

Comments of Sierra Club California  
Energy & Climate Committee,  
California/Nevada Regional Conservation Committee

to California Air Resources Board

Recommendations Regarding Implementation of AB 32  
to Achieve Reductions in Greenhouse Gas Emissions

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## Table of Contents

<b>Introduction</b>	3
<b>Innovative Programs</b>	
Land Use Sector: Regional Blueprint Planning and Mass Transportation	4
Transportation Sector: Electrification of Transport	8
Utilities Sector: Community Choice Aggregation (CCA) and Renewable Energy	12
Waste Sector: Zero Waste Policies & Landfill/Compost Regulations	17
<b>Market Based Incentives</b>	
Feed-in Tariffs	21
Setting a Price on GHG Emissions	22
<b>Conclusion</b>	24

## **Introduction**

Thank you for this opportunity to assist the California Air Resources Board in developing a Scoping Plan to meet the Greenhouse Gas emissions reductions mandated by AB 32. In the sections below, Sierra Club California highlights emission reduction strategies by selecting one or two innovative programs in each of four sectors -- Land Use, Transportation, Utilities, and Waste -- that we believe are most likely to have positive effects in reducing both conventional 'criteria' pollutants as well as greenhouse gas emissions. There is an effort to approach the problems holistically, to see the interaction between sectors, such as transportation and utilities or land use, and also to consider solutions that work simultaneously for the environment and the economy. Each strategy is directed toward three groups of stakeholders -- wholesalers/manufacturers, retailers/providers, and consumers/ratepayers/residents. Afterwards, we describe and comment on two market-based incentives that are currently the subject of much public debate.

Local, state, and federal governments in the US are experiencing a growing recognition of the potential environmental, social, political, and financial benefits inherent in adopting the goal of near-term emissions reductions. The urgency of achieving GHG reductions in the near future gives ARB an unprecedented opportunity to strengthen liaisons among the various agencies and planning divisions. ARB has the potential to simultaneously accomplish goals along three dimensions: decrease in GHG emissions, further clean-up of criteria air pollutants, and reduced reliance on imported conventional fuels. Toward these goals, we propose the adoption of the programs and incentives described below.

## Innovative Programs

### Land Use Sector: Regional Blueprint Planning and Mass Transportation

*Summary: California's Regional Blueprint Planning legislation provides clear directives for state agencies and local governments to work together to integrate mass transportation alternatives into smart growth planning models. The convergence of the Regional Blueprint directives and the AB 32 goals affords an unprecedented opportunity to 'fast-track' improved design and development of regional mass transit infrastructure, including Bus Rapid Transit programs, expansion of existing Amtrak corridors, High-Speed Passenger Rail systems, electrified commercial transport, and accessible siting of transit stations for neighborhood inter-modal connections. Correct design and use of valid performance metrics will be essential for realizing these goals. Sierra Club California recommends that we begin thinking in terms of the 'true cost' of driving passenger vehicles, and reduce current incentives to driving, thereby discouraging the car-centric way of life that has been adopted in California and throughout the country.*

Urban planning that reduces driving times and avoids suburban sprawl has been recognized as an important strategy for reducing GHG emissions across the US. In the recently published Urban Land Institute's Growing Cooler: The Evidence on Urban Development and Climate Change (2008), the authors warn that if sprawling development across the US continues to fuel growth in vehicle use, the projected 59 percent increase in the total miles driven between 2005 and 2030 will overwhelm expected gains from vehicle efficiency and low-carbon fuels. Even if the most stringent fuel-efficiency proposals under consideration are enacted, notes co-author Steve Winkelman of the Center for Clean Air Policy, "vehicle emissions still would be 40 percent above 1990 levels in 2030 – entirely off-track from reductions of 60-80 percent below 1990 levels by 2050 required for climate protection." Clearly, urban/suburban planning decisions go hand-in-hand with programs to reduce GHG emissions in the transportation sector (see <http://www.smartgrowthamerica.org/gcindex.html>).

Traditionally, land use decisions have been local prerogatives, and 18 California counties are already using "UPlan", a "micro-economic integrated land use and transportation model" advocated by the Information Center for the Environment at UC Davis. It is on a regional scale, however, that California land use policies can be meaningfully linked with more effective mass transportation alternatives. Traditionally, transportation planning agencies have not considered land use to be within their effective

scope. However, the recognition that a regional approach is critical for changing travel patterns and decreasing GHG emissions has led four metropolitan regions -- San Francisco, Sacramento, Los Angeles, and San Diego -- to create Regional Blueprints. The Regional Blueprint Planning process is designed to build consensus on practical solutions for managing growth. In total, nine regions, encompassing 95% of the state's population, are actively engaged in Blueprint Planning. This convergence presents an unprecedented opportunity for incorporating innovative mass transit programs and infrastructure into a visionary statewide transportation network that provides attractive alternatives to current driving practices. (see [http://climateplanca.org/climateplan\\_brochure.pdf](http://climateplanca.org/climateplan_brochure.pdf)).

Accomplishing these goals will require moving beyond "business as usual" approaches, and it will be very useful if CARB can develop a working relationship with *governing bodies and appropriate staff in the state and regional transportation planning agencies*. The aim, in our view, should be to create *plans as well as meaningful performance metrics* for meeting greenhouse gas reduction goals, and integrating these into the regular decision processes of the planning agencies. Directors of these agencies need to be held responsible for implementing the appropriate metrics and meeting goals.

