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California’s Climate Change Policy

The Case of a Subnational State Actor Tackling a Global Challenge

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For all its economic capacity, population size, and resource base, California remains only one among the 50 United States and, essentially, is a subnational actor attempting to play a role in the climate change policy arena on par with the nation-states of the world. This raises a series of questions about the substance and breadth of the state’s new policy and what has motivated it. The state’s policy declarations and initial flurry of activities are impressive. As with all so broad and sweeping initiatives, it remains to be seen the extent to which policy goals can and will be translated into operational rules and regulations, incentives and sanctions, and actual accomplishments across all the sectors of the state’s economy over the course of not just months and years but the decades to come.

**Keywords:** California; climate policy; regulation; environmental political economy

The debate is over. We know the science. We see the threat. And we know the time for action is now.  

California Governor Arnold Schwarzenegger, June 1, 2005

California has surpassed any other American state in the sheer range of climate policies enacted or the boldness of its overall emissions reduction plan. The state can even lay credible claim to “world leadership” on this issue.  

Barry G. Rabe, 2007

Political leaders in California and the nation’s leading climate change policy researchers argue that California is leading the United States in promulgating policies to reduce greenhouse gas (GHG) emissions. These policies are intended to substantially reduce the amount of fossil fuels used in the state and by doing so the carbon intensity of the state’s energy usage. They are also intended to inspire and...
encourage coordinated actions by other western states and adjacent Canadian provinces and to align the state with leading policies being adopted in the European Union. The effort and the belief by the state’s policy makers in its importance politically, economically, and environmentally were dramatically underscored when the legislature enacted the landmark Global Warming Solutions Act of 2006 (Assembly Bill 32 [AB 32]). The bill is the first state-level statute in the United States calling for a comprehensive, economy-wide, and multifaceted emissions-reduction effort.

AB 32 and other recent climate change policies can be seen, at least in part, as the latest manifestation of the state’s decades-long effort to promote energy efficiency and alternative energy and to reduce conventional air emissions from fixed and mobile sources. As reported in the recent California Energy Commission (CEC, 2007) annual energy report, after years of nearly parallel patterns of growth in per capita electric energy consumption,

while the United States increased per capita electricity consumption by nearly 50% over the past 30 years, California’s per capita electricity use remained almost flat due, in large part to a variety of cutting edge efficiency programs and cost-effective Building and Appliance efficiency standards. (p. 15)

In fact, some level of concern with climate change had been part of California’s attention to energy usage prior to the flurry of recent climate change policy activity. An early indication of attention to this can be traced back to 1988, when the CEC was directed to assess the likely impacts of climate change on the state’s economy, energy and water supplies, and agricultural activity (S. Brown, 2005). California’s efforts have already resulted in the state having one of the lowest rates of GHG emissions per person of any American state. Although California’s overall GHG emissions did increase 6% between 1990 and 2004, this was only 40% as much as the national average. California’s low emissions growth rate was out-performed only by states experiencing substantially less population and economic growth. California emissions during this period would have been essentially flat were it not for the growing emissions in the transportation sector. Standing at approximately 12.8 tons carbon dioxide (CO₂) per capita, this rate resembles those of energy-conserving nations such as Germany, at 12.4 tons CO₂ per capita. It is about half the U.S. per capita emissions rate of 24.3 tons CO₂.

**Background on California Climate Policies**

AB 32 stipulates that statewide emissions limits are to be enacted by 2011 and are to go into effect in 2012. In the meantime, “early action” measures for GHG reduction can be required by the California Air Resources Board (CARB). The intended direction of the state’s GHG-reduction goals has already been strongly suggested
through the governor’s executive order, which directs state agencies to begin planning for GHG emissions being reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050. To put this in perspective, the 2020 goal alone will require a 25% reduction in emissions. Figure 1 shows the forecasted emissions from California's economy. Four fifths of the emission reductions are expected to come from six key sectors of the state’s economy—power generation, manufacturing and industry, buildings, transport, forestry, and agriculture and waste.

Emissions from transport will also be reduced from the adoption of smart growth planning and urban and regional antisprawl design regulations. Based on this presumption, the state’s attorney general is already intervening in major land use decisions, demanding that climate change goals and strategies be included as conditions for permits and approvals (E. G. Brown, 2007).

All but a small portion of California's GHG emissions come from the combustion of fossil fuels. The overwhelming share of this combustion takes place in transportation and motor vehicles (40%) and the generation of electricity (22%). Nonetheless, the technical studies indicate that the moderate reductions mandated under AB 32 for 2020 should be sought disproportionately from the power sector because of the greater availability of relatively lower-cost emission-reduction measures. For instance, in a recent extensive modeling effort, the Electric Power
Research Institute (EPRI) forecasted that, to the extent that California implements AB 32 in a least-cost manner, 55% of the total GHG reductions will come from the electricity sector, compared to about 30% from private and commercial transportation (EPRI, 2007).

Attaining these reduction levels will require the application of a variety of policy “tools,” including some degree of command-and-control regulations, regulatory mandates, emissions trading across sources, direct and indirect subsidies for new technologies, and tax incentives. Many of the anticipated tools will be applied at the business firm level, such as setting emission caps for electricity-generating companies, whereas others will operate at the individual or household levels, such as incentives for purchasing low-emission vehicles or installing rooftop solar panels. The following section provides an overview of some of the prominent policies that have been enacted by the state.

