POLICY FORUM: CLIMATE CHANGE

Fundamentals of Treaty-Making on Climate Change

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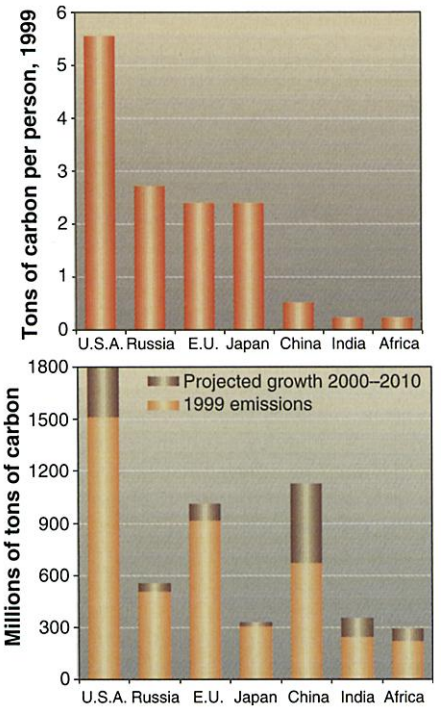
The challenge of building a viable treaty response to climate change is enormous and multifaceted. President Bush's rejection of the Kyoto Protocol highlights a variety of reasons why any given proposal may encounter considerable resistance. His actions require us to step back and to assess the basic logic behind the last decade of treaty-making on climate change. In this policy forum, we review factors that make action on climate change challenging and present key elements for an effective treaty response.

Challenges

Several factors make climate change an especially challenging public policy issue both for nations and for the international community as a whole.

First, scientific and political time scales are mismatched. The Intergovernmental Panel on Climate Change (IPCC) predicts that, under business-as-usual scenarios, mean temperatures worldwide will increase 1.4 to 5.8°C by 2100 as a result of growing greenhouse gas (GHG) concentrations in the atmosphere (*1*). This rate of warming is likely without precedent in the last 10,000 years (*1*). By way of comparison, the difference between average global temperatures today and during the last Ice Age is about 4°C (*2*). Projected impacts from this warming include disruption of ecosystems, inundation of coastal areas, and more severe and frequent storm activity (*3*). However, temperature changes during any single election cycle are likely to be quite small. For example, the average temperature increase during the term of a U.S. President would likely be less than 0.1°C. Political systems are not well designed to address problems that proceed at this pace.

Second, responses to climate change involve modifications in energy and transportation infrastructure. With trillions of dollars invested in existing infrastructure, many energy providers, manufacturers, and others have enormous investments already sunk in the status quo. Unlocking the necessary technological innovation to reduce GHG emissions, while avoiding politically difficult short-term disruptions, is a substantial challenge.



Carbon emissions associated with fossil fuel combustion. **(Top)** Carbon emissions per person, 1999. **(Bottom)** 1999 Carbon emissions and expected increase by 2010. Source: World Resources Institute, data from (*6*, *14*).

Third, widely varying national circumstances complicate policy responses. Differing patterns of economic activity lead to different abatement costs among and within nations. Different political cultures influence the acceptability of the range of mitigation options.

Fourth, defining the relative responsibilities of industrialized and developing countries in a manner acceptable to each is particularly challenging. Industrialized nations are responsible for most of the increase in atmospheric GHG concentrations during the past century (*4*). Per capita GHG emissions in industrialized emissions dwarf those in developing nations (see figure, top). For example, U.S. emissions are currently about 20 times those of India per capita (*5*). The ability of industrialized countries to invest in GHG emissions reductions also far exceeds that of developing countries. At the same time, emissions in developing countries are growing sharply and are projected to surpass those of industrialized countries in about 20 years (*6*) (see figure, bottom). No long-term solution to climate change is possible unless all countries pursue a development path that entails slower emissions growth than currently projected.

Treaty Elements

In 1992, more than 160 nations adopted the United Nations Framework Convention on Climate Change (*7*). Its main elements included acknowledgment of the science of climate change; establishment of a long-term objective: preventing "dangerous anthropogenic interference with the climate system"; division of responsibilities between industrialized and developing countries; and, acceptance by industrialized countries of a nonbinding goal: returning their emissions to 1990 levels by the year 2000.

In the years since 1992, the international community has grappled with many of the complex issues presented by growing GHG emissions and has worked to develop a more specific, binding regime. Yet in most countries, emissions have increased.

One question that has arisen recently is whether emissions reduction commitments should await additional work to define a safe concentration level for GHGs in the atmosphere (*8*). We believe not. Today, GHG concentrations are greater than at any time in the last 420,000 years (*1*). Absent a reduction in projected emissions, concentrations by 2100 will reach levels not seen in 40 to 50 million years (*9*). Given the long atmospheric lifetime of most GHGs, concrete steps to curb emissions are justified in the short term. Further research on the impacts of different atmospheric GHG concentrations is important, but should not become an excuse to defer short-term action to reduce emissions.