At the state level, Caltrans' Division of Transportation Planning has been directed— "through active engagement with all segments of the population as well as critical stakeholders in the community, business interests, academia, builders, [and] environmental advocates"—to "foster a more efficient land use pattern that supports improved mobility and reduced dependency on single-occupant vehicle trips." For the third year, Caltrans is offering monetary grant funding for "regional collaborative decision-making" that will lead to providing consumers with more transportation choices and will "[r]educe costs and time needed to deliver transportation projects through informed early public and resource agency involvement." (see <http://calblueprint.dot.ca.gov/>).

A group of consultants who have conducted studies pursuant to Regional Blueprint directives have calculated that Vehicle Miles Traveled (VMT) have seen a 45% reduction, compared to the regional average, in households located within a ½ mile of transit stations, and a 21% reduction for households located between ½ and 1 mile of transit stations. Mass transit is particularly well suited for shorter trips, which cause a disproportionately large percentage of total GHG vehicle emissions. Often-cited studies have shown that 55-65% of all trips are less than 3 miles, and up to 80% are less than 5 miles. (See [http://www.dot.ca.gov/hq/tpp/offices/opd/past\\_files/Presentation\\_2-4Ds.pdf](http://www.dot.ca.gov/hq/tpp/offices/opd/past_files/Presentation_2-4Ds.pdf)).

Mass transit options should be accessible, reliable, and reasonably comfortable in

order to provide realistic alternatives to the familiar allures of personal vehicle use. With a few notable exceptions, budget allocations for mass transit infrastructure in California have far under-paced government funding for state roads and highways. Policies in the Transportation sector that have favored passenger vehicles and cargo trucking have resulted in serious traffic congestion, high accident and injury rates, alarming levels of GHG emissions, and problematic waste issues in the manufacturing and disposal of cars and trucks. The convergence of the Regional Blueprint Planning directives and the AB 32 reduction goals affords an unprecedented opportunity to 'fast-track' design and development of regional mass transit infrastructure, including Bus Rapid Transit programs, expansion of existing Amtrak lines, High-Speed Passenger Rail systems, electrified commercial transport, and accessible siting of transit stations for neighborhood inter-modal connections. At the same time, we need to begin thinking in terms of the 'true costs' of driving passenger vehicles, and reduce current incentives to driving, thereby discouraging the 'car-centric' way of life that has been adopted in California and throughout the country. Several of these disincentives have already been discussed and recommended in the February 2008 report by ARB's Economic and Technology Advancement Advisory Committee (ETAAC).

Bus Rapid Transit (BRT) is an innovative program that will require minimal additional infrastructure, and will have the multiple effect of enhancing service capacity within the existing highway system while reducing VMT and GHG emissions levels. Bus Rapid Transit integrates bus with rail transit, while also making use of existing High Occupancy Vehicle (HOV) lanes, priority at traffic lights, and several other technologies to improve mobility and efficiency. The Director of Caltrans has asserted: "It is our policy to transport the maximum number of people as efficiently and cost effectively as possible through comprehensive, multimodal 'system management' ... [BRT] is emerging as one of the most attractive investment choices, especially since our State Highway System presents tremendous opportunities to quickly implement BRT services. With one of the most extensive networks of High Occupancy Vehicle (HOV) lanes in the world, California already has a foundation in place to support the development of BRT operations in our urban areas." (See: <http://www.dot.ca.gov/hq/MassTrans/Docs-Pdfs/BRT-Handbook-030706.pdf> ).

The goal of maximizing usage and insuring cost-effectiveness is also important for realizing greenhouse gas reduction in other transportation modes, such as rail, bicycle and pedestrian. ARB can play an effective role in moving CALTRANS and other transportation agencies to expand the role of these metrics, and promote effective implementation of transportation options that are too often short-changed in the planning and budget process. In addition, ARB should develop policies that assist rail and transit agencies to move away from dirty diesel fuel to cleaner energy sources. This will

improve the environment while making public transportation a much more attractive option for the public.

Developing new models to more accurately forecast emissions is a critical step to identifying and implementing regional land use strategies for GHG pollution reduction. The Sacramento Area Council of Governments (SACOG) has created one of the most sophisticated models in the country, and recently used it to review a large-scale development proposal. The Blueprint process resulted in a scenario with 33% less water consumption, a 26% decrease in average vehicle travel per new household, and a 7% reduction in travel time spent in heavy congestion when compared to existing land use patterns. SACOG is now providing resources and incentives to help other cities realize this vision (see Base Case and Draft Preferred Scenario: Key Statistics, [www.sacog.org](http://www.sacog.org)).

The CEC's Integrated Energy Policy Report (2007) states that the Blueprint Planning program is in the early stages of implementation, and will require technical, financial, and regulatory assistance to meet its goals of reducing climate and energy impacts throughout the state's metropolitan areas. The Report encourages state agencies to assist local governments in reducing energy use and GHG emissions. This is one crucial area where ARB can facilitate energy-efficient land use development patterns by supporting the incorporation of statewide mass transit planning into Regional Blueprints processes. Coordination of efforts with Caltrans, Amtrak railways, and BTH (California Business, Transportation, and Housing Agency) could result in dramatic improvements in the availability, comfort, and cost of neighborhood mass transit stations, metropolitan-intercity rail services, and bus rapid transit systems.

