

California's New Greenhouse Gas Laws

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Introduction and Overview

On August 31, 2006, the California Legislature passed AB 32, the California Global Warming Solutions Act; SB 1368, the Greenhouse Gas (GHG) Emissions Performance Standard; and SB 107, the Renewable Energy Act. AB 32 places a cap on all GHG emissions in California and requires that they be reduced to their 1990 levels by 2020. This is a reduction of 25–30 percent from the emissions projected to occur otherwise. SB 1368 prohibits any retail seller of electricity in California from entering into a long-term financial commitment for baseload generation if the GHG emissions are higher than those from combined-cycle natural gas. This performance standard applies to electricity generated out-of-state as well as in-state, and to publicly owned as well as investor-owned electric utilities (IOUs). SB 107 advances from 2017 to 2010 the deadline for compliance with an earlier enacted requirement that 20 percent of the electricity sold by IOUs in California come from renewable sources.

Together with other related regulatory actions taken by California, these laws constitute the most ambitious and comprehensive effort to control GHG emissions presently in force in the United States. They apply to the statewide emissions of all GHGs in California, not just carbon dioxide (CO₂).¹ While other states have set GHG emissions-reduction targets, several of which are more stringent for 2020, these targets either are not legally binding or have a narrower focus. The only other states with a binding cap on emissions are the seven northeastern states in the Regional Greenhouse Gas Initiative (RGGI). However, the RGGI

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¹The AB 32 cap includes emissions from electricity used in California but generated out of state. Including these emissions, California produced 492 million metric tons of CO₂-equivalent GHG emissions in 2004. Of this, 81 percent was emissions of CO₂ from the combustion of fossil fuels; 2.8 percent was from *other* sources of CO₂; 7.7 percent was from emissions of methane; 6.8 percent was from emissions of nitrous oxides; and the remaining 2.9 percent was from emissions of other GHGs (Bemis 2006).

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cap is restricted to CO₂ emissions from electric power generation, which, by 2019, must be reduced by 10 percent relative to their 2005 levels.²

The purpose of this article is to explain how California's GHG laws came to be enacted, why they took the form that they did, and how they differ from the approaches to pollution control adopted by the federal government in the 1990 Clean Air Act (CAA) and the northeastern states in the RGGI. The remainder of the paper is organized as follows. The second section describes early climate change policy in California, prior to the election of Governor Arnold Schwarzenegger. The third section describes the origins of the 2006 legislation, including the climate policy initiatives launched by the Schwarzenegger Administration between April 2004 and April 2006. While the application of these regulatory initiatives to GHG emissions was something new, they grew directly out of the state's prior regulatory experience with air pollution and energy efficiency, which is summarized in the fourth section. The next section describes the political debate in California over the GHG legislation during the summer of 2006 and summarizes the content of the legislation. The sixth section describes subsequent developments in California. The last section summarizes differences between California's approach and the approaches adopted in the CAA and RGGI.

Early Climate Change Policy in California³

Climate change first surfaced as a policy issue in California in 1988, when the legislature passed AB 4420, calling for an inventory of GHG emissions from all sources in California. In response, the California Energy Commission (CEC)—the designated implementing agency—prepared a series of reports, including a report on emissions-reduction strategies for California and an assessment of global warming impacts (CEC 1989, 1990, 1991). The CEC updated both the emissions inventory and the report on emissions-reduction strategies in 1997 (CEC 1998).

In 2000, the legislature passed SB 1771, which established an independent organization, the California Climate Action Registry, to record and register voluntary GHG emissions reductions achieved since 1990. The registry, which is a public nonprofit corporation, not a state agency, was designed to provide baseline protection to businesses that were willing to take early action to reduce their GHG emissions and to encourage them to report their emissions. The registry was required to adopt standards for verifying emissions reductions, identify approved auditors to verify emission reductions, and maintain a record of all emission baselines and reductions.

By 2002, the situation was as follows. During 2001, the registry had developed its reporting and certification protocols, gathered charter members, and built its online reporting software. It opened for business with twenty-three charter members in October 2002 (California Climate Action Registry, 2003). The CEC, as the lead state agency for climate change, had

²The emissions limit set by AB32 amounts to a 15-percent reduction relative to emissions in 2005. Since August 2006, three more states have joined RGGI. Also, Oregon, Washington, and Hawaii have since enacted the same emissions limit as AB 32, and Arizona and New Mexico are in the process of doing so. Illinois and Florida have adopted a similar emissions limit by executive order. Minnesota has enacted a law requiring a 30-percent reduction in GHG emissions from electricity, relative to 2005, by 2025.

³A fuller account of the political and legislative history summarized here can be found in Hanemann (2007).

issued an updated inventory of GHG emissions (CEC 2002), had funded an integrated climate impact assessment study for California (Wilson et al. 2003), and was developing a roadmap document for future follow-up impact assessment analysis (CEC 2003). In addition, CEC was actively funding research on carbon sequestration and other climate-related topics. Although there was substantial activity on climate change in California, the focus was primarily on the generation of information, advice, and guidance—not on regulation.

