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A National Climate-Change Program: Building on State and Regional Initiatives

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On November 18, President-elect Obama delivered a message to the Governors' Global Climate Summit that many have waited years to hear. "Now is the time to confront this challenge once and for all. Delay is no longer an option." The governors of California, Florida, Illinois, Wisconsin, and Kansas joined representatives from Canada, Mexico, Brazil, Indonesia, India, China, and the European Commission to turn talk into action, build green economies, and advance an international agreement in 2009.

With new leadership in the White House and a new Congress beginning in 2009, the United States is now poised to develop a national response to climate change. Two regional agreements already commit one-third of the states to cooperative climate-change measures and provide possible models for the national cap-and-trade system that President-elect Obama supported in his campaign. California's comprehensive state program shows how wide-ranging actions can add up to get the job done. So much has already been accomplished by state and regional initiatives that the prospects for concerted national and international action have never been better.

This article features the climate-change programs of California and two regional initiatives. The Regional Greenhouse Gas Initiative (RGGI <rggi.org>) establishes a mandatory, market-based CO₂ emission-control program in ten northeastern and mid-Atlantic states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont).

The Western Climate Initiative (WCI <westernclimateinitiative.org>) includes seven U.S. states (New Mexico, Arizona, Utah, California, Oregon, Washington, Montana) and four Canadian provinces (British Columbia, Manitoba, Ontario, Quebec). Six U.S. states, one Canadian province, and six Mexican states hold observer status.

Both the RGGI and WCI are members of the International Carbon Action Partnership <www.icapcarbonaction.com>, which also includes ten European Union nations as well as Norway, Australia, and New Zealand. Plus, twelve U.S. states are prepared to follow California's lead on vehicle emission controls. As states and provinces adopt actions and develop regional and international agreements, all that remains is the firm commitment of the U.S. federal government.

Questions and Answers

State and regional programs have already had to wrestle with many critical questions. The answers, hammered out during the past few years while the federal government hibernated, give direction to a new national climate-change program.

Which climate-change agents will be addressed?

The 1990 Kyoto Protocol identified six greenhouse gases (GHG): carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). While CO₂ emissions are much greater than emissions of the other five Kyoto GHGs, each of the others has a larger global warming potential (GWP) than CO₂ on a per-pound basis. Most of the state and regional initiatives address all six Kyoto GHGs. By adopting regulations directed at all six GHGs, more can be achieved than by addressing CO₂ alone.

Some programs go beyond the six Kyoto GHGs. For example, certain California regulations also address particles. Since some types of particles warm the atmosphere but other types cool it, including particles in climate-change programs requires careful planning. Air pollutants are not the only agents of climate change. Climate is the result of many physical, chemical, and biological processes that involve the atmosphere, oceans, land, and vegetation. Agricultural and forestry practices, as well as other activities affecting land use, are an integral part of the California climate-change program.

How much and how quickly will GHG emissions and other climate-change agents be controlled?

Most scientists believe that very large (roughly 80 percent) reductions of GHG emissions are needed in one to a few decades to minimize the increase in global temperatures, but the technical and economic feasibility of such a massive reduction has generated spirited debate. Most state and provincial climate-change programs have been built around multiple time scales: immediate (2009-2012), short-term (2020), and long-term (2040 to 2050). Much can be accomplished immediately, permitting ongoing progress while agencies design programs for 2020 and 2050. The 2020 timeline provides a date that is soon enough for regulatory agencies to base rules on current technological capabilities and distant enough for business and industry to incorporate the new regulations into their planning cycles.

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The vision of **Quaker Earthcare Witness (QEW)** includes integrating into the beliefs and practices of the Society of Friends the Truths that God's Creation is to be held in reverence in its own right, and that human aspirations for peace and justice depend upon restoring the Earth's ecological integrity. As a member organization of Friends Committee on National Legislation, QEW seeks to strengthen Friends' support for FCNL's witness in Washington DC for peace, justice, and an Earth restored.

QEB's purpose is to advance Friends' witness on public and institutional policies that affect the Earth's capacity to support life. QEB articles aim to inform Friends about public and corporate policies that have an impact on society's relationship to Earth, and to provide analysis and critique of societal trends and institutions that threaten the health of the planet.

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- Explain why the issue is a Friends' concern.
- Provide accurate, documented background information that reflects the complexity of the issue and is respectful toward other points of view.
- Relate the issue to legislation or corporate policy.
- List what Friends can do.
- Provide references and sources for additional information.