## Transportation Sector: Electrification of Commercial, Public, and Private Transport

*Summary: A large number of private and public stakeholders around the world recognize that battery electric vehicles (BEVs) are the most feasible candidates to meet imminent needs for Zero Emission Vehicle (ZEV) production and availability. Near-term electrification of all modes of transportation – commercial, public, and private – is an essential component for the implementation of AB 32 goals. The urgency of reducing GHG emissions should guide ARB to create a Battery Electric Vehicle Partnership for fulfilling near-term reductions, while realistically relegating the role of the Hydrogen Fuel Cell Partnership to long-term reductions.*

Transportation is the largest contributor to GHG emissions in California, currently measured at approximately 40% of the total. It is urgent that programs in this sector be scaled up in a serious way in order to contribute to the implementation of AB 32 requirements. The February 2008 report by ARB's Economic and Technology Advancement Advisory Committee (ETAAC) identifies three major areas for "rethinking transportation to lower demand and carbon": changes in private and commercial driving practices, cleaner fuels, and new technologies. In the area of driving practices, the report makes several worthwhile suggestions relating to state agencies' revisions of roadway designs, transportation planning metrics, and land use programs to optimize traffic patterns. The report also focuses on the implementation of regulations that encourage drivers to reduce their length of miles traveled, the number of trips taken, and time spent in congested traffic, while promoting an increase in carpooling and mass transit for daily commutes.

Recognizing the large percentage of GHG emissions contributed by commercial trucking, freight, and cargo services throughout California, the ETAAC Report recommends that ARB extend its partnership with state transportation agencies to plan commercially viable electric rail systems that would help replace reliance on standard diesel trucks and trains. Sierra Club California appreciates the attention that ARB has already given to anti-idling laws for the trucking industry, the promotion of on-board and off-board electrification at rest areas and truck stops, and the regulation of diesel emissions for buses and waste collection vehicles. ARB has also wisely turned its attention to the diesel emissions of ships and trucks at California marine ports. However, such regulations targeting diesel and gas engine emissions are transitional in nature, given the imperative of achieving system-wide redesigns of vehicle propulsion. In order to offset the environmental impact of population increases and anticipated growth in the Transportation sector, it is essential that new technologies be researched, developed, and adopted by government-manufacturer partnerships in an expedited manner.

The two leading technologies that are being developed for replacing conventional gas engines are electric- and hydrogen-powered vehicles. Both technologies are able to power zero emission vehicles (ZEVs), depending upon the sophistication of their designs and their methods of power-source generation. Sierra Club California is joined by a consortium of environmental and health organizations that is advocating the near-term production and availability of ZEVs as an essential component for the implementation of AB 32. The overwhelming consensus is that battery electric passenger vehicles (BEVs) are the most feasible candidates to meet imminent needs for ZEV availability. Future electrification of all modes of transportation— commercial, public, and private—is indispensable for meeting longer-term reduction targets.

The first phase of ARB's ZEV program has focused on private passenger transport, and considered only criteria pollutants. However, in relation to meaningful progress toward GHG reduction goals, a substantial shortfall exists for this first phase of electrification in the number of vehicles proposed. In its March 2008 ZEV revisions, ARB failed to increase the number of ZEVs to be produced (which had been 25,000 in 2012-14 and 50,000 in 2015-17). Instead, these inadequate requirements were further reduced to a paltry 7,500 ZEVs in 2012-14 by allowing "near zero" emission vehicles (plug-in hybrids and hydrogen internal combustion engines) to substitute for "pure" ZEVs. Although ARB claims that its strategy has "appropriately considered the state of technology, market factors, economic impact, and our mission", Sierra Club California respectfully disagrees and believes that there should be hundreds of thousands of ZEVs on the road in that timeframe. The three main considerations for ARB's decision making— technological readiness, market factors, and economic impact— have changed considerably since the Staff ZEV Technology Review of April 2007. (see <http://www.arb.ca.gov/msprog/zevprog/zevreview/zevreview.htm>).

Updated data should guide ARB's actions. For example, the Staff Review estimates that consumers will 'break even' on the battery costs of electric vehicles when gasoline prices reach approximately \$2.75-\$4.25 per gallon. *Gasoline prices already have hit the higher end of that range, and battery prices are falling.* Next-generation lithium-ion batteries are being developed by a number of manufacturers in Asia, Europe, and the US; they are being readied for commercial availability in OEM (Original Equipment Manufacturer) car models that will deliver near 100-mile range. Existing lithium-ion batteries are also being used by non-OEM manufacturers to produce EVs with greater than 200-mile range. Thus, the advances and readiness of battery technology, coupled with the economic impact of the price of gasoline, have dramatically improved the market picture for battery electric vehicles (BEVs) in the past year.

Furthermore, the Staff Review is based on inaccurate OEM estimates of the projected costs for plug-in hybrid electric vehicles (PHEVs) and hydrogen Fuel-Cell Vehicles. Table 6.1 (Incremental Vehicle Cost Estimates) relies on 2003 data for battery costs and OEM guesswork about the cost of fuel-cell technology in 2012. The conclusion that a PHEV in 2012-2014 will cost \$25,000 more than a conventional vehicle is not supported by current prices. OEM HEVs are now being converted to PHEVs for \$10,000 or less, and at least two OEMs plan to market new PHEVs in 2010 with an incremental cost of less than \$15,000. The conclusion that BEVs will cost from \$35,000-\$65,000 (Type I) to \$80,000-\$120,000 (Type II) more than conventional vehicles is also over-estimated. On the other hand, the OEM opinion that a Fuel-Cell Vehicle in 2012 will only cost \$250,000-\$350,000 more than a conventional vehicle appears to be wishful thinking, given the lack of significant progress in many areas of Fuel Cell technology—including range, hydrogen storage, fuel cell life, cost, etc—and other major impediments to mass production.