This changed significantly with the enactment of AB 1493, which was introduced by freshman Assembly member Fran Pavley and required the California Air Resources Board (CARB) to adopt regulations to reduce GHG emissions from new motor vehicles sold in California. Originally introduced in February 2001 as AB 1058, the bill immediately drew opposition from General Motors, the Alliance of Automobile Manufacturers, and the California Chamber of Commerce. As industry opposition intensified, the bill was modified. By May 2002, for example, the regulations were prohibited from including bans on any specific category of vehicle. This particular provision was a response to opposition from the automobile industry, which characterized this as an “anti-SUV, anti-minivan” bill. Following a media campaign by the automobile industry, the bill was stalled. The bill was revived at the end of June 2002 when an existing, unrelated bill, AB 1493, was amended by the Democratic leadership to include the content of AB 1058. The bill passed with a bare majority on a mostly party-line vote.

The final text of AB 1493 required CARB to “develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles.” The law did not mandate specific reduction levels, but instead set out three criteria for the new GHG emissions standards:

1. the standards must be “capable of being successfully accomplished within the time provided . . . taking into account environmental, economic, social and technological factors”;
2. the standards must be “economical to an owner or operator of a vehicle”; and
3. the impact of the new law on the economy and jobs in California, especially in the automobile industry, must be considered.

It was left to CARB, following these criteria, to decide what constitutes the “maximum feasible and cost-effective” reduction of emissions. CARB was instructed to provide auto makers with flexibility in complying with the emissions standard. In addition, CARB was restricted from adopting several potential forms of regulation; specifically, it may not:

1. impose additional fees or taxes on vehicles, fuel, or vehicle miles traveled;
2. ban the sale of any vehicle category (such as SUVs);
3. require a reduction in vehicle weight;
4. impose a limitation or reduction of speed limits; or
5. impose a limitation or reduction of vehicle miles traveled (VMT).

The law set a specific timetable for CARB: regulations must be adopted by January 1, 2005, for 2009-model-year vehicles. However, the regulations would not go into effect before January 1, 2006, in order to allow the legislature the opportunity to review and modify the regulations.

A few months later, in September 2002, the legislature passed SB 1078, which required California IOUs to obtain 20 percent of their electricity from renewable sources by 2017, then the most stringent renewable standard in the nation.⁴

The most important event that occurred next was the election of Governor Schwarzenegger in a special recall election against Governor Davis in October 2003. During the campaign, Schwarzenegger stressed his commitment to environmental protection and promised to support the effective implementation of AB 1493, but he did not highlight climate change specifically.⁵ Governor Schwarzenegger took office in November 2003 and appointed Terry Tamminen, former head of Environment Now, an environmental advocacy group, as Secretary of CalEPA, the supervisory agency for CARB. Under Tamminen, ending dependence on imported oil and promoting ocean protection would become the Schwarzenegger Administration's chief environmental priorities.

The Origins of the 2006 Legislation

The Schwarzenegger Administration's climate change policy evolved somewhat slowly at first. In April 2004, the governor announced a "Hydrogen Highway" initiative for California, a public and private partnership "that will create hydrogen highways all over the state of California by the year 2010."⁶ During the summer of 2004, Tamminen and his staff began to consider a specific GHG emissions-reduction target for California. In November 2004, the governors of California, Oregon, and Washington jointly approved a series of staff recommendations for managing GHG emissions, including using their combined purchasing power to obtain more fuel-efficient vehicles and coordinating reporting protocols for GHG emissions. They also flagged a regional carbon-trading program as an item for future consideration.

The Implementation of AB 1493

However, the main events of 2004 were the publication in June of the CARB staff report on regulations for implementing AB 1493, and their adoption by the CARB Board in September. The CARB staff had performed an evaluation of vehicular GHG emissions and the technologies available to reduce them, focusing only on technologies that were currently in use in at least some vehicle models or had been demonstrated by auto companies and/or vehicle component suppliers in at least prototype form. They did *not* consider hybrid gas-electric vehicles. The emissions standards took the form of fleet average emissions per new vehicle, in grams of CO₂ equivalent generated per mile driven, with a declining annual schedule for each model year between 2009 and 2016.⁷

⁴California was already generating about 10 percent of its electricity from renewables.

⁵Governor Davis also had promised to defend the implementation of AB 1493. His other climate-related action during 2003 was to negotiate an agreement with the governors of Oregon and Washington to collaborate in controlling GHG emissions.

⁶The quotation is from the governor's announcement on April 20, 2004.

⁷Auto makers selling over 60,000 vehicles must comply with the new fleet averages starting in model year 2009; smaller manufacturers have until 2016 to comply. Once they comply, both groups face the same annual fleet average emissions standard.

