1

Introduction: The Challenges of U.S. Climate Governance

BARRY G. RABE

Policy analysts and policymakers continue to search for metaphors to describe the unique complexities posed by climate change. According to economist William Nordhaus, "If global warming is the mother of all public goods, it may also be the father of decision making under uncertainty."[1] Other policy analysts have referred to climate change as "perhaps the most hotly debated and controversial area of environmental policy ever" and as "one of the most complex challenges that the human race has ever created."[2] In the final days of a federal government career that spanned five decades and included a leading role in many foreign and domestic policy challenges during thirty years in the U.S. Senate, Republican John Warner of Virginia put it more simply: "Without question, this is the most complex problem I have ever faced."[3] Most of those comments were uttered prior to the tumultuous climate policy events of 2009–10, which included prolonged political combat over dauntingly complex legislative proposals before Congress, fallout over revelations from hacked e-mails that raised questions about the integrity of some high-profile climate scientists, and the melodramatic albeit largely inconclusive Copenhagen climate summit.

The discovery that accumulating levels of carbon dioxide, methane, and other gases in the atmosphere could cause a "greenhouse effect" that both elevated global temperatures and disrupted the climate is not new, though its saliency has grown markedly in recent years. In the United States, "rapid climate warming" first arose as an issue for the Domestic Policy Council in 1976, as the Gerald Ford

administration responded to concerns raised by counterparts in the Soviet Union.[4] Ronald Reagan signed the first federal climate change legislation, the Global Climate Protection Act (P.L. 100-204), into law in 1987. This authorized the State Department to develop an approach to address global warming and established an intergovernmental task force to develop a national strategy. One year later, governors in California (George Deukmejian) and New Jersey (Thomas Kean) signed the first of many state laws designed to respond to climate change, none of which were capable of "solving" the problem or reversing the threat of climate change. But they initiated a process of "greenhouse governance" that has reached new prominence in the twenty-first century.

A domestic path to policy exploration was also established in other national and subnational capitals and moved rapidly into the arena of international policy. Well before the 1997 Kyoto Protocol to the United Nations Convention on Climate Change, which has triggered much controversy and proven such an abject failure of global governance, international agreements on different aspects of climate change were reached. The United States has been a participant in the vast majority of those agreements. In fact, it was among the first of more than 170 nations to ratify the 1992 UN Framework Convention on Climate Change, which formally pledged to attain "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."

Between the first indicators of concern and the December 2009 United Nations Climate Change Conference in Copenhagen, it is impossible to calculate how much has been said and written about this topic. But we clearly know much more about climate change than in prior decades, and the vast preponderance of relevant evidence from the natural and physical sciences indicates a diverse and alarming set of threats to future generations. Former U.S. vice president Al Gore won the 2007 Nobel Peace Prize for his advocacy on this issue in his post-political career, during which he produced an award-winning film on climate change. Gore shared that award with a veritable army of international climate scientists, known as the Intergovernmental Panel on Climate Change (IPCC), which has brought new focus to what we know about this issue from virtually every discipline in the natural and physical sciences. The ongoing IPCC project remains only one piece of a massive effort that involves the work of countless scientists from around the world. For example, in November 2008 the American Geophysical Union, an international body of 50,000 members who study the earth and its environment, presented a number of major new studies on climate change, ranging from ice-melting patterns to temperature trends. This ever-growing body of scientific analysis has been explored in the hundreds of congressional hearings on climate science held between 1975 and 2009. It resonates with research findings from leading scholars on every continent, creating a consistently disturbing portrait of a staggering challenge. Although policy responses to climate change

vary markedly, no national government in the world disputes the core scientific findings. Even the histrionics surrounding "Climategate" and the sophisticated effort to use a select set of purloined e-mails to challenge the existence of human-induced climate change do not reverse the veritable avalanche of evidence on this issue. That said, the best scientific practice remains limited in its ability to predict the future of the planet with any degree of exactitude. That leaves policymakers with considerable uncertainty as they weigh various strategies to reduce greenhouse gas emissions and evaluate the possible impact of the steps taken on global temperatures in future years and future decades.

While the community of natural and physical scientists has weighed in intensively on this issue, more modest contributions have emerged from the social and policy sciences. Within those disciplines, economists have clearly been the most active players on climate change, as reflected in a large body of publications and in active engagement in congressional and state legislative policy hearings and formal reports such as the 2006 *Stern Review on the Economics of Climate Change*. They have played a valuable role in shaping policy options and generally making the case in favor of market-based approaches, such as those that would allow for the trading of emissions among regulated parties or taxing directly the carbon content of fossil fuels. But economic analyses often confront serious limitations, such as weighing the most efficient strategy against political and institutional realities and constraints.

Other social science disciplines have been far more marginal players, including political science and allied fields that address public management and public policy concerns. A content analysis of the leading political science and public management journals over the past decade suggests a rather stunning absence of scholarly engagement on the topic of climate change. For example, between 1998 and 2009, the twenty-seven top-ranked public management journals published in English produced only a pair of articles on the application of management theory to the challenge of climate change. In more than 400 congressional hearings on climate change between 1975 and 2009, only two political science or public management scholars appear to have ever testified on climate change, in contrast to the far more substantial participation from economists, legal analysts, scholars in numerous natural or physical science disciplines, and representatives of diverse interest and environmental advocacy groups.

Consequently, we know far less than we should about what we will term "greenhouse governance," which involves the intersection of politics, history, public policy, and public management. Recognition of that void was an animating force behind the development of this book, which took shape through the National Conference on Climate Governance, held at the Miller Center of Public Affairs at the University of Virginia in December 2008. The intent was to convene leading scholars, drawn primarily from political science but with significant links to history, law, and other social science disciplines. All of the scholars had

distinguished records in public policy, public management, or both. About one-half of the invited scholars had launched research programs that focused heavily on climate change; the other half had not but had completed work in other policy areas that was highly relevant to climate governance. They were joined at the conference by a diverse mix of additional scholars as well as policymakers from the public, nonprofit, and private sectors in the United States and abroad, some of whom served as formal commentators on initial papers and all of whom added to the debate over the course of two days. Comments from those exchanges inform this chapter and are cited frequently in subsequent pages. While the chapters that follow make robust analyses and point toward important considerations for future policy development, there was no effort to impose uniformity of viewpoint or to conclude with a memorandum of understanding that presented bullet points marking the next steps to take. Presidents and Congresses had long before been inundated with such "action lists"; we wanted instead to focus on larger and longer-term considerations.