ARB's pessimistic under-emphasis on requiring auto manufacturers to produce the necessary numbers of BEVs is compounded by its optimistic over-emphasis on research and development of Fuel Cell Vehicles. The urgency of reducing GHG emissions should guide ARB to create a Battery Electric Vehicle Partnership for fulfilling near-term reductions, while realistically relegating Hydrogen Fuel Cell Partnership as an option that may in the longer-term future (post-2020) become a viable option for reducing GHGs. Today, Fuel Cell Vehicles should be considered a “risk strategy” that may not match the technology and performance characteristics of other options in a relevant time frame. Over-commitment to this very expensive and unripe technology is likely to divert funding away from more promising near-term options, and delay real solutions for decades. This would greatly increase the risk of failure to achieve reductions in GHGs in the transportation sector. 6

A re-ordering of AB 32 priorities toward increasing the production of BEVs should encompass augmented funding for the immediate development of plug-in hybrid vehicles (PHEVs). According to the Electric Power Research Institute (EPRI), half the cars in the US are driven 25 miles a day or less. It is also well understood that automobiles emit a greater percentage of pollution in the first few minutes of operation. Even an HEV, with its reliance on the gas engine to charge its battery, will commonly trigger the start-up of its gas engine for the first use of the day. On the other hand, a PHEV will rely on its electric motor almost exclusively for those shorter trips. Thus, the PHEV, especially on shorter-range trips, has the potential to increase the fuel efficiency of HEVs by 50% or more, while virtually eliminating the cold engine emission factor. PHEVs would therefore be an effective strategy for reducing both GHGs and criteria pollutants.

Recognizing the importance of PHEV technology, Google is in the process of converting its business fleet from HEVs to PHEVs. This is being accomplished by the installation of an after-market Battery Range Extender Module that results in double to triple the fuel efficiency of the conventional hybrids. Another private company has developed an ultra-capacitor component that is designed to enable smaller battery packs to provide outsized acceleration in PHEVs. The company is currently shopping for an OEM to mass-produce a PHEV which incorporates the innovation.

To help both OEMs and PHEV conversion companies produce PHEVs, ARB can create a program and incentives to encourage the conversion of the 100,000 HEVs that are currently in use on California highways. This would have immediate results in better fuel economy, fewer visits to gas station, lower fuel costs, a longer all-electric drive range, and a significant reduction in all types of emissions. To jumpstart the development and adoption of this new technology, ARB could mandate that all purchases and leases of state fleet vehicles of the appropriate class and size be PHEVs or ZEVs. This would create a working example that would incentivize manufacturers to fine-tune the technologies, increase production of units, and stabilize pricing and availability. Conversions alone, however, will not reach AB 32 GHG goals. ARB can also design requirements and incentives for OEMs to ramp-up factory production of PHEVs and EVs, and to provide reasonable service warranties for HEVs that have been converted to PHEVs.

The economic, political, social and health issues caused by reliance on conventional fuel consumption in the Transportation sector will increasingly crossover into the Utilities sector as transportation becomes electrified. Clearly, a BEV that is charged from coal-fired generators will be responsible for more 'upstream' GHG emissions than one powered by solar- or wind-produced electricity. However, it is notable that California only gets about 16% of its electric power from coal, far less than the US average of 50% (or more), and further reductions in the share of coal power in this state are likely—especially given the legal framework that now regulates carbon emissions from coal plants delivering power to California's electric grid. This means that California is in one of the best positions to realize the benefits of electrification of transportation.

Possibly the greatest challenge facing ARB is to envision and co-ordinate programs for all of the different sectors with state and local agencies. One innovative program in the Utilities sector -- Community Choice Aggregation -- has the potential to create a network of localities for accelerating the statewide adoption of renewable sources of electrical generation, while also offering unique opportunities for electrification of vehicles.

## Utilities Sector: Community Choice Aggregation (CCA) and Increased Use of Renewable Energy

*Summary: To date, approximately forty California local governments are in the process of considering and/or implementing Community Choice Aggregation (CCA). CCAs, like Investor-Owned Utilities (IOUs), participate in the statewide mandate for reaching 20% renewables by 2010. However, most of the California CCAs have adopted goals to double, triple or quadruple the renewables percentages currently deployed by the IOUs.*

*A major intent of CCA legislation is to encourage investment in, and build-out of, renewable energy production facilities in each locality throughout the state. CCAs provide consumers with administrative channels which fiscally support alternatives to conventional fuels, potentially jumpstarting the funding necessary to make cleaner (and ultimately less costly) alternatives economically viable and available to residents and businesses.*

The Expert Advisory Panel to ARB has singled out local governments as responsible entities for implementing greenhouse gas reduction in the energy sector. However, the Panel Report failed to include one of the most powerful tools the state has created for enabling local governments to have a voice in energy policy decisions: Community Choice. Community Choice is strongly supported by the Sierra Club, particularly because it can help reduce the environmental footprint of our energy supply.

California has joined the states of Ohio, Massachusetts, New Jersey, and Rhode Island in establishing a Community Choice law (AB 117, 2002). The legislation authorizes local governments (cities, counties, or a group of cities and/or counties) to combine the buying power of all customers in their jurisdiction for purchasing electricity in an entity called a Community Choice Aggregation, or "CCA". This is done, in order to achieve, among other benefits, local control over energy policy decisions, more customer friendly services, and an expanding percentage of renewables in their local portfolios. To date, approximately forty California local governments are in the process of considering and/or implementing CCAs.

In the CCA structure, local entities do not secure power for themselves, but rather sign contracts with state licensed electric service providers who are experienced in power purchasing. Transmission and distribution wires continue to be owned and operated by the local utility company. The utility company also retains responsibility for billing consumers, and may collect a Cost Responsibility Surcharge from all customers who join the CCAs. This surcharge is designed to include the same expenses that are paid by all

other customers who continue to receive service from the utility company. The surcharge is not permanent, and most of the amount will expire by 2012.