There were two separate standards, one for passenger cars and small trucks/SUVs, the other for large trucks/SUVs.⁸ The standards were to be introduced in two phases to allow auto makers to incorporate the changes into their normal product improvement cycle. Near-term standards (2009–2012), when fully phased in by 2012, would result in a reduction of GHG emissions of about 22 percent compared to the 2002 fleet; the mid-term standards (2013–2016) would result in a 30-percent reduction by 2016.

In addition to being allowed to average emissions reductions over their entire fleet of new vehicles in California, auto makers were allowed to use their own R&D to determine the most effective technology for their fleet. They were also permitted to use alternative methods of compliance to achieve their emissions reductions, for example, by reducing GHG emissions from their manufacturing facilities or by purchasing emissions-reduction credits from other sources.

The CARB staff defined cost-effectiveness in terms of the overall lifetime cost to the owner/operator of the vehicle; they did not consider the economic value of the reduced environmental damages associated with the reduction in emissions. They estimated that the 2016 standards would result in an average cost increase of \$1064 for passenger cars and small trucks/SUVs, and \$1029 for large trucks/SUV, but that this would be paid back by operating cost savings within five years, assuming a gasoline price of \$1.74 per gallon, and about three years with then-current gasoline prices. They concluded that the net savings to vehicle operators would provide an overall benefit to the California economy in terms of the impact on Gross State Product and statewide employment.

The automobile industry challenged both the staff's technology analysis and its cost estimates, arguing that the upfront vehicle costs would be larger and the operating savings smaller than estimated by CARB, leading to a net loss for vehicle operators.⁹ Another issue raised by the industry was the impact of lower fuel costs per mile (resulting from improved fuel economy) on total vehicle miles traveled (VMT), the rebound effect. This was analyzed by Small and Van Dender (2005) using annual data for the 50 states plus the District of Columbia. They found that the elasticity of VMT with respect to fuel cost per mile is smaller for California than for other states, partly because it declines with income, and California has a high average income. They estimated the short-run elasticity for California as -0.022 , and the long-run elasticity as -0.113 . Thus, if operating costs decreased by, say, 25 percent in California in 2009, the number of miles traveled there would increase by about 0.6 percent in 2009 and 2.8 percent in 2020.

Despite industry opposition, the CARB Board voted unanimously in September 2004 to adopt the staff recommendations and, since the legislature did not intervene to modify them, the regulations became law in January 2006. However, they have not yet taken effect. In December 2005, California applied to the USEPA for a waiver from the Clean Air Act in

⁸However, since a manufacturer is only required to meet the emissions limit on a fleet-average basis, over-compliance in one category of vehicle can offset undercompliance in the other. Johnson (2007) criticizes the way in which CARB set separate emissions limits for the two vehicle categories. He also argues that a "feebate" system involving a revenue-neutral tax on high-emissions vehicles combined with a subsidy on low-emissions ones would have been a more efficient economic instrument. However, this was specifically precluded by AB 1493.

⁹In light of the industry's overestimation of the cost of compliance with automobile regulations in the past (Anderson and Sherwood 2002), CARB staff dismissed these claims.

order to implement the regulations, but as of November 2007 there had been no response.¹⁰ Also, in December 2004, the automobile industry filed suit against CARB, asserting that the cap on GHG emissions is akin to a fuel economy standard, which is preempted by the federal government under the 1975 Energy Policy and Conservation Act. The case is currently being tried in the US District Court in Fresno.¹¹

Meanwhile, thirteen other states, which together with California make up over a third of the US automarket, have now expressed their intention to adopt the AB 1493 standards if these are upheld.¹² In Canada, which was considering legislating an emissions limit, the automobile industry has voluntarily agreed to adopt GHG reductions similar to AB 1493.

The Governor's Climate Change Initiative

During this time period, there was also growing anticipation about a significant announcement on climate change from the governor's office. The governor unveiled his climate change policy in San Francisco on June 1, 2005. The governor stated: "I say the debate is over. We know the science. We see the threat. And we know the time for action is now." The governor then signed Executive Order S-3-05, establishing the following targets for California: by 2010, reduce all GHG emissions to the level in 2000; by 2020, reduce emissions to the level in 1990; and by 2050, reduce emissions to 80 percent below the level in 1990. He also made an administrative change: CalEPA was now designated the state's lead agency for climate affairs, and the Joint Agency Climate Team, chaired by a CEC Commissioner, gave way to a Climate Action Team (CAT), chaired by the Secretary of CalEPA.

The executive order set targets, but it did not specify how the targets were to be met. Instead, it directed the Secretary of CalEPA to report to the governor and the legislature by January 2006, and biennially thereafter, on the progress in meeting the targets. The Secretary of CalEPA was also directed to report on the impacts of global warming on California.