Establishing an Economy-Wide Cap

AB 32 is the first state-level economy-wide approach in the United States, establishing a cap on GHG emissions that cuts across all major sectors of the economy to achieve the mandated reductions, and, in many respects, anticipates the kind of comprehensive approach hoped for in the post-Koyoto era now being entered into on the international stage (Clemencon, 2008). The cap also allows regulated actors to trade the rights to pollute GHGs among themselves. The trading portion of the cap equalizes marginal costs of mitigation among actors and potentially reduces statewide compliance costs. The legislation includes mandatory rules for reporting GHG emissions and calls for enforceable penalties in the event of noncompliance. It requires the publication of a list of specific, early action measures by June 30, 2007, that could be implemented before January 1, 2010. The recommended list covers 44 measures, primarily in transport but extending across every sector (CARB, 2007). As these early action measures are moving forward, the California Environmental Protection Agency (Cal/EPA) is required to provide an annual “report card” or benchmarks for the development of regulations that will determine how emissions reductions will be achieved from significant GHG sources, what policy tools will be employed, how equity will be ensured across regulated constituencies, and how it will be ensured that emission reductions will not have a disproportionate impact on low-income communities (Cal/EPA, 2007).

Curbing Tailpipe Emissions

California’s initial step in claiming leadership on climate change actually precedes AB 32 and reaches back to 2002 when it enacted legislation that established the first statutory caps in the United States on carbon emissions from vehicles (AB 1493, called the Pavley Bill). Transportation contributes 40% of the state’s GHG
emissions and approximately one third of the nation’s total. The legislation did not specify a particular technology to achieve the emissions reduction and ruled out such possible approaches as tax increases, required vehicular weight reduction, mandatory vehicular use reduction, and the prohibited sale of certain types of vehicles. Instead, it called for the development of a series of policies that would begin to take hold in 2009.

As required by the Pavley Bill, CARB developed the Climate Change Program for Mobile Sources, with standards designed to result in a 22% reduction of emissions by 2009 to 2012. In the second phase, from 2013 to 2016, the standards target a 205 g/mile emissions rate for cars and light trucks and a 332 g/mile rate for large trucks and SUVs. These targets represent a 30% reduction from the emissions rates in the baseline period. When converted to kilometers, the 205 g/mile target for passenger vehicles is 127 g/km, which is more or less comparable to the EU Commission’s (2008) proposal of 120 g/km by 2012.

However, the Pavley Bill almost immediately became mired in litigation based on allegations that California was overstepping its jurisdictional bounds and encroaching on regulatory issues preempted by the federal government. Specifically, the automobile manufacturers argued that the only practical way to reduce CO₂ emissions per vehicle mile was to improve the fuel economy of vehicles but that the federal government had previously preempted regulatory authority over this issue. Also, in completely separate litigation, in 1999 a group of NGOs had petitioned the U.S. Environmental Protection Agency (EPA) to initiate rule making to regulate GHG emissions from new automobiles. The EPA subsequently refused to do so. However, in 2007, the U.S. Supreme Court, in Massachusetts v. Environmental Protection Agency, found that CO₂ met the broad definition of a pollutant under the Clean Air Act and that the EPA had no discretion to refuse to consider its regulation. In a subsequent petition supported by 12 other states, California sought a waiver from the EPA to allow California to adopt new vehicle standards to implement AB 1493. In February 2008, the EPA issued a formal denial of this petition for a waiver of federal jurisdiction. This interjurisdictional battle is far from over, and California has appealed the ruling to the federal 9th Circuit Court (http://ag.ca.gov/cms_attachments/press/pfds/n1514_epapetition-1.pdf). The legal battle might become truncated in 2009 as both presidential candidates have pledged their support for the California waiver.

Decarbonizing Transportation Fuel

California also lays claim to having established “the world’s first global warming standard for fuel.” This policy takes the form of a low-carbon fuel standard that sets an initial goal of reducing the carbon intensity of California’s vehicle fuels by at least 10% by 2020. It was established through an executive order of the governor that is intended to reduce the carbon intensity of transportation fuels by encouraging greater use of low-carbon transportation fuels. Much like the renewable portfolio
standard (RPS), it outlines a series of low-carbon fuels that could contribute to meeting the standard, including electricity, liquefied petroleum gas, ethanol, and compressed natural gas. But it does not endorse any particular fuel or guarantee market shares to potential competitors. This policy remains in the very early stages of development. Executive Order S-01-07 states that the standard “shall be measured on a full fuels cycle basis,” which requires highly technical analysis of “well-to-wheel” sustainability issues and guarantees significant stakeholder involvement in administrative rulemaking or legislation.

**Mandating Clean Energy**

Perhaps the most popular emissions-reduction policy tools among the American states is the RPS imposed on retail sellers of electricity. The RPS requires these retailers to provide a portion of their electricity from renewable sources. A total of 24 states representing well more than half of the American population have established RPSs, with at least 10 others actively considering adoption of such a policy. It is not surprising that, as one of the leaders in this area, California has required that 20% of the electricity sold at retail in California be generated from renewable resources by 2010. The California Public Utilities Commission (PUC) is currently considering raising the target to 33% by 2020, and the draft compliance plan for AB 32 released by the Air Resources Board also recommends a 33% renewables target by 2020 (CARB, 2008b). In addition, Senate Bill 1368 mandates that no retail supplier of power in California can acquire a long-term generation resource having CO₂ intensity (metric tons of CO₂/MW hr generation) greater than a new efficient natural gas electricity plant. The goal is to limit the construction of new coal-fired electricity generation in the intermountain west that would serve California power demand. Combined, these measures ensure that the growth of GHGs associated with California electricity demand will be modest. However, once again, only AB 32 establishes explicit statewide comprehensive emissions-reductions targets.

**The Interdependence Between Electricity and Transportation**

One of the strategies very likely to be employed in reducing GHG emissions per passenger mile is the introduction of electric plug-in hybrid technology. In this case, the electric power provider essentially becomes a transportation fuel provider. However, if the electricity sector is simply subject to its own independent sectoral GHG cap, power suppliers will be penalized for satisfying the increased demand for electricity resulting from plug-in hybrids, even though this strategy may actually reduce overall GHG emissions. Thus, the policy challenge is to design the GHG regulations governing the transportation and electricity sectors so that they interact in a rational manner to achieve overall GHG reductions at least cost. This is another very...
interesting policy challenge to be worked out in the details of California’s policy implementation.

