

State Agency Greenhouse Gas Emission Reduction Report Card

Background

Under Section 12892 of Part 2.5 of Division 3 of Title 2 of the Government Code (as set forth in AB 1338, 2008), the California Environmental Protection Agency (Cal/EPA) is required to prepare an annual report describing state agency actions to reduce greenhouse gas (GHG) emissions. Cal/EPA is required to compile and organize this information in the form of a 'Report Card' and post it on the Cal/EPA website. The Report Card must include:

- A list of those measures that have been adopted and implemented by the state agency with the actual GHG emissions reduced as a result of these measures.
- A list and timetable for adoption of any additional measures needed to meet GHG emission reduction targets.
- A comparison of the reductions from actions taken or proposed to be taken by a state agency to that agency's GHG emission reduction targets.
- An estimate of the greenhouse gas emissions from each agency's own operations and activities.

Climate Change Report Card Tables

The required information is organized into four tables, described below. This is the third of these yearly reports, and this report follows the same format as the one developed last year.

TABLE 1 - On-going Measures and Reductions in 2008: A number of GHG emission reduction measures were in place in 2008, including: forest management practices; solid waste recycling; energy efficiency programs; building and appliance energy efficiency standards; cement standards; water conservation; and utility efficiency programs. The emission reductions achieved by these and other measures in calendar year 2008, as reported to Cal/EPA by the responsible agencies, are shown in Table 1.

TABLE 2 - GHG Emission Reduction Strategies, and Timelines for Implementation:

The agencies of the Climate Action Team (CAT) also provided Cal/EPA with information regarding the strategies and measures that they will implement over the next few years, including the expected GHG emission reduction from each and the timeframe for completion. This information is reported in Table 2.

The timeframes noted in Table 2 reflect current estimates based on the work to date. Where the timetable indicates "To Be Determined (TBD)", work on the measure is in preliminary stages. Measures described as "ongoing" have already begun, but either the final completion dates are still to be determined, or they are

programs being implemented on a continuous basis. Future Report Cards will update these completion dates as implementation efforts mature.

There are several factors to consider regarding the reported GHG emission reductions in Table 2. There are a number of strategies with cross-agency implementation responsibilities. The individual agency reduction targets for these strategies will be better refined as implementation actions progress. The total reduction for these measures may be listed twice in some cases to reflect that each agency is in fact responsible for some portion of the reductions. There are also several individual measures for which there are interacting impacts so that the reduction numbers from each are not strictly additive (as recognized and explained in the AB 32 Scoping Plan). Also, there are a number of CAT agency efforts which are not reflected in the AB 32 Scoping Plan but are included here to provide a fuller picture of the many GHG emission reduction efforts being initiated by the CAT.

TABLE 3 - GHG Emission Reduction Target Comparison: Table 3 displays the agency targets. The targets were developed based on the strategies that the agencies will implement in the coming years. The total reduction for each agency shown in Table 2 is summarized in Table 3 and shown in comparison to the agency target.

TABLE 4 - Climate Action Team – GHG Inventory Status: New to the Report Card this year is the requirement for each agency to report an estimate of the GHG emissions from their own operations and activities. Table 4 lists the CAT agencies, boards, departments and commissions, and the current status of the GHG emissions inventory activities for each.

The GHG emission inventories are conducted using protocols established by the California Climate Action Registry (CCAR). The 'verified' inventory data has been submitted to CCAR and can be found on their website (<https://www.climateregistry.org/CARROT/public/reports.aspx>). The data that has not yet been verified has been included in this report to show the current status of the inventory activities. These unverified data are not final and may change during the process of verification.

Table 1: Ongoing Measures and Related GHG Emission Reductions

Agency Program Title	Description of Measures	2008 Emission Reductions, MMTCO ₂ E
California Air Resources Board Diesel Anti-Idling	This Air Toxic Control Measure limits general idling of all commercial and publicly owned diesel-fueled vehicles with a gross vehicle weight of greater than 10,000 pounds. This regulation reduces diesel particulate matter and also reduces the amount of diesel fuel used in California, saving 50 million gallons in 2006. Each gallon saved reduces climate change emissions by 0.01005 metric tons of CO ₂ (MtCO ₂).	0.5
BT&H / Caltrans Cement Standards	The emission reduction estimate indicated here reflects Caltrans cement consumption only and based on 2008 cement standards of 2.5% limestone and up to 25% fly ash. The CO ₂ emission reduction estimate includes both domestic and imported cement, which are not differentiated here for the purpose of GHG emission calculations. Caltrans cement consumption in 2008 is estimated at 500,000 Metric Tons. The fly ash consumption was 125,000 Tons which displaced clinker, reducing climate change emissions by 0.125 MMTCO ₂ in California.	0.1
CAL FIRE (various programs) - Forest Practices	<p>Sustainable Forests: Existing state and federal regulations and assistance programs. Recent research shows California forests increasing in growing stock¹ and sequestering significantly more than 5.0 MMTCO₂e per year.² CAL FIRE, federal and other known state forest sector activities contributing to current sequestration rates include:</p> <p><u>Conservation Forest Management Strategy benefits:</u> ^o Annual benefit from California Forest Practice Act rule changes instituted in December 2004 equals 2.2 MMT.³</p>	> 5.0

Agency Program Title	Description of Measures	2008 Emission Reductions, MMTCO ₂ E
<p>- Urban Forestry</p> <p>- Forest Legacy</p> <p>-Vegetation Management Program</p>	<p><u>Urban Forestry Strategy benefits:</u></p> <ul style="list-style-type: none"> • CAL FIRE funded planting of 18,675 trees in 2007 and a total of over 39,000 trees since 2005⁴ resulting in 0.0002 and .0003 MMT respectively.⁵ There were no additional plantings in 2008 due to Prop 84 funding freeze. Annual benefits increase over time as trees mature. Educational programs enhance effectiveness of voluntary tree planting by homeowners, utilities and others, but we cannot reliably track voluntary outputs at this time. <p><u>Forestland Conservation Strategy benefits:</u></p> <ul style="list-style-type: none"> • State Prop 40 and 50 conservation purchases (multiple agencies) in 2005 and 2006 produce annual benefits through continued growth and sequestration equal to 0.03 MMT.⁶ • Department of Fish & Game purchased 2300 acres of oak woodland in 2007 through Prop 84⁷, potentially avoiding up to 0.03 MMT emissions due to conversion and the loss of 0.0001 MMT annual sequestration thereafter.⁸ No conservation purchases were made in 2008 due to the State bond freeze. • In 2008, CALFIRE conserved over 2,600 acres of timberland with easements through state and federal funding and landowner donations for a one-time avoided conversion benefit of .0775 MMT and subsequent annual benefits of .0007 MMT for avoided lost uptake.⁸ • Other state entities may be conserving forests and woodlands, however CAL FIRE is not tracking that at this time. <p><u>Fuels Management benefits:</u></p> <ul style="list-style-type: none"> o CAL FIRE conducted fuel or forest health treatments on 15,281 acres in 2007 and 4,566 acres in 2008, avoiding about 0.0022 and 0.0006 MMT CO₂e, respectively, in wildfire emissions.⁹ Biopower benefits were negligible and not accounted for at this time. o USFS and other federal agencies treated over 50,000 acres in 2007¹⁰ and 93,000 acres in 2008¹¹ for approximately 0.007 MMT and 0.013 MMT.⁹ 	

Agency Program Title	Description of Measures	2008 Emission Reductions, MMTCO ₂ E
- California Forest Improvement Program (CFIP)	<p><u>Reforestation benefits:</u></p> <ul style="list-style-type: none"> o CA Forest Improvement Program (CFIP) acreage for 2005-07 revised. CFIP planted 512 acres in 2008 for a cumulative total of over 1600 acres. Projects may produce near-term emissions due to site preparation treatments¹², however methodology likely underestimates benefits for many CFIP and USFS projects conducted on areas immediately after wildfires.¹¹ Sequestration benefits increase as trees mature. o Actions by non-state CAL FIRE partners: USFS planting of about 8,600 acres in 2007 and 2008.¹¹ 	
Other Forest Sector Programs	<p><i>Additional Forest Sector Opportunities (stretch target)</i></p> <p><u>Voluntary carbon projects and markets</u></p> <ul style="list-style-type: none"> o Private forest carbon projects continue to be registered with the Climate Action Reserve, though CAL FIRE is not funded to track these at this time. 	Not available
California Department of Water Resources End Use Water Conservation & Efficiency	This program promotes greater implementation of water conservation measures, including best management practices, to improve efficiency. Implementation occurs at the local level, and reporting of conservation implementation is inconsistent and incomplete, making it impossible to report progress accurately or quickly. Estimates of conservation savings lag at least three years behind implementation of conservation measures.	**
California Energy Commission Appliance Energy Efficiency Standards	The Appliance Efficiency Regulations are designed to increase the efficiency of appliances sold or offered for sale to California consumers and businesses. Emission reductions result from energy efficient appliances consuming less electricity and natural gas, thereby avoiding emissions associated with electricity generation and natural gas combustion appliances used by residential and non-residential customers. Each MWh of electricity avoided reduces emissions by 0.499 MtCO ₂ . ¹³ Each MMBtu of natural gas combustion avoided prevents emissions by 0.0529 MTCO ₂ . Reductions in 2007 were 0.3 million MWh of electricity and 0.5 million MMBtu of natural gas.	0.2

