STATES ON STEROIDS:
THE EVOLUTION OF CLIMATE POLICY
IN THE AMERICAN INTERGOVERNMENTAL CONTEXT

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Most scholarly and journalistic analysis presents the odyssey of climate change policy in the United States as if America was a unitary system of government. This leads to a familiar tale, whereby the federal government signed the Kyoto Protocol in 1997, spurned ratification four years later, and neither the Clinton nor current Bush Administration and respective Congresses have been able to agree to anything beyond climate research funding and voluntary reduction programs. At the same time, most international analysis has assumed that climate policy would entail bargaining and implementation among nations, culminating in a world climate governance regime. Two previous environmental cases have been invoked repeatedly as viable precedents for climate. The international ozone depletion accords have been commonly depicted as establishing a model for multi-national collaboration on climate protection. In turn, the American experience with emissions trading for sulfur dioxide has been widely heralded as a cost-effective policy tool that can be adapted to create an international carbon trading market.

As the tenth anniversary of the signing of Kyoto nears this December, it is increasingly evident that climate policy is proving far messier than conventional depictions had anticipated. The Kyoto process is in tatters, attributable not only to American disengagement but also to an inability of many ratifying nations to honor their commitments. This is reflected in numerous failures to approach pledged emissions reductions, as in the Canadian and Japanese cases, or to successfully implement national or multi-national policies, as in the debacle of the Emissions Trading Scheme in the European Union. There also continues to be enormous uncertainty about engagement by developing nations, at the very point where China is primed to eclipse the United States as the world's leading source of greenhouse gases.

But perhaps the biggest single surprise as climate policy continues to evolve is that in the American case and many others, it is becoming increasingly evident that climate policy constitutes an issue of federalism or multi-level governance. As the recent emergence of California Governor Arnold Schwarzenegger as a rival to British Prime Minister Tony Blair as the "world leader" in the development of far-reaching climate policy attests, individual units across different federal or multi-level governance systems may have more in common with one another in climate policy than they have with the neighboring units of their overall federation. Indeed, one can see stronger parallels between such jurisdictions as Connecticut and Sweden, Pennsylvania and Germany, New York and New South Wales, and North Carolina and Ontario than exists across members of the same federation.

This paper will focus primarily on the American case, although it is part of a larger project designed to compare climate policy across competing governmental systems. It will begin with an overview of American sub-national policy development, attempting to provide a review of the tapestry of policies that have been enacted over the past decade and some of the key factors that have led to such a robust state response in the absence of federal mandates or incentives. In turn, this will lead to a consideration of the divergent paths taken by the fifty states, reflected in their carbon dioxide emission trends since 1990 and varied levels of climate policy development. At the very moment that the U.S. Congress has begun to explore a diverse array of federal climate policy options, each state finds itself in a unique context, with significant possibilities for future intergovernmental bargaining over any future federal policy that would allocate costs and benefits across regions and sectors. Finally, the collective state experience offers some possible lessons for future policy development at either sub-national or national levels. In particular, we will see that there appears to be a nearly-inverse relationship between those policies that economists tend to endorse as holding the greatest promise to reduce emissions in a cost-effective manner and the political feasibility of respective policy options. These patterns could offer significant lessons for the future of climate policy development, whether on a sub-national or federal basis in the United States, and possibly for other polities.

Toward a State-Centric American Climate Policy

The recent trend toward state-driven policy is not unprecedented in American federalism. In many instances, early state policy engagement has provided models that were ultimately embraced as national policy by the federal government. This has been evident in a range of social policy domains, including health care and education, and can either result in federal preemption that obliterates earlier state roles or a more collaborative system of shared governance (Teske 2004; Manna 2006). In some instances, states have taken the lead and essentially sustained policy leadership through multi-state collaboration and the absence of federal engagement. Such policy arenas as land use management and policies guiding organ donations have remained largely state-dominated, despite occasional federal exploration of legislation or regulation. To date, American climate policy is following the latter pattern, with prolonged federal inability to construct policy leaving substantial opportunity for state engagement and innovation. At the same time, the 110th Congress is weighing a variety of policy options, some of which could ultimately encourage, constrain, or preempt existing state policies (Selin and VanDeveer 2007). However, the institutional impediments to any federal action remain significant, suggesting that there will be continued state latitude to play a lead role for some time to come. In turn, this could ultimately give a number of states a strong bargaining role in any future federal policy given their sunk institutional and policy investments. Many states now possess a considerable body of climate policy expertise that may well rival federal institutions (Rabe 2007).

Many scholars scoffed at the very possibility of "bottom-up" American climate policy during the previous decade but several factors have converged to place states in increasingly central roles. First, many have seen early steps that would have the effect of reducing greenhouse gases as being in their economic self-interest. This helps explain the expanding state government interest in developing a set of technologies and skills to promote renewable energy, energy conservation, and expertise to foster a low-carbon economy. Indeed, virtually every governor has now embraced the notion of developing "home-grown" energy sources in order to foster long-term economic development. This has resulted in an active exploration of various policy tools that might achieve these goals. Second, a growing number of states are beginning to experience significant impacts that may be attributable to climate change, whether through violent storms, species migration, prolonged droughts, or changing vectors of disease transmission. Some of these are having the classic effect of "triggering events" that create an impetus for a policy response, however modest the climate impact that any unilateral state efforts to reduce greenhouse gas emissions may be (Repetto 2006). Third, some states have consciously chosen to be "first movers," often taking bold steps with the explicit intent of trying to take national leadership roles on climate policy. In some instances, such as California's legislation to restrict carbon emissions from vehicles and New York's efforts in the northeast to establish a regional carbon emissions trading zone, states are also trying to establish models that will influence their neighbors to join them and possibly position them to influence any future federal policy. In this regard, states are similar to corporations; some seek an early and active role, sensing potential strategic advantages over their more recalcitrant competitors (Hoffman 2006; Kamieniecki 2006). Fourth, state capitals have proven very fertile areas for the development of networks advocating climate policy. In many instances, earlier state efforts reflected leadership from higher levels of state agencies working in environmental protection, energy or other areas relevant to climate (Rabe 2004). These policy entrepreneurs continue to operate but increasingly partner with other forces, such as legislators and advocacy groups, to form policy networks that build support for policy strategies that are particularly appealing to an individual state (Selin and VanDeveer 2007; Montpetit 2004). Fifth, states also provide venues for strategies not available at the federal level, including direct democracy and litigation that confronts federal institutions. Ballot propositions are proving an increasingly popular way to advance climate initiatives once representative institutions stall. At the same time, the recent U.S. Supreme Court verdict in *Massachusetts, et al. v. U.S. Environmental Protection Agency* indicates that a collective of states can win an intergovernmental court battle that may serve to force a reluctant federal agency to declare that carbon dioxide is an air pollutant. The decision in this case is already triggering additional multi-state efforts to use the federal courts as a venue to challenge other decisions by the private sector or federal agencies.