Most of our analysis examines the United States. The conference took place at the midpoint of the transition between the November 2008 national election and the January 2009 inauguration of the 44th president and installation of the 111th Congress. There is, of course, a vast array of issues facing national elected leaders, as well as their counterparts in other nations and at the state and local levels. Some new policy steps have been taken in the United States since our gathering, others remain under consideration, and innumerable implementation challenges lie ahead. Climate change is both competing for attention and intermingled with other current issues, such as economic recovery, health care reform, energy diversification, infrastructure repair, and the redirection of U.S. foreign policy. It is our collective intent to reflect on some of the most serious challenges to developing a coherent set of policies in order to reverse the long-standing trend of growth in U.S. greenhouse gas emissions, to avoid causing economic harm through the implementation of climate change policies, and to re-engage the United States effectively in future international deliberations.

We offer our reflections with full awareness that unilateral action by any one government, even a nation as large as the United States or a state as large as California or Texas, has limited capacity to influence global concentrations of greenhouse gases. But we take seriously the fact that the past two decades have witnessed considerable policy experimentation, both in the United States and abroad. That experimentation provides us a unique opportunity to consider the likely challenges facing future policy alternatives by relying on real experience rather than estimates, models, and projections. It allows us to weigh the capacity of various levels of the federal system to engage on this issue, the political and institutional feasibility of various policy options to reduce greenhouse gas emissions, the capacity of existing federal government institutions to play coherent roles, and possible routes whereby the United States might reconnect with other nations, including its North Ameri-

can neighbors, in search of opportunities for international collaboration. Several key themes, discussed below, animate much of the discussion in subsequent chapters.

U.S. Climate Policy Already Is Operational

Many analysts contend that President Barack Obama and the 111th Congress were the first political actors in the United States to "do something" about climate change. President Obama quickly signaled his views on the federal role through high-level appointments and a pledge from the new leadership of the U.S. Environmental Protection Agency (EPA) to revisit an earlier decision to reject the designation of carbon dioxide as an air pollutant. Moreover, approximately 10 percent of the $787 billion American Recovery and Reinvestment Act signed into law in February 2009 will ultimately be devoted to a range of energy efficiency and renewable energy projects, which could serve to reduce U.S. greenhouse gas emissions. In his first address to Congress, on February 24, 2009, the president called for "this Congress to send me legislation that places a market-based cap on carbon pollution and drives the production of more renewable energy in America." All of this reflected a shift toward more energetic engagement on climate change, thereby reversing the Bush administration's stance, which was epitomized by the 2001 decision to withdraw the United States from the Kyoto Protocol. Indeed, the United States has been widely denounced in the European Union and around the world for its seeming indifference to climate change, best reflected in the slow pace of federal government action.

Along with those steps, a series of major climate policy initiatives were indeed taken in Washington during the first year of the Obama presidency. The EPA not only deemed carbon dioxide and other greenhouse gases to be air pollutants but moved beyond that step to issue an "endangerment finding" that could lead to unilateral executive branch steps to restrict future emissions to protect public health. A far-reaching agreement was reached in May 2009 to attempt to reduce greenhouse gas emissions from the transportation sector through substantial increases in mandatory fuel economy standards for future vehicle fleets. One month later, legislation that stretched to nearly 1,500 pages passed narrowly in the House of Representatives; its intent was to reduce U.S. emissions by 17 percent of 2005 levels by 2020, with more dramatic targets set for subsequent decades. The so-called American Clean Energy and Security Act would establish an exceedingly complex form of a cap-and-trade program for carbon, based loosely on earlier experience with more conventional air pollutants. This legislation included provisions to allow for the purchase of carbon offsets as an alternative to reducing emissions outright, through an elaborate system for regulating newly created carbon markets; for border tariffs to protect energy-intensive domestic industries; and for a maze of additional renewable energy and energy efficiency mandates and subsidies. The legislation stalled in the Senate, leaving its future

uncertain in the remainder of the term of the 111th Congress. These domestic steps set the stage for nearly two weeks of international diplomacy in Copenhagen, in which a seeming collapse of the negotiation process was partially allayed by a last-minute agreement by a set of large national players that included a very general statement of future principles.

Despite the frenetic activity that occurred during 2009, one often-overlooked reality is that climate policy development has already been quite active in the United States, albeit at the state and local levels rather than the federal. That reflects the unique political dynamics of recent federal institutions but also a time-honored pattern for bottom-up development of U.S. public policy. In fact, many of the most prominent policy tools under consideration around the world for possible reduction of greenhouse gas emissions have their origins in one or more U.S. states and in many instances have been adopted by many other states. Mandates to increase the level of electricity derived from renewable sources are in operation in portions of nearly every continent. So-called renewable portfolio standards (RPSs), which were first developed in Iowa in 1991, are now in operation in twenty-nine states, with some presence in every region of the nation. In 2001, New Hampshire became the world's first government to enact carbon cap-and-trade legislation. That expanded into a ten-state regional network, the Regional Greenhouse Gas Initiative (RGGI), which in 2008 became the first zone in the world to auction nearly all of its carbon allowances. Some twenty-three states, concentrated in the Northeast, Pacific West, and Midwest, have committed to their own version of a regional cap-and-trade program that also includes four neighboring Canadian provinces. In 2002, California became the world's first government to enact carbon emission limits on new vehicles. It was formally joined by fourteen other states in seeking federal authority to implement its policy, and it became in effect the model for the 2009 national program on mandatory fuel economy. Wisconsin became the world's first government to mandate disclosure of carbon emissions from a wide set of sources, through an administrative change in 1993, and thirty-nine states have since negotiated the terms of a national emissions disclosure system. Local governments such as municipalities and counties have also launched far-reaching climate policy innovations.[5]