Taken together, the RPS, transportation efficiency, biofuels, and a likely economy-wide cap-and-trade program represent California’s comprehensive approach to reducing GHG emissions. In the sections that follow, we address the motivations of policy makers, the extent of policy innovation in California’s approach, the extent that a subnational actor can play a leading role in GHG policy, and the extent to which California’s lead is affecting national policy in the United States.

Subnational Leadership: Why Did California Choose to Act So Aggressively?

For all its economic capacity, population size, and resource base, California remains only one among 50 of the United States and, essentially, is a subnational actor attempting to play a role in the climate change policy arena on par with the nation-states of the world. This raises questions: Why has California moved so aggressively to assume this posture and new role? What has motivated the initiative? And what may this suggest for the future efforts among subnational actors to move center stage not only within their nation-states but also on the international stage, as we move further into the post-nation-state world of the 21st century (Hooghe & Marks, 2003; Ohame, 1995; Slaughter, 2004)? As we attempt to understand these developments, it needs to be remembered that policy articulation, the building of administrative capacity, and the mobilization of governmental and societal resources do not themselves ensure the intended changes in behavior and substantive results being sought. Important, especially in an area so broad and sweeping as climate change, it remains to be seen the extent to which policy goals are translated into operational rules and regulations, incentives and sanctions, and actual accomplishments across all the sectors of the state’s economy over the course of not just months and years but also the decades to come.

What motivated California’s Republican governor to team up with a Democratic assembly speaker and democratically controlled legislature to devise and pass AB 32? There is no unequivocal answer, though it has been widely explained in terms of political ambition, on one hand, and, political leaders attempting to position their state as a “first mover” or at least a “fast second” in capturing the economic value of the 21st century’s global, “green” economic revolution, on the other (Betsill & Rabe, in press). The governor and legislature have often said that they want California to “demonstrate leadership” in a critical area of environmental policy, where federal leadership is sorely lacking. That said, California acted after Kyoto entered into force and the EU Emissions Trading System had been in operation for nearly 2 years. In this sense, California did not act alone; rather, it views its actions in global eco-environmental policy terms. The fact is, California is one of the top 20 GHG
emitters globally, ahead of the nations of Spain and South Africa, and views itself as a member of the global community.

Credit claiming, or efforts to capture favorable political recognition by the state’s elected leaders, is also a credible explanation for California’s climate policy (Mayhew, 1974). Governor Schwarzenegger sought to burnish his environmental credentials by championing a cornerstone environmental cause in a state with a heavily proenvironment electorate. In doing so, he stood to gain by contrasting his position to President Bush’s policies and strongly posturing himself nationally—and internationally—as a moderate Republican voice. Democratic legislators were then left scrambling to fashion the specific legislative content of AB 32 in such a way that they could claim a share of the credit for its adoption. The Schwarzenegger strategy seems to have worked. Although AB 32 has the Democrat speaker of the state assembly name on it, the press and the public by and large identify the policy with Schwarzenegger, especially because in 2005 the governor took the initial strong steps prior toward passage of AB 32 in directing his cabinet secretaries to begin preparing for a state-level GHG policy initiative. In a world of state legislative and gubernatorial term limits, and in dealing with a policy with a long lead time before any evidence of its success is knowable, ambition may have been sufficient to motivate the unilateral adoption of this policy.

A “Free Lunch”?

A second often heard explanation for California’s strong climate change policy is that it is required to assert leadership—or at least not lose its high tech standing—in the emerging world of green technology and green global trade. Leadership is especially desirable if the GHG reductions could be achieved at no cost, or possibly even at a net negative cost, to the state. Supporting such a notion were three separate studies that were released during the deliberations over AB 32 by the Climate Action Team (CAT, 2006), the Center for Clean Air Policy (2006), and an adjunct professor at the University of California, Berkeley (Hanemann & Farrell, 2006). These studies forecast that implementation of the policies in AB 32 could be accomplished while incurring impacts ranging from no net cost to actual gains of several billion dollars in the form of increased energy efficiency savings and economic growth because of investments in new technologies and incubation of new businesses. In other words, adopting aggressive CO₂ reduction measures would provide a “free lunch.”

It is beyond the scope of this article to attempt to evaluate the modeling and forecasts of the three studies.¹ However, after passage of AB 32, in March 2007 Stavins, Jaffe, and Schatzki published a critique of the three California models, and in June 2007 EPRI published the results of its own substantial effort to model the potential results of implementing AB 32. Focusing especially on the modeling of energy-efficiency measures, Stavins et al. criticized the three studies for underestimating regulated entities’ compliance costs, underestimating emissions “leakage” to out-of-state
locations, underestimating program implementation costs, and underestimating the extent to which energy-efficiency measures would be adopted in the absence of GHG policies. Expressing similar criticisms, the EPRI modeling effort forecast a net positive cost of implementation but with a wide variation depending on the precise choices made among inherently controversial modeling assumptions regarding energy-efficiency investment behavior. It is important that both Stavins and EPRI emphasized the need to move beyond the use of models to generate speculative forecasts of absolute levels of compliance costs and instead recommend turning the modeling focus toward analyses of alternative policy designs.

Although it is not clear to what extent the initial studies actually affected legislative voting, they certainly provided some technical cover for any legislator who may have been teetering on the edge of supporting the policy. For anyone who believed that there truly would be net negative implementation costs, the case for unilateral action would have been considerably strengthened compared to a strategy of not acting until a broader coalition of states could be brought together.

