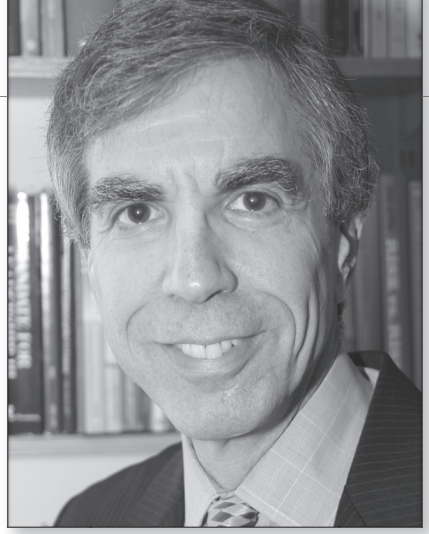

By Robert N. Stavins

# A Sensible Way to Cut $CO_2$ Emissions

There is growing impetus for a domestic U.S. climate policy that can provide meaningful reductions in emissions of carbon dioxide and other greenhouse gases. It is important to identify the best policy instruments at the outset, because once a policy architecture is put in place, it can be very difficult to make a change. A poorly designed policy could impose unnecessarily high costs while providing little public benefit, and could detract from the development of a more effective, long-run policy.

In a paper I prepared recently for The Hamilton Project at The Brookings Institution (available at www.hamiltonproject.org), I propose a scientifically sound, economically rational, and politically feasible approach for the United States to reduce its contributions to the increase in atmospheric concentrations of greenhouse gases. The proposal features an up-stream, economy-wide $CO_2$ cap-and-trade system that implements a gradual trajectory of emissions reductions over time (with selective inclusion of non-$CO_2$ greenhouse gases), and includes mechanisms to reduce cost uncertainty.

Initially, half the allowances should be allocated through auction and half through free distribution, with the share being auctioned gradually increasing to 100 percent after 25 years. This pattern is consistent with analysis of the share of allowances that would need to be distributed for free to compensate firms for equity losses.

In the short term, free allowance distribution should be targeted to entities that are burdened by the policy, including primary fuel suppliers, power companies, and energy-intensive manufacturers. This may help establish a policy consensus that achieves meaningful reductions. The auction revenue can be used for compensating low-income consumers, spending for related research and development, reducing the federal deficit, or reducing distortionary taxes.

Offsets should be made available both for underground and biological carbon sequestration, to provide for short-term cost-effectiveness and long-term incentives for technological change. The federal cap-and-trade system should provide for linkage with emission reduction credit projects and cap-and-trade systems in other countries, and require allowances for carbon-intensive imports from countries without commensurate climate policies in order to establish a level playing field for domestically produced and imported products.

*The analysis indicates significant but affordable impacts on GDP*

The cap-and-trade system reduces compliance costs by building on the scientific nature of the climate change problem, offering "what, where, and when" flexibility. The system allows — indeed encourages — emission reductions through whatever measures are least costly, and it achieves reductions wherever they are least costly, adjusting automatically as control costs change over time. It provides temporal flexibility by permitting the banking and borrowing of allowances.

To provide empirical cost estimates, I examined two illustrative trajectories of emissions caps. One trajectory involves stabilizing $CO_2$ emissions at their 2008 level over the period from 2012 to 2050. That trajectory lies within the range defined by the 2004 and 2007 recommendations of the National Commission on Energy Policy. The second trajectory involves reducing $CO_2$ emissions from their 2008 level to 50 percent below their 1990 level by 2050, which is consistent with the lower end of the range proposed by the U.S. Climate Action Partnership.

This pair of trajectories is consistent with the frequently cited global goal of stabilizing atmospheric concentrations of $CO_2$ at between 450–550 ppm (if all nations were to take commensurate, globally cost-effective action). The caps gradually become more stringent over time, thus reducing costs by avoiding the necessity of premature retirement of existing capital stock, reducing vulnerability to siting bottlenecks, and ensuring that long-lived capital investments incorporate appropriate advanced technology.

The analysis indicates significant but affordable impacts on GDP, generally reductions of below one-half of one percent per year for the less aggressive trajectory and ranging up to one percent per year for the more aggressive policy. While these impacts are on the order of tens to hundreds of billions of dollars annually, note that compared with average annual GDP growth in the business-as-usual case of 2.901 percent, annual growth would be 2.895 percent and 2.891 percent under the two respective trajectories.

Getting serious about greenhouse gas emissions will not be cheap and it will not be easy. But if the current state-of-the-science predictions about the consequences of another few decades of inaction are correct, the time has arrived for a serious and sensible approach.

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