




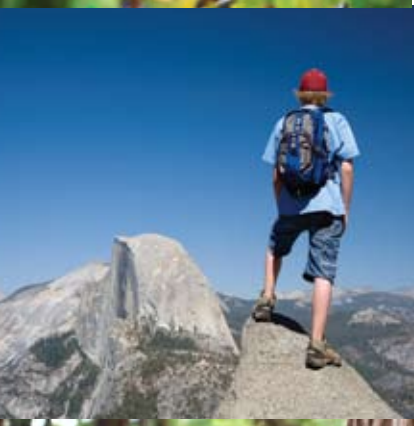

Climate Change Draft Scoping Plan

a framework for change

Executive Summary

of the June 2008 Discussion Draft

Pursuant to AB 32, The California Global Warming Solutions Act of 2006

Prepared by
the California Air Resources Board
for the State of California

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EXECUTIVE SUMMARY

California strengthened its commitment to develop a comprehensive approach to address climate change when Governor Schwarzenegger signed Assembly Bill 32, the Global Warming Solutions Act of 2006 (Núñez, Chapter 488, Statutes of 2006). By requiring in law a reduction in greenhouse gas emissions to 1990 levels by 2020, California set the stage for its transition to a clean energy future. This historic step helped put climate change on the national agenda, and has spurred action by many other states.

The California Air Resources Board (ARB) is the lead agency for implementing AB 32, which set the major milestones for establishing the program. ARB met the first milestones in 2007: developing a list of early actions to begin sharply reducing greenhouse gas emissions; assembling an inventory of historic emissions; and establishing the 2020 emissions limit.

ARB must develop a Scoping Plan to lower the state's greenhouse gas emissions to meet the 2020 limit. This Draft Scoping Plan, developed by ARB with input from the Climate Action Team, proposes a comprehensive set of actions designed to reduce overall carbon emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, and enhance public health while creating new jobs and enhancing the growth in California's economy. ARB will revise this Draft Plan based on continuing analysis and public input, and will take the Proposed Scoping Plan, which will be released in early October, to the Board for consideration at its meeting in November, 2008. The measures in the Scoping Plan adopted by the Board will be developed over the next three years and be in place by 2012.

Reduction Goals

This Draft Plan calls for an ambitious but achievable reduction in California's carbon footprint. Reducing greenhouse gas emissions to 1990 levels means cutting approximately 30 percent from business-as-usual emission levels projected for 2020, or about 10 percent from today's levels. On a per-capita basis, that means reducing our annual emissions of 14 tons of carbon dioxide for every man, woman and child in California down to about 10 tons per person by 2020. This challenge also presents a magnificent opportunity to transform California's economy into one that runs on clean and sustainable technologies, so that all Californians are able to enjoy their rights to clean air, clean water, and a healthy and safe environment.

Significant progress can be made toward the 2020 goal relying on existing technologies and improving the efficiency of energy use. A number of the solutions are "off the shelf," and many – especially investments in energy conservation and efficiency – have proven economic benefits. Other solutions involve improving our state's infrastructure, transitioning

to cleaner and more secure sources of energy, and adopting 21st century land use planning and development practices.

A Clean Energy Future

Getting to the 2020 goal is not the end of the State's effort. According to climate scientists, California and the rest of the developed world will have to cut emissions by 80 percent from today's levels to stabilize the amount of carbon dioxide in the atmosphere and prevent the most severe effects of climate change. This long range goal is reflected in Executive Order S-3-05 that requires an 80 percent reduction of greenhouse gases from 1990 levels by 2050.

Reducing our greenhouse gas emissions by 80 percent will require California to develop new technologies that dramatically reduce dependence on fossil fuels, and shift into a landscape of new ideas, clean energy and green technology. The measures and approaches in this Draft Plan are designed to accelerate this necessary transition, promote the rapid development of a cleaner, low-carbon economy, create vibrant livable communities, and improve the ways we travel and move goods throughout the state. This is the firm commitment that California is making to the world, to its children and to future generations.

