2016
State Agency Greenhouse Gas Reduction Report Card

Background

Section 12892 of Part 2.5 of Division 3 of Title 2 of the Government Code SB 85 (Stats. 2007, ch. 178) requires the California Environmental Protection Agency (CalEPA) to prepare an annual report describing state agency actions to reduce greenhouse gas (GHG) emissions. State law directs CalEPA to compile and organize this information in the form of a 'Report Card' and post it on the CalEPA website. The report reflects information gathered in 2015 for actual GHG reductions occurring in 2014, the last year of available data. Projections of future GHG emissions were current as of October 2015, when state agencies were required to submit their information to CalEPA.

The statute requires that the Report Card include the following:

- 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 as described below:

TABLE 1: On-going Measures and Reductions in 2014:

The vast majority of the GHG emission reduction measures in the AB 32 Scoping Plan are already in place and operational. Table 1 shows the emission reductions achieved by these measures in calendar year 2014, as reported to CalEPA by the responsible agencies.

TABLE 2: GHG Reduction Measures and Reductions Expected in 2020:

There are several factors worth noting about the reported GHG emission reductions in Table 2. A number of measures have cross-agency implementation responsibilities. Agencies will refine their reduction targets for these measures as implementation actions progress. The total reduction for these measures may be listed twice in some cases to reflect that each agency is responsible for some portion of the reductions. Also, several individual measures have interacting impacts so that the reduction numbers from each are not strictly additive (as recognized and explained in the 2008 Scoping Plan, which can be found at http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm). Finally, nearly all the Scoping Plan measures are now in place. For the few exceptions, the final column of Table 2 indicates the implementation timeline.

Previous editions of the Report Card showed Table 2 with a column for Implementation Timeline. This year Table 2 no longer has that column, because nearly all of the measures have begun implementation by now. For the few measures with implementation dates in the

future, this fact gets mentioned in the last column, now denoted "Activities since last Report Card or Implementation Timeline."

TABLE 3: GHG Reduction Target Comparison:

Table 3 summarizes the reductions shown in Tables 1 and 2, and compares the 2020 goals from Table 2 with the annual reductions from current programs shown in Table 1. Reductions shown are only those achieved within California during the given year. The annual figures are not cumulative and do not reflect reductions that might occur out-of-state.

TABLE 4: Climate Action Team (CAT) – GHG Inventory Status:

Each CAT agency is required to report an estimate of the greenhouse gas emissions from their own operations and activities. Table 4 lists the CAT agencies, boards, departments and commissions, and the current status of the greenhouse gas inventory activities for each. The information in this Table was provided to CalEPA by the named agency or department.

The GHG inventories are conducted using protocols established by The Climate Registry (TCR)*. Inventories identified as 'verified' have been verified by an approved third party and submitted to the registry. The verified inventory reports can be found on the registry's websites: http://www.theclimateregistry.org/public-reports.

*Originally chartered by the state of California as the California Climate Action Reserve

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Abbreviations:

ARB – Air Resources Board

CAL FIRE – California Department of Forestry & Fire Protection

CAT -- Climate Action Team

CDFA – California Department of Food & Agriculture

CEC – California Energy Commission

CalRecycle – California Department of Resources Recycling and Recovery

CPUC – California Public Utilities Commission

DGS – Department of General Services

DWR – Department of Water Resources

GHG – Greenhouse Gas

GW – Gigawatt

GWh – Gigawatt hour

GWP –Global Warming Potential

LEED – Leadership in Energy and Environmental Design (certification program)

MMBtu – Million British Thermal Units

$MMTCO_2E$ - Million Metric Tons of CO_2 Equivalent

$MTCO_2E$ - Metric Tons of CO_2 Equivalent

MW – Megawatt

MWh – Megawatt hour

OPR – Office of Planning and Research

SF_6 – Sulfur Hexafluoride

SWRCB – State Water Resources Control Board

TABLE 1: ONGOING MEASURES AND RELATED GHG EMISSION REDUCTIONS

$MMTCO_2e$ - Million Metric Tons of CO_2 Equivalent

Numbered footnotes appear at the end of each agency's section.