Agency Program Title	Description of Measures	2008 Emission Reductions, MMtCO ₂ E
California Energy Commission Building Energy Efficiency Standards	The Building Energy Efficiency Standards are designed to increase the efficiency of all newly constructed residential and nonresidential buildings and additions and alteration to existing buildings in California. The principal strategy is to develop, implement, and enforce standards that require and result in reduction in energy use in these buildings. Each MWh of electricity avoided reduces emissions by 0.499 MtCO ₂ . Each MMBtu of natural gas combustion avoided prevents emissions by 0.0529 MtCO ₂ . Reductions in 2007 were 0.4 million MWh of electricity and 0.7 million MMBtu of natural gas.	0.2
California Energy Commission Comprehensive Publicly Owned Utility Customer Energy Efficiency Programs	The publicly owned utilities in California offer primarily electric energy efficiency programs to their ratepayers (one utility, City of Palo Alto, has a natural gas efficiency program). In 2008, the 39 utilities that report to the Energy Commission had saved 402,000 MWh. The publicly owned utilities reported GHG emissions reductions for the first time in 2007. Their 2008 programs will save 0.4 million MWh and reduce statewide emissions by 0.2 MMtCO ₂ .	0.2
California Integrated Waste Management Board Statewide Recycling	This program reduces GHG emissions associated with energy-intensive material extraction and production as well as methane emission from landfills. The program reduces GHG emissions by several MMtCO ₂ e. However, many of the reductions take place outside of California. In 2006 California's diversion rate was 54 percent, surpassing the goal of 50 percent. The 2007 diversion rate increased by four percentage points to 58 percent, or an additional 3.6 million tons of diversion, from the 2006 level. The 2008 diversion rate was 59%.	**
State and Consumer Services Agency (SCSA) Green Buildings - LEED	This measure reduces GHG emissions associated with the design and construction of state buildings. During 2008, three building projects were completed and certified under the LEED program at the level of Silver. These buildings exceed current Title 24 code requirements, for a total reduction of 725 MtCO ₂ . The combined reduction in electricity usage from what it would be if the buildings were designed to code is used to compute the GHG reductions.	<0.1

Agency Program Title	Description of Measures	2008 Emission Reductions, MMTCO ₂ E
SCSA Green Buildings – Distributed Generation	This measure reduces GHG emissions associated with the installation of clean on-site renewable generation. A total of one solar Photo Voltaic project was completed in 2008 for a total of 1 MW of generation capacity, resulting in a reduction of 482 MtCO ₂ .	<0.1
SCSA Green Buildings – Existing State Buildings Retro-Commissioning	This measure reduces GHG emissions associated with the optimization of energy systems and improvement of environmental performance in existing buildings. A total of 12 of these projects were completed in 2008 for an overall reduction in grid-based electricity usage of 7.1 Million KWH/Year, for a reduction of 3,265 MtCO ₂ .	<0.1
SCSA Right-size the State Fleet	This measure focuses on reducing the number of State vehicles with the goal of increasing the efficiency of vehicle uses and assignments. A typical effect of right-sizing is a reduction in the number of vehicles in the fleet overall.	**
California Public Utilities Commission Investor-Owned Utilities Energy Efficiency Programs	The CPUC funds energy efficiency programs through a combination of the Public Goods Charge (mandated by law) and the resource procurement budgets of the utilities. The programs developed for energy efficiency reach residential - single family, residential - multi-family, commercial, industrial, and agricultural customers of investor-owned distribution utilities. Reductions in 2008 are based on reported EE savings from the IOUs. Total 2008 reported savings were 5.062 million MWh of electricity (3,037,000 MWh from PG&E; 1,638,000 MWh from SCE; 387,000 MWh from SDG&E) and 67 million Therms of natural gas. Each MWh of electricity avoided reduces emissions by: 0.26 MtCO ₂ for PG&E; 0.32 MtCO ₂ for SCE; 0.35 MtCO ₂ for SDG&E. ¹³ Each Therm not produced by the combustion of natural gas prevents emissions by 0.00529 MtCO ₂ .	1.8
California Department of Food and Agriculture Renewable Energy - Photovoltaic	CDFA Division of Fairs and Expositions continues to coordinate the funding, site selection, and installation of photovoltaic panels at fair facilities. Currently, 26 fairs have operational systems producing approximately 8.1 megawatts of energy. There are 12 more projects in the pipeline.	**

Agency Program Title	Description of Measures	2008 Emission Reductions, MMTCO ₂ E
California Department of Food and Agriculture Waste Reduction / Recycling	To date, 35 fairs in California are serving as community sites for e-waste recycling to assist in diverting waste to landfills. Several fairs have participated in recycling grant programs overseen by the Integrated Waste Management Board. Specifically, the Fresno fair applied for and received a \$400,000 grant to build new footing areas in their paddock stalls at their horse race track and installed 4,000 square feet of new flooring in their pavilions. All of the products used consisted of recycled tire material.	**

** Emission Reduction not quantified.

¹ Christensen, Glenn A.; Sally J. Campbell; Jeremy S. Fried, tech. eds. 2008. California's forest resources, 2001–2005: five-year Forest Inventory and Analysis report. Gen. Tech. Rep. PNW-GTR-763. Portland, OR: U.S.D.A., Forest Service, Pacific Northwest Research Station. 183 p.

² Smith, James E., and Linda S. Heath. 2008. Carbon stocks and stock changes in U.S. forests, and Appendix C. P. 65-80, C-1-C-7 in: U.S. Department of Agriculture. U.S. Agriculture and Forestry Greenhouse Gas Inventory: 1990-2005. Technical Bulletin No. 1921. Washington, DC: Office of the Chief Economist.

³ CAL FIRE, Forest Conservation Management Strategy, AB 32 Scoping Plan, Appendix E.

⁴ Revised per Urban Forestry Program staff, October 2009.

⁵ Benefits estimated using methodology developed for Urban Forestry Strategy in CAT Report and AB 32 Scoping Plan.

⁶ CalFire Conservation Strategy, AB 32 Scoping Plan, Appendix E.

⁷ Personal communication, DFG.

⁸ Benefits estimated using methodology developed for Forest Conservation Strategy in CAT Report and AB 32 Scoping Plan. DFG.

⁹ Estimate derived from methodology developed for Fuels Management/Biomass Strategy in CAT Report and for AB 32 Scoping Plan: i.e., 0.022 MMT C02e/155,600 acres x acres treated = MMT reductions

¹⁰ Department of Interior and USDA Fuels Treatment Accomplishments Report website: <http://www.forestsandrangelands.gov/reports/fuel-treatments.cfm?statename=California&FY=2008>

¹¹ Personal communication, USFS.

¹² Estimates based on methodology developed for Reforestation Strategy in AB 32 Scoping Plan.

¹³ CEC uses a GHG emission factor for electricity averaged over all utilities statewide. CPUC uses emission factors for investor-owned utilities, which are lower than the statewide average.

TABLE 2: GHG EMISSION REDUCTION STRATEGIES AND TIMELINES FOR IMPLEMENTATION

Numbered footnotes appear at the end of the document. Notes identified with asterisks are at the end of each agency's section.