Variation in State Emission Trends and Policy Development

None of these factors converge in identical ways in various states. Indeed, no two states have uniform profiles in terms of actual rates of greenhouse gas emissions

growth or climate policy development. Just as the nations of the world diverge on these dimensions, so do American states. In turn, as we shall see, the combination of emissions growth and policy development to date may vary greatly among states and lead them to consider different strategic positions. This may apply to either further state policy development or any bargaining position that they might assume in future negotiations over federal policy.

State Emission Trends. The range of emission trends may be particularly surprising, when weighed against the widespread reporting of national averages for emission rates. With 1990 established as a near-universal baseline internationally, American emissions increased approximately 15 percent overall from that point through 2003. This reflects steady growth throughout the 1990s, with a somewhat slower pattern in more recent years. The most recent estimates suggest that American emissions were 18 percent above 1990 levels through 2006. But this aggregate measure looks very different when looking at the rates of change in the fifty states and the District of Columbia (Table 1). One state, Delaware, is actually on track to meet the reduction targets that would have been imposed had the United States ratified Kyoto, and twelve other states have contained growth rates to single digits. These include several states, such as California, Pennsylvania, New York, and Michigan that have very large emission bases and would rank among national leaders in emissions were they not part of a federation. At the same time, many other states, particularly those of the southeast and southwest, have registered rates of emissions growth that are double or more than the national average.

Such a range of emissions is not unique to the United States, despite the tendency to focus only on national-level trends. Despite its ratification of the Kyoto Protocol, Canadian national emissions increased 26 percent between 1990 and 2003. Only Manitoba and Quebec approaches those states toward the lower end of the growth continuum in the United States, whereas many others such as Saskatchewan, Alberta, and British Columbia, were far above the national average. Similar variability exists among the nations of the European Union. In that case, differential national reduction targets were negotiated as part of the price for ratification but many individual nations have vastly exceeded their particular targets. In each instance, political leadership of individual jurisdictions (American states, Canadian provinces, European nations) will be attentive to their emission patterns since 1990 and make that a consideration in any intergovernmental bargaining over future emission reductions or selection of policy tools.

Policy Development Trends. The ways in which governments can enact policies that purportedly stabilize or reduce their greenhouse gas emissions is virtually limitless. Since greenhouse gas emissions emanate from essentially every sector of the economy, a vast range of policies and sectors could come into play. But our effort to measure intensity of state climate policy development uses a measure from eight policy options that are prominently addressed either in current practice or the scholarly literature on

climate policy options (Pew Center 2007). In Figure 1, we not only dichotomize the states by their rate of emissions growth since 1990 but also divide them according to low (zero to one) versus high (two or more) policy adoption rates from this census of eight possibilities. These policies include: renewable electricity mandates, or portfolio standards; carbon taxes; renewable fuel mandates or equivalent programs that mandate expanded use of bio-fuels; carbon cap-and-trade programs; statewide emissions reduction targets; mandatory reporting of carbon emissions; participation as a co-plaintiff in the recent Supreme Court case led by Massachusetts; adoption of the carbon emission standards for vehicles enacted by California.

This demarcation essentially divides the nation into two blocs. Twenty-two states representing about one-half of the American population have enacted two or more of these eight climate policies. A few of these states, such as California, Massachusetts, Connecticut, and New York have as many as six or seven of them. In some cases, states have revisited early policies and decided to "raise the bar" elevating initial emission reduction targets or earlier commitments to renewable energy. The remaining 28 states represent the other half of the American population and have either zero or one such policy in operation. Over the past three years, at least eight states have moved from the "low" policy cell to the "high" policy cell. That trend appears likely to continue in the coming months given the amount of activity on various climate policies in many state legislatures.

Strategic Considerations Emerging from Emissions Growth and Policy Capacity

Figure 1 represents the convergence of these two dimensions, depositing the fifty states into one of four cells that reflect relative growth of emissions and commitment to policy development. Each cell includes reference to the total number of states that currently fall within it as well as a sample set of applicable examples. The convergence of these factors illustrates the diverse contexts facing individual states as they contemplate future initiatives or engagement in intergovernmental bargaining as Congress begins to weigh a wide range of possible options. But they also suggest that states may view various climate initiatives in very different ways, depending upon where they stand in relation to the 1990 baseline that is used almost universally in American and international climate policy deliberations and whether or not they have developed any experience in policy development or implementation. Just as private businesses and industries are increasingly thought to adjust their strategies based on their emissions levels and internal incentives for action or inaction (Layzer 2007, 209-210), states may face similar strategic choices and be influenced by their current context. Subsequent sections will review each of these cells and consider possible strategic considerations as states approach the growing likelihood of serious federal legislative engagement and consider their possible influence on such policy output.

Low Emissions, High Policy. States that have sustained low rates of emissions growth while developing significant policy capacity may be eager to exert their influence over neighboring states and federal policy debates. They will be adamant that 1990 remain sacrosanct as the emissions baseline, assuring maximal credit for "early reductions" and for being "first movers." Pulling other states or the entire nation into their orbit is likely to maximize their leverage on overall emissions reductions. This might also serve to provide them with economic advantages, having already invested in technology and staff and thereby forcing recalcitrant states to begin the process of "catch-up."

