How to Evaluate Domestic Climate Policy Options

When Cap and Trade Is Not on the Agenda

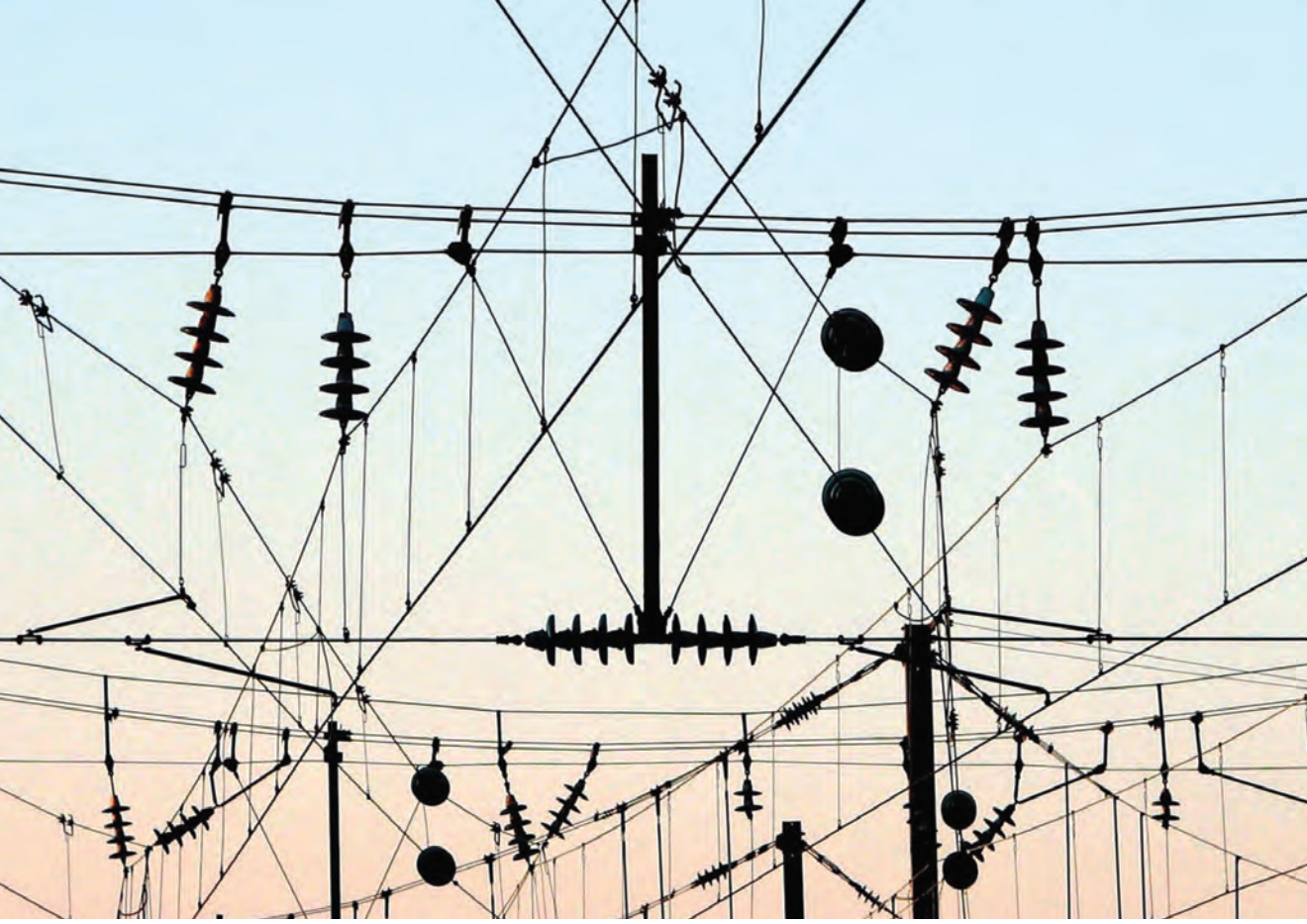
Raymond J. Kopp

President Obama pledged to the world community that the United States will reduce its emissions of greenhouse gases (GHGs) 17 percent below 2005 levels by 2020. The basis of that pledge was comprehensive climate legislation—the American Clean Energy and Security Act of 2009—passed by the House of Representatives in June 2009. That legislation contained numerous provisions to reduce U.S. GHG emissions. Perhaps the most important feature was cap and trade, which established a price and yearly declining limit on U.S. emissions, which would yield the reductions pledged by the president. However, similar legislation was not passed by the Senate in the 111th Congress, and given the results of the recent midterm elections, it seems unlikely the Senate will pass similar cap-and-trade oriented, comprehensive legislation in the next Congress.

While cap and trade may not be on the immediate congressional agenda, concern over U.S. GHG emissions remains. In the near term (12 to 24 months), one can expect proposals and action to reduce those emissions emanating from Congress, the executive branch agencies, and the states. These proposals and actions will likely manifest in many forms and vary considerably with respect to their environmental efficacy (tons of GHGs reduced), economic efficiency (cost per ton reduced), and political viability (who bears the costs and reaps the benefits of the policy).

The articles in this special issue of *Resources* discuss and analyze a great many of the climate policy options that will be considered in the near term. The purpose

Visit us for additional readings: **www.rff.org/resourcesno176/kopp**



gettyimages

of this introductory essay is to provide some guidance to aid readers as they evaluate these very same options.

A Uniquely Difficult Problem

In a very simple sense, GHG emissions can be viewed as air pollution. Since we have decades of experience controlling air pollution, it seems it should be a straightforward task to develop policies to control GHGs and prevent serious alteration to the global climate system. However, to properly design and evaluate policy options one must appreciate the distinctive features of the climate problem and the varied ways in which GHG emissions substantively depart from simple air pollutants. It is these unique features that make the formulation of climate policy challenging.