Scoping Plan: Strategy Number or Chapter / Section	Agency ¹ and Sector	Name	Implementation Timeline	Expected GHG Emission Reductions in 2020 ² (MMTCO ₂ E)	Brief Description
AIR RESOURCES BOARD (ARB) STRATEGIES					
AGRICULTURAL SECTOR					
A-1	ARB	Methane Capture at Large Dairies	Voluntary Measure Implement 2017-2020	1 ³	This measure, developed in collaboration with CDFA, encourages voluntary installation of anaerobic digesters at large dairies to capture methane from manure.
Appendix C, Section 12	ARB	Manure Digester Project Protocol	Approved Sep-2008	N/A ⁴	This measure provides a standardized accounting methodology for projects that reduce GHG emissions through optimal waste management practices, from storage, disposal, and transport.
ELECTRICAL AND NATURAL GAS SECTOR					
E-3	ARB	Renewable Electricity Standard	Board to Consider Jul-2010. Implementation 2011	13.4	Formerly known as the Renewable Portfolio Standard (RPS), this measure was re-assigned to the ARB by Executive Order S-21-09 in September 2009. This measure requires California electric utilities to obtain 33% of their electricity from eligible renewable energy resources by 2020. Scoping Plan Measure E-3 will reduce approximately 21.3 MMTCO ₂ e, of which 7.9 MMTCO ₂ e is attributed to the RPS measure to reach 20% reduction by 2010 and 13.4 MMTCO ₂ e attributed to RES to reach 33% reduction by 2020. [Scoping Plan, Vol II, page I-30]
FOREST SECTOR					
Appendix C, Section 16	ARB	Forestry Sector Project Protocol	Approved Oct-2007. Updated to Board Sep-2009	N/A ⁴	This protocol is an accounting mechanism to determine, on a project level, GHG emissions reductions from forest management practices.
Chapter II, Sections B and D	ARB	Urban Forestry Protocol	Approved Sep-2008	N/A ⁴	The goal of the Urban Forestry Protocol is to provide a credible methodology for accounting and reporting the effects of urban forests on greenhouse gases (GHGs).
HIGH GLOBAL WARMING POTENTIAL (GWP) GASES					
H-1	ARB	HFC Reduction Strategies: Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing	Approved Jan-2009 Implementation 2010	0.26	This regulation requires a self-sealing valve on small cans of refrigerant, and a deposit and recycling program for the cans.
H-2	ARB	SF ₆ Limits in Non-Utility and Non-Semiconductor Applications (Discrete Early Action)	Approved Feb-2009 Implementation 2010	0.1	This regulation places restrictions on nonessential end uses of SF ₆ , where feasible alternatives are available.
H-3	ARB	High GWP Reduction in Semiconductor Manufacturing (Discrete Early Action)	Approved Feb-2009 Implementation 2012	0.18	This regulation requires manufacturers to use process optimization, alternative chemistries, and abatement technologies in combination or separately (reduces PFCs through changing the process to use lower GWP chemicals, or installing thermal oxidizers to destroy the PFCs).
H-4	ARB	Limit High GWP Use in Consumer Products-- Pressurized Gas Duster GWP Limit of 150 and Other Consumer Product Categories (Discrete Early Action)	Approved Jun-2008 Implementation 2010	0.23	This regulation requires setting GWP limits on specific consumer products.

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H-5	ARB	High GWP Reductions from Mobile Sources: 1) Low GWP Refrigerants for New Vehicle A/C Systems 2) Air Conditioner Refrigerant Leak Test During Vehicle Smog check. 3) Refrigerant Recovery from Decommissioned Refrigerated Shipping Containers 4) Enforcement of Federal Ban on Refrigerant Release during Servicing or Dismantling of Motor Vehicle Air Conditioning Systems	1) Board to consider 2010 Implementation 2017 2) Board to consider 2010 Implementation TBD 3) Board to consider 2010 Implementation TBD 4) Board to consider TBD Implementation TBD	3.3	This strategy proposes: 1) the use of low GWP refrigerants be used for new MVAC systems, 2) the addition of a refrigerant leak check on MVAC Systems when the smog check is required, 3) the recovery of refrigerants from decommissioned refrigerated shipping containers, and, 4) Enforcement of Federal Ban on Refrigerant Release during Servicing or Dismantling of Motor Vehicle Air Conditioning Systems.
H-6	ARB	High GWP Reductions from Stationary Sources: 1) SF ₆ Emission Reductions from Gas Insulated Switchgear 2) Foam Recovery and Destruction Program 3) High-GWP Refrigerant Management Program for Stationary Sources 4) Residential Refrigeration Early Retirement - Voluntary Program 5) Alternative Fire Suppressants	1) Board to consider Feb-2010 Implementation 2011 2) Board to consider Dec-2011 Implementation TBD 3) Board to consider Dec-2009 Implementation 2011 4) Board to consider Dec-2011 Implementation TBD 5) Board to consider 2011 Implementation TBD	10.9	This strategy proposes: 1) to set maximum SF ₆ emission rate for gas insulated switches; 2) collection of foam and then either recycling or destruction of high GWP gases; 3) to reduce emissions of high-GWP refrigerants from stationary, non-residential refrigeration equipment through leak detection and repair, system retrofit or retirement and reporting and recordkeeping requirements as well as reduce emissions resulting from the installation and servicing of refrigeration and air conditioning appliances using refrigerants; 4) ARB work with utilities to encourage recovery of high GWP materials from residential refrigerators at end of life; and, 5) Use of leakage reduction methods and/or lower GWP fire suppression agents.
H-7	ARB	Mitigation Fee on High GWP Gases	Board to consider Dec-2010 Implementation 2011	5	This regulation proposes establishment of an upstream fee on high GWP gases based on their global warming potential.
INDUSTRY SECTOR					
I-1	ARB	Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	Board to consider Apr-2010 Implementation 2010	N/A ⁴	This regulation proposes major industrial facilities be required to conduct audits of the potential to reduce greenhouse gas emissions, and possible co-benefits for criteria air pollutants and toxic air pollutants.
I-2	ARB	Oil and Gas Extraction GHG Emission Reduction	Board to consider Sep-2010 Implementation 2012	0.2	These regulations propose to require minimizing the venting of natural gas to the atmosphere during maintenance procedures.
I-3	ARB	GHG Leak Reduction from Oil and Gas Transmission	Board to consider Jun-2010 Implement 2012	0.9	These regulations propose to improve maintenance and inspection requirements for valves and flanges.
I-4	ARB	Refinery Flare Recovery System Improvement	Board to consider Dec-2010 Implementation 2012	0.33	This regulation proposes to minimize GHG emissions by recovering gases before they are combusted by the refinery flare. The system collects the gas, compresses it, cools it, and then sends it back to a refinery process, where the recovered gas can be used as refinery fuel gas or refinery feedstock.

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Scoping Plan: Strategy Number or Chapter / Section	Agency ¹ and Sector	Name	Implementation Timeline	Expected GHG Emission Reductions in 2020 ² (MMTCO ₂ E)	Brief Description
I-5	ARB	Removal of Methane Exemption from Existing Refinery Regulations	Board to consider Dec-2010 Implement 2012	0.01	This regulation proposes to remove existing fugitive methane exemptions from the regulations applicable to equipment and sources employed in California's refineries.
RECYCLING AND WASTE MANAGEMENT					
RW-1	ARB	Landfill Methane Control Measure (Discrete Early Action)	Approved Jun-2009 Implementation 2010	1.5	This regulation requires enhanced control of methane emissions from municipal solid waste landfills and would require owners and operators to install gas collection and control systems at smaller and other uncontrolled landfills. Affected landfills would be required to implement advanced methane monitoring requirements.
TRANSPORTATION SECTOR					
T-1	ARB	Pavley I and Pavley II--Light-Duty Vehicle GHG Standards	Pavley I: Approved Sep-2004 Implement 2009-2016 Pavley II: Board to consider 2010 Implement 2017-2020	31.7	Pavley I requires reduction of GHG emissions from new passenger vehicles and light-duty trucks beginning with the 2009 model year. These regulations add four GHG air contaminants to the vehicular criteria and toxic air contaminant emissions that California was already regulating – carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), and hydrofluorocarbons (air conditioner refrigerants).
T-2	ARB	Low Carbon Fuel Standard (Discrete Early Action)	Approved April-2009 Implementation 2010	16	This regulation requires fuel providers in CA to ensure that the mix of fuel they sell into the CA market meets, on average, a declining standard for GHG emissions measured in CO ₂ equivalent grams per energy unit of fuel sold.
T-3	Local Governments / ARB / CalTrans / HCD/ OPR / Regional Planning Agencies	Regional Transportation-Related Greenhouse Gas Targets	Set Targets by Jan-2010 Implementation TBD	5	This regulation would require that GHG targets be incorporated in land use decisions and in regional planning.
T-4	ARB	Vehicle Efficiency Measures: 1) Solar-Reflective Automotive Window Glazing 2) Tire Pressure Program (Discrete Early Action)	1) Approved Jun-2009 Implementation 2012 2) Approved Mar-2009 Implementation 2010	1.63	This strategy requires 1) the use of solar-reflective automotive window glazing with the purpose of reducing the solar heat gain in a vehicle parked in the sun; and, 2) automobile servicing businesses to ensure proper tire inflation at the time of service, as well as public education about proper tire inflation
T-5	ARB	Ship Electrification at Ports (Discrete Early Action)	Approved Dec-2007 Implementation 2010	0.2	This regulation requires most container, passenger, and refrigerated cargo ships to shut off their auxiliary engines while at dock and receive power from the electrical grid, or reduce their emissions by a similar amount via the implementation of other technologies.
T-6	ARB	Goods Movement Efficiency Measures: 1) Port Drayage Trucks 2) Transport Refrigeration Units Cold Storage Prohibition and Energy Efficiency 3) Cargo Handling Equipment Anti-Idling 4) System-Wide Efficiency Improvements	1) Approved Dec-2007 Implementation to begin 2010 2) Board to consider 2010 Implementation 2012 3) Board to consider 2010 Implement 2010-2011 4) Board to consider 2010 Implement 2012-2015	3.5	1) This regulation requires the reduction of GHG, diesel PM, and NOx emissions from drayage trucks operating at California's ports and rail yards through retrofits and turnover of pre-1994 trucks. 2) Transport Refrigeration Units (TRUs) are powered by external combustion engines. More efficient engine designs and advanced cooling technologies will reduce fuel requirements and thereby reduce GHG emissions. 3) This measure proposes to require ARB to investigate and potentially develop a new measure to restrict unnecessary idling of cargo handling equipment, which would reduce fuel consumption and associated greenhouse gases, criteria pollutants, and toxic air contaminants. 4) The System-wide Efficiency Improvements measure addresses emissions from marine vessels, trucks, trains and port-support equipment. This measure entails development and implementation of strategies that provide continued progress toward a lower carbon, more sustainable freight transport system.