Preliminary Recommendation

The preliminary recommendation in this Draft Plan has been developed by ARB staff after considering public comment and input from the Climate Action Team, the Environmental Justice Advisory Committee (EJAC), the Economic and Technology Advancement Advisory Committee (ETAAC), and the Market Advisory Committee (MAC). The Proposed Plan, which will be released in October, 2008, will be based on additional staff modeling and analysis, consideration of public comment on the Draft Plan, recommendations from the advisory committees and other experts. All of the measures in the Proposed Plan will be analyzed for the impacts they will have on the economy, public health and the environment, including effects on low-income communities. The Proposed Plan will have a 45-day comment period before the Board considers adoption at its November meeting. The Scoping Plan, even after Board approval, will remain a *plan*. The measures in the Scoping Plan must be adopted through the normal rulemaking process, with the necessary public input.

Key elements of ARB's preliminary recommendation for reducing California's greenhouse gas emissions to 1990 levels by 2020 include:

- **Expansion and strengthening of existing energy efficiency programs and building and appliance standards;**
- **Expansion of the Renewables Portfolio Standard to 33 percent;**
- **Development of a California cap-and-trade program that links with other WCI Partner programs to create a regional market system;**
- **Implementation of existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard;**
- **Targeted fees to fund the State's long-term commitment to AB 32 administration.**

The complete list of recommended measures is shown in Table 2 of the main text.

A Comprehensive Approach

Meeting the goals of AB 32 will require a coordinated set of solutions to reduce emissions throughout the economy. The preliminary recommendation includes a mix of strategies that combine market mechanisms, regulations, voluntary measures, fees, and other policies and programs to reduce greenhouse gas emissions. Many of the measures complement one another, and provide a comprehensive framework of emissions accounting, tracking, and enforcement. For instance, the Low Carbon Fuel Standard, which reduces the carbon intensity of transportation fuels sold in California, will complement technology-forcing regulations designed to reduce greenhouse gas emissions from cars and trucks. Improvements in land use and the ways we grow and build our communities will further reduce emissions from the transportation sector.

Many of the measures build on highly successful long-standing practices in California, such as energy efficiency and use of renewable energy resources, that can be accelerated and expanded. Increasing the amount of energy we get from renewable energy sources, including placing solar arrays and solar water heaters on houses throughout California, will be supported by an increase in building standards for energy efficiency. Other measures address the transport and treatment of water throughout the state, lower greenhouse gas emissions from ships in California's ports, and make changes to agricultural and forestry practices. Some measures address ways to safely reduce or recover a range of very potent greenhouse gases, including refrigerants and other industrial gases, that contribute to global warming at a level many times greater per ton emitted than carbon dioxide.

The preliminary recommendation places 85 percent of California's total greenhouse gas emissions under a declining emissions cap by 2020, which will reduce emissions from the covered sectors by almost 30 percent from business as usual. Many of the emission sources covered within this cap-and-trade program are also addressed under other recommended measures, which will account for a majority of the reductions needed to comply with the cap. Sources within the cap-and-trade program will need to meet other regulatory requirements, but will then have the flexibility to reduce emissions further or purchase allowances to cover their compliance obligations. Initial reductions in greenhouse gases, beginning as early as 2010, will be achieved by new and existing regulations and other measures. By 2012, the cap-and-trade program will begin delivering reductions, and by 2020 it will achieve a significant portion of the required reductions under AB 32. Beyond 2020, all the mechanisms, including cap and trade and innovations in technology, will be needed to meet California's long-term greenhouse gas reduction goals.

Working with the Western Climate Initiative

California is working closely with six other states and three Canadian provinces in the Western Climate Initiative (WCI) to design a regional greenhouse gas emission reduction program that includes a cap-and-trade approach. ARB will develop a cap-and-trade program for California that will link with the programs in the other partner states and provinces to create this western regional market. California's participation in WCI creates an opportunity to provide substantially greater reductions in greenhouse gas emissions from throughout the region than could be achieved by California alone. The larger scope of the program also

expands the market for clean technologies and helps avoid leakage, that is, the shifting of emissions from sources within California to sources outside the state. ARB will continue to work with WCI partners to ensure that the final program design provides real and enforceable emission reductions in the region. ARB will also design the California program to meet the requirements of AB 32, including the need to address potential localized impacts, ensure market security (avoid gaming), and ensure enforceability. Significant technical work and consensus building remain before the WCI partners agree on the design of a regional market program. The creation of a robust regional trading system can complement the other policies and measures included in this Draft Plan, and provide the means to achieve the emission reductions needed from a wide range of sectors as cost-effectively as possible.