Perhaps the greatest air pollution success story in the United States is the ongoing control of acid-rain causing sulfur dioxide emissions. These emissions are largely confined to a relatively small number of coal-fired electricity generation facilities. In contrast, GHGs, especially carbon dioxide (CO_2), are ubiquitous gases, emitted by a vast number of sources in every country on the planet. They are emitted naturally and anthropogenically through many human activities in quantities ranging from trivially small to truly massive. Even the initial process of identifying relevant emissions sources is daunting.

GHGs remain resident in the atmosphere for a century or more, and therefore concentrations of these gases (quantities of GHGs per given volume of atmosphere) accumulate over time. This "stock" aspect of GHGs means that current concentrations are the result of global actions, natural and human, over the past century and the emissions today and over the next decade will in part determine concentrations a century from now.

GHGs are uniformly mixing gases that

contribute equally to global concentrations no matter where they are emitted. A ton of GHGs emitted in New Jersey has the same effect on global concentrations as a ton emitted in Paris, or Moscow, or Cape Town. Unlike many conventional air pollutants, local concentrations of GHGs are not greater near large sources than they are in areas far distant from sources. The geographic location of emissions simply does not matter in terms of global or local GHG concentrations.

Given the global nature of the emissions sources, the uniform mixing attribute of these gases, and the stock accumulation characteristics of the gases, programs to reduce GHG atmospheric concentrations must be global. Local GHG reduction programs are helpful, but by themselves they will be insufficient. The United States is a large GHG emitter, but not the largest—that honor now rests with China. U.S. GHG reductions are necessary to maintain concentrations at desired levels, but not sufficient to further reduce concentrations.

The investments in new technology and other changes to the global socioeconomic system necessary to seriously reduce global GHG emissions will not be free. The greater the cost, the greater the political reluctance to undertake the programs aimed at severe cuts in global emissions.

At the present time, the safe level of GHG concentrations is not known with any degree of certainty. Therefore, as time passes and knowledge is gained, programs to control GHG emissions will have to be adjusted to reflect new knowledge.