California perhaps epitomizes this cell, taking the long-standing term of "California effect" in American intergovernmental policy leadership to new lengths in climate change (Vogel 1995). The state has long played a pioneering role in environmental protection and other areas of policy, often stimulating cross-state diffusion and ultimate embrace at the federal level. In climate, it is literally "running the table" by putting into place virtually every kind of climate policy imaginable. Politically, this allows Governor Schwarzenegger and other state leaders to claim credit for "global leadership" on climate policy, even pushing Constitutional bounds in ways that allow for direct negotiation with other national heads of state or sub-national governments outside the United States (Breslau 2007; Adams 2006). The state entered into the climate policy arena during the late 1990s, having already achieved one of the lowest rates of per capita greenhouse gas emissions due to major energy conservation efforts in the prior decade. But it has since followed with a blizzard of climate initiatives, including the 2006 Global Warming Solutions Act that established bold statewide reduction commitments over coming decades and set in motion a carbon cap-and-trade program with wider scope than attempted in any Western democracy to date. In turn, California state government is being reconfigured to begin to allow for all of the inter-sectoral and inter-agency collaboration that will be necessary to secure implementation, including hiring of dozens of new state staff.

It has become increasingly clear that California intends for this massive effort to achieve additional emissions stabilization in as cost-effective a manner as possible. But there is also an effort to use this platform to influence neighbors and ultimately national and perhaps even international policy. Evolving interpretation of California statutes to guide regulation of vehicle emissions would clearly impinge most heavily outside of the state. The state has a relatively small vehicle manufacturing sector but a good portion of it is concentrated on high-fuel efficiency vehicles which would be boosted by regional or national adoption of the California standards (Rabe and Mundo 2007). In turn, California's evolving efforts to markedly reduce carbon emissions from utilities are being designed so that regulation would be implemented on a "load-based" basis and thereby force any utilities from other states or provinces that might export electricity into the state to adhere to California standards. At the same time, the state's carbon vehicle emissions policies are designed to apply to all vehicles registered in California, allowing the state to influence emission standards for vehicles purchased outside of the state. These

approaches raise a series of political and Constitutional issues but the California case suggests that, at least in some instances, a low-emission and high-policy development footing can allow for simultaneous pursuit of environmental improvement and rent-seeking. In this regard, California is somewhat unique given its sheer size in terms of populace and economic heft. But one can see somewhat similar strategic thinking in play elsewhere, particularly Pennsylvania, New York, and other northeastern states that are similarly trying to position themselves as models for regional and national policy adoption and emergence as "national climate leaders."

High Emissions, High Policy. The establishment of multiple climate policies does not guarantee their effectiveness or their ability to achieve significant emission reductions given other competing factors. Indeed, states such as Arizona, Minnesota, and Oregon, among others, have actively pursued multiple forms of climate policy, including particularly early initiatives in the latter two states. But their rate of emissions growth remains well above national averages, whether attributable to overall population growth or changes in the mix of electricity generation or economic activity.

States with this blend of emissions and policy development will likely approach intergovernmental negotiation from a somewhat different position. They will be more enthusiastic about modification of the 1990 baseline, seeking greater credit for early policy initiatives even if these had little effect on reducing emissions growth. They might well seek special treatment or status for policies that were enacted more recently and are only moving into preliminary stages of implementation. This might include allowance of a two-tiered system, whereby states would be free to exceed federal minimum standards.

Arizona provides an illustration of this phenomenon having established in the last few years a series of renewable energy policies and entered into a number of collaborations with California that range from negotiation of a regional carbon cap-and-trade program to formal endorsement of its carbon emissions regulations for vehicles. But it has the second-highest increase in emissions of any American state between 1990 and 2003, with a rate of growth that is more than four times that of one of its neighbors, New Mexico. The state has experienced particularly steep emission growth in the transportation sector. It will likely endorse federal policies that concentrate emissions reductions in that sector, given the small presence of vehicle manufacturing in the state, as reflected in its formal adoption of the California vehicle emissions legislation. Minnesota's emissions growth is similarly dominated by the transportation sector and so it might take a position similar to that of Arizona. In turn, much of Oregon's emissions growth is in the electricity sector, due in part to diminished output from nuclear and hydro plants, which could lead it to support a different set of policies. All of these states tend to view themselves as "mini-Californias," supporting cutting-edge policy experimentation. But they will want to be protected against penalty for any substantial emissions growth and rewarded for early policy action.

High Emissions, Low Policy. A significant number of states fall into the cell with above-average rates of emissions growth and low levels of policy development. Many of these states are located in the southeastern portions of the nations, including Alabama, Florida, and Texas. They have generally experienced steady rates of population and economic growth, tend to have expanding manufacturing industrial bases, and are heavily reliant on coal for electricity. In turn, they are generally thought to have some of the weakest potential capacity for renewable energy and have taken few if any steps to promote alternatives. Moreover, they tend to be among those states that receive low rankings for their levels of commitment or institutional capacity to pursue environmental protection (Resource Renewal Institute 2001).

Many of these states have been non-players in climate policy, although Texas and a few others have developed single policies of some consequence. In some instances, these states may literally adopt policies with significant greenhouse gas reduction potential, as in the case of a renewable portfolio standard that was enacted in Texas in 1999 and expanded six years later. But this particular policy and others like it were essentially not adopted for their climate protection potential, instead supported for such reasons as energy supply diversification and reduction of conventional air contaminants (Rabe 2004). Their prospects for passage might have been jeopardized by explicit labeling as climate policy. As a result, state proponents will sustain a "stealth" approach and emphasized other attributes, unless it proves advantageous for them to become more explicit about possible climate benefits at some future point.