One can consider virtually every conceivable strategy to reduce greenhouse gas emissions and find one or more examples of it in operation somewhere in the U.S. federal system. Many of those efforts are modest and, as subsequent chapters suggest, many face significant implementation challenges. But collectively they demonstrate that there has been at least some degree of political will in most regions of the United States to take the initial steps in policy development. That squares with Christopher Borick's findings in chapter 2, which draw on the National Survey of American Public Opinion on Climate Change, a survey commissioned for this book that questioned more than 2,000 Americans in September 2008. Borick found strong evidence, even in very different states, that majorities of Americans

considered climate change to be a serious problem, believed that both federal and state governments should respond with policies, and supported many (but not all) of a menu of policy options presented to them. A companion survey completed in late 2009 found some decline in the perceived severity of the problem since the previous year but revealed continued support for many forms of policy engagement across the different levels of government. Translating public sentiments into policy decisions and drawing careful lessons from the vast laboratory of policy experiments poses both challenges and opportunities for U.S. political leaders.

Climate Change Remains a Federalism Issue

The U.S. legacy of subnational policies gave President Barack Obama and the 111th Congress something other than a blank canvas on which to expand the federal role. On one hand, it offers innumerable models and lessons, allowing the federal government to build on the real experience of policy successes—and failures—at the state and local levels. It also ushers in the very real possibility of some formal intergovernmental sharing of responsibility for climate policy, consistent with other areas of U.S. public policy that entail joint jurisdiction. Done effectively, that could result in a creative strategy that plays to the respective strengths of the various levels of government and of policy alternatives, ultimately resulting in a dynamic federalist response to climate change. Chapter 3, by Martha Derthick, and chapter 4, by Paul Posner, explore the evolving relationship among the various levels of government, outlining points of possible contention and opportunities for building on the strengths and weaknesses of each level. A number of other chapters also consider collaborative intergovernmental strategies.

But such strategies have hardly been a hallmark of U.S. federalism in the last quarter-century, as both Derthick and Posner note. Federal engagement with states on climate change thus far has been limited, whether involving collaboration between executive agencies (as discussed by Walter Rosenbaum in chapter 12) or congressional consideration of state experience in guiding federal legislative options (as I discuss in chapter 11). Indeed, much intergovernmental interaction thus far has been adversarial, and it has required the involvement of the judiciary to try to resolve state-federal disputes, as in the 2007 *Massachusetts* v. *U.S. Environmental Protection Agency* case. The adversarial approach also is reflected in a growing body of other legal and political challenges involving an ever-expanding set of intergovernmental disputes, as explored by Kirsten Engel in chapter 10.

Any future federal effort to devise climate policy will require deft navigation between competing interests. That will invariably include collisions between proponents of competing energy sources and transportation modes as well as between representatives of different states. The odyssey of "homegrown" ethanol derived from American corn is one early indicator of likely dividing lines. Domestic ethanol production has long been propelled by generous federal subsidies and import

restrictions, which were expanded into a renewable fuel mandate through 2007 federal legislation. The ethanol program has now generated enormous controversy over its actual impact on emissions as well as commodity prices, with considerable tension between various agricultural interests and consumers of transportation fuels. But there is also an increasingly tense interstate struggle, with some state leaders adamant about maintaining federal support for ethanol production while another set of governors calls for repeal of the existing policy.

The issue of biofuels looks straightforward compared with efforts to develop a national carbon cap-and-trade system, as reflected in the combat between organized interests, political parties, and regions of the nation in the months of battle that resulted in House passage of the American Clean Energy and Security Act in 2009. Even the seemingly simple task of allocating allowances was quickly transformed from a straightforward analytical task based on a measure of emissions derived from a previous annual baseline into an extraordinarily complex effort to reward allies and punish foes. Electric utilities generally got a much better deal, based on each unit of emissions released, than oil refineries, for example, but in the quest for political allies, treatment of individual sectors tended to further divide firms into net winners and losers. Even the issue of incorporating existing state cap-and-trade policies into a new national trading regime involved a unique formula that would freeze all operating state programs for five years, but only in the unlikely event that the federal regime was up and running by 2012. All of that would be revisited after the launch of the federal program, however, with the possibility of thawing out the state policies at a later time. As in this case, each and every provision of the so-called Waxman-Markey legislation that emerged in June represented a masterful political effort to accommodate key constituents and hold in place a narrow legislative majority. In the process, however, proponents produced a package with so many loopholes, and of such staggering complexity, that it was not at all clear that it would even approach its emission reduction targets in the event that the legislation were passed by the Senate and then signed into law by the president.

Regardless of the policy option considered, no two states will begin a future federal climate regime from the same starting point. Their state political leaders as well as their representatives in Congress will be increasingly forced to confront the very dramatic differences between individual states. Table 1-1 illustrates this phenomenon, considering both greenhouse gas emission trends between 1990 and 2007 and the level of state climate policy development as of 2009. The national average for emissions growth was 16 percent during that period, though it was expected to decline by about one-third by the end of the decade due to the economic contraction and the related reduction in energy use. Between 1990 and 2007, growth in state emissions ranged from a low of –5 percent in Delaware and Massachusetts and –4 percent in New York to a high of 62 percent in Arizona, 46 percent in Colorado, and 45 percent in South Carolina.[6] In the table, states

Table 1-1. *State Climate Policies and GHG Emissions Growth*

Number of policies, 2009	*Emissions growth, 1990–2007: High (>16 percent)*	*Emissions growth, 1990–2007: Low (<16 percent)*
High (12–20 policies)	Arizona, Colorado, Illinois, Iowa, Maine, Minnesota, Montana, Nevada, New Hampshire, New Jersey, Oregon, Rhode Island, Utah, Vermont, Wisconsin	California, Connecticut, Delaware, Hawaii, Maryland, Massachusetts, New Mexico, New York, Pennsylvania, Texas, Washington
Low (0–11 policies)	Alabama, Alaska, Arkansas, Florida, Georgia, Idaho, Kansas, Kentucky, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, Oklahoma, South Carolina, Tennessee, Virginia	District of Columbia, Indiana, Louisiana, Michigan, Ohio, South Dakota, West Virginia, Wyoming