California Air Resources Board **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Pavley (AB 1493) (National GHG Standard for 2012 - 2025 Model Year Light-Duty Vehicles ≤ 8,500 lbs. GVWR)	This regulation, required by AB 1493 (Pavley, Chapter 200, Statutes of 2002) sets fleet-average GHG standards for new passenger vehicles, phasing in over 2009-2016. The emission reductions increase to 26 $MMTCO_2e$ annually in 2020 as the GHG standards are fully implemented.	2.69	4.56
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, NOx, and also reduces the amount of diesel fuel used in California. For overnight cab comfort, vehicle owners may choose from several idle emission reduction technologies including diesel-fueled auxiliary power systems and certified clean idle engines. While it provides significant NOx reductions, the certified clean idle engine, which is widely used in 2008 and newer models, offers limited fuel saving.	0.36	0.19[1]
Tire Pressure Program	This strategy requires specified automobile servicing businesses to ensure proper tire inflation at the time of service, as well as public education about proper tire inflation.	0.7	0.7

California Air Resources Board Program Title	Description of Measures	Emission Reductions, $MMTCO_2e$	
		2013	2014
Goods Movement (Drayage Trucks)	This regulation requires the reduction of GHG, diesel particulate matter (PM), and oxides of nitrogen (NOx) emissions from drayage trucks operating at, or transporting cargos to or from, California's ports and intermodal rail yards through retrofits and fleet turnover of pre-1994 trucks.	0.1	0.1
Ship Electrification	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.	<0.1	<0.1
Reduction of Refrigerant Emissions from Non-Professional Services	This regulation requires a self-sealing valve on small cans of refrigerant, and a deposit and recycling program for the cans.	0.4	0.4
SF_6 Limits in Non-Utility and Non-Semiconductor Applications	This regulation achieves GHG emission reductions from SF_6 use in non-semiconductor and non-utility applications through a phase-out of use over several years. The use and sales requirements exclude a limited number of uses such as use in eye surgeries.	<0.1	<0.1
GHG Emission Reductions from Semiconductor Operations	This regulation requires semiconductor operations to use process optimization, alternative chemistries, and abatement technologies in combination or separately to reduce GHGs. The emission standards apply to semiconductor operations that emit more than 0.0008 $MMTCO_2e$ per year. Reduction of GHG emissions from this measure began in 2012.	0.2	0.2

California Air Resources Board Program Title	Description of Measures	Emission Reductions, $MMTCO_2e$	
		2013	2014
Global Warming Potential Use in Consumer Products	This regulation sets Global Warming Potential (GWP) limits for compounds used in specific consumer products.	0.2	0.2
Refrigerant Management Program	This regulation requires facilities with large refrigeration systems with more than 50 pounds of high-GWP refrigerant to conduct periodic leak inspections, promptly repair leaks, and keep service records on site. These facilities are also required to register and submit annual refrigerant usage reports to ARB. This regulation also affects any person who installs, services, or disposes of any appliance using a high-GWP refrigerant; as well as refrigerant wholesalers, distributors, and reclaimers. The regulation became effective January 1, 2011. The emissions are based on facilities with large and medium (200 to 2,000 lbs.) refrigeration systems that have reported. The annual leak rate for these facilities was reported to have been reduced from 25 to 14 percent annually.	1.4	2
SF_6 Emission Reductions from Gas-Insulated Switchgear	This regulation sets an annual emission rate limit for sulfur hexafluoride as a proportion of an entity's capacity of sulfur hexafluoride in gas-insulated switchgear. The maximum allowable annual emission rate was ten percent for 2011 and will decrease one percent per year until 2020, at which point the maximum allowable annual emission rate remains at one percent.	<0.1	<0.1

California Air Resources Board Program Title	Description of Measures	Emission Reductions, $MMTCO_2e$	
		2013	2014
Landfill Methane	This regulation requires enhanced control of methane emissions from municipal solid waste landfills and requires owners and operators to install gas collection and control systems at smaller and other uncontrolled landfills. Affected landfills are required to implement advanced methane monitoring requirements. Design Plans were required by June 17, 2011 and emission controls are required within 18 months after approval of the Design Plan for active municipal solid waste (MSW) landfills or within 30 months after approval of the Design Plan for closed or inactive MSW landfills.	0.18	1.8^2
Low Carbon Fuel Standard	This regulation requires fuel providers in California to ensure that the mix of fuel they sell into the California market meets, on average, a declining standard for GHG emissions measured in CO_2 equivalent grams per energy unit of fuel sold. Estimated reductions include those achieved by over-compliance with the regulation.	3.7	4.3
Heavy-Duty Vehicle GHG Emission Reduction Measure TTGHG + Phase I (above 8,500 lbs. GVWR)	Tractor-Trailer Greenhouse Gas regulation reduces GHG emissions from 53-foot or longer box-type trailers and the tractors that pull them by increasing their fuel efficiency through improvements in aerodynamic drag and tire rolling resistance. It requires (i) 2010 and older tractors to be retrofitted with U.S. EPA SmartWay verified tires, (ii) 2010 and older model year trailers with U.S. EPA verified aerodynamic technologies and low rolling resistance tires, and (iii) 2011+ model year trailers and 2011 through 2013 model year tractors to be U.S. EPA SmartWay designated. Phase 1 standards align with the federal Phase 1 Regulation, adopted by U.S.EPA in 2011. The adoption provides nationwide consistency for engine and vehicle manufacturers, and allows ARB to enforce the requirements.	0.44	0.65