CCAs, like Investor-Owned Utilities (IOUs), participate in the statewide mandate for reaching 20% renewables by 2010. However, most California CCAs have adopted goals to double, triple or quadruple the renewables percentages currently deployed by the IOUs. When a community forms a CCA, the IOU which services the community retains its renewables portfolio, including the share that formerly was used to supply the departing customers. This means that forming a CCA actually benefits the utility company by increasing its percentage share of renewable energy, since the same amount of renewable energy now serves the remaining customers who have not switched to CCA. For this reason it is important to understand that any renewable supply for the CCA should be measured from a correct baseline. In general, the renewable power supply that a CCA contracts with or builds itself will represent an increase in renewable power to the state. This is certainly the case if the CCA finances and builds its own new renewable energy supply.

A major intent of CCA legislation is to encourage investment in, and build-out of, renewable energy production facilities in each locality throughout the state. This can be accomplished by the CCA providing financing and/or guaranteeing long-term purchase contracts to prospective builders of renewable energy facilities. Use of public financing, such as low-interest municipal bonds, can significantly reduce the cost of renewable energy and help to make renewables competitive with conventional power supplies. Bond financing can cut the long-term cost of renewable energy by 5 % to 50%. (see California Energy Commission, Comparative Costs of California Central Station Electricity Generation Technologies (2007 Update) - FINAL STAFF REPORT, CEC-200-2007-011-SF.)

The local nature of CCA programs enables each entity to tailor their energy supply according to the particular geographical strengths and resources. For example, portfolios can be assembled from power generation by solar photovoltaics, solar thermal, wind, geothermal, hydroelectric, tides and waves, ocean thermal, and biomass/methane combustion. By providing local communities with administrative power to financially support alternatives to conventional fuels, CCAs can jumpstart the funding necessary to make cleaner alternatives economically viable and available to residents and businesses.

Traditionally, the California Public Utility Commission (CPUC) has regulated the IOUs across the state. The three major IOUs— Pacific, Gas, and Electric (PG&E), Southern California Edison (Edison), and San Diego Gas and Electric (SDG&E)— have

expressed a laundry list of concerns about CCA implementation, and in some instances, have actively sought to impede the development of CCAs in their service areas. For example, PG&E is currently involved in legal disputes with the San Joaquin Valley Power Authority -- the governing body for a CCA comprised of 12 municipalities in the Kings River Conservation District. While some IOU-CCA disputes involve control over local power generating sources, others arise due to the 'risk adverse' nature of the IOU corporate structure in general. IOUs are simultaneously responsible to their shareholders for maintaining economic profits and to their customers for maintaining utility services. These dual responsibilities have the effect of creating a vested interest in preserving existing infrastructure retained by the utility—the transmission and distribution system and nuclear power plants. Renewable and natural gas power plants have nearly all been divested under the market restructuring of the 1990s, and utility companies are not given a profit for purchasing power from these sources. Utility companies often oppose new technologies or market structures which they perceive as disruptive to the status quo, and this has been a source of conflict over implementation of a wide range of programs, including CCA.

In addition to utility companies fighting CCA, there are other important market barriers to implementing clean energy. The IOUs and the CPUC have used a 'Least-Cost/Best-fit' criterion for evaluating contract needs, which often stacks the deck against renewable power. This method evaluates 'one contract at a time' under a competitive solicitation process to determine which power generation is the least costly for fulfilling utility service needs. That type of evaluation is incompatible with efforts to transform the existing energy supplies for at least three reasons: 1) A contract-by-contract approach is too fragmented to successfully redesign the entire electric system as a renewable system, 2) The "Best-Fit" criterion means that renewable supplies must fit in to a system that is designed around conventional power sources, not for integrating renewable energy, and 3) It requires all renewable energy to compete with forecasted prices for natural gas power plants. This last point has multiple problems: renewable energy often provides greater service than it is given credit for, particularly for environmental protection, and natural gas price forecasts have been notoriously low, which understates the price-risk protection that renewables provide.

Actually, the IOUs' current 12-13% renewables portfolios were built almost entirely in the 1970s and 1980s when state and federal tax credits were in place. Since the inception of AB 107, the IOUs have hardly increased the percentage of renewable energy in the state. Instead, we have seen a massive build-out of new natural gas fired power plants, exceeding 15,000 megawatts. Furthermore, five years into the renewables program, no penalty has ever been assessed for non-compliance, even though IOUs have consistently fallen short on mandates. The loopholes entertained by the CPUC are too

broad and lax, and the penalty assessment cap -- were it to be enforced -- of \$25 million per utility represents a meager fine in comparison with billions in yearly revenues and profits. One of the most important roles that ARB could play in this realm is to recommend restructuring of state law to allow a price structure that is more favorable to renewable energy, such as "feed-in tariffs" that insure full compensation for cost of renewable energy plus a fair rate of profit (discussed more fully under **Market-Based Incentives** below).

Given the fact that the electric utilities account for over 20% of the state's total GHG emissions, it is imperative for ARB to facilitate a restructuring of the state's reliance on conventional fuels for its electricity generation. The current impasse among the IOUs and the nascent CCAs could be ameliorated by new ARB regulations that formalize the connection between the growth of CCAs and the fulfillment of the AB 32 mission. Participation in the CCA initiatives provide venues for the IOUs to compete in achieving higher levels of renewable energy without bearing all of the planning burdens for new infrastructure, and without being outpaced by consumer demand for renewable sources of power generation.