The analysis for the report on implementing the governor's emissions targets was conducted by staff from the CAT agencies. The report focused primarily on the 2020 target. The main approach was to identify specific regulatory policies within the purview of state agencies that, in aggregate, could yield the 2020 target for emissions reduction—in effect, demonstrating the feasibility of this target. CAT came up with a set of forty regulatory actions by CEC, CARB, the California Public Utilities Commission, and other state agencies. Some were large, including AB 1493 plus additional automobile emissions reductions after 2016, increasing the proportion of electricity generated from renewable sources to 33 percent by 2020, promoting afforestation, and additional energy conservation by municipal utilities; others were small, such as regulating the handling of wet manure at animal facilities.

Implicit in this approach was an emphasis on "cap" rather than "cap and trade." There were two reasons for this. First, it was a natural extension of the regulatory approach traditionally used with air pollution and energy efficiency in California. Second, strong oppo-

¹⁰The EPA has stated that it will issue a decision by the end of 2007. Meanwhile, in November, California filed a suit seeking that the EPA be compelled to issue a waiver.

¹¹A hearing was scheduled in Fresno for November 2007.

¹²One of these states is Vermont. Using the same arguments as in California, the automobile industry also filed a suit against Vermont to block its version of AB 1493. In September 2007, the US District Court in Vermont rejected the suit, but this may be appealed.

sition to emissions trading was expressed by some environmental groups and, especially, by environmental justice groups. They asserted that the virtues of the market had been oversold by economists in the case of electricity deregulation and the Regional Clean Air Incentives Market ("RECLAIM") emissions trading program in the Los Angeles air basin, and that such a program should be viewed with skepticism now (Moore 2006). There was also concern about the possibility of "hot spots" for conventional air pollutants, such as oxides of nitrogen or mercury as an incidental by product of GHG trading by electricity generators.

Meanwhile, political tension between the governor and the Democratic leadership of the legislature had increased when the governor called a special election for November 8, 2005, to allow voters to decide on eight ballot propositions, including the governor's four propositions concerning teacher tenure requirements, the use of union dues for political campaigns contributions, state budgetary spending limits, and redistricting. All eight propositions were rejected by large margins. This had two important consequences for California's climate change policy. The governor moved to the political center, and the Democrats felt empowered to confront him on the issue of climate change.

The CAT Report was submitted to the governor's office on February 1, 2006.¹³ It was a cautious document with regard to policy. A cap and trade system was discussed but was not made a primary recommendation. Instead, the key policy recommendations were to require mandatory reporting of GHG emissions by major industrial sources, such as cement manufacturing, oil refining, and electricity generation, and to add a "public goods" surcharge to gasoline to fund research on strategies to reduce dependence on petroleum and to lower GHG emissions. Both recommendations were strongly opposed by industry groups, including the California Chamber of Commerce. On April 2, 2006, the governor's office released the final CAT Report, which eliminated the public goods surcharge but retained the mandatory emissions reporting. In addition, language was added to the CAT Report calling for "a multi-sector, market-based system" using economics incentives, and the CAT was directed to develop a plan for such a trading program by January 2008.

The California Public Utilities Commission

Another regulatory agency, the California Public Utilities Commission (CPUC), had also taken up the issue of GHG emissions. In June 2004, the CPUC asked IOUs to address climate change in their long-term energy procurement planning. In December 2004, the CPUC required IOUs to employ a "greenhouse gas adder" when evaluating competitive bids to supply energy. The adder, intended to reflect the financial risk from emitting GHGs given the likelihood that these will eventually be regulated, would be determined subsequently. Despite opposition from the southern California utility SCE, in April 2005, the CPUC adopted \$8/ton as a reasonable proxy for the future cost of the carbon constraint in 2005, to rise 5 percent annually thereafter.

¹³Simultaneously, CalEPA released a series of studies on the potential impacts of climate change in California on water supply, agriculture, forestry, vegetation, coastal resources, wildland fires, hydropower, energy demand, air pollution, and human health (Luers et al. 2006).

In September 2005, it announced a goal of raising the renewable portfolio standard to 33 percent by 2020. It also initiated an effort to regulate GHG emissions from *new* electricity supply contracts entered into by IOU electric utilities. In October 2005, it issued a Policy Statement on Greenhouse Gas Performance Standards. This statement directed staff to investigate the adoption of a GHG emissions performance standard for IOU procurement that is “no higher than the GHG emissions levels of a combined-cycle natural gas turbine” for all procurement contracts that exceed three years in length and for all new IOU-owned generation.

In February 2006, the CPUC announced a cap on all GHG emissions from IOU utilities and other load-serving entities, including emissions associated with energy imported from out of state; the details, including the baseline, were to be determined subsequently. The CPUC also expressed its interest in exploring flexible compliance options to minimize the cost of meeting the cap. The rule-making process to implement the new plant performance standard and the emissions cap was initiated in April 2006.