California's Economy, Environment and Public Health

The Scoping Plan is designed to maximize the total benefits that can accompany the transition to a clean energy economy. California has a long and successful track record of implementing environmental policies that also deliver economic benefits. ARB is continuing to conduct economic modeling, including impacts on low-income households, and evaluation of related public health and environmental benefits for the measures under evaluation. The results of this ongoing analysis will be provided as a supplemental report in the summer of 2008. These results will be used to refine the overall program design, including identifying any economic, environmental and public health safeguards that should be included in the Plan.

Evaluating the Economic Effects

ARB has developed preliminary estimates of the costs and savings of the various measures considered in this Draft Plan. These estimates indicated that the overall savings from improved efficiency and developing alternatives to petroleum will, on the whole, outweigh the costs. This balance is largely driven by current high energy costs and the degree to which measures increase energy efficiency throughout the economy and move California toward ultimately cheaper alternatives to fossil fuels. Summary information on costs is included in the measure descriptions in Appendix C. The economic modeling completed to date is preliminary and does not reflect all measures under evaluation. These estimates will be further refined as the evaluation is completed during the coming months, and ARB will provide a supplement to this Draft Plan with the results of the economic and other evaluations later this summer.

The potential costs of implementing the Plan pale beside the cost of doing nothing. Looking globally, the Stern Review issued by the Treasury of the United Kingdom estimated that "…if we don't act, the overall costs and risks of climate change will be equivalent to losing at least five percent of global [gross domestic product (GDP)] each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20 percent of GDP or more. In contrast, the costs of action – reducing greenhouse gas emissions to avoid the worst impacts of climate change – can be limited to around one percent of global GDP each

year."[1] Programs to reduce greenhouse gases under AB 32 are a prudent investment in the future, addressing future costs and significant environmental risks.

California is particularly vulnerable to the costs associated with unmitigated climate change. A warming California climate would generate more smoggy days by contributing to ozone formation while also fostering more large brush and forest fires. Continued increases in global emissions at business-as-usual rates would result in California losing 90 percent of the Sierra snow pack, sea level rising by more than 20 inches, and heat wave days increasing three- to four-fold by late in the century.[2] These impacts will translate into real costs to California. A 12-inch sea level rise by 2050 would translate into $1.2 billion in levee improvements needed in the San Francisco Bay Delta and the San Joaquin Valley.[3] Water supply costs due to scarcity and increased operating costs would increase by as much as $689 million per year by 2050.[4] Due to snow pack loss, California's winter sports businesses would shrink by $1.4 billion annually by 2050, and lose 14,500 jobs, and many other sectors of California's economy would suffer. California cannot avert these impacts of global climate change by acting alone, but failing to act now will slow action around the world. The costs of implementing the Scoping Plan will be a necessary investment in California's future and will spur action in other states and at the federal level.

Providing Savings for Households and Businesses

The Plan's emphasis on increasing energy efficiency throughout the economy will help mitigate impacts from the likely moderate increases in the prices of energy and fuels that result from moving away from more polluting fuels. More efficient homes and buildings that require less energy to heat and cool, and cars and trucks that use less fuel will result in utility bills and vehicle fuel costs that are below the projected rise in actual fuel prices and energy rates. Revenues generated as part of the program could also be distributed in a way to substantially mitigate any price increases.