Consequently, this set of states represents a substantial area zone of the nation that is essentially the converse of the Northeast of Pacific West. Not only is their emissions growth high and policy development modest at best, but they may view any federal climate policy as a possible threat to their economic well-being (Rabe and Mundo 2007). They are likely to oppose any policy that would impose significant costs on them and would be particularly mindful of possible redistributive effects that could result from mandates to purchase carbon credits or renewable energy credits from outside their state and region. Moreover, they would have significant incentive to adjust the emission baseline to a date well after 1990 and seek substantial federal subsidies to compensate against any possible adverse economic consequences from policy implementation.

Ironically, many of these states may be among the most vulnerable to climate change, at least over the next few decades. Coastal states from the Carolinas to Texas have become particularly concerned about growing risk from severe weather episodes and some significant temperature increases. Several such states are enmeshed in discussions of the future of insurance coverage, particularly from coastal property owners who are facing steep rate hikes due to increased vulnerability. This issue has begun to move climate change onto the agenda in such Gulf Coast capitals as Tallahassee and Columbia, although it has not yet generated any serious policy response in these states.

But it is increasingly possible that issue saliency could grow so substantially in this area that it triggers a new position on climate policy.

Low Emissions, Low Policy. The odyssey of state experience with greenhouse gas trends reveals that it is indeed possible to attain stable levels of emissions in the absence of climate policy designed to achieve these goals. In seven states, including Louisiana, Michigan, Indiana, Ohio, and West Virginia, there has been virtually no movement toward any greenhouse gas reduction policies and yet all have emission growth rates well below the national averages between 1990 and 2003. Louisiana and Michigan emissions, for example, are largely unchanged over this period (see Table 1). However, states in this cell are not exactly models for effective transition to a less carbon-intensive society in that much of their stability is due to economic stagnation. In the Michigan case, an actual increase in emissions in most sectors is offset by significant outright declines in manufacturing-based emissions since 1999, reflecting the marked decline in that sector. Louisiana has undergone similar transitions and both states may have even declined further once 2006 and 2007 emissions data is available due to continuing economic contraction.

In some respects, this parallels the "East German model" for emissions reduction, drawing comparisons with those portions of Eastern Europe which easily met Kyoto goals through industry-sector collapse in the early 1990s. Any such states will approach climate policy with trepidation, particularly inclined to combat any policies that might further weaken declining industries. In Michigan, this is already manifest in an aggressive effort by its Congressional representatives to fend off any new federal restrictions on fuel economy, on the heels of its decision to formally support the federal position in the recent Supreme Court case on climate change. Indiana and Ohio already have vulnerable vehicle manufacturing sectors and can be expected to take a similar posture, hoping to concentrate any climate regulations in other sectors where they have less at risk. This may explain the strong push in these states for bio-fuel policies at the state and federal levels, as this is seen as favoring traditional American vehicle manufacturers who have invested in technologies to allow for expanded use of such fuels.

Consistent with the bio-fuel experience, states in this cell are likely to seek minimal interference with threatened industry and also insist on very favorably financial terms to compensate them for any possible costs that might be imposed by federal policy. States of all sorts are keen to maximize federal transfer payments but the demand may be particularly great in these states given their relative economic position. Some of these, including Kansas and West Virginia, have actively called for expanded federal support to develop potential renewable energy sources that are particularly promising within their boundaries, arguing that they lack the capacity to develop these on their own given their economic circumstances. Relatively recent expansion of interest in possible climate

possible adoption in several of these states such as Kansas and Michigan is based almost exclusively on anticipated economic development potential.

Policy Selection: Economic Desirability v. Political Feasibility

The expanding body of state experience in climate policy may also afford insight into the varied prospects for future enactment of various policy instruments intended to reduce greenhouse gas emissions. As discussed, greenhouse gases emanate from every sector of economic and social activity, opening up the possibility of an almost-infinite number of possible policy interventions. These run the gamut from more conventional command-and-control policies that emphasize rigid regulations and standards to economically-based policies that allow flexibility as long as overall emission reduction goals are met. States clearly have substantial latitude to choose from this range of policy tools, offering an indicator of how they fare when placed into a political context. Many scholars have noted a general shift in various areas of environmental protection toward the latter set of policies, particularly in the American context (Fiorino 2006; Mazmanian and Kraft 1999). This trend is energetically embraced in much of the scholarship on climate policy, with widespread endorsement of policies that make use of economics-based mechanisms to maximize the likelihood that any reductions will be produced in as cost-effective manner as possible (Stewart and Wiener 2003; Victor 2004; McKibbin and Wilcoxen 2002; Jaccard et al. 1992; Cline 1992, et al.).

But the preferences of scholars, particularly economists, are not readily translated into new policy. Indeed, climate change may well illustrate the confrontation between the pecking order of policies, as endorsed by most economists and kindred souls in other social science disciplines, and the reality of gaining political support for various policies through elected representative institutions. In short, those policies that tend to maintain the strongest base of support from economists appear to have the greatest difficulty of being adopted by state legislators and governors. In turn, those policies that have many features of more traditional approaches that have been long criticized by economists are far more successful in securing significant support from elected officials. In some respects, as Figure 2 indicates, the relationship between "economic desirability" and the "political feasibility" of climate policy options may be nearly inverse based on American state experience to date. This Figure calculates the horizontal dimension of economic desirability through an extensive literature review on climate policy that compares and ranks various policy alternatives. It calculates the vertical dimension of political desirability by a measure of the number of states that have adopted a particular policy, ranging from low (0-to-5 states), medium (6-to 10), to high (11 and above).

If the American state experience with carbon taxes to date is also applicable to other polities, it raises important questions about the political viability of those policies that might deliver emission reductions in the most cost-effective manner possible. In particular, this experience suggests that state governments are extremely reluctant to impose strategies that are explicit about any costs that will be imposed, particularly if they are likely to be evident at the point of product purchase or utility bill payment. Instead, they may have considerable incentive to produce far more complex policies which may require greater overall costs but allow them to be less visible either by being hidden or spread out over a longer period of time.