California Air Resources Board Program Title	Description of Measures	Emission Reductions, $MMTCO_2e$	
		2013	2014
Medium- and Heavy-Duty Vehicle Hybridization	This incentive program reduces 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 and zero-emission technology. Incentives for hybrid and zero-emission trucks became available starting the first quarter of 2010 and the program will continue into 2015 with up to $15 million in additional funding augmenting the $69 million previously allocated.	0.4	0.4
With California Energy Commission, California Building Standards Commission Specifications for New Supermarket Refrigeration	The measure sets minimum prescriptive standards for energy efficient refrigeration systems and for design and installation of leak-tight refrigeration systems, which will apply to new supermarket construction and new supermarket refrigeration installation beginning January 1, 2014. The measures have been added to the California Title 24 Building Standards Code, Part 6 (Energy Efficiency), and Part 11 (Green Building Standards Code). GHG emission reductions are expected from increased energy efficiency, and from reduced refrigerant leakage. Estimated reductions are expected to be 0.5 $MMTCO_2e$ annually by 2020, and as more supermarkets replace their older systems with newer systems, the reductions are expected to achieve a maximum of 1.2 $MMTCO_2e$ annually by 2030.	N/A	~0.1

ARB NOTES:

[1] **Diesel Anti-Idling:** The primary contributor to reduced GHG emissions savings since 2013 is an increase in clean idle-certified trucks (30g NOx/hr) in 2014. The Anti-idling regulation limits the minutes a truck can idle. However, if the truck is certified clean idle, it may idle for hours. The increase in idling can be attributed to most late model trucks, which are certified clean idle. In addition, the Truck and Bus regulation has led many truck owners to prefer compliance through the purchase of 2007 standard trucks (many of which are clean idle) over the retrofit of older trucks.

[2] **Landfill Methane:** Several variables increased the calculated GHG emissions savings by a factor of 10 from 2013 to 2014. The largest factor is due to improved data resolution. There are now more than 100 landfills for which sufficient data exists to estimate emission reductions, as opposed to less than 10 previously.

California Department of Forestry and Fire Protection (CAL FIRE) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Sustainable Forests (various programs)	Existing state and federal regulations and assistance programs. Recent research shows California forests increasing in growing stock[1] and likely sequestering more than 5.0 $MMTCO_2e$ per year.[2] CAL FIRE, federal and other known state forest sector activities contributing to current sequestration rates include:		
Forest Practices	Annual benefit from California Forest Practice Act rule changes instituted in December 2004 equals 2.2 $MMTCO_2e$.[3]	2.2	2.2
Urban Forestry	CAL FIRE funded planting of zero trees in 2014 for a cumulative total of 75,988 trees since 2005 resulting in annual reductions of 0.0009 $MMTCO_2e$.[4] Annual sequestration is based on cumulative numbers of trees since sequestration increases 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.	<0.1	<0.1
Forest Legacy	CAL FIRE conserved 49,576 acres in 2014 for a one-time avoided conversion emission of 1.5 $MMTCO_2e$.[5] Ongoing annual uptake benefits from conservation purchases by other agencies in 2005-2007 total 0.02 $MMTCO_2e$.[6] CAL FIRE has not tracked subsequent conservation purchases.	0.0	1.5

California Department of Forestry and Fire Protection (CAL FIRE) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Vegetation Management Program (VMP)	CAL FIRE conducted fuel reduction on 7,260 acres using mechanical or manual treatments and 1,142 acres using prescribed burning in 2014. No reliable methodology for calculating avoided fire emissions is available at this time. Biomass is not being used for energy, thus no avoided fossil fuel benefits are being realized at this time. CAL FIRE does not track fuel treatments and biomass utilization by federal agencies. CAL FIRE is revising its Vegetation Treatment Program EIR and will conduct a more detailed analysis of fuel treatment emissions.[7]	N/A	N/A
California Forest Improvement Program (CFIP)	CFIP planted 238 acres in 2014 for a cumulative total of 2,232 acres since 2005. Annual sequestration from cumulative acres planted since 2005 are still negligible, since the methodology assumes near-term emissions from site preparation treatment. The methodology likely underestimates benefits for reforestation projects conducted immediately after wildfires, however, and should be revisited.[8] In addition, CFIP treated 436 acres for fuel reduction in 2014.	0	0

CAL FIRE NOTES:

[1] CAL FIRE anticipates revisions to the estimate of carbon sequestration in California forests with recently revised estimates from Forest Inventory and Analysis data that are currently under review by CAL FIRE and the Forest Climate Action Team. New estimates should be made available in 2015.