ARB can provide a 'voice of reason' in this arena and can bypass traditional obstacles to achieving meaningful progress in this sector. For example, ARB can play a role in forging fair rules and accommodations for co-generation and distributed generation of renewables within CCA portfolios. In its 2007 Integrated Energy Policy Report, the California Energy Commission (CEC) declares: "Distributed generation and combined heat and power, regardless of size or interconnection voltage, are valuable resource options for California. Combined heat and power, in particular, offers low levels of greenhouse gas emissions for electricity generation, taking advantage of fuel that is already being used for other purposes." As the CEC has pointed out, it will be important to create rules that are not discriminatory against cogeneration, as these facilities combine what would otherwise be two emission sources into one location. A narrow view might otherwise make it appear as though the cogenerator were increasing emissions on the site, when in fact they are substantially reducing emissions overall for the energy sector in a given area. Clearly all such facilities must meet all applicable air quality standards, and special attention should be paid not to increase criteria pollutants in heavily impacted areas.

Distributed generation, such as local solar, wind or fuel cells, can also play an important role in helping to meet local capacity requirements. (See: <http://www.energy.ca.gov/2007publications/CEC-100-2007-008/CEC-100-2007-008-CMF.PDF>). Traditionally, distributed generation has been penalized with 'standby reservation' charges, while combined heat and power has been taxed by non-bypassable

charges. This is just one area where ARB could assist in removing barriers to adoption of more favorable clean energy portfolios by CCAs. Unlike utility companies, CCAs are groups of customers. This is important since cogeneration and distributed generators allow customers to generate their own power, and thus reduce usage of utility owned assets. Rewarding clean local and onsite power supplies would thus be a stabilizing influence to the emerging clean power generation market, and substantially contribute toward a statewide reduction in GHG emissions.

## Waste Sector: Zero Waste Policies and Landfill/Composting Regulations

*Summary: Sierra Club California endorses the Zero Waste Hierarchy – Reduce, Reuse, Recycle, Compost, Discard – as the model to accomplish CIWMB’s Zero Waste policies. We urge ARB to implement ETAAC’s recommendations for ‘lifecycle tracking’ of manufactured products, for the reduction of landfill waste by requiring recycling in the commercial sector, and for the construction of discrete composting facilities to separate greenwaste from landfill waste. Furthermore, in order to ensure the continued viability of the composting industry in California, proper co-ordination among state and local agencies is essential for achieving reductions in VOC and GHG emissions in concert, attendant to rules and regulations which adopt economically- and technologically-sound solutions.*

California is a US leader in recycling programs at both the state and local levels. The California Integrated Waste Management Board (CIWMB) is promoting a ‘Zero Waste California’ program at the state level that redefines the concept of waste to include the assurance that products are designed and manufactured with the potential to be repaired, reused, or recycled: “In the past, waste was considered a natural by-product of our culture. Now, it is time to recognize that proper resource management, not waste management, is at the heart of reducing waste sent to landfills... For years, we have been throwing valuable resources away—the same resources we will inevitably need in the future—all in the name of consumer and manufacturer convenience” (<http://www.zerowaste.ca.gov/WhatIs.htm> ).

On the local level, notable California city mayors have signed the United Nations Urban Environmental Accords (2005), which address seven environmental areas common to all the world’s large cities: water, energy, waste, urban design, transportation, urban nature, and environmental health. To reduce the waste stream in their cities, these timetables have been established: 1) Achieve Zero Waste to landfills and incinerators by 2040; 2) Adopt citywide laws that reduce the use of disposable, toxic, or non-renewable products by at least 50% by 2012; and 3) Implement ‘user-friendly’ recycling and composting programs, with the goal of reducing solid waste disposal to landfills and incineration by 20% per capita by 2012. (See: <http://www.cameronforcolumbia.com/Downloads/Documents/UNEnvironmentalAccords.pdf> ). The CIWMB emphasizes that Zero Waste will only succeed if local governments, businesses, industry, and private citizens embrace coherent resource management programs. The Sierra Club wholeheartedly embraces Zero Waste policies, and agrees with CIWMB that the two major points for scrutiny of consumable products are at the beginning and end of their lifecycles, i.e., at the points of manufacture and disposal.

Zero Waste is based on the concept of Extended Producer Responsibility (EPR). EPR requires that manufacturers, retailers, and consumers share responsibility for minimizing a product's environmental impact (e.g. 'embedded or upstream' emissions) throughout all stages of the products' lifecycle. EPR is also called 'product stewardship'. At the birth of a product, Zero Waste requires that materials, containers, and packaging be cleanly manufactured, without contributing to GHG and criteria air pollutant emissions. At the sale and consumption phases, Zero Waste privileges those products that are reusable and have been manufactured locally. At the end of the cycle, Zero Waste creates a hierarchy of actions which emphasizes reusing, recycling, and composting in descending order, and resorts to the discarding of materials as a last resort (see <http://www.sierraclub.org/committees/zerowaste/policy.pdf>).

The 2008 ETAAC Report supports the concept of 'lifecycle tracking' as one of a "suite of emissions reduction protocols for recycling" in the commercial sector, along with the use of secondary or post-consumer materials in manufacturing, and the separation of cardboard and paper from other commercial waste. The Report suggests that any firm generating 4 or more cubic yards of waste per week be required to "implement a recycling program that is appropriate for that kind of business." Lifecycle initiatives directly address the issue of embedded or upstream GHG emissions which are present in every manufactured product. Likewise, the Zero Waste Hierarchy recognizes that the recycling of manufactured products has the effect of offsetting embedded emissions by extending the useful lifespan of the materials, while simultaneously eliminating the emissions that would have been attendant to the new manufacture of similar materials.