Sources: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2007*, EPA 430-R-09-004 (Washington: 2009); Barry G. Rabe, "Racing to the Top, the Bottom, or the Middle of the Pack? The Evolving State Government Role in Environmental Protection," in *Environmental Policy: New Directions for the Twenty-First Century*, edited by Norman J. Vig and Michael E. Kraft (Washington: CQ Press, 2010), p. 32.

are clustered depending on whether they are above or below the national emissions average. In turn, state engagement in climate policy varies just as dramatically. States were given a score ranging from 0 to 20 points as a proxy measure of their policy development to date based on twenty possible climate policy options established by 2009.[7] In some cases, such as California, Connecticut, Oregon, and Rhode Island, perfect or near-perfect scores are evident, reflecting extensive policy engagement. Mississippi receives the lowest score (3 points), and many Southeastern states are well below the national mean of 11 points.

Placing the fifty states into four separate cells serves to illustrate the competing state concerns and claims that state representatives are likely to carry into any debate over federal policy development and implementation.[8] In the case of California, there has been a high degree of policy engagement and the rate of emissions growth is about one-half the national average. Indeed, the state has already

laid claim to national and even global preeminence on this issue, as indicated in a number of subsequent chapters. California will clearly want to be rewarded for its early actions and emissions record. In the case of Michigan, there was minimal climate policy development until 2008, making it impossible for it to seek credit for early efforts. But its emissions rate increased less than 1 percent between 1990 and 2007, due in large part to a 32 percent emissions decline in the manufacturing sector. All of that decline was registered prior to the near collapse of the auto manufacturing industry in Michigan in the final years of the 2000s, suggesting an emissions decline in that sector similar to that of Eastern European nations following the end of the cold war. Michigan's representatives in Washington will likely seek some form of credit or compensation for its emissions trend, even though realistically it had nothing to do with state policy, while also seeking maximum economic development assistance to rebuild its economy.

In contrast, many other states have experienced much higher emissions growth rates. Minnesota, for example, has experienced a 26 percent increase in emissions, although that increase has corresponded with high policy engagement, including renewable portfolio standards, pioneering efforts to price the environmental impact of carbon emissions in the electricity sector, and leadership in the Midwestern partnership designing a regional cap-and-trade program. Such a state would likely prefer to see its last decade and a half of emission trends ignored, while receiving credit for all of its policy initiatives. At the same time, another subset of states, such as Mississippi and its neighbors, is in a very different bargaining position. These states have very high emissions growth rates; high per capita emissions, reflecting intensive fossil fuel use; and little if any evidence of serious policy engagement. They would also like to overlook recent trends and may also be the most resistant to any federal engagement in this area given their potentially very high adjustment costs.

Each possible federal policy option presents a somewhat different intergovernmental challenge—and opportunity. A federal version of a renewable portfolio standard (explored by Ian Rowlands in chapter 8) is likely to present intergovernmental design challenges that are very different from those of a federal cap-and-trade program (examined by Leigh Raymond in chapter 5). Perhaps the most straightforward policy to implement on an intergovernmental basis, a carbon tax, appears likely to have the highest state and federal political opposition (a likelihood that I discuss in chapter 6 and that is reflected in the national survey findings presented in chapter 2), leading to policy options that involve a federal-state tug-of-war. The issue of preemption, whereby Washington periodically marches into a state-occupied policy area and takes the eraser to existing state efforts, would likely be received very differently in various state capitals. But that is the reality of working within a bottom-up intergovernmental system, one that is hardly unique to the United States. A similar dynamic is evident in other federal systems that have ratified Kyoto—for example, in the experiences of differ-

ent Canadian provinces and Australian states. And as Henrik Selin noted, an "uneven response" is highly evident among member states of the European Union, in terms of both attainment of the emissions reductions that they pledged under Kyoto and the type and intensity of policy development.[9] So variation in the extent of policy engagement is not confined to the United States or even to formal federations.

Once Established, Climate Policy Does Not Self-Implement

Perhaps one reason that political scientists and scholars of policy implementation have played such a modest role in the climate policy debate thus far is the conventional wisdom that has emerged in recent decades asserting that market-based systems involving emissions trading would essentially self-implement upon creation. A U.S. program for trading sulfur dioxide emissions established in the 1990 Clean Air Act Amendments has been promoted repeatedly as a model to guide both domestic and international climate policy deliberations. The program—which was established for coal-burning utilities, building on some earlier experiments—is widely heralded as a success, having produced the desired emission reductions at a cost lower than anticipated and having taken advantage of the ready availability of low-sulfur coal. It has been heralded by many policy analysts as one of the great public policy breakthroughs of the modern era.[10] This case history has been trundled out repeatedly in congressional hearings in recent years, but with minimal consideration of the challenges of adapting the program to the far more numerous and complex set of sources that generate carbon dioxide.

The United States earlier carried this policy option into international negotiations leading up to Kyoto, arguing that it could be readily transferred to greenhouse gases through an international trading system. Ironically, the European Union initially balked at this strategy, although it accepted it as part of a larger bargain that it thought that it was striking with the United States.[11] The EU has since moved away from its earlier focus on carbon taxation and instead embraced the emissions trading approach, developing the EU Emission Trading System (ETS). The ETS began operation in 2005, although it left selection of policies for attaining a substantial portion of Kyoto-required reductions to the discretion of individual member states. Every recent Congress has been flooded with proposals for some variant of a carbon cap-and-trade system for the United States, including the one that was a cornerstone of the American Clean Energy and Security Act, which passed the House in June 2009 but faced substantial opposition in the Senate.