Responding to Public Demand

Political responsiveness has been given as another explanation for California’s action on climate change, with the state leaders simply responding to public opinion combined with the well-organized efforts of the environmental community. The most recent and thorough survey of Californians on environmental issues—the Public Policy Institute of California (PPIC) survey of July 2007—showed that concern with the environment remains one of the paramount issues in the minds of Californians, with concern about air pollution continuing to top the list. Moreover, it appears that the extraordinary state, national, and international publicity that California has received with the unveiling of AB 32 and associated climate and clean air policies, and the accompanying media coverage of the now “green governor” of the state, Arnold Schwarzenegger, has added climate change to the mix of environmental concerns and “environmental anxieties,” according to the survey.

The spreading message of the scientific community about the ramifications of climate change would appear to be underlying the growing expectation for even more substantial and rapid state action. Global warming is identified as the biggest environmental problem facing the state by 11% of the adult population, up from bare mention in previous years. “Even more striking,” according to the PPIC researchers, “for the first time a majority of Californians (54%) say that global warming poses a very serious threat to the state’s future economy and quality of life” (PPIC, 2007). A substantial three fourths of the state’s adults support AB 32, and an even larger proportion, more than 80%, supports the 2002 state law that requires automakers to reduce emissions from new cars sold in California, starting in 2009 (PPIC, 2007).

The survey also speaks to the decision level and locus of authority that Californians believe appropriate in addressing the state’s environmental challenges,
at least with respect to air pollution policy. When asked if it should be at the level of the federal, state, regional, or local government, the vast majority prefers the state.

The Window of Opportunity

In view of the several possible explanations, we return to the question of why. The most appropriate answer, we believe, lies beyond rational political actors maximizing their self-interest and ambitions or any of the other conventional explanations, at least taken by themselves. Rather, the successful adoption of major public policies appears to be the result of the rare occurrence when the stars are aligned just right—in John Kingdon’s (2003) terms, when the “window of opportunity” for a major policy change is pried open just far enough. Kingdon’s approach and contribution to our understanding of major policy change are twofold. First, he argued that politics and policy making are not like physics and cannot be understood mechanistically, where the course of policy follows predictable patterns. Rather, the emergence of major public policy is the confluence of three separate “policy streams” that converge in a “window of opportunity,” and only then is major change in public policy possible. The three streams are the recognition of a situation as a problem (e.g., that GHG emissions are rising, that they are the result of human behavior, and that this poses an extreme threat to humankind), the presence of a host of advocates waiting in the wing with potential policy solutions, and finally the alignment of political forces, ambitions, and the executive and legislative actors ready to respond, that is, the presence of political timing (Kingdon, 2003).

Climate change policy in California meets the Kingdon (2003) test of an issue that had been sufficiently elevated as a serious problem in need of public policy response. An army of climate change activists within and outside the state saw California as ripe for action and brought forth a series of policy proposals. And the political needs of a Republican governor and democratically controlled state legislature converged, with the governor especially in need of an issue by which he could reposition himself and redefine his political image among the California electorate.

Subnational Innovations: Strong Leadership, Shared Responsibility, Continuous Feedback, Science, and Transparency

As important as are the innovative ideas and implementation strategies that have been woven together by the governor and legislature in designing California’s climate change policy, equally important is what they did not do. They chose not to follow the conventional strategy of delegating problem identification and specification of the state’s long-term macro-GHG policy reduction goals to an existing state agency, with the inevitable vagaries of bureaucratic deliberations and special interest lobbying that often follows. For one thing, the issue is too all encompassing,
affecting every sector of the state, with too great an uncertainty about how best to proceed and too politically and scientifically contentious to follow the conventional approach to policy implementation. Instead, specific GHG policy goals were set forth in AB 32 and accompanying legislation and the governor’s executive orders, with performance benchmarks that are to be attained beginning in 2010 and extending out to 2050. The policy goals are clear, numerical, and easy for everyone and, important, the general public to understand and, hopefully, to embrace.

The Climate Change Team (CAT)

How the state government would be directed to implement the goals was not approached in the normal manner either. The governor and legislature did not delegate decisions about the implementation process and rules and regulations over substantive issues to a single state agency, new or existing, at least not thus far in the early stages of implementation. Rather, the governor established the CAT as the peak administrative and oversight body, with responsibility to report on the array of agency and department-level activities and the overall progress on GHG policy to the governor, legislature, and public. Responsibility for coordinating the climate team was given to the secretary of the California EPA by the governor. The governor’s order states,

The Secretary of Cal-EPA will lead a Climate Action Team made up of representatives from the agencies listed above to implement global warming emission reduction programs and report on the progress made toward meeting the statewide greenhouse gas targets that were established in the executive order. (Schwarzenegger, 2005)

The CAT is made up of the secretary of the Business, Transportation and Housing Agency, the secretary of the Department of Food and Agriculture, the secretary of the Resources Agency, the chairperson of the Air Resources Board, the chairperson of the State Energy Resources Conservation and Development Commission, and the president of the PUC. Under the guidance of the CAT, much work has been assigned to the relevant agencies of the state. To ensure transparency of activities, to encourage dialogue and input, and to educate everyone involved, the activities, deliberations, and documents of the different agencies, departments, and commissions are regularly posted on the California Climate Change Portal (http://www.climate-change.ca.gov/index.html), and meetings are announced widely and often broadcast via the Web for those who cannot attend in person.