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	ARB	5) Commercial Harbor Craft Maintenance and Design Efficiency 6) Clean Ships 7) Vessel Speed Reduction	5) Board to consider in 2010 Implement 2010-2011 6) Board to consider TBD Implementation TBD 7) Board to consider 2010 Implementation TBD		5) This measure proposes to facilitate reduction of fuel consumption and associated CO2 emissions through a variety of technologies and strategies that improve vessel efficiency. 6) This regulation proposes to require a reduction of fuel consumption and associated CO2 emissions through a variety of technologies and strategies, such as hull and propeller design in new ships, that improve the efficiency of ocean-going vessels. 7) This measure proposes to primarily require reduction of NOx emissions as well as diesel PM, SOx, and CO2 emissions resulting from reduced fuel consumption from speed reduction.
T-7	ARB	Heavy-Duty Vehicle GHG Emission Reduction Measure (Aerodynamic Efficiency) (Discrete Early Action)	Approved Dec-2008 Implement 2010-2013	0.93	This regulation requires existing trucks/trailers to be retrofitted with the best available technology and/or ARB approved technology to reduce GHG emissions and improve the fuel efficiency of trucks; may include devices that reduce aerodynamic drag and rolling resistance.
T-8	ARB	Medium- and Heavy-Duty Vehicle Hybridization	Board to consider TBD Implementation TBD	0.5	This regulation and incentive program will reduce the GHG emissions of urban, stop-and-go vehicles, such as parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks, through the use of hybrid technology. Incentives for hybrid trucks will be available starting the first quarter of 2010. The first public workshop for the regulation and updates to hybrid truck test procedures will occur in the first quarter of 2010. Board to consider and implementation of the regulation is TBD.
OTHER SECTORS / STRATEGIES					
Appendix C, Sections 3 and 4	ARB	Cool Communities	Approved Apr-2009 Implementation Ongoing	N/A ⁴	This guidance encourages efforts such as light colored pavement, cool roofs and shade trees to decrease the effective temperature of urban areas. These strategies can result in energy savings due to decreased need for air conditioning, leading to decreased GHG emissions associated with energy generation.
Chapter IV, Section B	ARB	Approval of guidance/protocols for businesses	Approved Apr-2009 Implementation Ongoing	N/A ⁴	This protocol will provide guidance and informational resources to local businesses on best practices, emission calculation methods, case studies, cost-effectiveness information, and other tools to assist in reducing GHG emissions.
Chapter II, Section B	ARB	Approval of Local Government Operations Protocol	Approved Sep-2008 Implementation Ongoing	N/A ⁴	This protocol provides a standardized set of guidelines to assist local governments in quantifying and reporting GHG emissions associated with their government operations. Allows cities to track their own emissions over time, but is not intended to be used to compare one city's emissions to another city's emissions.
Chapter II, Section C.1.	ARB	Cap and Trade Program	Board to consider Oct-2010 Implementation Jan-2012	35***	The broad-based California cap & trade program will provide a firm limit on GHG emissions from the electricity, industrial, commercial and residential fuels and transportation fuels sectors. Links the California program with other Western Climate Initiative Partner programs to create a regional market system that will achieve greater environmental and economic benefits for the state.
Total Reductions Expected from ARB Led Strategies				0.0	
ARB NOTE: *** Set at a level needed to help achieve the GHG emission reduction target for 2020 as established in the Scoping Plan.					

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BUSINESS, TRANSPORTATION AND HOUSING (BTH) STRATEGIES					
TRANSPORTATION SECTOR *					
Not in Scoping Plan	BTH, CalTrans	Strategic Growth Plan - Operational Improvements	2020	1.2	Congestion Management Plan
Not in Scoping Plan	BTH, CalTrans	Fleet Greening and Fuel Diversification	2020	0.1	Fleet replacement
Not in Scoping Plan	BTH, CalTrans	Non-Vehicular Conservation Measures	2020	0.3	Energy Conservation Opportunities
T-3: C-56	BTH, HCD	Regional, Transportation-Related Greenhouse Gas (GHG) Targets.	Begin in 2010 in preparation of the next update for the SANDAG, RTP and RHNA. Then ongoing	HCD will work with CARB to establish baseline and targets in 2010-2011	Regional Transportation-Related Greenhouse Gas (GHG) Targets: Integrate the regional housing needs allocation (RHNA) and housing element update processes with regional transportation plans (RTP's) and develop new RHNA methodology to meet GHG targets for the land use portion of the transportation sector.
INDUSTRY SECTOR					
Not in Scoping Plan	BTH, CalTrans	Portland Cement - 5% limestone cement mix and up to 50% fly ash**	On-going	1.5	Cement and Construction Industries
GREEN BUILDINGS *					
GB-1 C-107 ***	BTH - HCD	Green Building Standards	Beginning in 2010 and ongoing.	HCD will work with CARB to establish baseline and targets in 2010-2011	Work with the Building Standards Commission and the Building Industry to implement and periodically update Green Building standards and develop outreach and educational materials to generate support and understanding about the value and benefits of green building.
LAND USE *					
C-82 ***	BTH - HCD	Housing Element Technical Assistant	Beginning in 2010 and ongoing.	Not quantified. HCD will work with ARB to establish mechanism to evaluate impact of land use changes.	Housing Element Technical Assistance: HCD will update technical assistance and outreach efforts to include climate change and greenhouse gas emission reductions objectives in technical assistance materials and resources for local governments updating their housing elements. This will include identification of new land use strategies that both address housing supply and affordability requirements (density of housing, infill potential, energy conservation in residential development both in construction and retrofitting and design) and reduction in greenhouse gas emissions.
C-83 ***	BTH - HCD	Affordable Housing Finance Incentives	Beginning in 2010 and ongoing.	Not quantified. HCD will work with ARB to establish mechanism to evaluate impact of land use changes.	Promote GHG emission reductions and energy conservation in HCD-administered funding programs. Evaluate how existing funding programs could provide competitive advantage to housing and community development projects that incorporate design and land use changes to achieve GHG emission reductions.
C-49 ***	BTH - HCD	Local Assistance on GHG Reduction Strategies	Beginning in 2010 and ongoing.	Not quantified. HCD will work with ARB to establish mechanism to evaluate impact of land use changes.	Education housing developers, housing advocacy groups, business and industry groups, environmental advocates, and local government housing and planning departments about the relationship between planning well for housing and achieving climate change objectives and effective housing and land use strategies to reduce greenhouse gas emissions.