In theory, an emissions trading regime for greenhouse gases has enormous promise, even if it is an infinitely more complex undertaking than trading emissions from a limited number of sulfur dioxide sources. Early experience with this model underscores numerous challenges of policy design and implementation. In the EU ETS case, early design flaws included inadequate data on emissions and

inequities in allocating emission allowances across member states, leading to considerable early controversy. ETS proponents have made significant modifications and contend that needed reforms have been made. It remains too early to discern how effective subsequent implementation will be.

As Leigh Raymond observed, there is a "daunting complexity" inherent in any such program for greenhouse gases. In the case of the Regional Greenhouse Gas Initiative in the U.S. Northeast, more than four years of careful interagency and interstate negotiations were required before the launch of initial auctioning in late 2008, with many key design elements still to be considered. RGGI, if anything, remains an "easy case," involving states with abundant experience with emissions trading, unusually close relations between neighboring states and agencies, and a focus on only the very kinds of facilities that had been covered under the sulfur dioxide trading system for nearly two decades. The Western and Midwestern versions of RGGI have set ambitious goals but have struggled to resolve basic design features, much less approach the point where they could begin implementation. Any national expansion, especially reaching beyond the RGGI target of coal-fired power plants, will be much more complicated, and most of the leading federal cap-and-trade bills that surfaced in the 111th Congress called for such broader scope. As Raymond observed, there can be a "danger of a cap-and-trade fetish," whereby a tool has been sold so aggressively that it may be tempting to look past likely problems and complexities in the rush to get something enacted.[12] That can include, for starters, such matters as compensatory offsets, leakage that makes the import of non-capped energy sources more attractive, and questions of allocating revenue generated by auctions. In many respects, a federal cap-and-trade bill would be among the most complicated pieces of legislation ever enacted by Congress, and it would also have to navigate numerous interstate differences. It remains, as Raymond noted, an intriguing and promising policy option, but will require careful consideration of numerous governance details if it is to be effective.

Proposals to tax the fossil content of fuels represent an alternative form of a market-based strategy. Like the cap-and-trade approach, carbon taxes are designed to deter consumption and hence reduce greenhouse gas emissions by increasing the cost of energy. Such an approach has long had support in the economics community and has been endorsed by a diverse group of analysts and commentators, as well as governments ranging from British Columbia to Sweden. It offers the clear advantage of relative simplicity, working from existing provisions in the federal tax code. Indeed, existing carbon tax proposals are relatively brief and remarkably simple in administrative detail, and they could go into operation almost immediately. At the same time, these taxes face steep political hurdles in that the costs are far more direct and visible than under cap-and-trade, and they might require adjustments in order to meet specific emission reduction goals given the uncertain consumer response to various prices. Ironically, carbon taxes, perhaps the most desir-

able approach from a policy perspective, may face the steepest climb politically, as explored in chapter 6 and in the analysis of public opinion in chapter 2.

Other climate policy options present significant implementation challenges of their own, and early experiences give one some pause. As Pietro Nivola notes in chapter 7, efforts to regulate vehicles for fuel economy (and, in effect, carbon emissions) have a very shaky track record despite decades of experience. Nivola compares the U.S. experience with that of the European Union and notes that steep taxation of transportation fuels has produced far greater fuel efficiency in the latter case, even in the continued absence of vehicle mandates. This is a sobering reminder of possible limitations facing such an approach, including President Obama's 2009 embrace on a national basis of efforts by California and like-minded states to, in effect, accelerate current vehicle fuel efficiency mandates.

Ian Rowlands observes in chapter 8 that a range of policies exists in the electricity sector to promote renewable energy and energy efficiency but that each presents different implementation challenges. The popular renewable portfolio standards, as he notes, have been "successful in catalyzing technologies and moving large-scale renewable energy projects" but have been "less successful at engaging individual or community groups" and face enormous legal and regulatory complexities. He also considers the interplay between regulatory tools such as the RPS and other policy options, such as "feed-in tariffs," which can be used to make renewable energy more cost-competitive with traditional sources but present their own governance challenges. As Marc Landy explains in chapter 9, adaptation strategies are only in their infancy but they are likely to entail many technical and ethical challenges, with very different framing depending on the region and the climate threat likely to take precedence.

Such complexities may help explain why so many governments, from nations that have ratified Kyoto to those that have set their own unilateral emission reduction targets, have failed miserably in their early efforts. Many nations that ratified Kyoto clearly will miss their pledged 2012 targets, including many EU member states whose efforts have been somewhat overshadowed by the outsized reductions achieved in Germany and the United Kingdom. Some will only begin to approach their target due to the economic collapse in the late 2000s and the attendant emissions decline, hardly a model for long-term climate policy.

In the United States, a number of individual policies have indeed succeeded, including a number of well-designed RPSs such as the one launched in Texas in 1999 and expanded in 2005. But a great many policies have struggled, with statewide as well as local targets frequently missed. For example, as highlighted in chapter 3, New Jersey issued an executive order in 1998 to reduce its emissions in accord with Kyoto targets and developed a series of policies under various governors to attempt to achieve its goals. But between 1990 and 2007, its emissions moved in the opposite direction, slightly exceeding the national rate.

Even California's 2006 statutory commitment for far-reaching emission reductions and renewable energy expansion in the coming decades has been veering in a direction that suggests that it is likely to miss early targets, despite considerable state policy expertise and broad public support for an active state response and pursuit of multiple policy options, as noted in chapter 2. A number of states have begun to follow the California model and may be heading in a similar direction. In turn, a number of state renewable portfolio standards appear unlikely to approach their mandated levels of renewable energy generation, in part due to policy design problems. Consequently, an early lesson from the past decade of experience with state climate policies is that emissions trading as well as other climate-friendly policies come with no guarantees that simply setting bold reduction targets and enacting climate legislation will reduce greenhouse gas emissions at all, much less in a timely and cost-effective manner.[13] That lesson applies with force at the federal level, where an aggressive effort to cut a deal in Congress could generate policies so loaded with exemptions and complex provisions to reward various stakeholders that they cannot be implemented over the near or long term. As a result, it is essential to give careful attention to key design elements and to establish institutions capable of effective implementation. Yet those prerequisites often get overlooked in the rush to get something through the political system when the opportunity arises.