The Plan will build on California's 30-year track record of pioneering energy efficiency programs that have already delivered significant savings to California's customers. Energy efficiency will continue to provide significant savings that can be reinvested into the California economy. California's energy efficiency policies, including standards, research and development, and utility programs, have helped hold per capita electricity use constant while in the U.S. as a whole per-capita electricity has use increased by nearly 80 percent since the mid-1970s.[5] Under the Plan, homeowners can achieve electricity savings between 1,500 and 1,800 kWh per year for older and newer homes, respectively, and over 300 therms of natural gas per

[1] Stern, N. (2006). The Economics of Climate Change: The Stern Review. Cambridge, UK: Cambridge University Press.
[2] Our Changing Climate: Assessing the Risks to California (2006), www.climatechange.ca.gov
[3] Jeffrey Mount, professor of geology at UC Davis.
[4] "Climate Warming and Water Supply Management in California," California Climate Change Center March 2006 CEC-500-2005-195-SF, pp. 13-14.
[5] Commissioner Art Rosenfeld, California Energy Commission Presentation, "California's Success in Energy Efficiency and Climate Change: Past and Future," May 24, 2007.

year. This will be accomplished through improving energy efficiency by 25 percent.[6] These energy efficiency improvements translate into savings of about $200 per year for the average homeowner.[7] Over the past three decades, California consumers have saved more than $50 billion from appliance and building efficiency policies alone.

Business owners will benefit, too. By upgrading existing facilities to improve energy efficiency, they can save approximately $0.60 per square foot, reducing per-square-foot energy costs (currently $1.50 to $2.50[8]) by as much as 40 percent. Similarly, if commercial buildings in California adopted measures to save water equivalent to current energy efficient building guidelines, buildings would save an additional $0.10 per square foot annually.[9]

Similar savings can be achieved in the transportation sector. By reducing greenhouse gas pollution from more efficient and alternatively-fueled cars and trucks under California's clean car laws (the Pavley greenhouse gas standards), consumers will save on operating costs through reduced fuel use. Although cars will be marginally more expensive, owners will be paid back with savings over the lifetime of the car, and the average new car buyer will have an extra $30 each month for other expenditures.

Driving Investment and Job Growth

Addressing climate change also provides a strong incentive for investment in California. California's leadership in environmental and energy efficiency policy has already helped attract a growing share of the nation's venture capital investment in green technologies. As California continues to improve on its environmental record with programs under AB 32, this is very likely to continue. According to statistics from PriceWaterhouseCoopers and the National Venture Capital Association, California's share of national venture capital investment in innovative energy technologies more than tripled from 1995 to 2007. In 2006, approximately 40 percent of all clean tech venture capital investment was made in California, just over $1 billion.

These investments in building a new clean tech sector also translate directly into job growth. A study by UC Berkeley's Energy and Resources Group and Goldman School of Public Policy found that investments in green technologies produce jobs at a higher rate than investments in comparable conventional technologies.[10] And the National Venture Capital Association estimates that each $100 million in venture

[6] Projections based on average electricity and gas usage per California household. California Energy Commission, "Options for Energy Efficiency in Existing Buildings," Publication 400-2005-039-CMF.
[7] Energy Information Administration (EIA), Annual Energy Review 2006, DOE/EIA-0384(2006) (Washington, DC, June 2007) and supporting databases.
[8] http://www.cool-companies.org/profits/
[9] http://www.earth-policy.org/Updates/2007/Update64.htm
[10] Kammen, D, Kapadia, K. & Fripp, M. "Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate?" Energy and Resources Group/Goldman School of Public Policy at University of California, Berkeley, 2004

capital funding helps create 2,700 jobs, $500 million in annual revenues for two decades and many indirect jobs.[11]

Green technology businesses are already contributing to California's economy. According to the California Green Innovation Index (2008), between 1990 and 2006 green technology businesses in California grew by 84 percent.[12] Much of this growth came in the solar energy, energy efficiency and green transportation sectors. By creating a policy landscape that favors low-carbon energy and efficient technology, the implementation of AB 32 will accelerate this trend.