TABLE 2: GHG EMISSION REDUCTION STRATEGIES AND TIMELINES FOR IMPLEMENTATION

Scoping Plan: Strategy Number or Chapter / Section	Agency ¹ and Sector	Name	Implementation Timeline	Expected GHG Emission Reductions in 2020 ² (MMTCO ₂ E)	Brief Description
C-76 ***	BTH - HCD	Regulatory Relief to GHG Emission Reduction Land Use Strategies	By 2012	Not quantified. HCD will work with ARB to establish mechanism to evaluate impact of land use changes.	BTH is required to convene a group to identify regulatory barriers to housing and efficient land use strategies and prepare recommendations on how such barriers can be addressed. HCD will lead this effort on behalf of BTH.
Total Reductions Expected from BTH Led Strategies				3.1	
BTH NOTES:	<p>* Responsibility for many of the reductions previously associated with land use, smart growth and related strategies has shifted to the ARB to ensure consistency with the Scoping Plan and the mandates of SB 375 (Steinberg, Chapter 728, Statutes of 2008). BTH/CalTrans/HCD will play a very active role in the implementation of these and related land use measures through the Blueprint Planning process and other ongoing programs.</p> <p>** This strategy reflects Caltrans cement consumption only. The measure includes both the 2.5% limestone cement mix and up to 25% fly ash. It is also expected that given the new Caltrans' cement standards, the GHG emission savings could be reflected in the statewide cement consumption as well. However, that saving is not shown here. Starting 2009, new Caltrans cement standards will reflect 5% limestone and up to 50% fly ash which is expected to improve the CO2 emission savings correspondingly. The Scoping Plan has identified the Cement Sector as falling under Cap & Trade.</p> <p>*** References section numbers of the Scoping Plan where the strategies are described.</p>				
CalFIRE / BOARD OF FORESTRY STRATEGIES					
FOREST SECTOR					
F-1 (Substrategies Below)	CalFIRE / BOARD OF FORESTRY	Sustainable Forests *	On-going	5.0	Maintain the current level of carbon sequestration through sustainable management practices including reducing the risk of wildfires, avoiding or mitigating land-use changes that reduce carbon storage, and supporting voluntary actions to conserve biodiversity. Actions to support this strategy are detailed below.
F-1: Substrategy 1	CalFIRE / BOARD OF FORESTRY	Conservation Forest Management	2005-2020		Maintain and enhance forest stocks on timberlands through forest management practices subject to the Forest Practice Act.
F-1: Substrategy 2	CalFIRE / BOARD OF FORESTRY	Forest Conservation	2005-2020		Prevent conversion of forestlands through publicly and privately funded acquisitions and easements.
F-1: Substrategy 3	CalFIRE / BOARD OF FORESTRY	Fuels Management/Biomass	2005-2020		Reduce wildfire emissions through fuels reduction on private and federal lands and provide GHG benefits by using woody biomass for biofuels and biopower as fossil fuel alternative.
F-1: Substrategy 4	CalFIRE / BOARD OF FORESTRY	Urban Forestry	2005-2020		Plant trees in urban areas to sequester carbon and provide shade to reduce energy use. Urban forest wood waste will also be used for biopower (renewable energy/fossil fuel alternative).
F-1: Substrategy 5	CalFIRE / BOARD OF FORESTRY	Afforestation/Reforestation	2005-2020		Reforest state, private and federal lands to produce sequestration benefits.
Total Reductions Expected from CalFIRE Led Strategies				5.0	
CalFire NOTES:	* CalFIRE led activities may increase the baseline sequestration potential in future years as funding becomes available for more expansive implementation of the 5 substrategies listed above.				
CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA) STRATEGIES					
AGRICULTURAL SECTOR					
A-1	CDFA, ARB	Methane Capture at Large Dairies (Enteric Fermentation, Dairy Digesters)	TBD	¹ 3	In collaboration with ARB and stakeholders, CDFA continues to work on addressing regulatory permitting and financial barriers to a widespread voluntary adoption of anaerobic digesters on dairies.

TABLE 2: GHG EMISSION REDUCTION STRATEGIES AND TIMELINES FOR IMPLEMENTATION

Scoping Plan: Strategy Number or Chapter / Section	Agency ¹ and Sector	Name	Implementation Timeline	Expected GHG Emission Reductions in 2020 ² (MMTCO ₂ E)	Brief Description
Appendix C, Section 12	CDFA	Conservation Tillage/Cover Crops	TBD	TBD	CDFA's Fertilizer Research and Education Program has funded two studies related to conservation tillage and cover crops: 1. "Effects of Cover Cropping and Conservation Tillage on Sediment and Nutrient Losses to Runoff in Conventional and Alternative Farming Systems" was completed in 2008, and "Fertilization Technologies for Conservation Tillage Production Systems in California" was completed in 2006.
Early Action Item	CDFA, ARB, CEC	Agricultural Research - Nitrous Oxide Reduction	Ongoing	N/A ⁴	CDFA has engaged in efforts with ARB and CEC during the past year to coordinate research proposals on reducing nitrous oxide emissions from fertilizer applications. As a result, CDFA has committed to funding a \$150,000 research project on baseline agricultural nitrous oxide emissions. CDFA has secured additional funding commitments from fertilizer industry to fund staff work to coordinate nitrous oxide research, conduct literature review on the current nitrous oxide baseline for agriculture, and to eventually establish recommended best management practices to reduce nitrous oxide emissions.
Not in Scoping Plan	CDFA, USDA	Agricultural Management Efficiencies	TBD	TBD	CDFA has selected two projects under the USDA, CDFA-administered Specialty Crop Block Grant: the first is \$99,968 to University of California, Davis, for a study to provide walnut growers with a trade-off analysis model to calculate the environmental impact and economic cost for conventional, organic and IPM strategies, and to examine likely impacts of climate change on walnut development; Second, \$100,000 to the California Sustainable Winegrowing Alliance, which in collaboration with industry and academic partners will examine all data pertaining to emissions and offsets of greenhouse gases to better understand the grape growing sector's greenhouse gas "footprint".
Not in Scoping Plan	CDFA	Bio-fuels (E-85 and Biodiesel)	TBD	TBD	CDFA Division of Measurement Standards (DMS) is working with renewable fuel producers to develop and market test fuels through an established variance program. This collaborative venture allows "experimental fuels" (fuels without ASTM adopted standards) to gain broad based market feedback, exposure, and market access with close regulatory oversight.
Not in Scoping Plan	CDFA, CEC, ARB	Hydrogen Fuel Standards	TBD	N/A ⁴	CDFA DMS, is charged with developing hydrogen fuel standards for use in combustion systems and fuel cells. These standards were adopted by regulation September 2008. CDFA DMS is also working with ARB and CEC to address the implementation of fuel quality standards. Reference standards will be used to determine hydrogen dispenser accuracy, field fuel sampling techniques, and laboratory test methodology.
Not in Scoping Plan	CDFA	Farm-Based Clean Energy Technologies	TBD	TBD	CDFA is working with The San Joaquin Valley Partnership and the SJV Clean Energy Organizations on developing strategies to remove barriers and promote the adoption of clean farm-based energy technologies, such as biogas, biofuels and biomass technologies.
Not in Scoping Plan	CDFA, CEC	Energy Crops	Jan. 1, 2009 - Dec. 31, 2011	TBD	Coordinate with the CEC on research to demonstrate potential energy and industrial crops under commercial conditions; familiarize growers with these crops; focus on crops that use marginal lands and that minimize environmental externalities; determine the suitability of these crops for various energy markets; determine costs and energy balance of production; and, identify barriers to commercialization.
WATER SECTOR					
Not in Scoping Plan	CDFA, USDA-NRCS	Promote water use efficiency through case studies and outreach to growers	December 31, 2009	TBD	CDFA has a \$45,000 contract with NRCS to develop a forum to provide outreach to growers on irrigation methods and funding programs that promote water-use efficiency methods and technologies.
Not in Scoping Plan	CDFA/DWR/ARB	Ag Water Use Efficiency to reduce energy and related GHG emissions from the movement of water	Ongoing	TBD	CDFA, through the CAT, will be collaborating with other state agencies to identify data to estimate the energy footprint of agricultural water use.