Federal Institutions Are Not Ready for Prime Time

It may be telling that the first branch of the U.S. government to establish a clear position on climate change is the judiciary. Associate justice John Paul Stevens's opinion in *Massachusetts* v. *U.S. Environmental Protection Agency* speaks very clearly to the issues of climate science and the likely risks posed by policy inaction.[14] The decision also placed a clear set of challenges before the executive branch in revisiting its reluctance to engage with the issue. Combined with the minority opinion and the competing briefs, the outputs from this case may represent the high-water mark of federal deliberation on climate change thus far. As Kirsten Engel noted, the decision "has had some impact in terms of depoliticizing the science surrounding climate change" and thereby enabled increased focus on public policy questions.

In contrast, the executive and legislative branches have been stunningly ineffective in engaging with climate change, both in response to the Supreme Court case and more generally. The Bush EPA ran out the clock on its term and essentially evaded the Court's challenge, even going so far as to make the EPA administrator regularly unavailable for congressional hearings. And repeated Congresses have chosen to pass on the straightforward question at the heart of the 2007 case, namely whether or not the 1990 Clean Air Act Amendments were designed with sufficient elasticity to allow for inclusion of carbon dioxide. Many of the key

architects of that legislative achievement remain in office, and yet Congress has remained silent. That left the Obama administration the option of a unilateral interpretation of what the legislative branch really meant. Carol Browner began that process toward the end of her tenure as EPA administrator in the 1990s without issuing a formal decision before leaving office, but she returned to the matter in her subsequent incarnation in 2009 as "climate czar." During 2009, the administration did resolve the definitional debate in declaring carbon dioxide an air pollutant. On the verge of the December 2009 Copenhagen meetings, EPA administrator Lisa Jackson issued an "endangerment finding," designating greenhouse gas emissions a human health threat, which could propel some forms of agency regulation under the umbrella of clean air legislation in the absence of new climate legislation.

Beyond these important definitional steps are sobering questions about the capacity of executive entities such as the EPA and the legislative branch to play constructive roles in coming years and decades. In the former case, Walter Rosenbaum notes in chapter 12 that EPA may well be woefully unprepared for dealing with climate change, a reflection of an agency resource base that is actually smaller in constant dollars than it was when it was cobbled together during an administrative reorganization by Richard Nixon. The agency was also formally constrained from taking a constructive role on climate change for more than a decade, whether hampered by congressional restrictions on funding in the Clinton years or by the Bush-era aversion to involving EPA staff in climate policy development internally or in collaboration with the states. Both unilateral regulatory steps through the endangerment findings and implementation of federal climate legislation would likely impose a staggering new workload, in terms of both sheer volume and technical complexity.

Moreover, the EPA continues to operate under the traditional division of environmental media into air and water as well as along the functional fault lines established at its inception, which analysts have lamented for decades as a barrier to effective performance. Ironically, as Rosenbaum notes, climate change represents "a magnitude of issues that are fundamentally different" from those that the EPA was designed to address and therefore the basic governance structure of the agency may be uniquely ill-suited for such a challenge. The agency will clearly need new resources but also new tools and skills to promote inter-unit collaboration. New agency leadership and the presidential appointment of an overarching czar may help increase its focus on climate change, but there has been no serious consideration of how EPA may need to be reconfigured to play a constructive role in dealing with the issue. All of this underscores the risks inherent in any agency-led effort to reinterpret the 1990 clean air legislation and advance a range of climate-related regulations in the event that Congress fails to act.

Beyond internal machinations within the EPA, there is the larger reality that climate change cannot be neatly compartmentalized under any single unit of the

executive branch. That has been a clear lesson from the states and nations that have launched climate policies without attention to design or redesign of the institutions responsible for implementation. Many leading legislative proposals in the 110th and 111th Congresses called for sweeping collaboration between the EPA and virtually every other unit of the federal government, including the departments of energy, agriculture, transportation, commerce, and defense. They also have tended to call for the creation of a series of new institutions, many modeled on the agencies and boards that have regulated U.S. banking and finance, to oversee any transition toward an emissions trading system. These new entities have never been well-defined in legislative proposals and are all the more suspect given serious concerns about the performance of the existing financial regulatory bodies with respect to the banking and financing practices that led to the severe downturn of the economy. Collectively, that suggests that careful attention needs to be paid to the federal entities that will be responsible for any implementation of future climate policy, a task that will involve far more than simply expanding budgets and adding staff.

Thus far, Congress has shown little if any appetite for this task or the other vital challenges of climate governance. As I noted, recent Congresses have shown a proclivity to either "pass the buck, pass the pork, or pass the microphone" on climate change rather than demonstrate a serious capacity to assume a leadership role. Buck-passing has resulted in a steady pattern of failure to enact legislation that would provide a basic infrastructure for climate governance, such as an emissions disclosure system or even a definition of whether carbon dioxide is a pollutant, much less a comprehensive legislative strategy. Pork-passing is reflected in the gargantuan energy bills of 2005 and 2007, which allocated a stunning array of subsidies and incentives to every conceivable energy source; a serious assessment of the carbon impact of those bills probably is impossible (and would likely be disconcerting it if could be undertaken). In both laws, the notion of "energy independence" has provided a broad fig leaf to evade serious consideration of how best to transition to less dependence on carbon-based energy sources.[15] There is considerable risk that the provisions of the 2009 American Recovery and Reinvestment Act that have an energy and environment focus will simply move the decimal point on provisions included in the earlier bills, throwing more money at multiple sources rather than systematically pursuing the most viable paths to minimizing carbon emissions.