Economic Attractiveness, Political Anathema: Pity the Carbon Tax. A review of diverse literatures on climate policy indicates a very broad consensus among scholars regarding the desirability of using carbon taxes as a central approach to climate policy. In 2007, a *Wall Street Journal* survey of leading economists showed overwhelming support for carbon taxes as the preferred tool for addressing climate change. "A tax puts pressure on the market, rather than forcing an artificial solution on it," noted one of the survey participants in a representative comment. In turn, carbon taxes have been formally endorsed by a who's who of very diverse economists who often agree on little. Harvard economist Gregory Mankiw, who chaired President Bush's Council of Economic Advisors between 2003 and 2005, has established a pro-carbon tax blog, known as the Pigou Club Manifesto, which has been endorsed by such diverse luminaries as Gary Becker, Martin Feldstein, Thomas Friedman, Alan Greenspan, Paul Krugman, Anthony Lake, William Nordhaus, Richard Posner, Jeffrey Sachs, Isabel Sawhill, Lawrence Summers, and Paul Volcker among many others. As Edward Snyder, dean of the University of Chicago School of Business has noted, "We need to recognize carbon is a "bad," tax it, and let the market work" (Carbon Tax Center 2007).

In practice, carbon taxes would be based on the carbon content in respective fossil fuels, presumably establishing a higher cost for a similar unit of coal versus natural gas given the high carbon levels of the former. Such taxes could also be modified for specific sources, such as various blends of gasoline for transportation or electricity that uses some mixture of coal, natural gas, and oil. They give consumers incentives to use less carbon-based energy but do so without imposing uniform constraints on citizens or industries. In turn, it is thought that the establishment of such a tax would be relatively straightforward and that compliance would be high since it would be applied at the point of purchase of carbon-based energy sources. All 50 states clearly have Constitutional authority to establish multiple forms of carbon taxes, as they have long used a combination of sales and excise taxes for gasoline and can use their considerable power over electric utility regulation to apply taxes to electricity usage.

One might anticipate that the intellectual consensus behind carbon taxation, the need in many states for additional revenue, and the growing saliency of the climate

change issue in many states would create a groundswell of sorts behind some form of carbon taxation. But there is no evidence to suggest that any state has decided to make carbon taxes a central plank of their climate protection strategies. The lone American jurisdiction that has taken such a step is Boulder, Colorado, having enacted an explicit carbon tax through a 2006 ballot proposition that will generate revenue to help underwrite the city's climate protection program (Arrandale 2007). But Boulder appears likely to remain an anomaly. Indeed, California, the very state synonymous with an aggressive, across-the-board approach to greenhouse gas reduction has essentially put every imaginable climate policy into play with the conspicuous exception of carbon taxation. On the same day that Boulder voters approved their carbon tax in November 2006, California voters decisively rejected Initiative 87, a ballot proposition that would have increased statewide energy taxation as a climate policy tool.

In the arena of gasoline, all states have maintained some form of taxation, with most of that revenue used to support highway maintenance and expansion. In 2006, the average state gas tax was 21 cents per gallon, which is combined with a federal gasoline excise tax of 18.4 cents per gallon (Dernbach, et al. 2007; American Petroleum Institute 2006). The actual rates have changed only modestly over the past decade and state tax policy analyst John Petersen has noted that they are not indexed to inflation or changes in gasoline prices. As a result, "the value of the taxes has been declining in real terms over the years" and is actually less in price-deflated terms than it was in prior decades (Petersen 2007). Some states are actively exploring suspension of their gasoline taxes in the face of climbing prices. Consequently, there does not appear to be any appetite for addressing this area of possible carbon tax development.

Electricity taxation is somewhat different in that 18 states have established some form of specialized taxation beyond conventional sales taxes, whereby at least some of the collected revenues generally are earmarked for energy efficiency programs or renewable energy development. These programs range from 0.03 to 3 mills per kWh, with one mill equivalent to one-tenth of one cent (Dernbach, et al. 2007, 10025). These programs generate between $8 million per year in Illinois to $440 million per year in California, and the average cost per residential household across these 18 states is relatively low, an estimated $1 per family per month in these states.

Perhaps the most revealing aspect of these policies is that they are universally not referred to as taxes in authorizing legislation or inclusion on customer bills. Instead, they tend to be characterized by terms such as "social benefit charges" or "public benefit fees" and many states neither itemize nor acknowledge them on customer electricity bills. All have been authorized through either legislative action or decisions by state public utility commissions. They have been designed to sustain a low enough level of taxation and innocuous enough of a title so as not to trigger opposition to the notion of energy taxes. This "stealth" quality raises a number of interesting questions about future prospects for carbon taxes at either state or federal levels but underscores the political complexities

involved in being explicit about their role or setting them at levels sufficiently high to have a realistic capacity to deter energy consumption.

Economic Shortcomings, Political Attractiveness: Renewable portfolio standards (RPS) may represent the near-complete converse of carbon taxes in terms of economic desirability and political feasibility as a climate policy option. They require that all providers of electricity within a state increase the amount of power that they derive from renewable sources over time. Most of these policies steadily increase the total percentage or volume of electricity that must come from renewables and often establish financial penalties in the event of non-compliance. This is representative of a body of policies that follow a command-and-control pattern. Related climate policy options include renewable fuel standards that mandate increased levels of bio-fuels and emission control policies that mandate use of a particular technology or achievement of a specific level of emission reduction.