Evaluating Policy Options

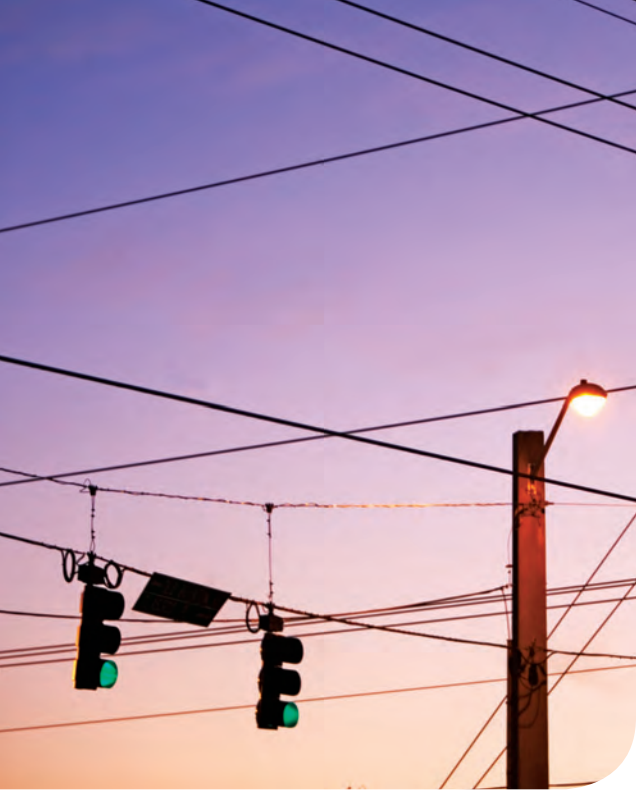
Governments, including that of the United States, have agreed to work toward limiting global GHG concentrations to no more than 450 parts per million. To reach such a goal, the United States must reduce its GHG emissions essentially to zero over the next 75 to 100 years (accounting for GHGs that are emitted, but then embodied in forests and other plants through photosynthesis).

The policies put in place today must be effective and robust with respect to the many unknown and unknowable social, economic, technological, and political changes that will occur throughout the world over the next century.

GHGs are emitted from fundamental human activities having to do largely with energy production and use, and land-use changes. Reducing emissions requires massive alterations to global energy systems and the manner in which we manage our landscapes. Reducing emissions in the energy sector will require massive global investments in new climate-friendly energy sources and end-use technologies, many of which have yet to be invented and developed for widespread commercial deployment.

However, given the global nature of GHGs, actions by the United States working alone or in concert with European allies will not be sufficient to reach the goal. It will be up to major emitters like China, India, Brazil, and Indonesia to take similar action. Effective U.S. GHG policy must not only control domestic emissions, but also include an effective foreign policy component that encourages long-term cooperative action among all the major global emitters.

Reducing U.S. emissions to zero requires



gettyimages

a policy that can effectively target tens of millions of domestic GHG sources. Policies that target sources on an individual basis will be effective for very large sources but wholly intractable for millions of smaller sources. Effective policy must target all sources or provide incentives for the many small sources to reduce emissions in the absence of direct regulation.

Slowing the growth in global emissions, eventually stopping the growth, and then working to reduce emissions until global concentrations stabilize at acceptable levels will take decades. The policies put in place today must be effective and robust with respect to the many unknown and unknowable social, economic, technological, and political changes that will occur throughout the world over the next century. Overly complex, costly, and politically divisive policies are unlikely to survive and be effective over the long term.

One of the keys to the global transformation necessary to reduce GHG emissions is the cost of making that transformation, and the key to cost is technology. If there were GHG-free electricity generation technologies today that were as productive, globally available and as cheap as current fossil-fuel technologies, the task of reducing GHG emissions would be considerably easier. Effective U.S. climate policy must embody economywide incentives to develop, commercialize, and deploy such technologies on a global scale, decade after decade going forward.