Administering Substantive Policy Components

Given that fossil fuels are the major source of GHGs and these fuels are inputs into every major sector of the economy, the regulation of GHGs is complicated. The institutional arrangements to regulate GHGs in California reflect the breadth and
depth of fossil fuel consumption in a modern economy. The primary air quality regulator in the state has been Cal/EPA’s CARB. As a department within Cal/EPA, CARB has been given lead agency status in the ongoing efforts to develop rules for GHG mitigation under both the Pavley Bill and AB 32. CARB has been exercising its authority to develop rules for nearly all aspects of California’s GHG-reduction strategies, and some might consider it a “strong executive” agency. However, CARB has been tasked to develop the rules under AB 32 with both the California PUC, which regulates the investor-owned utilities, and the State Energy Resources Conservation and Development Commission, more commonly known as the CEC. AB 32 states that CARB must consult with these two agencies “on all aspects of its plan that pertain to energy related matters.” Thus, CARB is utilizing the existing rule-making expertise of the CEC and PUC in the electricity sector while it moves ahead on other sectors such as petroleum refining and other industrial emitters as well as the transport sector.

A broad system of advisory bodies and mechanisms for public and stakeholder inputs has been established as well as state funding of a wide range of policy, technical, and scientific studies and reports (see http://www.climatechange.ca.gov). Based on the state’s ambitious goals, the growing administrative capacity devoted to carrying out these goals, the public’s support for the policy and expectations that the state will succeed, and the increasing economic ramifications this implies for the state’s economy, it is understandable that the policies that have been adopted have been widely characterized as the most comprehensive in the United States—and possibly beyond.

California’s administrative design might be considered another case of “committee rule,” but it actually devolves decision making to relevant actors. For example, the EPA shares decision making with other federal and state agencies. This design is not likely to remain unique. In one of the leading contenders for federal government climate change policy, the Lieberman-Warner Climate Security Act of 2007, a Carbon Market Efficiency Board would be established to advise on market and environmental policies. That bill also designates the Secretary of Agriculture responsible for offset accreditation. And the Department of Labor would be responsible for worker retraining for those who are adversely affected by the bill. Implementation of climate policies involves all sectors of the government and the economy, and California’s administrative structure, while leading the way, simply mirrors this reality.

A Think Tank for Climate Change

To foster scientific research on GHG and inform the decision makers and the public yet maintaining an arm’s-length distance from the policy-making and administrative processes, the state’s PUC established an independent think thank, the California Institute for Climate Solutions, in April 2008. The institute will be funded through a surcharge on utility fees regulated by the PUC, generating $60 million per
year for the institute for 10 years. For California, this is an extraordinary commit-
tment to research, matched only by the traditional efforts of the federal government.

In sum, to tackle an extraordinary challenge that reaches across all sectors of the
economy, that will require decades, not simply years, to address, with significant
uncertainty about the governing process and substantive changes that will be
required, California has initiated an equally extraordinary implementation process.

To What Extent Is Subnational Leadership Affecting National
Government Policy and Vice Versa?

In instances where a state attempts to regulate behavior or activities in a particular
arena within its borders that has broad implications for other states and especially the
federal government, it undergoes significant scrutiny and often meets substantial resis-
tance. GHG policy is one of those arenas. First, under the Interstate Commerce Clause
of the U.S. Constitution, states are forbidden from enacting laws that place an undue
burden on interstate commerce. In this regard, the precise dividing line between per-
missible and forbidden state regulations is not a bright line. Many observers agree that
it is very difficult for a state to enact regulations that are highly effective in reducing GHG
emissions, that avoid significant leakage, and that also do not place an illegal burden on
interstate commerce. Second, under the Supremacy Clause of the U.S. Constitution, fed-
eral law preempts any conflicting state law. This preemption need not be explicit so long
as courts determine that the federal government has “moved to occupy the field.” In view
of the recent court finding that carbon dioxide is a pollutant under the California Clean
Air Act, the stage is already set for preemption arguments. Moreover, in deliberating over
any national GHG legislation, Congress will need to grapple with whether state GHG
laws should be explicitly allowed to coexist or be preempted.

Third, states cannot collectively enter into agreements with one another to form
interstate compacts without express federal legislation enabling them to do so. Finally,
states cannot themselves enter into international treaties with foreign countries to reduce
GHG emissions. In short, the states have very circumscribed powers to effectively regu-
late GHG emissions and, in the final analysis, must necessarily rely on or at least be com-
patible with federal policy to achieve the best-rationalized overall GHG policies.

Nonetheless, California did adopt AB 32, aware that it would be seen as a chal-
lenge to federal authority and in direct opposition to the position taken by the admin-
istration of President George Bush. In this regard, California’s action needs to be
understood at least partially as instrumental, as posturing to serve as a catalyst to
spur federal action. With respect to the anticipated reaction by the business commu-
nity, rather than risking up to tens if not hundreds of different sets of GHG regula-
tions as California sets a course that others states would soon follow, some hoped that
American business would soon have a change of heart and support federal standards
in an effort to preempt the commercial chaos of a patchwork of state GHG policies.
In effect, one way to view California’s action on climate change is that it is an attempt to promote a GHG agenda not just for the state but for the nation. This is true not only in terms of forcing federal executive and legislative action but also in terms of specific policy design elements that California has adopted and believes necessary to effectively deal with GHGs. This section reviews what the state has proposed thus far and what are believed to be the “best practices” in climate policy for the state, which in turn can be seen as a subnational policy pilot and the “foreshadowing” of forthcoming federal climate policy.