Just as a large range of climate scholars are enamored with the concept of carbon taxation, many view policies like RPSs with trepidation on economic grounds. Such policies are generally seen as more expensive per unit of greenhouse gas emission reduction, in that they mandate use of technologies that may be considerably more expensive than traditional electricity supplies. This is particularly a concern as RPSs become complex, with so-called "carve-out" provisions that require not only an overall level of renewables but supplemental commitments to also expand more expensive renewable sources such as solar power (Rabe and Mundo 2007). In turn, it remains very difficult to discern the actual carbon-reduction impact of RPSs, since it is not always clear which type of existing source is being supplemented and because the policy does not reduce demand for electricity. This issue is especially significant in those instances where the definition of renewables includes energy sources, such as biomass, which have questionable greenhouse gas benefits as opposed to many conventional sources. Concerns about the cost-effectiveness of this tool are reflected in a number of early studies on actual RPS performance, even in cases where renewable capacity is high and overall cost is below national averages (Dobesova, et al. 2005; Chen, et al. 2007). These concerns are further compounded if jurisdictions adopting RPSs take steps to assure that newly-mandated renewables are generated within their boundaries, even if that produces higher-cost electricity than through importation. As one prominent study of competing climate policy tools concludes, "the RPS may be one of the less efficient means of achieving greenhouse gas emission reductions. Unlike a more flexible carbon cap, it does not reward generation from non-renewable sources of low carbon power, and rewards energy conservation only very weakly" (Bushnell, et al. 2007).

Any misgivings over RPSs from an economic standpoint have not served as a stumbling block to their rapid adoption and diffusion. Indeed, of the eight major climate

policies outlined in Figure 1, RPSs have clearly been the most popular politically. They have been approved in 23 states and the District of Columbia, representing more than half of the nation's Congressional districts. RPSs are operational in every section of the nation except for the Southeastern states. Moreover, they are under active consideration in at least eight other states and at least half of the current RPS states have revisited their earlier enactments by setting more ambitious goals through legislative reauthorization. Many states are establishing very ambitious targets, such as 25 percent in New York by 2013, 20 percent in Colorado and New Jersey by 2020, 18 percent in Pennsylvania by 2020, and 15 percent in Arizona by 2025.

It is not clear that states adopting RPSs have conducted careful economic analyses or carefully assessed their capacity to reach these various targets (Chen, et al. 2007). In turn, a number of states have faced early implementation problems, ranging from local resistance to the siting of renewable generating facilities or transmission capacity to pressures from supporters of particular renewable energy sources to receive increasingly favored treatment in RPS implementation (Rabe and Mundo 2007). All raise added concerns over long-term economic impact of these policies and questions of whether neighboring states can work collaboratively to establish common renewable energy markets or instead erect barriers to discourage cross-border movement and purchase.

None of this has dampened political enthusiasm for the RPS approach, which may be attributable in part to the fact that it is perceived as delivering multiple benefits, only one of which is climate change. Most states enacting RPSs have characterized them as long-term investments in future technologies that could provide long-term economic benefits. In turn, renewable energy is portrayed as far more labor-intensive than conventional electricity, for which imported fuel costs are high, hence leading to a characterization of renewables as a source of within-state job creation. At the same time, various states have emphasized other co-benefits, including diminished release of conventional air contaminants through transition to new electricity sources and reduced dependence on other jurisdictions to sustain a supply of fossil fuel or uranium. Yet others have emphasized the desirability of sending early "market signals" that encourage develop of energy technologies that could provide long-term benefits of accelerated energy system transformation not normally captured through conventional economic analysis. Indeed, the implementation of the existing 23 RPSs would have the effect of increasing national levels of electricity derived from renewable sources from less than one percent in 2000 to more than six percent by 2020, with assumptions that project continued expansion of electricity demand, no additional state policies on renewables, and no increased cost-competitiveness by renewables over that period of time. Consequently, the "technology-forcing" capacity of this policy tool could be considerable.

Perhaps most significantly, RPSs are framed as essentially cost-free in political debates, with any added costs "passed along" to electric utilities, even though consumers

will likely pay any difference for an electricity supply that has a higher level of renewables, whether they realize it or not. As one team of analysts of the early experience with these programs concluded, RPSs "are attractive politically because they accomplish multiple objectives with one policy, and are not perceived as a tax" despite the fact that they are likely to prove "somewhat more expensive" than more market-based strategies such as carbon taxes (Dobesova, et al. 2007, p. 8583). This may explain why RPSs continue to draw broad, bipartisan support in states with every pattern of partisan control and have even been approved via ballot initiatives in Colorado and Washington State.

In addition, this political calculus that perceives an RPS as offering environmental, economic, and political benefits, however spurious in practice, may also explain why this is the one climate policy tool that has formally been embraced at the national level by at least one branch of the U.S. Senate. In both 2003 and 2005, the Senate approved creation of a national RPS that would reach a 10 percent level by 2020 and allow for a two-tier system whereby states could seek higher levels through their own policies if they desired. These measures died in conference proceedings with the House of Representatives, but they remain the only instances in which either chamber has ever voted in favor of a non-voluntary climate measure (Rabe 2007). It is thus no surprise what while a carbon tax appears to be every bit the non-starters in Congress as at the statehouse level, the prospects for some form of national RPS remain reasonably in the 110th Congress.

Moderate Economic and Political Attractiveness: Carbon Cap-and-Trade. Emissions trading through some version of a carbon cap-and-trade system has emerged as a reasonably attractive policy option from both an economic and political perspective. Economists may not be quite as effusive about cap-and-trade as carbon taxes but they tend to characterize this approach as a very viable alternative. Indeed, many policy analysts have long championed such a policy design for many environmental problems, based in part on the extensive and near-euphoric assessment of the American sulfur dioxide emissions trading program that was launched under Title IV of the 1990 Clean Air Act amendments (Ellerman, et al. 2000). Such a policy could theoretically be applied to specific sectors that generate carbon emissions, such as electric utilities, or an entire economic and political system. Ironically, this approach was actively pushed by the American federal government as a model for international climate policy during the negotiations that led to the Kyoto Protocol.

Scholarly proponents of cap-and-trade emphasize that it injects far more flexibility into emissions reduction than conventional command-and-control approaches and holds considerable promise for achieving cost effective reductions. Under cap-and-trade, an overall budget for carbon releases is established and gradually reduced over time. Once emission allowances are allocated to individual sources or jurisdictions, they

are then free to negotiate transactions to allow for the most inexpensive possible reductions. These may be achieved, at least in part, through so-called offsets, such as carbon sequestration through tree planting or subterranean storage. As David Victor has noted, "Launching an emissions trading system requires creating a new form of property right—the right to emit greenhouse gases—and institutions to monitor, enforce, and secure those new property rights" (Victor 2004, xii).