In the near term, before the new generation of climate-friendly technology is developed and deployed, we must begin to control GHGs with available technology. The enormous number of domestic GHG sources is characterized by great heterogeneity with respect to the cost of reducing emissions. Even among specific source categories like electric power generation, there is a stark difference in the cost of control.

One aspect of climate policy is simple. Basic math and economics tells us the lower the total cost of reducing emissions, the greater the amount of emissions we can reduce. The key to lowering the total cost is to develop and deploy a policy where the greatest reductions are sought from the sources that can reduce emissions most cheaply. And then things start to get complicated: given the global nature of the problem, effective regulation must look beyond U.S. borders and motivate reductions from foreign sources as well.

Even the most cost-effective U.S. policy will raise domestic energy prices and the prices of other goods dependent on energy—at least in the near term. Given the diverse pattern of energy production and use in the United States, this will cause the burden of these price increases to be unevenly distributed across regions, household demography, and industry. Environmentally effective GHG policy must also be politically viable, and that means that it must recognize and, in some manner, address the differential distribution of these costs across society.

Considering Our Options

While many policy approaches to reduce GHGs are under discussion, a 2007 Supreme Court ruling provided the U.S. Environmental Protection Agency (EPA) with the authority to regulate GHGs, at least in part, under the nation's Clean Air Act (CAA). In this issue, Richardson, Fraas, and Burtraw examine the options and latitude EPA has to regulate under the act, "options and latitude" being the operative words, since the regulatory path forward is quite uncertain.

If the new Congress turns its attention to energy and climate change, which seems likely, a package of new policies designed to enhance energy efficiency and the deployment of renewable and climate-friendly energy technologies could be politically viable. Palmer describes and simplifies the complex existing landscape of state and federal energy efficiency and renewable policies and discusses some modifications that would enhance these policies to attain greater economic efficiency and environmental benefit.

Fraas and Lutter assess the impact of EPA's parallel efforts to develop and issue several major rules to reduce conventional pollutants, which will impose heavy costs on the electric utility sector, especially coal-fired plants, for the installation of new emissions control equipment. EPA is responding to a set of independent and unrelated court decisions, settlement agreements, and statutory requirements that mostly tie back to the CAA. Facing the uncertainty of congressional or EPA actions to control carbon, utilities are facing the choice between making these investments given the potential that they become "stranded" by future carbon regulations or to retire these coal-fired EGUs and replacing them with other power sources.

For better or worse, labels matter in political discourse. The economic efficiency of a GHG regulatory framework designed around a tax on carbon has always been overshadowed by the negative political connotations attached to a tax. Now the same negativity has been attached to cap-and-trade policies. However, the current undesirability of these labels does not diminish the value of regulatory policies that place a price on carbon, and suitable relabeling of these policies (such as "deficit reduction policies") may give them new life. Parry and Williams revisit the carbon tax idea with an eye toward the importance of recycling the revenue to improve the performance of the U.S. tax system and address deficits.

Regardless of the policy path taken to reduce domestic GHG emissions, the economist's mantra that there is "no free lunch" means someone will the bear the cost of these reductions. Morgenstern considers how regulation of the nation's electricity generation sector under CAA will inevitably lead to higher electricity prices, negatively impacting energy-intensive, trade-exposed industries. Importantly, he examines the flexibility within the act to mitigate the impact of the regulations on these particular industries.

At the same time President Obama pledged to reduce GHG emissions, he promised that the United States would provide financial aid to poor countries to help them "green" their energy sectors and adapt to a changing climate. This commitment too was based on the comprehensive climate legislation passed by the House containing provisions by which the purchase of carbon offset credits would result in billions of private-sector dollars flowing to developing countries. Purvis considers the diplomatic fallout of the likely failure to meet that financing pledge due to the demise of the House-passed legislation, and the need to develop alternative sources of finance in order to keep important international climate negotiations moving forward.

Corbis