A treaty response in the short to medium term should accomplish at least three basic objectives. It should (i) create strong incentives to start to reduce GHG emissions, (ii) provide a cost-effective framework for international cooperation, and (iii) maintain options and flexibility as an international regime is built over the coming years and decades. A treaty response should have the following elements:

Emissions targets. The core element of any treaty response should be national targets. These are rules concerning the total

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amount of GHGs a country may emit during a specified time period. The theory is simple: Each country should decide for itself how best to reduce emissions within its borders. GHG emissions come from hundreds, if not thousands, of different types of sources in each country. Because economic costs and political acceptability of mitigation options vary, national targets provide needed flexibility. Such flexibility also allows for experimentation and innovation.

During the past decade, two principal alternatives to national emissions targets have been offered. First, some have suggested common tax or regulatory policies, arguing that competitiveness concerns between industries in different countries could best be addressed by ensuring that those industries faced identical tax or regulatory policies. However, differing national circumstances make this approach overly rigid. In some countries, for example, environmental taxes are generally accepted and emissions trading is unknown; whereas in other countries, environmental taxes are absent and emissions trading programs have a long record of success.

Second, some have suggested technology programs, or tax incentives, for research and development. Such policies are an important part of any solution. Standing alone, however, publicly financed technology programs do not represent an adequate response to the challenge of climate change. Clear rules are needed to motivate the private sector to take cost-effective action. Market incentives are needed for deployment and commercialization. Furthermore, there is little realistic prospect that sufficient public sector funding will be made available at the scale needed.

Legally binding commitments. In environmental treaties, as in others, legally binding commitments have been more successful than those based on voluntary actions. The reason is simple: absent consequences, incentives for compliance are minimal.

The Montreal Protocol on substances that deplete the ozone layer (*10*), the 1987 treaty designed to phase out production and use of a range of ozone-depleting chemicals, is widely viewed as a success. Its core design feature was a set of legally binding commitments to eliminate the chemicals. The Montreal Protocol provided a clear signal to industry to begin an orderly transition to production of non–ozone-depleting chemicals.

In contrast, the Framework Convention on Climate Change set only political goals of stabilizing GHG emissions at 1990 levels by the year 2000. The failure of the Framework Convention to reduce emissions led parties to develop the 1997 Kyoto Protocol (*11*), an agreement designed to force emissions reductions in a cost-effective manner.

A state can always withdraw from a treaty; however, by expressing the intent to be legally bound and by accepting the consequences set forth in a treaty, a state in practice materially affects its conduct as circumstances evolve.

All GHGs. CO_2 has contributed more than 60% of the radiative forcing from anthropogenic GHG emissions in the last 250 years (*1*). However, there are other GHGs known to contribute to the greenhouse effect, including methane, nitrous oxides, and others. Each of these gases has a greater global warming potential by volume than does CO_2 (*12*). A treaty response should provide sufficient flexibility to accommodate cost-effective strategies to abate emissions of each gas.

Multiyear compliance periods. GHG emissions are influenced by factors with considerable interannual variation, including weather and business cycles. The appropriate period for measuring compliance with a country's obligations should be long enough to take account of such variations through averaging, without being so long that legal and regulatory systems become impractical. A multiyear compliance period allows flexibility and provides a buffer against unforeseen annual variations in GHG emissions.

Emissions trading between parties. Because GHGs are uniformly mixed in the atmosphere, the point of origin for emissions is of no significance from an atmospheric perspective. One innovative approach to reducing the abatement cost for emissions is to allow trading of emissions rights or allotments between countries. Such trading will enhance the market's influence and allow for emissions reductions to find their lowest marginal cost. In order to function, an emissions trading system requires a binding cap or target on emissions to create economic value for permits.

Sequestration. The terrestrial biosphere removes large amounts of carbon from the atmosphere each year. Additional sequestration (e.g., planting forests) is a cost-effective option for reducing net emissions and has the potential to provide collateral environmental benefits (*13*). Sequestration can contribute to a bridging strategy as low-emitting technologies are improved in the decades ahead. Because sequestration potential varies according to levels of available territory and ecological characteristics, and because countries bring very different political viewpoints to negotiations on sequestration, reaching agreement on this topic is particularly difficult.

Incentives for developing countries. A global agreement on climate change must create incentives and mobilize resources to reduce the GHG emission intensity of economic growth in developing countries. Among the mechanisms to accomplish this goal are: credit for clean energy and energy efficiency projects, technical assistance, and options for developing countries to adopt emissions targets and participate in international emissions trading.

Discussion

Climate change diplomacy is at a crossroads. Questions have been raised about much of the work done in recent years by the international community. As policymakers now chart the path forward, their actions should be guided by a clear understanding of the urgency of the challenge and the basic elements that will contribute to a successful treaty response. The core choice for policy-makers is not whether, but how, to build and implement a binding international regime to address climate change.

The Kyoto Protocol has proven to be a popular target for criticism. In light of the enormous challenges associated with treaty-making on climate change, such criticism may be inevitable. However, the seven key elements we present for an effective treaty are all found in the Protocol. This landmark agreement provides an important foundation for future international work to address climate change.

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