This approach also has considerable political appeal, reflected initially in its adoption in the European Union under the Emissions Trading Scheme and currently in its inclusion in a series of proposals before the 110th Congress. Ten states have made some level of commitment to a cap-and-trade program, nine of which are working through the Regional Greenhouse Gas Initiative (RGGI) that is attempting to establish a regional emissions trading zone for utility sector emissions in the northeast. California has also interpreted its 2006 climate legislation to allow for development of a comprehensive cap-and-trade system. In turn, both RGGI and California are keen to expand their coverage to include as many of their neighbors as possible and it is quite plausible that the total number of states with a cap-and-trade program will grow in the coming months. However, it is not clear that emissions trading retains as strong a base of political support as tools such as renewable portfolio standards. Not only are the number of RPS states more than double that of states pledged to cap-and-trade but prior U.S. Senate votes over a national carbon trading system, most notably through iterations of the proposed Climate Stewardship Act, have received considerably fewer votes than earlier proposals for a national RPS (Rabe 2007).

At the same time that cap-and-trade blends a reasonable level of economic and political appeal its Achilles Heel may be its extreme complexity and steep implementation challenges. Whereas both carbon taxes and renewable portfolio standards are relatively straightforward policies to implement, whatever their shortcomings either politically or economically, that is simply not the case for carbon cap-and-trade. The early experience with this policy in the implementation stage underscores that it has features of what political scientist Charles Jones once characterized as "policy beyond capacity" (Jones 1975). This early difficulty may be exacerbated by the very weak intergovernmental institutions establish to date to secure inter-jurisdictional efficacy.

The economic elegance of cap-and-trade quickly dissolves once one moves toward actual policy development and implementation, at least based on early experience in the United States and elsewhere. In Europe, the ETS failed to establish an institutional structure that might have allowed it to run effectively. Each member of the EU was permitted to allocate and monitor its own emission allowances, without any overarching authority in place to assure accuracy and integrity. EU members had little experience with any form of emissions trading and the ETS experience is emerging as a textbook example of how not to put a cap-and-trade system into place. National compliance plans were loosely

structured and repeatedly violated in implementation, with few if any consequences from the EU or its member nations.

Early North American experience with the same tool underscores these difficulties. In RGGI, multi-stage negotiations have proceeded for more than four years, building on a history of northeastern regional collaboration on a wide range of environmental and energy issues. What has emerged is a set of components in a treaty-like agreement, endorsed by the nine signatory states and being considered by others. However, each state must still secure formal support politically, whether through legislation or formal executive action before it can begin to move forward on implementation. In turn, many key elements of the system, such as whether emission allowances should be auctioned or distributed without charge and the methods of curbing carbon emissions from electricity generated outside of the RGGI zone, remain unresolved and highly-contentious. At the same time, RGGI features a dizzying array of provisions that address such issues as offsets, "early reduction credits," "triggers," and "safety valves" that will require considerable administrative sophistication and intergovernmental collaboration to sustain. Perhaps predictably, individual states and interest groups bring very different agendas to the negotiations over cap-and-trade programs thereby weakening its economic purity. States with smaller populations or projections for population growth seek favored status in the allocation of emission allowances.

Perhaps the political challenges are most evident in California. The 2006 authorizing legislation was clear about the desirability of a statewide emissions cap but intentionally evaded the issue of whether a trading mechanism would be established because it was so divisive. In 2007, Governor Arnold Schwarzenegger used his executive authority to insist on such a trading system but this has proven extremely controversial. On the one hand, a number of industry groups suggest that such a system will be particularly disadvantageous to them. This has produced a splintering of interests and competing pressures on the California Air Resources Board to adjust any trading system to ease challenges for particular sectors. On the other hand, a range of environmental groups contend that emissions trading is a "sell-out that endorses pollution"; their reading of the 2006 statute suggests early and aggressive mandated reductions rather than a more flexible cap-and-trade system. Environmental justice advocates have further contended that any trading system will place particular disadvantages on low-income and predominantly-minority communities. Many state legislators have joined this chorus in Sacramento, alleging that Schwarzenegger has exceeded his powers and should instead focus on an immediate command-and-control approach. As State Senate President Don Perata has stated, the 2006 Global Warming Solutions bill "is getting bogged down in arcane discussions over intercontinental trading schemes, 'carbon markets,' and free 'credits'. That may work for Wall Street traders and Enron economists, but it doesn't work for Californians" (*Carbon Control News, 2007).* At the same time that California is struggling to implement its own variant of a cap-and-trade system, it is also negotiating a multi-state pact that follows the regional approach taken by RGGI. Thus far, the Governors of Arizona, New Mexico, Oregon, and Washington have signed a

memorandum-of-understanding with California to begin work on the "design for a regional market-based multi-sector mechanism, such as a load-based cap and trade program." None of these states, however, have joined California in adopting emissions trading legislation.

LOOKING AHEAD: FROM A STATE-CENTRIC TO A FEDERAL SYSTEM?

The resurgent interest in climate change evident in the 110th Congress raises the serious possibility that federal climate legislation could be enacted at some point during the next few years. Proposals in both the House and the Senate cover all three of the policy types presented in this paper, although most attention is being devoted to renewable energy mandates (for both electricity and fuel) and a cap-and-trade system. There is no guarantee that Congress will take action at any future point, having conducted at least 175 climate change hearings since 1975 and not yet attained legislative consensus on any issue besides funding of additional research (Rabe 2007). The possibility of national-level action atop a growing tapestry of state and regional policies offers unique opportunities and challenges for future federal activity. To date, there is very little evidence of serious Congressional efforts at intergovernmental learning, as portions of only two of these previous hearings have given any attention to state level policy lessons or intergovernmental policy design issues.