TABLE 2: GHG EMISSION REDUCTION STRATEGIES AND TIMELINES FOR IMPLEMENTATION

Scoping Plan: Strategy Number or Chapter / Section	Agency ¹ and Sector	Name	Implementation Timeline	Expected GHG Emission Reductions in 2020 ² (MMTCO ₂ E)	Brief Description
OTHER SECTORS / STRATEGIES					
<i>Strategies Targeting GHG Emission Reductions at Agricultural Fairs</i>					
Not in Scoping Plan	CDFA	Energy Efficiency	Ongoing	TBD	CDFA Division of Fairs and Expositions (F&E) has facilitated energy audits and encouraged the implementation of the described measures to increase energy efficiency. By implementing energy efficiency retrofits, these actions could result in annual emission reductions of 26 Mt CO ₂ E
Not in Scoping Plan	CDFA	Renewable Energy -Photovoltaic	Estimated 2010 construction start	TBD	CDFA Division of Fairs and Expositions continues to coordinate the funding, site selection, and installation of photovoltaic panels at fair facilities. Currently, 26 fairs have operational systems producing approximately 8.1 megawatts of energy. There are 19 projects in the pipeline with unknown completion dates.
Not in Scoping Plan	CDFA	Waste Reduction / Recycling	Ongoing	TBD	Several California fairs are serving in an ongoing capacity as community sites for e-waste recycling to assist in diverting waste to landfills. Several fairs have also participated in recycling grant programs overseen by the California Integrated Waste Management Board. The Calaveras County Fair fair applied for and received a \$69,000 CIWMB grant to install recycled rubber paving materials.
Not in Scoping Plan	CDFA	Stimulus Projects for Infrastructure Upgrades	Estimated 2010 construction start	On-going	The CDFA Division of Fairs & Expositions submitted 74 stimulus projects in 2008 for federal economic stimulus monies. The economic stimulus money will be used to modernize fairgrounds in California which all would directly or indirectly reduce gases in the state. In addition, requests have been submitted for 19 additional projects at California fairs to install Photovoltaic Solar Energy Systems utilizing federal economic stimulus monies.
<i>Strategies Targeting GHG Emission Reductions using more efficient IT Infrastructure</i>					
Not in Scoping Plan	CDFA	Verdiem Surveyor Power Management	Ongoing	TBD	CDFA Sacramento-based computers are centrally managed by the Verdiem Surveyor power management utility. This software helps to reduce GHG by ensuring an efficient power management setting is attained on each computer attached to the Sacramento Headquarters network.
Not in Scoping Plan	CDFA	VM Ware Virtualization Technology	Ongoing	TBD	CDFA is starting to utilize virtualization software to attain an efficient economy of scale for use of computing hardware, floor space, HVAC, and energy utilization. By using virtualization technology, the Office of Information Technology Services is able to save electricity and floor space by running the core network services on fewer physical devices. This on-going effort will reduce electrical usage.
Total Reductions Expected from CDFA Led Strategies				1.0	
CALIFORNIA ENERGY COMMISSION (CEC) STRATEGIES					
ELECTRICAL AND NATURAL GAS SECTOR					
E-1	CEC	Comprehensive Publicly Owned Utilities Efficiency Program	2016	3.5	POUs' pursue energy efficiency programs for their customers in all end uses, notably cooling and lighting. They report their goals and accomplishments to the Energy Commission.
Not in Scoping Plan	CEC	Building Energy Efficiency Standards in Place	Ongoing	2.1 ⁵	Current energy efficiency requirements for newly constructed buildings, additions and alterations (Title 24, Part 6)
Not in Scoping Plan	CEC	Appliance Energy Efficiency Standards in Place	Ongoing	4.5 ⁵	Current energy efficiency requirements for appliances sold in California (Title 20)

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Scoping Plan: Strategy Number or Chapter / Section	Agency ¹ and Sector	Name	Implementation Timeline	Expected GHG Emission Reductions in 2020 ² (MMTCO ₂ E)	Brief Description
TRANSPORTATION SECTOR					
T-4	CEC	Fuel-Efficient Tire Program	Ongoing	0.26	Adoption/Implementation in 2010-2011. Reducing the average rolling resistance of replacement tires through consumer information and minimum standards promises fuel savings and a resultant reduction in GHG emissions.
WATER SECTOR					
W-3	CEC, DWR, CPUC, SWRCB	Energy Intensity of the Water System	Ongoing	2 ³	The Commission has a current investigation into water conservation and subsequent energy conservation
W-5	CEC, DWR, CPUC, SWRCB	Increase Renewable Energy Production from Water	Ongoing	.9 ³	The purpose of this measure is to identify and implement specific projects that take advantage of the State's water system-related opportunities to generate renewable electricity. Examples: water moving through conduits, sunlight, wind, and gases emitted during treatment of wastewater at wastewater treatment plants.
Total Reductions Expected from CEC Led Strategies				6.7	
CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD (CIWMB) STRATEGIES					
RECYCLING AND WASTE MANAGEMENT					
RW-2	CIWMB	Landfill Methane Capture Guidance Document	Guidance Document Complete April 2008, outreach on-going	TBD ³	The Landfill Methane Capture Guidance Document measure developed a document listing numerous "best management practices (BMPs) and options that municipal solid waste (MSW) landfill owners and operators may reference to maximize greenhouse gas (GHG) emission reductions from their operations.
RW-3 (Substrategies listed below)	CIWMB	Zero Waste - High Recycling	On-going	Reductions detailed below	Detailed description of related measures below.
RW-3: Substrategy 1	CIWMB	Anaerobic Digestion	Full implementation achieved by 2020	2.0 ^{**}	Anaerobic digestion involves using an enclosed, covered system for accelerating decomposition of organic materials for the dual purposes of biogas production and waste volume reduction. Diverting organic waste from landfills to beneficial use can provide a significant reduction of GHG emissions through landfill methane avoidance. This strategy will also result in substantial renewable energy production that will aid in the 33% Renewable Portfolio Standards goal and compliance with the Low Carbon Fuel Standard.
RW-3: Substrategy 2	CIWMB	Mandatory Commercial Recycling	Full implementation achieved by 2020	5.0 ^{**}	GHG emission reductions are achieved by recycling materials which reduces fossil fuel energy used to extract resources and process materials and in some cases, avoided methane emissions at landfills. Efforts include: <ul style="list-style-type: none"> • Conduct study to analyze the cost-benefits of commercial diversion programs • Encourage business and industry to implement commercial recycling programs (2008-2012) • Adopt Mandatory Commercial Recycling regulations by 1/1/12 with jurisdictions adopting & implementing programs by 7/1/12.
RW-3: Substrategy 3	CIWMB	Extended Producer Responsibility (EPR)	• Establish authority for EPR framework	TBD ³	EPR places a shared responsibility for end-of-life product management on the producers and all entities involved in the product chain. Some of the strategies include reducing the amount of materials used to make products and influencing product design, use, and reuse capabilities to minimize raw material inputs, extend product life spans, and maximize the ease and frequency of subsequent product disassembly, recycling, and/or transformation for further productive use. GHG emission reductions are realized from avoided energy use in the extraction of resources.

TABLE 2: GHG EMISSION REDUCTION STRATEGIES AND TIMELINES FOR IMPLEMENTATION

Scoping Plan: Strategy Number or Chapter / Section	Agency ¹ and Sector	Name	Implementation Timeline	Expected GHG Emission Reductions in 2020 ² (MMTCO ₂ E)	Brief Description
RW-3: Substrategy 4	CIWMB	Increase Production & Markets for Compost	Full implementation achieved by 2020 • Complete Life Cycle Assessment of organic diversion alternatives: Fall 2009	2.0 **	Diversion of organic materials from landfills can provide a significant reduction of GHG's through landfill methane avoidance while the organic materials can be used as feedstock for producing compost. Efforts include: completing a Life Cycle Assessment of organics diversion alternatives; development of compost based BMPs and compost specifications for agriculture crops; studying the effectiveness of compost as cover to mitigate methane emissions at landfills; and evaluating economic incentives/disincentives and siting and capacity issues.
Appendix C, Section 9. C.	CIWMB/ARB	Liquefied Natural Gas from Landfill Gas Measure	Projects expected to be completed by end of 2010	1.0	The Liquefied Natural Gas (LNG) from Landfill Gas Measure implements grant-funded projects at two landfills to demonstrate commercial-scale technologies for converting landfill gas to LNG vehicle fuel.
Not in Scoping Plan - completed prior to Scoping Plan development	CIWMB	Achieve 50% Statewide Recycling Goal On-going efforts continue	Achieved 52% in 2005 Achieved 54% in 2006 Achieved 58% in 2007 Achieved 59% in 2008	3.0 ⁵	Recycling has the potential to significantly reduce GHG emissions because the majority of GHG reduction benefits from recycling or waste prevention come from the energy savings from avoided resource extraction and materials processing.
Not in Scoping Plan	CIWMB, CEC, ARB, CPUC	Waste Technology Demonstration & Development	Began demonstration project to convert solid waste into bioenergy and biofuel.	TBD	Aid in the development of new technologies to reduce GHGs by providing necessary funding that will assist developers in demonstrating their technology on a commercial scale. Of particular interest is development of technologies that produce renewable energy from municipal solid waste. The project will use post-Material Recovery Facility (MRF) organic residuals as feedstock and produce liquid, solid or gaseous (or combination of) energy products that will have specific end-uses and market value in energy markets.
WATER SECTOR					
Appendix C, Section 4.E.	CIWMB, DWR	Watershed Friendly Landscape Guidelines	Full implementation achieved by 2020	2.7	Adopted guidelines that will reduce GHG emissions related to transportation of green material and generation of methane related to disposal of green materials in landfills. The guidelines can also reduce fossil fuel consumption by reducing landscape power equipment usage and by reducing the use of chemical fertilizers and also reduce GHG emissions related to water treatment and distribution. Outreach efforts continue.
Total Reductions Expected from CIWMB Led Strategies				12.7	
<p>CIWMB NOTES: * Split Subcategory 3, CIWMB is lead for EPR and DGS is lead for EPP. ** GHG emission reduction estimate in Scoping Plan</p>					
CA. PUBLIC UTILITIES COMMISSION (CPUC) STRATEGIES					
ELECTRICAL AND NATURAL GAS SECTOR					
E-1	CPUC	IOU Energy Efficiency Programs	Ongoing through 2020	11.7	Reflects EE program reductions in IOU territories not included in the CEC standards measures above. Based on the 2008 ITRON High Goals Scenario and EE reductions based on the Commission's Long Term Energy Efficiency Strategic Plan, including four "Big Bold strategies" strategies: 1) All new residential construction in California will be zero net energy by 2020 2)All new commercial construction in California will be zero net energy by 2030 3) HVAC industry will be reshaped to ensure optimal equipment performance 4) All eligible low-income homes will be energy-efficient by 2020.
E-2	CPUC, CEC	Customer-Installed CHP (non SGIP)	2008-2020	6.7	The Commissions are implementing AB 1613 and AB 2791 to create standards and a tariff for new small highly efficient CHP systems. For large CHP systems, a standard offer contract as authorized under PURPA is ready for Commission consideration but is on hold pending settlement negotiations. In addition, there will be future policy framework on CHP for all systems.