Microphone-passing refers not only to the staggering number of congressional hearings on climate change, with more than 200 being held in the 110th Congress alone, but to a disturbing lack of anything approaching serious deliberation over difficult climate policy choices. Congress will have to confront a series of continuing challenges if it is to play a more constructive policy development role. They include both navigating the proliferation of committees in both chambers competing for jurisdiction and avoiding a tendency to gravitate toward policy

options and design elements that may be appealing to special interests but ultimately prove expensive and minimally effective in reducing greenhouse gas emissions. Previous cases of environmental and other public policies suggest that those hurdles can be cleared, but not easily. As Daniel Fiorino warned, "Environmental responsibilities at the federal level alone are so fragmented and divided up amongst so many different organizations, and the whole congressional oversight system is very fragmented, and yet climate, by definition, is an integrating problem that requires integrating responses." The first session of the 111th Congress demonstrated such characteristics. Through the American Clean Energy and Security Act, the House of Representatives indicated that it was possible to secure a majority vote in favor of a far-reaching climate bill, albeit one that posed numerous governance concerns and did not match the policy preferences of the Senate, suggesting that it faces a highly uncertain future.

The Uphill Climb to a Global Regime

Much of the scholarly and popular discourse on climate change has assumed that it would involve exclusively nation-states engaging in international bargaining that would lead to a global regime. Perhaps that assumption was based on some prior cases in international environmental policy, such as the relative success of establishing an international regime to guide the transition to reduced use of substances that endanger the earth's ozone layer. In that instance, a relatively small number of national actors worked cooperatively with key industries to forge a pact that phased out ozone-depleting substances in favor of other alternatives; they also devised mechanisms to begin to share those alternatives with emerging nations. That was indeed a great success, but it remains an anomaly in the environmental policy area; moreover, it does not translate well to the far more complicated arena of emissions of carbon dioxide and other greenhouse gases. In turn, the continued hope that "the next" international gathering of nations to debate climate governance will represent the "turning point" toward a global regime may simply be unrealistic. Indeed, the much-anticipated December 2009 Copenhagen summit appears to have followed this pattern. Despite President Obama's contention that the event produced "an unprecedented breakthrough," Copenhagen adjourned with only a vague and nonbinding agreement by five large nations on a set of future goals. There was no formal endorsement from the dozens of other participants, including the European Union, much less a clear plan for translating those goals into concrete policy steps.[16] Instead, Copenhagen simply kept alive the possibility that the issues might be more fully addressed down the road at some other international conclave, such as the 2010 version in Cancun.

Stacy VanDeveer and Henrik Selin explained the limited applicability of an international regime approach to the climate arena, at least at this stage. Instead, other kinds of multilevel governance arrangements have begun to emerge, some of

which are especially promising. They often begin with ad hoc coalitions, alliances among nations in a geographic region, such as North America, or among an established network, as in various trade regimes. Fostering collaboration across national borders should build on "existing forums which actually do things," in VanDeveer's terms. That idea suggests many possible routes toward a more bottom-up approach to development of international capacity, perhaps generally following the paths taken by trade and public health policy rather than the once-anticipated "ozone blueprint." In turn, comparative analysis can yield considerable insights for the United States. Despite their divergent views on Kyoto ratification, the European Union and the United States may actually be laboratories for mutual learning with respect to policy options rather than polar extremes, as may be the case for other governmental systems that formally divide powers, such as Australia, Canada, and India.

Plan of the Book

The subsequent chapters in this volume, which develop these themes in greater detail, are divided into four parts. Part 1 helps frame the climate change issue in the U.S. context. Chapter 2, Christopher Borick's analysis of key findings from the 2008 and 2009 versions of the National Survey of American Public Opinion on Climate Change, devotes particular attention to public views of the roles of different levels of government in climate change policy and public receptivity to many policy options, including those explored in individual chapters in part 2. Chapters 3 and 4 present distinct analyses of federalism issues, by Martha Derthick and Paul Posner respectively. Derthick develops the idea of "compensatory federalism," considering the respective strengths and weaknesses of the federal and state governments in evaluating the bottom-up nature of climate policy development that has dominated in the United States thus far. Posner follows with an analysis of methods of "vertical diffusion," the process whereby a policy area initially dominated by states ultimately shifts toward either a balanced intergovernmental role or federal domination through preemption. He examines a range of previous environmental policy cases and considers them as possible models for climate change policy.

That sets the stage for part 2, five chapters that consider a series of leading climate policy options. Some of the chapters focus on a specific policy tool, such as the cap-and-trade model, whereas others explore options within an entire sector, such as alternative methods for promoting renewable energy. Chapters 5 and 6 consider a pair of market-based options: Leigh Raymond examines the cap-and-trade issue, and I explore carbon taxes. Both of these tools involve some effort to use pricing mechanisms to allow adjustments to a more carbon-constrained society, though they use very different methods and seem to have somewhat varied levels of political support. The two subsequent chapters focus on options that

would tend to fall into the realm of "command-and-control"–type approaches. In chapter 7, Pietro Nivola navigates "the long and winding road" of U.S. experimentation with setting federal standards for vehicle fuel efficiency. He notes many ways in which this policy has only marginally reduced fuel consumption and greenhouse gas emissions, and he is fairly skeptical of the likely impact of the 2007 or 2009 federal expansions of the program. In chapter 8, Ian Rowlands reviews renewable portfolio standards and a range of subsidy programs to expand the supply of renewable electricity. He draws on the considerable experience in the U.S. states and around the world and also explores variants on this approach, such as "feed-in tariffs," which guarantee a long-term price to providers of renewable energy. In chapter 9, Marc Landy concludes part 2 by exploring an increasingly salient consideration in climate policy: shifting from mitigating greenhouse gas emissions toward adapting to their consequences. Such a strategy would entail a very different set of policy challenges and responses to climate change as it plays out in coming years. Landy does not dismiss mitigation efforts, but his chapter underscores another key dimension of climate policy: the likely need to adjust to a climate that is already changing and is likely to do so to varying degrees regardless of near-term reductions in emissions.