Prior experience suggests at least three distinct intergovernmental paths for American climate policy. First, there is substantial precedent for federal government preemption of existing state policies. In such instances, Congress often responds to industry concerns about inter-state regulatory variation and eliminates the "patchwork quilt" of policies with a uniform program (Nivola 2002; Posner 2005). Such diverse individuals as John Engler of the National Association of Manufacturers and U.S. Senator Barbara Boxer (D-CA) have referred to preemption as a distinct possibility, essentially wiping out existing state policies as part of a larger bargain to create a nation-wide policy. Such policies could also establish a baseline later than 1990 for reductions, much as is being proposed in the latest legislative proposals in Canada. This would, of course, invariably raise concerns about equity among those states that have achieved low emissions growth (through whatever mechanism) and might be denied credit. Moreover, states that had actively developed their own policies would argue that preemption was particularly unfair to them as it would invalidate their early investments. In turn, some concerns have arisen that a federal preemption policy of modest scope might actually achieve lower emission reductions than through the existing compilation of state policies. Nonetheless, any serious discussion of a Congressionally-enacted cap-and-trade program or a renewable portfolio standard increasingly turns to the possibility of federal usurpation of a policy arena heretofore developed and dominated by states.

Second, it remains very possible to envision a system that retains a strong bottom-up emphasis, at least for several more years. There is no guarantee that Congress or the executive branch will reach closure on any policy in the coming years and there are numerous areas of policy in which nationalization seemed inevitable but have continued to operate with state-domination (Teske 2004; World Resources Institute 2007). The recent patterns of diffusion, proliferation, and regionalization in state climate policy seem very likely to continue. This will be reflected in expanded adoption of policies already operational in one or more states and the growing pattern of multi-state negotiation once neighboring states establish similar or identical policies. It is conceivable that the United States could even set a national cap of sorts and simply allocate overall allowance or reduction requirements state-by-state, then allowing for inter-state bargaining over the mechanics of reduction. This would follow the model of the European Union and would require some form of intergovernmental coordination superior to the EU ETS. No current policy proposals in Congress follow this format and, instead, continued bottom-up policy development in the absence of formal federal engagement remains more likely.

Third, it is at least possible to envision an American climate policy that builds on the respective strengths of both state and federal governments. As discussed, many states have developed considerable climate policy expertise and may remain particularly well-equipped to target areas of "low-hanging fruit," namely low-cost emission reductions unique to their state. At the same time, the federal government retains the ability to develop consistent rules and incentives on a national scale and, of course, the Constitutional authority to work collaboratively with other nations. Perhaps the United States could evolve into a multi-tier climate governance system, consistent with practice in other areas of environmental, educational, and medical care policy. One such option is a two-tiered mechanism whereby, unlike preemption, the federal government would establish a national minimum but states would be free to retain or develop policies that were more ambitious. Relatedly, it remains possible that climate policy will follow an iterative path for some time, with at least some states continuing to play a role of policy innovator and thereby influencing various rounds of federal policy.

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Table 1-----State Carbon Dioxide Emission Trends, 1990-2003*

States Below National Average

	1990	2003	Pct. Change
Delaware	18	17	-5
Louisiana	191	189	-1
District of Columbia	4	4	0
Hawaii	21	21	0
Connecticut	41	42	2
Michigan	180	183	2
New York	208	214	3
Pennsylvania	260	267	3
Massachusetts	83	86	4
California	361	384	6
Ohio	243	261	7
South Dakota	12	13	8
West Virginia	105	113	8
New Jersey	114	124	9
New Mexico	52	57	10
Wyoming	57	63	11
Kansas	69	77	12
Indiana	201	228	13
Maryland	70	79	13
Washington	71	80	13
Tennessee	105	121	15
Utah	53	61	15
Oklahoma	88	102	16

States Above National Average

	1990	2003	Pct. Change
Illinois	192	227	18
Montana	28	33	18
North Dakota	40	47	18
Texas	587	694	18
Kentucky	118	141	19
Georgia	138	166	20
Vermont	5	6	20
Maine	19	23	21
Wisconsin	85	103	21
Iowa	63	77	22
Rhode Island	9	11	22
Alabama	108	135	25
Minnesota	79	99	25
Arkansas	51	65	27
Idaho	11	14	27
Nebraska	33	42	27
Alaska	34	44	29
Mississippi	48	62	29
Oregon	31	40	29
Virginia	94	121	29
Florida	186	242	30
North Carolina	110	144	31
South Carolina	61	80	31
Missouri	103	136	32
Colorado	66	88	33
New Hampshire	15	20	33
Arizona	62	88	42
Nevada	30	43	43

*Fossil Fuel Combustion, Million Metric Tons CO_2 ($MMTCO_2$). Includes emissions from commercial, electric power, industrial, and transportation sectors

Source: U.S. Environmental Protection Agency (2007)

Figure 1 – State Climate Policy Development and Greenhouse Gas Emission Trends

Emission Growth Trends (1990-2003)*

		High (>15%)	Low (< 15%)
Levels of State Climate Policy Development**	**High (2 or more policies)**	10 States Arizona Minnesota Oregon	12 States California New Mexico Pennsylvania
	Low (0-1 policies)	22 States Alabama Florida Texas	7 States Louisiana Michigan West Virginia

* See Table 1

**Measures the following policies within a state: Renewable Portfolio Standard
Carbon Tax
Renewable Fuel Standard
Carbon Cap-and-Trade
Statewide Emissions Target
Mandatory Emissions Reporting
Litigation (*Ma. Vs. EPA* Plaintiff)
Vehicle Emission Regulations (CA adoptees)

Figure 2 – Political Feasibility and Economic Desirability of State Climate Policy Tools

Economic Desirability*

		High	Medium	Low
Political Feasibility**	High			Renewable Portfolio Standard (23)
	Medium		Cap & Trade (10)	
	Low	Carbon Tax (0)***		

*Reflected in climate policy literature review (Rabe 2007)
**Measured by number of states adopting policy: 0-5 – Low
6-10 – Medium
11 – above - High
***Excludes stealth-like programs such as public benefits charges/social benefits funds