TABLE 2: GHG EMISSION REDUCTION STRATEGIES AND TIMELINES FOR IMPLEMENTATION

Scoping Plan: Strategy Number or Chapter / Section	Agency ¹ and Sector	Name	Implementation Timeline	Expected GHG Emission Reductions in 2020 ² (MMTCO ₂ E)	Brief Description
E-2	CPUC	Electricity Sector Carbon Policy	Began in 2007 (emissions performance standard); 2008 recommendations expected to ARB for AB 32 implementation (2012)	TBD	The Emissions Performance Standard creates rules that baseload generation to serve California consumers will be from power plants that have emissions no greater than a combined cycle gas turbine plant.
E-3	CPUC, CEC	20 % RPS	Ongoing -- legislative target is to reach goal by 2010	7.9	Current projection is that Investor Owned Utilities will meet this target in 2012-2013.
E-4	CPUC, CEC	Million Solar Roofs	Program began in 2007; projected completion by 2016	2.2	The Million Solar Roofs program goal is to install 3,000 MW of rooftop solar (and achieve greater market transformation) via provision of a subsidy based on performance to help buy-down the cost of rooftop solar PV on residential and commercial buildings.
CR-1	CPUC, CEC	Energy Efficiency: 800 mil. therms reduced consumption.	TBD	4.3	Strategy includes: utility energy efficiency programs; building and appliance standards; and additional efficiency and conservation programs.
CR-2	CPUC	Increased Use of Solar Water Heating	TBD	0.1	The PUC is currently in the process of implementing AB 1470 (Huffman) which requires consideration of the results of a pilot program in San Diego before implementing additional solar hot water heating incentives. The PUC released a set of recommendations for this program in 2009.
Not in Scoping Plan	CPUC	Self Generation Incentive Program	Began in 2001; ongoing	TBD	This program currently only includes Fuel Cells and Wind Turbines. SB 412 recently passed to allow the CPUC the authority to include new technologies that are GHG beneficial
Not in Scoping Plan	CPUC, CIWMB, ARB	Expand Awareness of AB1969	Begins 2009	TBD	The CPUC has authorized new feed-in tariffs available for the purchase of up to 480 MW of renewable generating capacity from small facilities throughout California. The expanded efforts of this renewable Feed in Tariff will be ready for Commission consideration in Q1 2010.
Not In Scoping Plan	CPUC	Alternative Fuel Vehicles (Natural Gas and Electric Vehicles)	Begins 2009	TBD	The CPUC launched an Alternative Fuel Vehicle Rulemaking in August 2009. This rulemaking focuses on rates and infrastructure for Electric and Natural Gas vehicles.
	WATER SECTOR				
W-3	CPUC, CEC, SWRCB, DWR	Water and Energy Conservation	TBD	TBD	The Commission has a current investigation into water conservation and subsequent energy conservation
	Total Reductions Expected from Energy Sector Strategies			32.9	
CPUC NOTES: GHG Reduction goals for PUC measures are taken from ARB's AB 32 Scoping Plan. The values represent statewide reductions for the measures and are not prorated to the CPUC jurisdictional utilities' share.					

TABLE 2: GHG EMISSION REDUCTION STRATEGIES AND TIMELINES FOR IMPLEMENTATION

Scoping Plan: Strategy Number or Chapter / Section	Agency ¹ and Sector	Name	Implementation Timeline	Expected GHG Emission Reductions in 2020 ² (MMTCO ₂ E)	Brief Description
DEPARTMENT OF WATER RESOURCES (DWR) STRATEGIES					
WATER SECTOR					
W-1	DWR, SWRCB	Water Use Efficiency	Dependent upon resources; various milestones through 2020 per SBx7 7.	1.4 ³	Promote greater implementation of water conservation measures, including best management practices, to improve efficiency. Implement the Governor's 20x2020 Plan, implement provisions of SBx7 7.
W-6	DWR	Public Goods Charge on Water	TBD	TBD	A fee to be used to fund end-use water efficiency improvements, system-wide efficiency projects, water recycling, and other actions that improve water and energy efficiency and reduce GHG emissions.
Not in Scoping Plan	DWR	Reid Gardner Power Plant Divestiture	2013	1.2	DWR will divest its interest in a coal plant by July 2013. With this action, as well as DWR's procurement of renewable energy and on-going energy efficiency programs, including pump refurbishments, CO2 emissions from DWR's power portfolio will decrease an estimated 1,180,000 MT from its 1990 levels. By 2014, DWR's emissions will be almost 40% lower than its 1990 levels.
Total Reductions Expected from DWR Led Strategies				2.6	
OFFICE OF PLANNING AND RESEARCH (OPR) STRATEGIES					
OTHER SECTORS/STRATEGIES					
Chapter II Section A	OPR	CEQA Guidelines	1-Jan-10	No Direct Reductions	OPR is developing CEQA guidelines to help lead agencies address greenhouse gas impacts.
Not in Scoping Plan	OPR	Supplement to General Plan Guidelines	1-Dec-08	No Direct Reductions	OPR is developing a Supplement to the General Plan Guidelines to provide advice to cities and counties for including policies in their general plans to address climate change and greenhouse gas reduction strategies.
Total Reductions Expected from OPR Strategies				0.0	
STATE AND CONSUMER SERVICES AGENCY (SCSA) STRATEGIES					
GREEN BUILDINGS					
GB-1	SCSA	Green Buildings Initiative	Ongoing	5.24	This project focuses on implementing green building measures in new and existing buildings, including LEED certification, Retro-commissioning, Retrofit projects, and on-site clean generation projects (details below).
GB-1: substrategy 1	DGS, State Agencies	New state buildings	Ongoing: All new state buildings constructed to LEED-Silver standards	0.1	Ensuring all new and renovated state buildings are built to LEED-NC (New Construction) Silver or higher standards. This estimate is based on achieving LEED-NC certifications at a rate consistent with what was achieved in 2007-2008.
GB-1: substrategy 2	DGS, State Agencies	Existing state buildings	All existing State buildings over 50,000 SF in size to be LEED-EB certified by 2015	0.88	Attain LEED-EB (Existing Buildings) certification for all existing buildings over 50,000 square feet in size. This estimate is based on the LEED certification of 60 DGS buildings by 2020.