Sierra Club California urges CIWMB and ARB to implement regulatory mechanisms that reverse business-as-usual practices which have led to steady increases in GHG emissions in the industrial sector (Manufacturing processes account for 18% of total GHG emissions statewide). The state's 92 million tons of annual waste can be dramatically reduced by instituting lifecycle tracking of GHG emissions for all of the major mass-produced commodities. Manufacturers who meet a certain of volume of sales and/or exceed GHG emissions thresholds would be required to produce a lifecycle environmental impact statement. The statement would include a plan for how the waste impact would be mitigated. Until the present, businesses have calculated their costs without pricing the impact of their actions on the environment. In effect, the benefits have been privatized and the costs have been socialized. A reformulation of waste policies under AB 32 goals provides an opportunity for the business and industrial communities to work together with government and consumers to fairly distribute costs associated with reducing current GHG emissions from manufacturing processes and landfill facilities.

ARB has wisely recognized that improved landfill methane capture qualifies as an 'early action measure' under AB 32, and has expeditiously co-authored draft regulations with CIWMB to limit the volume of surface methane emissions from municipal solid waste (MSW) landfills to 200 ppmv, effected by requiring the installation of gas collection and control systems for maintaining those limits. At the same time, ARB also recognizes that these measures are transitional in nature, since the co-mixing of organic materials and non-recyclable materials is a sub-optimal practice slated to be discontinued as Zero Waste policies mature. Towards this goal, ARB's staff is currently working with the San Joaquin Valley Unified Air Pollution Control District and the CIWMB on two fronts: 1) to resolve conflicting studies measuring VOC emissions from composting facilities, and 2) to establish regulations that will cohesively address the Air District's concern with VOC emissions from composting facilities and the IWMB's focus on reducing GHG emissions through increased build-out of composting facilities statewide.

Establishing composting standards is an area where co-ordination among state and local agencies is essential for achieving reductions of air pollutants and emissions in concert, and Sierra Club appreciates the Air Resources Board efforts in working toward a comprehensive model. Sierra Club urges ARB to continue its oversight of the Waste sector by endorsing the cessation of diversion credits for the use of greenwaste as alternative daily cover, and by endorsing assessment fees for dumping compostable waste in landfills. Most importantly, ARB should advocate the separation of compostable organics (exclusive of sewage sludge or bio-solids) from materials deposited in landfills. In addition, assessments on carbon emissions, whether in the form of taxes, fees or auction revenues, should be used to subsidize technology upgrades to compost facilities so that they can comply with regulations for air quality and GHGs and also remain in business.

To assist ARB and CIWMB in rethinking the current design of waste facilities, Sierra Club proposes the statewide installation of 'Resource Recovery Parks' -- locations that centralize and integrate facilities for reusing, recycling, composting, and discarding materials. Such parks can include repair services, retail sales of reclaimed products and landscaping supplies, organically composted gardens, educational tours, and public amenities. The regional environmental park operated by the Monterey Regional Waste Management District in the city of Marina provides a model for this idea. The Park is comprised of three areas: 1) a 315 acre landfill site that houses construction and demolition recycling operations, composting facilities, and a soils-blending facility; 2) a 126 acre buffer zone of Salinas River floodplain; and 3) a 20 acre site that houses administration and maintenance buildings, a scale-house, a public drop-off recycling station, retail 'resale and materials recovery' businesses and stores, a landfill gas power project, and a household hazardous waste collection facility (see

<http://www.sierraclub.org/committees/zerowaste>).

The Waste sector is connected to all other sectors in the sense that it is the recipient of their discarded or 'used-up' materials. An innovative method of rethinking Waste's connection to our daily activities would be for ARB to partner with other agencies in developing demonstration projects for employing composted greenwaste and recycled products in a variety of state-and city-sponsored activities. The use of compost can benefit agricultural operations, landscaping businesses, and public parks and roadway plantings, which all contribute to GHG emissions by their reliance on pesticides and synthetic fertilizers. Such projects can help attain AB 32 goals for achieving Zero Waste by transforming discarded materials into useful resources.

## **Market-Based Incentives**

### Feed-in Tariffs (FiTs)

Feed-in Tariffs (FiTs) have been used in over 37 countries around the world for accelerating the adoption of renewable electricity generation, and for stabilizing the market prices of new technologies. A FiT establishes a price paid for a particular source of renewable energy -- such as wind, solar, or geothermal -- that is based on the actual cost of producing a kilowatt-hour (kWh) of electricity from that power source. This method is distinguished from California's system of using a 'market price referent', which evaluates each renewable energy contract based upon the expected future price of natural gas base-load generation. FiT implementation frequently obligates a utility company to buy renewable energy at rates higher than they might pay for a kWh of electricity generated by conventional fuels, often at rates based on the cost of production.

Any extra energy costs are distributed among all customers. In Germany, for example, it is commonly said that the added monthly fee on consumers' bills is comparable to the cost of a loaf of bread. US and worldwide polls have shown that most consumers are willing to pay more for electricity generated by renewable power sources. FiTs encourage the stabilization of energy prices because renewables' producers are guaranteed a 10, 15, or 20 year fixed price per kWh. This structure enables manufacturers to predict demand and to allocate investment resources with confidence. Prices for new contracts may be gradually lowered to encourage efficiencies in new renewable energy technologies, or they may be adjusted upward if the prices established are not sufficient to stimulate the market.

In February 2008, the CPUC approved a FiT to support the development of up to 480 megawatts (MW) of renewable generating capacity from small facilities throughout California. The PUC regulation targets wastewater treatment facilities and livestock operations that have access to substantial biogas (methane combustion) resources. However, the sale prices set by the tariff may be too low, and the 480 MW limit restricts the ability of the current FiT to significantly help achieve the Renewables Portfolio Standard (RPS) goals. The current FiT also excludes important sources of renewable energy such as solar and wind energy. Without an approved FiT, investor-owned utilities (IOUs) have a disincentive to unilaterally offer a standard contract rate to renewable energy generators. Countries with successful FiTs have required utility companies to offer standard rates until the national renewable energy goal is met. California should model any FiTs it may develop upon countries that have achieved significant growth of renewables by implementing a feed-in tariff.