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Participants in the WCI have generally adopted 2020 goals that reduce GHG emissions by 10 to 20 percent relative to either 1990 or 2000 baseline emissions. The California program honors the spirit of the Kyoto accord by using a 1990 baseline. It caps 2020 emissions at 1990 levels, which results in a 12 percent reduction of GHG emissions from the 2004 levels and a 28 percent reduction from what would happen in 2020 under "business as usual." Nearly all WCI participants have also established ambitious goals for 2040 to 2050, typically representing 50 to 80 percent reductions from their base years. Governor Schwarzenegger signed a 2005 Executive Order (S-3-05) that set a target of an 80 percent reduction of GHG emissions below 1990 levels by 2050. But the present focus of California action is on 2020, which means that control measures can be implemented now without the delays that might arise if programs had to be designed to meet the more challenging 2050 goals.

Should market-based regulatory mechanisms be employed as part of a climate-change program? Which ones?

If a national cap-and-trade system is adopted, will emission allowances be auctioned to the highest bidder or given away? Who and what will be included in a cap-and-trade program? Many of these questions have been settled by state and regional initiatives, but their answers aren't always the same. Market-based mechanisms, such as emission taxes and cap-and-trade systems, use financial incentives and penalties to encourage emission reductions. Because they provide flexibility for regulated industries to achieve emission targets at potentially lower costs, market-based mechanisms have been incorporated into nearly all state and regional climate-change programs.

Cap and trade has been favored over carbon taxes. With cap and trade, the cap ensures that the target level will be achieved. This assurance is lacking for emission taxes. The RGGI is auctioning emission allowances and RGGI states are dedicating revenues from the auctions to support energy efficiency programs and clean energy development. Each state and province that participates in the WCI will decide how to allocate allowances within its jurisdiction, but the WCI design specifies a minimum of 10 percent of allowances to be auctioned at the beginning of the program and 25 percent by 2020. California has not yet decided on the proportion of allowances to be auctioned and allocated.

North American agencies are well aware of the European experience of collapsing prices for CO₂ emission allowances, and are designing their auctions to avoid oversupply. The first RGGI auction was in September 2008, and additional auctions are scheduled for December 2008 and March 2009. The September auction was very competitive: 59 entities submitted bids and more than four times as many allowances were requested as were available <rggi.org/docs/Auction_1_PostSettlement_Report_from_Market_Monitor.pdf>.

The scope of the cap-and-trade systems varies. The RGGI program is a cap-and-trade system that applies only to CO₂ emissions from electric utilities. By 2018, the cap will be 10 percent lower than it was in 2009. In September 2008, the WCI released the design of a regional cap-and-trade system to begin operating January 1, 2012. The WCI cap-and-trade system will apply to the largest emission sources and will include electricity generation, industry, transportation, and residential and commercial fuel use. California's cap-and-trade program will be linked with WCI participants as part of a regional system.

What will the benefits and costs of climate-change programs be?

Many climate-change programs will save money. California's assessment concludes that its 2020 climate-change program will create jobs and save money for

households. Compared to business-as-usual in 2020, the state's economic analysis finds that economic production will be \$33 billion greater, the gross state product will be \$7 billion higher, personal income will be \$16 billion more, per capita income will be \$200 higher, and the number of jobs will increase by 100,000. Many of the economic gains result because energy efficiency leads to savings in fuel costs. Most experts agree that consumers can save money by driving more fuel-efficient vehicles, but some caution that California's program could increase electricity rates. The California assessment projects a range of public health benefits that result from reduced emissions of air pollutants and concludes that the benefits of the climate-change program would be even clearer if the social and environmental costs of doing nothing were evaluated.

The California Approach

California's climate-change program is based on state legislation, gubernatorial executive orders, and the existing regulatory authority of several state agencies. It is complex and comprehensive. One of the first tasks of the California Air Resources Board's (CARB) was to determine statewide emissions of GHGs in 1990 so that this value could be established as the limit for 2020. The California inventory includes emission estimates for all six Kyoto protocol gases. Each is expressed in terms of equivalent emissions of CO₂ through the use of Intergovernmental Panel on Climate Change (IPCC) values of GWP. CARB staff estimated that the 1990 GHG emissions were 427 million metric tons CO₂ equivalent. The predominant GHG was CO₂ (88 percent).