**Market-Based Compliance Mechanisms**

From the beginning, a debate has been engaged in California over the appropriate scope and role of possible market-based regulatory mechanisms. This debate has echoed similar international debates over implementing the Kyoto Protocol through cap-and-trade versus other mechanisms, albeit with far more attention given to the cap-and-trade approach than a comprehensive carbon tax policy approach represented in the debates in the European Union and some developing countries where advocates want nations to internalize the actual costs and bear the direct effects of GHG reductions (which can be sidestepped to an extensive degree through a cap-and-trade approach). In the California debate, the initial position of most Republicans with the notable exception of Governor Schwarzenegger was to oppose or at best be lukewarm to any mandatory GHG emissions controls. However, once it was evident that GHG controls were going to be adopted, almost all Republicans endorsed market-based compliance (generally understood to mean a cap-and-trade program). Although it is not clear whether antipathy toward the cap-and-trade approach is broadly shared among most Democrats, in the configuration of political forces in the state the approach has been strongly opposed by the environmental justice (EJ) community and appears to have exerted a strong influence on the position taken by their key allies among Democratic Party leadership figures (most notably, Assembly Speaker Nunez) who have been hostile to heavy reliance on such market-based policies. The issue was finessed politically in the final form of AB 32, which directed CARB to consider the use of market-based compliance mechanisms. The statute thus allows, but does not mandate, their adoption. Although the issue has yet to be decided, in June 2007 the Market Advisory Committee convened by CARB recommended adoption of a cap-and-trade system (Market Advisory Committee, 2007).

Why the opposition to a market-based approach? Some opponents believe that there are so many failures in market systems that they would prefer direct specific technological paths rather than leave such choices to the market. Others fear that the “cap” in “cap and trade” may be too easily politically eroded with the introduction of supplementary allowances and offsets. Still others believe that the price signals generated under cap and trade will not accomplish what economists forecast because the resulting allowance prices will be too volatile to be politically credible over the
long term and, therefore, will not adequately support the huge investments needed in new low-carbon technologies.

**Allowances: Free Allocation Versus Auctions**

One of the most important discussions that has arisen within the context of considering the design of a cap-and-trade program is whether and to what extent emission allowances should be auctioned or allocated free of charge. The most successful cap-and-trade program in the United States has been the sulfur oxide (SOx) trading program authorized under the Clean Air Act Amendments of 1990. Consequently, the initial touchstone for thinking about how best to design a cap-and-trade program for GHG emissions has been to consult the design of the national SOx trading program. This law proceeded by establishing a historical baseline of individual SOx emissions by large-point sources (mainly electricity-generation boilers) and then freely allocating to each of these sources a sufficient quantity of allowances to meet the targeted overall percentage of emission reductions. This allocation, based on roughly equal percentage reductions from the historical baseline, was seen as broadly equitable. Moreover, it was probably necessary to freely allocate these allowances rather than auction them to garner the required political support to pass the law.

However, intervening events, especially the experience under the European Union’s Emissions Trading Scheme (EU-ETS), have thoroughly reversed the presupposition that GHG emission allowances should be allocated free of charge to emitters based on historical baseline emissions. The political problem that arose under the EU-ETS was that many electricity generators reaped substantial windfall gains from the free allocations employed as part of the EU-ETS, whereas consumers paid for these windfall gains in the form of higher electricity prices.

In addition to windfall concerns, there are at least two strong political motivations supporting the auctioning of a sizeable portion of allowances. First and foremost, such an auction would generate revenues that could be used to subsidize development of new technologies and provide economic adjustment assistance for heavily affected sectors. Second, allocating allowances by auction—as opposed to giving them away based on past levels of emissions—treats incumbents and new entrants equally.

California is being proactive in addressing upstream and downstream emissions associated with energy use. Instead of regulating emissions only from within California’s jurisdiction, AB 32 addresses emissions associated with imported electricity. The bill directs the CARB to consider a “load-based” standard. A load-based cap-and-trade program has been proposed for the neighboring state of Oregon because it potentially addresses the emissions from sources of pollution that are outside the state jurisdiction but that meet state electricity demand within the state. Entities that import power into the state are held accountable for the emissions associated with the electricity. Recently, the California PUC recommended to the CARB that it focus on “deliverers” of power into the California grid as the appropriate
“point of regulation.” This recommendation is similar to the “first-seller” approach recommended by the Market Advisory Committee and would hold individual importers responsible for the out-of-state emissions associated with the power that each imports into California. This regulatory approach is believed to help reduce legal problems stemming from the Interstate Commerce Clause requirement to treat trade, in this case electricity, between states fairly. By regulating importers, it is also believed that the emissions associated with traded power will be more transparent and less likely to suffer from gaming, where high-emitting generation is imported into the state masquerading as low-emitting generation.

**Alternative Compliance Mechanisms**

The allowable scope for use of emissions “offsets” has been a controversial subject throughout the international debate over global warming policies (e.g., the debates over the appropriate design, scope, and applicability of the Clean Development Mechanism and Joint Implementation under the Kyoto Protocol). Likewise, similar debates over offsets have arisen in California, although the full debate has yet to be thoroughly joined for lack of a ripe regulatory decision-making forum.

**AB 32** does not actually use the term *offsets*. Instead, it uses the term *alternative compliance mechanisms*, which it specifically defines as “an action undertaken by a greenhouse gas emissions source that achieves the equivalent reduction of greenhouse gas emissions over the same time period as a direct emission reduction.” It gives the CARB wide latitude to approve such offsets. In the only section of AB 32 where the use of alternative compliance mechanisms is specifically mentioned, the CARB is directed to “identify and make recommendations” regarding these mechanisms in its scoping plan by January 1, 2009. Any such mechanisms must comply with the general requirement that these emission reductions be “real, permanent, quantifiable, verifiable, and enforceable by the state board” (sec. 38562(d)(1)).