California’s Prior Experience with Regulation of Air Pollution and Energy Efficiency

I have referred to the approach traditionally used in California to regulate air pollution and energy efficiency. This approach is quite unique, and it is, in fact, a crucial factor in explaining both why there was exceptionally strong support in California for taking decisive action on climate change in 2006 and why the policy intervention took the form that it did. It may be useful, therefore, to summarize this history.

Regulation of Air Pollution

With air pollution, the story starts with the appearance of smog in Los Angeles in the early 1940s. In 1945, the city passed an ordinance setting limits on industrial smoke emissions, and an air pollution control unit was formed within the municipal Health Department. In 1947, California passed a law authorizing the creation of county-level Air Pollution Control Districts and the Los Angeles County District (LAAPCD) was formed, the first of its kind in the nation. In 1959, California passed a law requiring the State Department of Public Health to establish air quality standards and necessary controls for motor vehicles. In 1960, the Motor Vehicle Pollution Control Board was established to test and certify devices for installation on cars sold in California. In 1961, the State Department of Public Health mandated positive crankcase ventilation on new vehicles sold in California starting in 1963, the first emissions controls in the nation. In 1964, the Motor Vehicle Board adopted tailpipe emissions standards for hydrocarbons and carbon monoxide starting in 1966. That year, the California Highway Patrol began random inspections of vehicle smog control devices. In 1967, a unified regulatory agency, CARB, was created.

The federal government took no action on motor vehicle emissions until 1965, when Congress passed the Motor Vehicles Air Pollution Control Act, which called on the Department of Health, Education, and Welfare (HEW) to develop emissions standards for new vehicles. The law was supported by the auto makers, who preferred national regulation to state-level regulation from California and, prospectively, several other states. HEW promptly

adopted both the California crankcase and tailpipe emissions standards, to go into effect in the 1968 model year. In 1967, HEW produced a proposal for a Clean Air law covering both motor vehicles and stationary sources. A major issue was whether California should be allowed to impose more stringent controls than the national standard. After a fierce battle, California got its way: the final legislation granted California alone a special waiver in recognition of its “unique problems and pioneering efforts.”¹⁴ Congress’s willingness to grant California this degree of latitude despite industry opposition reflected its awareness of California’s unique role as “a kind of laboratory for innovation” in emissions-control technology and regulation (*Motor and Equipment Manufacturers Association, Inc. v. EPA*, 627 F.2d [1979], DC Circuit Court ruling, cited in Giovinazzo 2003).

Since 1967, California has made use of its federal exemption on at least sixteen occasions to introduce standards in advance of the federal government’s regulation of motor vehicle emissions (National Research Council 2006). These include the first introduction of NO_x standards for cars and light trucks (1971), heavy-duty diesel truck standards (1973), two-way catalytic converters (1975), “unleaded” gasoline (1976), the low-emissions vehicles (LEV) program (1994 and 1998), zero-emissions vehicles (1990), and evaporative emissions standards and test procedures (1999).

The LEV program is the primary California emissions standard that has been adopted by other states. It originated from the California Clean Air Act (CCAA) of 1988, which instructed CARB to “achieve the maximum degree of emissions reduction possible from vehicular and other mobile sources.” In response, in 1990, CARB approved an ambitious new program of stringent exhaust emissions standards for NO_x, carbon monoxide, and particulate matter, starting in model year 1994. Rather than requiring every vehicle to meet the same emissions standard, the LEV program introduced a fleet-based approach. In both the legislative language and the framing of the rule-making by CARB, AB 1493 is the direct descendant of LEV and the 1988 CCAA.

Regulation of Energy Efficiency

Another forerunner of AB32 is the regulation of energy efficiency by the CEC. Energy-efficiency regulation dates back to the early 1970s, when utilities were projecting an unending growth in demand for electricity. These projections were challenged by environmentalists, who argued that the demand forecasts were exaggerated and that conservation was being ignored. They also argued that the CPUC, which focused on rate regulation, was not doing an adequate job of dealing with the larger issues of energy supply and demand in California. To address these concerns, the Democrat-controlled legislature passed a bill in 1973 to create an Energy Commission that would forecast energy demand, assess efforts to reduce this demand through conservation and efficiency, and provide a consolidated approval process for the siting of new power plants. The legislation was vetoed by Governor Ronald Reagan. Within a few months, however, the OPEC oil embargo occurred, creating an energy shortage and raising energy prices. At Governor Reagan’s request, a nearly identical bill, the Warren-Alquist Act, was passed and signed into law in May 1974.

¹⁴S. REP. No. 403, 90th Cong., 1st Sess. 33 (1967); Air Quality Act of 1967, Pub. L. No. 90-148, ¶ 208(b), 81 Stat. 485 (1967).

