

An evolutionary bottom-up strategy has several benefits. It can start today. As early adopters try different strategies, the world can evaluate and learn from alternative approaches. Early adopters can provide the inspiration, and proof of concept, to inspire or shame citizens in other regions, such as the United States and Canada, to take action. Some will argue that a bottom-up approach can never work, because nobody will go first, fearing competitive disadvantage. However, environmental policies are more often determined by broad considerations of public values than by any narrow calculus of benefit-cost. Growing numbers of people believe that the world must act and are willing to assume some extra burden to do the right thing and to provide an example.

The prospects for success with a bottom-up strategy would increase substantially if the diplomatic community softened its single-minded preoccupation with Kyoto and began to provide greater support and encouragement to early adopters. For example, some states or regions may impose a domestic carbon emissions tax. To avoid disadvantaging their own industry in domestic markets, they may want to impose nondiscriminatory border adjustment tariffs on the CO_2 releases that are implicit in imports. Similarly, states may wish to provide subsidies to cover the incremental cost to firms of adopting low-emission technologies. For example, it is rapidly becoming practical to separate hydrogen from hydrocarbon fuels and to sequester the CO_2 in geological formations at depths of several kilometers. In contrast to electric power from photovoltaics, which currently costs about 10 times as much as conventional fossil electric power, carbon separation and sequestration may cost as little as 20 to 30% more than a conventional coal plant (*5*–*6*). That makes it economically attractive, but wide adoption would still require a regulatory requirement or a subsidy.

Today, border adjustment tariffs and subsidies to support carbon management activities would likely encounter difficulties with World Trade Organization rules (*7*). But, trade rules are always in flux, and multilateral agreements are treated more favorably than unilateral initiatives. With some effort, the diplomatic community might find ways to allow border adjustment taxes and subsidies designed to address global pollutants, even if such policies continued to be disallowed for states addressing local or regional environmental problems.

The diplomatic community could also help by developing forums to address a number of the problems that must be resolved in a bottom-up strategy. These include the following:

• How can the international community speed adaptive learning based on a sharing of experiences of early adopters?

• How might different carbon management strategies, such as emissions taxes and trading regimes, best be harmonized?

• What problems will multinational firms operating in several jurisdictions face? How can such problems be eased? How can more such firms be encouraged to become agents for early action and learning?

• How can the safety and reliability of geological sequestration be assured so that early actions of single states do not create long-term problems for all?

• What international oversight is needed of other geoengineering strategies, such as deep ocean disposal of CO_2, ocean fertilization, and strategies to modify the earth's overall reflectivity or albedo, which, while they can be adopted by individual states, could have global consequences?

• What additional steps can be taken for the equitable transfer of clean energy technologies to the industrializing world?

• How can the world's industrialized states cooperate to dramatically increase their support for basic energy-technology research?

Free markets are great for inducing efficient allocation of scarce resources and for commercializing existing knowledge. However, if the world is going to make a major transition to a more sustainable energy system, it will need to develop cleaner, low cost, energy systems by dramatically increasing current investments in basic energy-technology research.

A single international accord is not the only starting place from which to move toward serious global management of CO_2 and other greenhouse gases. If we act now to encourage initiatives by individual states and regions, the world can learn from these efforts and begin to move, in a progressively more coordinated way, toward a more sustainable future (*8*).

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References and Notes

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