At the international level, the debate over offsets has focused primarily on the issues of “supplementarity” and “additionality.” *Supplementarity* refers to the widely held viewpoint that offsets should be allowed to satisfy only a minority portion of an entity’s emission-reduction requirements. *Additionality* refers to the requirement that a strong case must be made that the emissions reduction that generates the offset would not otherwise have taken place but for the fact that it creates a valuable offset in the compliance market. Surely, whenever the debate is finally joined in California, these two issues will also be the main focus. However, the debate in California may have its own special flavor because of, first, the influence of the EJ community and, second, the belief by many that there will be ancillary benefits emanating from GHG regulations even to the extent of having a net negative implementation cost per the three studies released in 2006. Each of these factors seems likely to lead to a reduced scope of allowable offsets and especially the use of offsets arising from out-of-state emission reductions.
Safety Valves

Uncertainties about the cost and timing of the adoption of new emission-reduction technologies may create high or volatile allowance prices under a cap-and-trade program. Unusually high prices would tend to signal unforeseen compliance difficulties and economic hardship. Volatility in allowance prices could create a level of uncertainty incompatible with optimal investment in pollution reduction measures and could be very disruptive in certain short-term commodity markets, especially the wholesale electricity market. Consequently, many observers have argued for the inclusion of “safety valves” in GHG-reduction programs (Jacoby & Ellerman, 2004). For instance, under a cap-and-trade program, the government could effectively cap the price of allowances by committing to issue an unlimited number of supplementary allowances at a stated price (e.g., $30 per ton of CO₂e). The major advantage of such a pre-established and known safety-valve price would be that it would prevent volatility above the capped price and would establish a “tunable” upper limit on the diversion of economic resources from the rest of the economy to achieve GHG emission reductions. The major disadvantage of such a safety valve is that it would remove the hard cap on permitted GHG emissions by creating supplementary allowances.

AB 32 does not provide for a pre-established numerical safety valve. Instead, it contains a broad safety valve with a vague trigger to be exercised at the judgment of the governor. Specifically, sec. 38599 provides,

- In the event of extraordinary circumstances, catastrophic events, or threat of significant economic harm, the Governor may adjust the applicable deadlines for individual regulations, or for the state in aggregate, to the earliest feasible date after the deadline.
- The adjustment period may not exceed one year unless the Governor makes an additional adjustment pursuant to subdivision (a).

Thus, it would seem that the governor can invoke these emergency powers with considerable latitude and perhaps can do so an indefinite number of times (although the words are ambiguous as to whether there can be more than two sequential delays).

Environmental Justice (EJ)

One of the surprising political dynamics emerging during the formation of AB 32 and subsequent GHG policy deliberations is the political strength of the EJ community. In California, the EJ community is a loosely knit network of environmental advocates of various organizations that concern themselves largely with the impact of environmental policies and industrial location decisions on low-income and minority neighborhoods. Among other concerns, they are broadly skeptical about market-based mechanisms because, without supplementary regulations, they believe
that these mechanisms are unreliable and can lead to local pollution “hotspots” (Environmental Justice Action Committee, 2008). The EJ community has traditionally complained about such “hotspots” within the context of regulating health-sensitive “criteria” pollutants (e.g., SOx and nitrogen oxide [NOx]). The initial reaction of many in the GHG policy community was to dismiss the EJ concerns about “hotspots” as irrelevant for GHG emissions and reflective of a misunderstanding of the distinction between GHG and criteria pollutants. However, the EJ community persisted and ultimately made their case that GHG regulations could easily affect the locational distribution of unhealthful criteria pollutants because these emissions are highly correlated with general combustion activities and, therefore, also with CO\textsubscript{2} emissions.

Consequently, the EJ community was extremely effective in bringing political pressure to shape the provisions of AB 32, including the establishment of an Environmental Justice Advisory Board to CARB (see http://www.arb.ca.gov/cc/ejac/ejac.htm/). The act directs CARB to ensure that activities comply with the regulations “do not disproportionately impact low-income communities” and “do not interfere with efforts to achieve and maintain federal and state ambient air quality standards and to induce toxic air contaminant emissions.” Also, if CARB ultimately chooses to adopt market-based compliance mechanisms, the act requires that it first consider “localized impacts in communities that are already adversely impacted by air pollution” and then “design any market-based compliance mechanism to prevent any increase in the emissions of toxic air contaminants or criteria air pollutants” (sec. 38570(b)). Moreover, the market-based mechanism must be designed “to prevent any increase in the emissions of toxic air contaminants or criteria air pollutants.”

Finally, the act directs the CARB to conduct a series of public workshops to review its scoping plan and to “conduct a portion of these workshops in regions of the state that have the most significant exposure to air pollutants including, but not limited to, communities with minority populations, communities with low-income populations, or both” (sec. 38560.5.g). These sections of the bill demonstrate California’s concern with equity issues in designing its climate policies. Although the legislative elements of the act intend to assuage the concerns of the EJ community, it is not clear that reservations about market-based policies will be calmed, especially given the problems with the RECLAIM market for NOx pollution in Southern California. This market-based system contributed to, and was a victim of, the California power crises of 2001. The crisis lead to a run up in RECLAIM NOx prices, and the cap was dismantled. The program suspension led to a 6% increase in NOx emissions that EJ advocates have used as a rallying point against market-based systems. When combined with its cutting edge, market-based approaches to regulating GHGs, it is evident that California is committed to balancing both equity and efficiency as public policy goals.
Regional and Local Impacts on Climate Policy Development

Although California has the most aggressive GHG policies in the country, California is not the only state in the United States that has adopted GHG emissions policies. New Hampshire, Washington, and other small states have caps on small portions of their emissions sources (Pew Center on Global Climate Change, 2008). California’s stated goal is to link its GHG policies with those of other states in a system of cooperative joint action. The CEC goals include “parallel development of regional market” (Griffin, 2008). CARB’s draft scoping plan includes a recommendation for the “development of a California cap-and-trade program that links with other WCI Partner programs to create a regional market system” (CARB, 2008a, p. ES2). California has been instrumental in developing the western regional market as a result of its own GHG activities. This can be seen as an effort to reduce costs to California stakeholders by increasing the scope of the trading system as well as an effort to spur other U.S. states to regulate their energy sectors. This helps California to mitigate CO2 leakage, reducing the incentive for energy-intensive industries to relocate to other states to avoid regulation.