The resulting California Energy Commission was given four mandates:¹⁵ (1) Facility siting and environmental protection: CEC has exclusive power to certify thermal power plants of 50 MW or larger to meet statewide energy needs; (2) Energy forecasting and planning: CEC is required to forecast future statewide energy needs, evaluate supply options for meeting those needs, and, more generally, develop and implement an energy policy for California; (3) Energy efficiency and conservation: CEC is empowered to establish building- and appliance-efficiency standards, and is required to promote conservation through research and public education programs and grant and loan programs; and (4) Technology development: CEC funds research, development, and demonstration programs for technologies using renewable, alternative, and cleaner energy, including transportation fuels.

One of the CEC's first actions in 1975 was to draft building energy-efficiency performance standards. Standards for new refrigerators and freezers were implemented in 1977. Over the next seven years, CEC followed up with appliance efficiency standards for fluorescent lamp ballasts, air conditioners, heat pumps, furnaces, boilers, wall heaters, showerheads, and faucets.

The federal government, by contrast, was inactive with regard to appliance standards. The initial federal response to the oil embargo had been to call for voluntary targets for appliance efficiency. This was overtaken by the mandatory appliance efficiency standards being imposed by California, New York, and some other states. The Carter Administration subsequently proposed mandatory federal standards and Congress ultimately agreed; the 1978 National Energy Conservation and Policy Act (NAECA) directed the US Department of Energy (DOE) to formulate mandatory efficiency standards for appliances. However, this was opposed by the Reagan Administration, which instead proposed a "no standard" standard. The Reagan standard was overturned by the federal courts in 1985. By 1986, six states had adopted standards for one or more products, and appliance manufacturers were coming to see that a preemptive federal standard would better serve their interests. The outcome was the 1987 National Appliance Energy Conservation Act, whereby Congress would adopt specific standards for many major appliances, with the provision that these federal standards would then preempt any state standards; states could still adopt efficiency standards for products *not* covered by federal standards. Subsequent moves by states to adopt standards for products not covered by NAECA led to the passage of federal legislation in 1988, establishing efficiency standards for fluorescent lamp ballasts, and in 1992 to standards for a variety of lamps, electric motors, and commercial heating and cooling products. Meanwhile, states including California have continued to innovate with efficiency standards for products not subject to DOE standards. In December 2004, for example, the CEC set new energy-efficiency standards for seventeen different products, estimated to save approximately 100 MW of new generating capacity in California.

No other state has an agency like the CEC, and no other state has been as active and effective in regulating energy efficiency. Over three decades, this has had a significant impact on electricity use in California. Since 1975, electricity use per capita in California has stayed the same. By contrast, it has increased by about 50 percent nationally, and by about 66 percent

¹⁵The CEC's authority covers not just IOUs, but also municipal utilities within California.

in other western states. California's willingness to act unilaterally in regulating motor vehicle emissions and energy efficiency was a crucial motivating factor in the unilateral passage of the 2006 GHG legislation, to which I now turn.

The 2006 Legislation: Political Debate, Passage, and Content

In February 2006, Senator Don Perata, Democratic President Pro Tem of the Senate, introduced SB 1368 to give legislative force to the CPUC's GHG emissions standard for new procurement contracts and to extend it to municipal utilities. But the Democrats' main legislative initiative was AB 32, a bill originally introduced by Assembly woman Pavley in December 2004. In April 2006, the bill was amended to direct CARB to adopt regulations by January 2008 for (1) the mandatory monitoring and reporting of GHG emissions from major sources, and (2) reducing statewide GHG emissions to their level in 1990 by 2020. Assembly Speaker Fabian Nunez became a cosponsor of the bill.

Negotiating an Agreement on AB 32

The structure of AB 32 was similar to that of AB 1493: it set a goal, in this case, reducing statewide GHG emissions to their 1990 levels by 2020, but let an entity in the executive branch determine the details for achieving the goal within a set period of time and subject to some specific restrictions. The governor wanted this entity to be the Climate Action Team led by CalEPA. The Democrats wanted it to be CARB, the agency that had implemented AB 1493.

With regard to emissions trading, there was again strong opposition from some groups that were influential with both CalEPA and the Democrats. The Democrats were willing to state that the implementing agency "may include" the use of market-based mechanisms, provided the agency took certain prior steps, including examining the possibility that this could exacerbate localized "hot spots" and designing a mechanism to rule out any increase in the emissions of toxic air contaminants or criteria air pollutants. The governor wanted the bill to state that CARB "shall include" market mechanisms.

In response to concerns from business groups that a cap on GHG emissions would raise energy prices in California, causing businesses to leave the state and creating job losses, the governor's office asked that a "safety valve" be written into AB 32, whereby the emissions cap could be relaxed if necessary. The Democrats saw the business arguments as overstated and opposed the safety valve.

An agreement was reached the day before the legislative session ended in August 2006. The Democrats succeeded in having CARB act as the implementing agency and in having the bill use "may" rather than "shall" with regard to emissions trading. The governor succeeded in having the bill incorporate a safety valve. He signed it into law on September 27.