Part 3 considers the capacity of the three branches of the federal government to assume an expanding role in addressing climate change. Although each chapter focuses on a federal institution, each takes account of intergovernmental considerations, given the inevitable interaction of the federal and state governments. In chapter 10, Kirsten Engel provides an extensive review of existing climate litigation, including *Massachusetts* v. *U.S. Environmental Protection Agency,* the prominent Supreme Court case noted previously. She demonstrates that much of the expanding body of cases that have some degree of climate content involves substantive differences between state, federal, and local governments. She also offers an examination of the varying types and amount of litigation that might be anticipated in response to alternative climate policies if they are adopted. In chapter 11, I explore Congress, which, after decades of inertia, began to take center stage in formulating federal climate policy in 2009. I review the many impediments to congressional deliberation and decisionmaking—some with particular salience to the issue of climate change—which cross many social and economic boundaries as well as the lines that demarcate the turf of individual congressional committees and subcommittees. In chapter 12 Walter Rosenbaum examines the Environmental Protection Agency, a federal body that Congress repeatedly harangues in public hearings but that is likely to be assigned a pivotal role in the implementation of future climate legislation. Rosenbaum refrains from the popular sport of EPA-bashing but notes the woeful lack of resources and support that the agency has received from Congress to prepare for what may be its greatest challenge in four decades of operation. He also raises sobering questions about the preparedness of other key bureaucratic players on climate, such as the Department of Energy. The

chapters on both Congress and the EPA note enormous intergovernmental divides and tensions, indicating potential collisions between early-mover states and federal institutions that enter the game belatedly but with considerable clout.

Part 4 considers ways in which the United States might "reconnect with the world" after the fallout over Kyoto, the failure to achieve major agreements in Copenhagen, and extended U.S. conflict with other nations over climate change. Stacy VanDeveer and Henrik Selin team up for a pair of chapters that consider alternative models that might constitute building blocks for U.S. re-engagement and movement toward greater multinational and international collaboration. They also draw heavily on experience from outside the United States, most notably in the European Union, in considering possible lessons for U.S. (and North American) leadership on the world stage. Collectively, these four sections set the stage for the concluding chapter, which reflects on early developments in the Obama administration and the 111th Congress. The final chapter also returns to the key themes introduced above with a brief set of recommendations to guide future policy development in the area of climate change and environmental governance.

Notes

1. William Nordhaus, *A Question of Balance: Weighing the Options on Global Warming Policies* (Yale University Press, 2008), p. 62.

2. Carlos Pascual and Evie Zambetakis, "The Geopolitics of Energy: From Security to Survival," in *Energy Security: Economics, Politics, Strategies, and Implications*, edited by Carlos Pascual and Jonathan Elkind (Brookings, 2010), p. 23.

3. This is a direct quotation of a comment at the National Conference on Climate Governance, held at the Miller Center of Public Affairs, University of Virginia, December 11–12, 2008. All subsequent quotes in this chapter from authors in this volume are drawn from comments that they made at the conference rather than in their respective chapters.

4. As Robert M. White, administrator of the National Oceanic and Atmospheric Administration, wrote to George W. Humphreys, associate director of the Domestic Policy Council, in July 1976, "I still believe that we need to undertake a lot more work on climate problems." I am grateful to David Horrocks, chief archivist of the Gerald R. Ford Presidential Library, for introducing me to this exchange.

5. This book focuses primarily on the state and federal levels, given their broad constitutional powers in policy design and implementation. Attention is given to local issues as appropriate in some chapters. For a broad overview of the evolving local government role in the United States and Canada, see Christopher Gore and Pamela Robinson, "Local Government Response to Climate Change: Our Last, Best Hope?" in *Changing Climates in North American Politics*, edited by Henrik Selin and Stacy VanDeveer (MIT Press, 2009), pp. 137–58.

6. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990–2007*, EPA 430-R-09-004 (Washington: 2009).

7. Barry G. Rabe, "Racing to the Top, the Bottom, or the Middle of the Pack? The Evolving State Government Role in Environmental Protection," in *Environmental Policy: New Directions for the Twenty-First Century*, edited by Norman J. Vig and Michael E. Kraft (Washington: CQ Press, 2010), p. 32.

8. An earlier version of this discussion appears in Barry G. Rabe, "States on Steroids: The Intergovernmental Odyssey of American Climate Change Policy," *Review of Policy Research* 25, no. 2 (March 2008), pp. 105–28.

9. This is a direct quotation of a comment at the National Conference on Climate Governance.

10. The program and the expansive literatures that examine it are explored in Dallas Burtraw and Karen Palmer, "SO_2 Cap-and-Trade Program in the United States: A 'Living Legend' of Market Effectiveness," in *Choosing Environmental Policy: Comparing Instruments and Outcomes in the United States and Europe*, edited by Winston Harrington, Richard D. Morgenstern, and Thomas Sterner (Washington: Resources for the Future Press, 2004), pp. 41–66.

11. For an excellent analysis of the evolving U.S. and European positions on climate change over multiple decades, see Loren Cass, *The Failure of American and European Climate Change Policy* (State University of New York Press, 2006).

12. This is a direct quotation of a comment at the National Conference on Climate Governance.

13. In one early effort to analyze the performance of state and local climate policies that emerged from broad commissions or planning processes, numerous problems were identified in achieving pledged reductions or moving successfully from policy design into policy implementation. See Stephen M. Wheeler, "State and Municipal Climate Change Plans: The First Generation," *Journal of the American Planning Association* 74, no. 4 (September 2008), pp. 481–96.

14. As the majority opinion noted, "The harms associated with climate change are serious and well recognized. The Government's own objective assessment of the relevant science and a strong consensus among qualified experts indicate that global warming threatens . . . a precipitate rise in sea levels, severe and irreversible changes to natural ecosystems, a significant reduction in winter snowpack with direct and important economic consequences, and increases in the spread of disease and the ferocity of winter events."

15. Pietro S. Nivola, "Rethinking 'Energy Independence,'" *Governance Studies at Brookings* (December 30, 2008).

16. John M. Broder, "Many Goals Remain Unmet in 5 Nations' Climate Deal," *New York Times,* December 19, 2009.