The California emissions inventory divides emissions into seven major sectors of use: agriculture, commercial, electricity generation, forestry, industrial, residential, and transportation. Of these, the three largest are transportation, electricity production, and industrial activities (Figure 1). Forestry is a net sink, that is, forests absorb more GHGs than they emit under current forestry practices in California. The inventory shows the importance of transportation. It also shows that the California program cannot ignore out-of-state electricity generation.

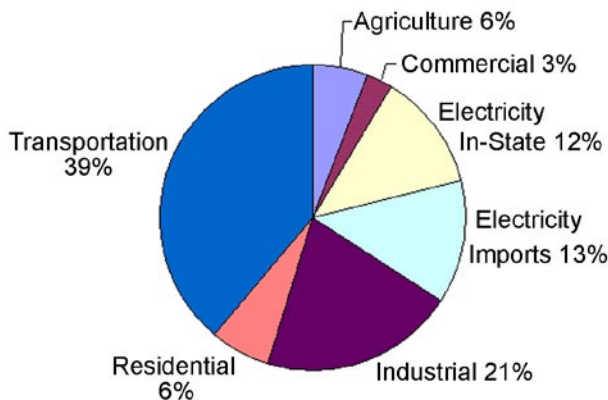


Figure 1. California greenhouse gas emissions in 2004, by sector.

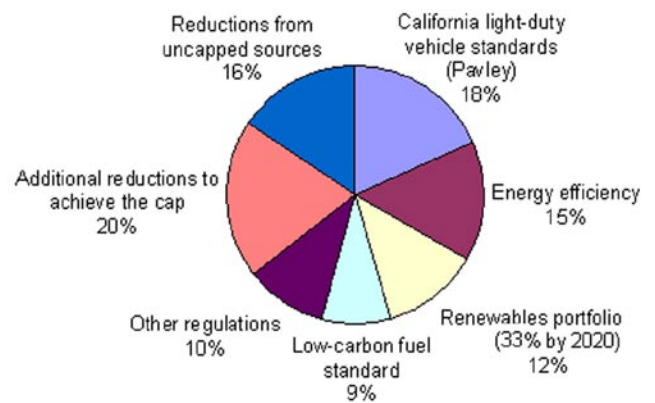


Figure 2. Emission reductions in the California plan. Some categories include multiple measures. The emissions for sources within the cap represent 85 percent of the overall 2020 limit. The CARB excluded certain sources from the cap due to challenges in measuring and tracking emissions accurately. For the uncapped sources, emission reductions include measures related to waste management, agriculture, forestry, and high-GWP gases.

HFC and PFC emissions increased from near-zero values in 1990 to three percent of total GHGs in 2004 because many of these compounds were introduced as substitutes for ozone-depleting substances that were phased out of use in accordance with the Montreal Protocol. In addition, an enormous stock of older chlorofluorocarbons remains within products that have a long lifespan, including refrigerators, air conditioners, and rigid insulating foam. The CARB estimates that this stock is nearly equal to the total projected business-as-usual GHG emissions in 2020. Therefore, emission control measures include important programs for collecting and destroying old appliances and materials containing GHGs.

CARB's proposed emission control plan was released in final form in October 2008 and was approved unanimously by the Board on December 11, 2008. The California program will achieve its emission reduction goal by implementing dozens of control measures. The individual measures each contribute GHG reductions ranging from fractions of a percent to over five percent of the total. While no single strategy provides more than 20 percent of the total reductions needed, the major contributions are from energy efficiency, renewable energy, transportation measures, and a cap-and-trade system. As shown in Figure 2, California's reduction from projected business-as-usual 2020 emissions will be achieved as an aggregate of many emission-control measures.

Early Action Measures

California's designated early-action measures provide significant rapid emissions reductions. This rapid response must be achieved within the framework of state laws, which require that all GHG-reduction regulations be technologically feasible and cost-effective. The law also requires that measures be structured to prevent increasing emissions of criteria pollutants, such as particulate matter, and to avoid any disproportionate socioeconomic effects.

By October 2007, the CARB proposed 44 early-action measures, which represent almost one-fourth of the total GHG reductions needed by 2020. Examples include a low carbon fuel standard (LCFS) for vehicles, restrictions on high global warming potential refrigerants, and landfill methane capture. The LCFS will establish a “carbon content” standard for transportation fuels, the goal of which is to reduce the “carbon intensity” of California’s vehicle fuel by at least 10 percent by 2020.