The FiT is an efficient market-based tool to implement a Renewable Portfolio Standard. In particular, it avoids much of the complexity, risk and delay that renewable developers face under the current regulatory structure, and that have created a formidable barrier to new projects. A FiT in California should be tied to meeting the state's RPS goals. One option would be to require utility companies to participate until their RPS obligations have been met, or in the alternative, they should be penalized for non-compliance with AB 107 mandates. A third alternative, following the German model, is to pool the incremental costs of renewable energy generation on a statewide basis, and apportion the costs to IOUs based on actual costs paid to generators. Under this alternative, IOUs would offer contracts at the FiT rate until the state RPS goal is met. This is a clear area where CARB's ability to take leadership by researching and recommending rational and necessary solutions is needed to overcome institutional prejudices against adopting cleaner technologies for power generation.

#### Cap-and-Auction and Offsets

The scoping plan should adhere to the legislative requirements in AB 32 mandating that the Board study the potential impacts on community air quality of any market-based compliance mechanisms, before adopting any such mechanism. Should California adopt a mechanism that creates emission allowances, it is vital that it require that all old and new sources of greenhouse gases pay for the privilege of using limited carbon sinks. Give-away carbon permit schemes, in which current emitters are permitted to turn their pollution into economically valuable rights, would violate this principle.

If CARB establishes a market for carbon emissions, after following the review process required by AB 32, allowances or permits should be auctioned. The auctioning of permits allows for the reduction of permits, and emissions, over time, so the market adjusts to reflect the true cost of greenhouse gas pollution. Such a mechanism for pricing the carbon released into the atmosphere is essential if we are to raise investment funds to construct the new clean energy economy in California, provide investment capital to guarantee that new technologies are available to our existing infrastructure, and make certain that the effects of re-pricing carbon fuels are not felt disproportionately by working families and small businesses. We believe that AB 32 has given ARB the authority to establish an auction system.

Freely issuing emission permits to industry based on historic performance would create a trading system with inherent flaws. Some industries may use such a system to guide them in making rational investments that achieve a beneficial social outcome. For

others, however, it would provide a perverse incentive to shut down existing California plant capacity and either relocate in other states or distant parts of the world. An auction system is capable of raising funds that can provide meaningful incentives for reinvestment in domestic energy-efficient industries. This could strongly counteract any potential flight of industry from the state, and would help assure the immediate goal of protecting the domestic economy.

Furthermore, Sierra Club will oppose any market system that would relieve carbon polluters from paying their fair share of the costs of the carbon they emit in exchange for "offsets," either internationally for CO<sub>2</sub> emissions, or domestically for activities designed to enhance carbon sinks, like tree planting. While government and private support for programs that increase soil carbon content and reforestation are highly desirable, it is impossible to retain the enforceability and effectiveness of a carbon pollution trading scheme if it is combined with efforts to preserve and enhance carbon sinks. We need both 80% reductions in CO<sub>2</sub> emissions and strong programs to enhance carbon sinks; we should not "trade" them off against each other. In addition, there are verification and "additionality" problems that severely impact the enforceability and validity of a cap-and-trade or offset system. By contrast, an auction without offsets allows the market to reflect the cost of carbon pollution while providing greater assurance of achieving greenhouse gas emission reduction goals.

If market mechanisms are used, they should be designed so that they contribute to verifiable and enforceable CO<sub>2</sub> reductions and work in harmony with other components of the climate change strategy, especially standards and incentives for promoting efficiency, conservation and renewable energy. Funds raised through the auction of carbon allowances should be used for public purposes such as energy efficiency, promotion of renewable energy, mitigation of ratepayer impacts, needed infrastructure in impacted communities, and job training opportunities in renewable energy for individuals working in the fossil-fuel industry.

Forests can play an important role in reducing the impact of global warming, since approximately half the weight of a tree is carbon. Growing larger, older trees is helpful because they capture and store more carbon. Conversely, converting forests to other uses, through sprawl and development, eliminates carbon storage opportunities now and into the future, and should be discouraged. Although forests will have a role in addressing global warming, they have many values besides carbon storage, and need to be managed in a way that promotes healthy natural systems. Above all, the ability of forests to store carbon should not become a justification for higher emissions of air pollution.

Allowances and auction revenues should be used to accelerate deployment of clean energy technologies, with priority given to the cleanest, cheapest, safest, and fastest means of reducing emissions. On the other hand, the Sierra Club strongly believes that a carbon pollution auction scheme is by no means the only option for reducing carbon emissions. At best it should be considered only one possible tool among many, and we urge ARB to remain open to alternative compliance options such as direct regulation with fines for non-compliance, or direct charges like fees or carbon taxes.

## **Conclusion**

ARB's mandate to author a Scoping Plan for AB 32 gives it wide-ranging authority to take wide-ranging laws and integrate these in a constructive way, to work collaboratively with local air quality districts and CCAs, and to coordinate state programs to quickly achieve quantifiable results. Where these are not sufficient, ARB can use its key role under AB 32 to help the legislature and state regulatory bodies to move to more effective policies. ARB is currently in a position—of truly global significance—to enact measures which can lend a greater degree of predictability and stability to this emergent paradigm. Sierra Club California recognizes the magnitude of the responsibilities laid upon the Air Resources Board, and is willing to work with staff and assist in any way we can. Thank you for this opportunity to participate in the Scoping Plan process.