Improving Public Health

The Plan will also provide a wide range of public health and environmental benefits anticipated from reducing greenhouse gases. Preliminary analysis indicates that the total economic value associated with public health benefits is likely to be on the order of $2 billion in 2020. The estimated reduction of combustion-generated soot (PM 2.5) associated with the recommended regulatory measures is 10 tons per day, and the estimated reduction of oxides of nitrogen (a precursor to smog) total 50 tons per day. These reductions in harmful air pollution lead to the following estimated health benefits in 2020:

- 340 fewer premature deaths
- 9,400 fewer cases of asthma-related and other lower respiratory symptoms
- 780 fewer cases of acute bronchitis
- 57,000 fewer work days lost
- 330,000 fewer restricted activity days

State Leadership

California is committed to once again lead and support a pioneering effort to protect the environment and improve public health while maintaining a vibrant economy. Every agency, department and division will bring climate change considerations into its policies, planning and analysis, building and expanding current efforts to green its fleet and buildings, and managing its water and natural resources and infrastructure to reduce greenhouse gas emissions.

In all these efforts, California is exercising a leadership role in global action to address climate change. It is also exemplifying the essential role states play as the laboratories of innovation for the nation. As California has done in the past in addressing emissions that caused smog, the State will continue to develop innovative programs that benefit public health and improve our environment and quality of life.

[11] Global Insight, National Venture Capital Association, "Venture Impact 2004: Venture Capital Benefits to the U.S. Economy," 2004

[12] Next 10, "California Green Innovation Index, 2008 Inaugural Issue," 2008, p.48

A Shared Challenge

Californians are already responding to the challenge of reducing greenhouse gases. Over 100 California cities and counties have signed on to the U.S. Conference of Mayors Climate Protection Agreement[13] and many have established offices of climate change and are developing comprehensive plans to reduce their carbon footprint. Well over 300 companies, municipalities, organizations and corporations are members of the California Climate Action Registry, reporting their greenhouse gas emissions on an annual basis. Many other businesses and corporations are making climate change part of their fiscal and strategic planning. ARB encourages these initial efforts and has set in place a policy to support and encourage other voluntary early reductions.

Successful implementation of AB 32 will depend on a growing commitment by a majority of companies to include climate change as an integral part of their planning and operations. Individuals and households throughout the state will also have to take steps to consider climate change at home, at work and in their recreational activities. To support this effort, the Draft Plan includes a comprehensive statewide outreach program to provide businesses and individuals with the widest range of information so they can make informed decisions about reducing their carbon footprint.

Californians will not have to wait for decades see the benefits of a low-carbon economy. New homes can achieve a near zero-carbon footprint with better building techniques and existing technologies, such as solar arrays and solar water heaters. Many older homes can be retrofit to use far less energy than they currently consume. A new generation of vehicles, including plug-in hybrids, is poised to appear in dealers' showrooms, and the development of the infrastructure to support hydrogen fuel cell cars continues. Cities and new developments will be more walkable, public transportation will improve, and high-speed rail will give travelers a new, clean transportation option.

That world is just around the corner. What lies beyond is even more exciting. Where will California be in 2050? By harnessing the ingenuity and creativity of our society and sparking the imagination of the next generation, California will make the transition to a clean-energy, low-carbon society and become a healthier, cleaner place to live.

Release of the Draft Scoping Plan is a major milestone in the development of the Proposed Scoping Plan. This summer, ARB will release an evaluation supplement which will provide the results of the economic, environmental and public health evaluations of the Draft Scoping Plan. Throughout the summer, ARB will hold workshops and community meetings statewide to solicit public comment on the Draft Plan and the evaluation supplement. ARB will release the Proposed Scoping Plan in early October for consideration at the November Board meeting. The Proposed Plan will be shaped by the public input on this Draft Plan. Once the Scoping Plan is approved the Board, the State has two years to develop and adopt regulations to implement the Plan. This regulatory development will follow normal rulemaking processes with focused workshops and stakeholder involvement for each measure.

[13] http://www.usmayors.org/climateprotection/agreement.htm

This Draft Plan offers a preliminary recommendation on how best to achieve the goals of AB 32. ARB invites comment and input from the broadest array of the public and stakeholders in the coming months as this Plan is finalized. Your participation will help craft California's framework for the future.