A second measure will restrict the use of high GWP refrigerants by non-professionals recharging leaky automotive air conditioning systems. The focus of this strategy is to eliminate unnecessary releases of HFC-134a, which is used in automobile air conditioners and has a GWP of 1300 compared with CO₂.

Yet another GHG, methane, is the target of a third measure that would improve the capture of emissions from municipal waste landfills. Although 94 percent of California landfills have gas collection systems, about 32 landfills do not have emissions controls.

Additional early-action measures are the responsibility of ten other state agencies that are members of the state Climate Action Team. Their measures potentially yield emission reductions of nearly 40 percent of the 2020 total. The single largest reduction in the first group of measures derives from regulations that were adopted in 2007 by the California Energy Commission and the Public Utilities Commission. These regulations were authorized by state legislation and require electric utilities to transition away from carbon-intensive energy sources. They specify GHG performance standards for all long-term baseload electric power, including both in-state generation and purchases from out of state. Additional immediately applicable early-action measures include new efficiency standards for buildings, appliances, tires, and water supply and use, as well as incentives for funding of new residential solar installations.

A second group of early action measures is expected to reduce business-as-usual emissions by another ten percent. This includes measures that are underway or that can be initiated between 2007 and 2009 but that may have a longer term regulatory deadline. For example, transportation-planning measures by the California Department of Transportation and the California Transportation Commission are expected to contribute to 2020 emission reductions by reducing congestion, improving travel time, and promoting coordinated land use-transportation decisions.

Other early-action measures that are not undertaken primarily for reducing GHG emissions will likely have climate-change benefits. Examples include biomass energy and recycling programs.

Vehicle Regulations

Transportation accounts for nearly 40 percent of California GHG emissions, so California’s 2020 goals cannot be met unless GHG emissions from vehicles are reduced.

The 2002 Pavley bill (AB 1493) directed CARB to develop and implement GHG standards for vehicles beginning with the 2009 model year. The CARB adopted regulations to implement AB 1493 in 2004, and these regulations are expected to contribute about 18 percent of the total emissions reductions needed (Figure 2). The automotive industry challenged AB 1493 on the grounds that it illegally imposes gasoline mileage standards for automobiles, which is pre-empted by federal law.

Although the CARB prevailed in court, one more hurdle remained. Federal law required California to obtain a waiver from the U.S. EPA to regulate GHG emissions from motor vehicles. In December 2007, the EPA Administrator denied the waiver. Much evidence has since surfaced to show that the decision was politically motivated. At the time, though, the EPA Administrator asserted that the 2007 federal Energy Bill, which raises the Corporate Average Fuel Economy (CAFE) standards for light-duty vehicles sold in 2020 to 35 miles per gallon, would be more effective than California’s approach to reducing GHG emissions from vehicles.

CARB responded with a technical study comparing GHG emission reductions achieved by the California and CAFE standards. It showed that by 2020 the California AB 1493 regulations would reduce CO₂ emissions by nearly twice as much as the new CAFE standards. California also filed two lawsuits. The first was dismissed on a technicality, and the second is in process. With new leadership in Washington, California can resubmit its request to EPA in January 2009 and it is likely that EPA will grant that request, since the records show that EPA staff had originally recommended approval of the waiver.

CARB reports that air pollution regulations that reduce emissions of diesel particulate matter and ozone precursors will also have climate benefits. Seven of CARB’s early action measures reduce emissions from diesel engines. In July 2007, CARB adopted a regulation to reduce emissions from off-road diesel sources, which was also expected to have climate benefits. On December 12, 2008, CARB approved a new rule requiring all big-rig diesel trucks to cut diesel soot using retrofits and replacements.

What Friends Can Do

The California climate-change program will reduce Californian’s per capita emissions from 14 to 10 tons CO₂ equivalent by 2020. That’s a 30 percent reduction per person, and it will yield an overall GHG emission reduction of 11 percent from 2004 to 2020, even while the population and economy both grow. Why not set our own personal goals, too? Anyone may choose to set a tougher goal, of course, but each of us could make a meaningful response to climate change by matching the California reductions with 30 percent decreases in our personal GHG emissions. You’ll feel better and save money, too.

Charles Blanchard is a member of Strawberry Creek Monthly Meeting. He has been an air quality research consultant for the past twenty years.