SB 1368 and SB 107 were also passed in the last days of the legislative session. SB 1368 was opposed by business groups, who argued that it would raise the cost of electricity in California. It was thought that the governor might veto it, but he signed it into law on September 28. SB 107 aroused less controversy and was signed by the governor on September 26.

The Content and Timetable of AB 32

As enacted, AB 32 requires California's GHG emissions to be reduced to 1990 levels by 2020 through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. CARB is authorized to develop and enforce appropriate regulations to implement the emissions cap, including a mandatory emissions reporting system. The timetable for implementation is as follows:

- By June 30, 2007, CARB must develop a list of "early action measures," to be adopted by January 1, 2010, that can reduce emissions in the short term.
- By January 1, 2008, CARB must determine what California's GHG emissions were in 1990, which will become the cap that must be met by 2020. By January 2008, CARB must also adopt regulations creating a statewide GHG emissions reporting and monitoring system.
- By January 1, 2009, CARB must prepare a plan for public comment for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions by 2020. The plan shall identify and make recommendations on direct emissions-reduction measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and nonmonetary incentives. CARB shall update this plan at least once every five years.
- By January 1, 2011, CARB must officially put into place specific regulations to achieve the required reduction in emissions. These regulations must be operative by January 1, 2012.

As mentioned above, AB 32 specifies some general criteria for reducing emissions but leaves the details of implementation to CARB. In particular, CARB is required to:

- seek to minimize costs and maximize the total benefits to California;
- not disproportionately impact low-income communities;
- give appropriate credit for early voluntary reductions;
- complement, and not interfere with, efforts to achieve and maintain federal and state air quality standards and to reduce toxic air pollution emissions;
- consider the cost-effectiveness of the regulations;
- consider the overall societal benefits, including reductions in other air pollutants and diversification of energy sources;
- minimize the administrative burden of implementing and complying with these regulations;
- minimize leakage (whereby reductions in emissions within California are made possible by increased emissions outside the state);
- ensure that emissions reductions are real, permanent, quantifiable, and verifiable, and enforceable by CARB; and
- count only emissions reductions that are new—not those that would occur otherwise.
- make recommendations on how to continue emissions reductions beyond 2020.

The "safety valve" is specified as follows: "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. The adjustment period may not exceed one year unless the Governor makes an additional adjustment.”¹⁶ This is potentially a large loophole.

Subsequent Developments in California

Tension between the governor and the legislature has continued since the passage of AB 32. Two weeks after signing AB 32, the governor issued Executive Order S-17-06, reaffirming the primacy of the Secretary of CalEPA as “statewide leader for California’s GHG emissions reduction programs.” The order directs CARB to “work with” the Secretary of CalEPA in developing measures to implement AB 32 and, in particular, to collaborate with him “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.” It also states that the CalEPA Secretary will “facilitate and coordinate” CARB and CPUC as they develop regulations that affect electricity and natural gas providers in order to avoid duplicative or inconsistent requirements. In January, Speaker Nunez introduced a new bill, AB 109, that reaffirms CARB’s primacy under AB 32 and directs CARB to report to the legislature annually on its status and progress in implementing the act.

CARB has commenced the execution of its duties, including appointing a Market Advisory Committee (MAC), an Environmental Justice Advisory Committee, and an Economic and Technology Advancement Advisory Committee. In June 2007, the MAC issued its Final Report, with recommendations for the design of an emissions trading program, including having a mixture of free allocation and auction of permits, and using a first-seller approach (i.e., at the retail utility level) to cap electricity emissions.¹⁷

Actions by the Governor

Meanwhile, the governor’s office has been active on two fronts. First, in January 2007, the governor issued an executive order to reduce the carbon intensity of California’s transportation fuels by at least 10 percent by 2020 and directed CARB to develop regulations establishing a Low Carbon Fuel Standard (LCFS) for transportation fuels in California. The LCFS will use market-based mechanisms that allow fuel providers to choose how they reduce emissions to meet the standard.¹⁸

Second, the governor has been pursuing an active program of what might be called GHG diplomacy. This had started in July 2006, when Governor Schwarzenegger and British Prime Minister Tony Blair signed an agreement committing California and the United Kingdom to collaborate on research regarding clean energy technologies and the implementation of market-based mechanisms for controlling GHG emissions. In October 2006, Governor Schwarzenegger met with New York Governor George Pataki to explore how emissions trading in California might be linked with RGGI. Schwarzenegger also expressed his hope

¹⁶California Health and Safety Code, Division 25.5, Section 38599 (a)(b).

¹⁷The report is available at http://www.climatechange.ca.gov/documents/2007-06-29_MAC_FINAL_REPORT.PDF.