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GB-1: substrategy 3	State Architect, Office of Public School Construction, Department of Education	Schools	Ongoing: California Schools encouraged to achieve green standards	13.2 *	Various activities to encourage California schools to be built and operated to high levels of energy and environmental performance. This estimate is based on 40% of California schools constructed/renovated to LEED/CHPS standards by 2020.
GB-1: substrategy 4	DGS, State Agencies	Leased Buildings	Ongoing: Encourage owners/occupants to implement green building measures	0.25	Encourage owners and occupants of leased buildings to implement energy and environmental improvements in their buildings. This estimate is based on all new build-to-suit leases constructed to LEED standards and continuing to educate owners/occupants on the benefits of green buildings.
GB-1: substrategy 5	DGS, State Agencies, CSU/UC	Distributed Generation	Ongoing: Investigate implementation of clean/renewable on-site generation	0.16	Implement clean renewable energy generation projects at state facilities. It is anticipated that at least 50 Megawatts of clean/clean renewable generation will be installed in state facilities by 2020. Installations will consist of Solar PV, Fuel Cell, Wind and Solar Thermal generation projects.
GB-1: substrategy 6	DGS, State Agencies, CIWMB, DTSC	Environmentally Preferable Purchasing	Ongoing: Operate green buildings and minimize energy and resource impacts.	**	Develop environmentally preferable purchasing specifications, contracts and guidelines to promote the use of commodities that lower energy use, increase recycling and reuse and reduce the emission of greenhouse gasses.
GB-1: substrategy 7	California Building Standards Commission, CEC, DGS, State Architect, HCD, OSHPD	Green Building Code Development	Ongoing	2.9	California adopted the first-in-the-nation Green Building Standards Code in 2008, which became effective on August 1, 2009. It is composed of voluntary standards. The commission is currently in an adoption cycle to develop a 2010 edition of this code, which will be composed of both voluntary and mandatory measures to further promote green buildings. Voluntary reductions estimated at 3.6. Mandatory reductions estimated at 2.9. (Source: ARB)
TRANSPORTATION SECTOR					
Appendix C, Section 2.B.	DGS, BAR, DMV, OFAM	Right-size the State Fleet	Ongoing	0.2	This measure focuses on reducing the number of State vehicles with the goal of increasing the efficiency of vehicle uses and assignments. A typical effect of right-sizing is a reduction in the number of vehicles in the fleet overall.
Appendix C, Section 2.B.	DGS, BAR, DMV, OFAM	Removing Higher-Polluting Vehicles from the State Fleet	Ongoing	0.4	After the state fleet is right-sized we will continue to identify the most polluting vehicles in the state fleet and replace those vehicles with greener more fuel efficient vehicles utilizing the Fleet Asset Management System. We will continue working with other state agencies on cost effective vehicle replacement strategies.
Appendix C, Section 2.B.	DGS, BAR, DMV, OFAM	Actively manage vehicle miles traveled and reduce petroleum consumption	Ongoing	0.2	Eliminating trip redundancy to optimize vehicle utilization reduces the number of vehicle miles traveled, GHG emissions, criteria pollutants, and maintenance costs. Actively managing fuel consumption meets objectives by decreasing petroleum use through the increased use of renewable and alternative fuels for necessary business travel. By combining all three strategies listed above the State fleet is expected to reduce petroleum consumption by 20% or 9 million gallons of gasoline and diesel.
Total Reductions Expected from SCSA Led Strategies				23.5	
SCSA NOTES: * Preliminary estimate. ** (Unable to determine projected GHG reductions arising from EPP Program due to the relative immaturity of computational algorithms and lack of data collection processes in this area).					

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Scoping Plan: Strategy Number or Chapter / Section	Agency ¹ and Sector	Name	Implementation Timeline	Expected GHG Emission Reductions in 2020 ² (MMTCO ₂ E)	Brief Description
STATE WATER RESOURCES CONTROL BOARD (SWRCB) STRATEGIES					
WATER SECTOR					
W-2	SWRCB, DWR, CEC	Water Recycling	by 2020	0.3 ³	This CAT measure proposes a requirement for development and implementation of water recycling plans by wastewater management agencies working with water supply agencies, where the recycling of treated effluent is not maximized at wastewater treatment plants located in areas of imported water supply. Implementation of water recycling plans would be prioritized for those plants that discharge to water bodies from which the wastewater cannot otherwise be easily recovered, such as the ocean and brackish water bodies. GHG benefits would be realized where recycled water would consume less energy than water obtained from existing sources.
W-4	SWRCB	Storm Water Reuse	by 2020	0.2 ³	This CAT measure proposes that Low Impact Development (LID) be required to maximize the infiltration and/or capture of stormwater to increase local water supplies. Where favorable soil and geologic conditions exist, stormwater would be infiltrated to increase groundwater supplies. In locations where potential infiltration is either limited or not recommended, capture and storage would be required to preserve stormwater for nonpotable applications. GHG benefits would be realized where local water would consume less energy than water obtained from existing sources.
Total Reductions Expected from SWRCB Led Strategies				0.5	
<p>DOCUMENT FOOTNOTES:</p> <ol style="list-style-type: none"> Where multiple agencies are noted, the first is the lead agency and the others work in collaboration to achieve strategy goals. Measures shown without an estimated GHG emission reduction represent on-going or future efforts for which quantification has not been completed. GHG emission reduction estimate not included in calculating the total reductions needed to meet the 2020 target as established in the Scoping Plan, (see Scoping Plan for details). These strategies will not result in direct reductions of GHG emissions but will facilitate reductions through associated voluntary actions and potential future regulatory efforts. These programs pre-date the Scoping Plan but are included here to document on-going efforts. GHG reductions are not included in the total for the agency as they do not provide additional reductions over and above what would have occurred absent AB 32. 					

TABLE 3: GHG EMISSION REDUCTION TARGETS (MMTCO₂E)

Agency	GHG Emission Reductions in 2008	GHG Emission Reductions Expected in 2020 from Proposed Strategies ¹	Agency 2020 GHG Emission Reduction Target
ARB	0.5	131.8	131.8
BTH	0.1	3.1	3.0
CalFIRE	5.0	5.0	5.0
CDFA	0.0	1.0	1.0
CEC	0.6	6.7	6.7
CIWMB	0.0	12.7	1 ²
CPUC	1.8	32.9	32.0
DWR	0.0	2.6	1.0
OPR ³	0.0	0.0	NA
SCSA	0.0	23.5	2 ⁴
SWRCB	0.0	0.5	0.5

[Statewide Emission Reduction Target Established in the Scoping Plan - 174 MMTCO₂E]

FOOTNOTES:

1. The values in this column are taken from the agency totals in Table 2. The total aggregate GHG reduction cannot be directly calculated from these values due to issues of double counting and some differences in baseline assumptions. Ex: the Green Building measures achieve reductions, primarily, by reducing energy consumption. The GHG reduction is captured within the energy sector but the measure is implemented by agencies such as SCSA.
2. Only 1 MMT of this target is included in the overall total because the balance of these reductions may occur largely out-of-state.
3. OPR has important programmatic responsibilities but does not have emission reduction regulatory authority.
4. Most of the GHG reductions from SCSA measures are captured within the energy sector. The target is for measures that are not counted elsewhere.

Table 4: Climate Action Team - GHG Inventory Status

INVENTORY STATUS - AGENCY/Dept.	Member of Climate Registry		Inventory Begun (CY)		Inventory Completed (CY)		Inventory Verified (CY)			Emissions in Metric Tons for each year calculated (verified figures in green)	Notes
	Year	Direct	Indirect	Total	Year	Direct	Indirect	Total			
Business, Transportation & Housing - CalTrans	YES	2007, 2008	2007, 2008	2007	2007	136,587	93,996	230,583			
CalEPA - includes the following Boards & Depts.	Yes	2005, 2006, 2007, 2008	2005	2005	2005	2,632	4,914	7,546			
- Air Resources Board - Integrated Waste Management Board - Dept. of Toxics Substance Control - State Water resources Control Board											
CA Department of Food & Agriculture	Yes	2007, 2008	2007								
CA Public Utilities Commission	Yes	2004, 2005, 2006	2004	2004	2004	92	849	941			
Health and Human Services Agency - Department of Public Health											
Natural Resources Agency	<i>Following Boards and Departments calculate emissions separately.</i>										
		2004, 2005, 2006, 2007, 2008			2007	41,756	7,364	49,120			
- CalFire	Yes	2004, 2005, 2006, 2007, 2008	No	No	2008	37,081	6,060	43,141			
					2003	22	576	598		Decrease in direct emissions due to shift to hybrid vehicles. Increase in indirect emissions due to inclusion of heating and cooling.	
- CA Energy Commission	Yes	2003, 2008	2003, 2008	2003	2008	14	948	962			
- Dept. of Fish & Game	Yes	2007, 2008	2007, 2008								
					2007	14,299	3,226,250	3,240,549			
- Dept. of Water Resources	Yes	2007, 2008	2007, 2008	2007, 2008	2008	4,116	2,397,336	2,401,452			
- State Parks	Yes	2006									
Office of Planning & Research											
					2,006	56,135	80,434	136,569			
State & Consumer Services Agency					2,007	58,124	90,739	148,863			
- Dept. of General Services	Yes	2006, 2007, 2008	2006	2006, 2007	2,008	60,256	83,678	143,934			

NOTE: If the emissions inventory is aggregated on an agency-wide basis, the agency total is shown. If the department/board does an inventory separate from the agency's assessment, the information for each department/board is shown

Verification: Inventory figures that have been verified according to protocols of the California Climate Action Registry are shown in green. Figures not yet verified are shown here for informational purposes but may change during the process of verification.