At this time, it appears that the Western Climate Initiative (WCI) and the northeast Regional Greenhouse Gas Initiative (RGGI) are likely to be the two most important vehicles for establishing these broader frameworks for multistate cooperation.

WCI

On February 26, 2007, the governors of California, Oregon, Washington, Arizona, and New Mexico signed the WCI, essentially consolidating, expanding, and deepening the initiatives that they began with the West Coast Governors Global Warming Initiative and the Southwest Climate Change Initiative. Within a few months, the state of Utah and the Canadian provinces of British Columbia and Manitoba joined the WCI. Significantly, the WCI membership cuts across philosophical and partisan political lines, including both Democratic and Republican governors as well as Canadian premiers from the Liberal Party and the New Democratic Party. The broad purpose of the WCI is to identify, evaluate, and implement ways to collectively reduce GHG emissions in the region and to achieve “co-benefits.” The initiative requires its signatories to set an overall regional reduction goal by August 2007, develop a market-based, multisector mechanism by August 2008, and participate in a central multistate GHG registry. In August 2007, the WCI members set an aggregate reduction target of reaching emissions 15% below 2005 levels by 2020. The WCI has not yet adopted longer-term goals, but it has officially noted that the Fourth Assessment Report of the Intergovernmental Panel on Climate Change suggests that reductions of GHG emissions of 50% to 85% from current levels by 2050 will be needed to contain climate risks. At least five of the WCI signatories
have previously stated long-term goals of reducing emissions by roughly 50% to 80% below 1990 levels by 2050. The multistate Climate Registry, a cross-border GHG registry that started in May 2007, has membership including 34 U.S. states, two Canadian provinces, and three Native American tribes.

RGGI

In December 2005, the governors of seven northeastern states (Connecticut, Delaware, Maine, New Hampshire, New Jersey, and Vermont) formed the RGGI and signed a Memorandum of Understanding to implement the first mandatory cap-and-trade program for CO\textsubscript{2} in the United States. Three more states (Massachusetts, Rhode Island, and Maryland) have subsequently joined, bringing the total membership to 10 states. Initially, the program will apply only to power plants of 25 megawatts or larger using at least 50% fossil fuels. Once implemented, the states may consider extending the reach of the program to other emission sources. It will begin by capping emissions at current levels in 2009 and then reducing emissions by 10% by 2019. In August 2006, the participants in RGGI issued a “Model Rule.” It is up to the legislatures in each state to jointly adopt statutes paralleling the provisions in this Model Rule. Allowances are to be distributed in accordance with each state’s adopted plan, but at least 25% of the allowances are to be auctioned, with the revenues used to fund beneficial energy programs. (As of our writing, six RGGI states have announced intentions to auction 100% of their allowances.) A source is allowed to cover up to 3% of its emissions through purchasing offsets, with triggers based on allowance prices potentially authorizing additional offsets to cover up to 20% of a source’s emissions.

These regional multistate initiatives, especially WCI and RGGI, are important because coordination of California’s programs with regional initiatives is an integral provision of AB 32:

The state board shall consult with other states, and the federal government, and other nations to identify the most effective strategies and methods to reduce greenhouse gases, manage greenhouse gas control programs, and to facilitate the development of integrated and cost-effective regional, national, and international greenhouse gas reduction programs. (sec. 38464)

Furthermore, the governor was even more specific about regional coordination and integration in his executive order establishing the Market Advisory Committee:

The State Air Resources Board shall collaborate with the Secretary for Environmental Protection and the Climate Action Team to develop a comprehensive market-based compliance program with the goal of creating a program that permits trading with the European Union, the Regional Greenhouse Gas Initiative and other jurisdictions.
Not only have California’s actions have been integral to the establishment of the regional market, but it is clear that California has larger international aspirations for its GHG policies.

**Conclusion**

California’s climate change policy is only in its infancy, though it is being designed to extend out to 2050. How effective it will ultimately prove to be is impossible to know at this juncture, though it is clearly worth following for anyone concerned with the climate change policy arena. Also of interest and importance is that the case illuminates what can happen when a subnational state actor chooses to insinuate itself into an issue of global breadth and effect, which is the normal purview of the nation-state of which it is only a member. In effect, California has unilaterally entered into the international policy arena and done so with ambitious policy goals and an extensive and innovative policy articulation and implementation strategy. Its plan is comprehensive, requiring GHG reductions from all sectors of society. It is inclusive, of all the relevant state agencies and of business, industry, and the environmental, health, and justice stakeholders in the state. Moreover, the state has recognized that although it may adopt policy unilaterally, the realities of the economic and energy activities of the state require it to work in collaboration with other states and even nations. This latter fact is clearly unprecedented and to an extent has challenged the prerogatives of the federal government. It has also triggered similar thinking and action by other subnational state actors in the United States and created its own albeit informal foreign policy in entering compacts, memoranda of understanding, and extensive information and policy-sharing agreements with Canada, the European Union, and, most recently, China. How binding and enforceable these agreements will be considered under the prevailing principles of international law has yet to be tested, though their intent is clear and may be reached through various less than legally binding but nevertheless viable bilateral compacts between the signature parties.

Finally, in view of the global scale and seriousness of the climate change challenge, California’s initiatives—in scope of policy, in innovative implementation strategy, in international outreach—may prove to be an exception to the normal role played by subnational actors on the world stage. Yet to the extent that subnational actors and cross-national networks and connections are becoming more prominent and important in the operations of those in the public, business, and nonprofit sectors in the 21st century, this may be only one of many new configurations of policy and subnational policy design that will become the hallmark of the coming decades.

**Note**

1. For an in-depth examination of the application of economic models to greenhouse emissions, see the March 2005 special issue of *The Journal of Environment & Development* (Vol. 14, No. 1).
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