¹⁸A report on implementation is available at http://www.energy.ca.gov/low_carbon_fuel_standard/UC-1000-2007-002-PT2.PDF.

that it might ultimately be linked with the European Union Emissions Trading Scheme and the Chicago Climate Exchange. In February 2007, he signed a memorandum of understanding with the governors of Arizona, New Mexico, Oregon, and Washington, directing their respective states to develop a regional target for reducing greenhouse gases. What is now called the Western Climate Initiative (WCI) was subsequently joined by Utah, British Columbia, and Manitoba. In August, the eight WCI partners released their regional goal to collectively reduce GHG emissions 15 percent below 2005 levels by 2020 (essentially the AB 32 goal); they committed to creating a regional Climate Registry by January 2008 and designing a “regional market-based multi-sector mechanism” by August 2008.¹⁹

The California Attorney General

The California Attorney General (CAG), Bill Lockyer, became involved in climate issues in 2003, when California followed Massachusetts in joining a suit against the EPA for not regulating CO₂ emissions under the Clean Air Act.²⁰ He defended the state when the automobile industry sued in 2004 to block implementation of AB 1493. In September 2006, he went further and filed a suit against the automobile manufacturers for public nuisance damages experienced by California as a result of climate change.

In April 2007, Lockyer’s successor, Jerry Brown, filed a controversial law suit against San Bernardino County, a rapidly growing area in Southern California, for updating its General Plan without considering the impact of future urban growth on GHG emissions. The suit was settled in August 2007, with the county committing itself to cutting GHG emissions attributable to its own governmental operations and its future land use decisions, an important precedent for local government in California.²¹

The California Approach versus the CAA and RGGI Approaches

California’s approach to emissions control differs in several respects from the approaches adopted by the federal government in the CAA and by RGGI.

With the CAA, the legislation specified all the key design features, including the two phases of the cap on emissions and the allocation of emissions allowances to generating units. By contrast, AB 32 sets a broad policy goal and specifies a general timeline, but leaves all the details of implementation to be determined through a future administrative process directed by CARB.

AB 32 differs from RGGI in its motivation, objectives, and implementation. RGGI was motivated by a desire to create a template for a national emissions trading program to control GHG emissions. California, by contrast, was building on its own past experience in regulating

¹⁹<http://www.westernclimateinitiative.org/ewebeditpro/items/O104F13006.pdf>. The US states of Colorado, Kansas, Nevada, and Wyoming, the Canadian provinces of Ontario, Quebec, and Saskatchewan, and the Mexican state of Sonora are participating in WCI as official observers.

²⁰In April 2007, the US Supreme Court issued a landmark ruling for the plaintiffs in *Massachusetts et al. v. EPA*.

²¹http://ag.ca.gov/cms_pdfs/press/2007-08-21_San_Bernardino_settlement_agreement.pdf.

pollution: AB 1493 built on the California Clean Air Act of 1988, and AB 32 built on AB 1493. While California lawmakers certainly recognized climate change as a global problem, they were especially mindful of the damage that it might cause in California. As with other air pollution, they were approaching it, in essence, as a local problem that calls for local action.

RGGI focuses on CO₂ emissions from electricity generation, while California focuses on *all* GHG emissions from *all* sources. With electricity, RGGI places the regulatory burden on the individual power plants, while California is likely to place it on the first seller (often the retail utility). In effect, RGGI focuses more on modifying the functioning of existing power plants, while California focuses more on demand reduction through increased energy efficiency, promoting renewables, and influencing the design of *new* fossil fuel plants through the restriction on new long-term power contracts, changes that first sellers are in a better position to encourage.

While RGGI sees emissions trading as its policy tool, California is likely to adopt a mixed approach with different strategies for different sectors, including regulatory measures and best management practices and incentives, as well as emissions trading. For example, CARB's implementation of AB 1493 is structured to function as either a direct regulation of fleet emissions or a downstream cap on the automobile industry within a broader emissions trading system. The role of emissions trading in the implementation of AB 32 relative to other policy tools remains to be determined.

Finally, while California and RGGI share a near-term goal of reducing emissions by 2020, California has an additional and more challenging long-term goal of substantially decarbonizing its economy by 2050. Achieving this long-term goal requires not only immediate emissions reductions, but also an emphasis on technology development and transformation of the energy industry.

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Abstract

Since 2004, California has taken a variety of measures to control greenhouse gas emissions. This culminated in August 2006 with the passage of AB 32, which requires that overall GHG emissions in California be reduced to their 1990 levels by 2020; SB 1368, which prohibits California utilities from signing new long-term baseload power contracts with emissions higher than those from combined-cycle natural gas; and SB 107, which requires 20 percent of California's electricity to come from renewables by 2010. This article describes how California's GHG laws came to be enacted, why they took the form that they did, and how they differ from the approaches to pollution control adopted by the federal government in the 1990 Clean Air Act and the northeastern states in the Regional Greenhouse Gas Initiative. California's approach grows directly out of its prior, and rather unique, history in controlling automobile emissions and in regulating energy efficiency. Moreover, its approach reflects an awareness of some differences between GHG emissions and SO₂ and NO_x emissions, which are important for the design of a GHG control policy.