[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-

[3] CAL FIRE, Forest Conservation Management Strategy, AB 32 Scoping Plan, Appendix C, p. 166.

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

[5] Benefits estimated using methodology developed for Forest Conservation Strategy in CAT Report and AB 32 Scoping Plan.

[6] Personal communication, DFG; Resources Agency Prop 40/50 database.

[7] Personal communication, CAL FIRE Vegetation Management Program.

[8] Benefits estimated using methodology developed for Reforestation Strategy for AB 32 Scoping Plan.

California Department of Resources, Recycling and Recovery (CalRecycle) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Statewide Recycling	CalRecycle provides assistance to local jurisdictions, businesses and the public with their recycling efforts. In 2014, a per-resident disposal rate of 4.5 pounds/resident/day was calculated using SB 1016's measurement system; the per-resident "diversion rate equivalent" was 65 percent.[1]	**	**
CALRECYCLE NOTES:	** Emission reduction not quantified. [1] Achieved 65 percent in 2010; 65 percent in 2011; 66 percent in 2012; 65 percent in 2013; 65 percent in 2014.		

California Department of Transportation (Caltrans) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Alternative Cement and Concrete Strategies	In 2009, Caltrans amended their Standard Specifications for concrete to allow contractors to use less energy-intensive concrete mixes. These alternatives include fly ash, blast furnace slag, and silica fume. Caltrans is also looking into ways to reduce GHG emissions associated with concrete. These include prototyping use of roller-compacted concrete which requires less cement as a binding agent and thereby reduces life-cycle emissions. Completed work on new construction specifications for 2015 implementation that provide for increased use of recycled Portland cement concrete. These specifications establish the means by which up to 15 percent returned plastic concrete (excess Portland cement concrete that has not yet hardened) can be used for specified infrastructure improvements. In addition to conservation of water and other resources, this provides for a 16.2 percent reduction in embodied energy and a 15.3 percent reduction in carbon footprint for items using returned plastic concrete.	<0.1	<0.1
Alternative Asphalt Strategies	Caltrans has multiple initiatives to reduce the carbon content of asphalt and the energy required to lay it: cold-in-place recycling, rubberized hot-mix asphalt, and rubberized warm-mix asphalt. Caltrans use of alternatives to hot mix asphalt reduces its operational GHG emissions by over 61,000 tons per year.	<0.1	<0.1
Alternative Fuel and Fleet Strategies	Caltrans has been working to conserve fleet fuel use since the mid-1980s by developing more efficient ways to manage the fleet. Recent efforts focus on using alternative fuels and more efficient vehicles in its fleet and equipment, including: renewable diesel, biodiesel, ethanol, liquefied petroleum gas (propane), compressed natural gas (CNG), hydrogen fuel cell vehicles, and hybrid electric vehicles.	<0.1	<0.1

California Department of Transportation (Caltrans) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Alternative Employee Commuting Strategies	Caltrans has many employee commute programs in place that reduce the need to drive to work. These include monthly bus passes, emergency ride home vouchers, subsidies for vanpools, carpool matching services, and secure-access bicycle parking.	<0.1	<0.1
LED Roadway Lighting	In 2010, Caltrans began retrofitting street lights with Light Emitting Diode (LED) light fixtures. Full deployment is continual.	<0.1	<0.1
Facility Efficiency and Energy Conservation	Caltrans continues to work towards reaching the goals articulated in Executive Order B-16-2, and Executive Order B-18-12 to support the state's renewable power statutes. These include energy and water conservation, and updated Leadership in Energy and Environmental Design (LEED) standards.	<0.1	<0.1

California Department of Food and Agriculture **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Fertilizer Research and Education Program	In collaboration with the Air Resource Board and the California Energy Commission, the CDFA Fertilizer Research and Education Program (FREP) is funding research to understand nitrous oxide (N_2O) levels from nitrogen fertilizers added to corn, tomatoes, and cotton crops. Research began in 2009. Research for tomatoes and cotton was completed at the end of 2014. Corn research was completed in 2015. A project to measure nitrous oxide emissions under various BMP regimes will be initiated in 2015 at CSU Monterey Bay.	**	**
Specialty Crop Block Grant Program	The CDFA Specialty Crop Block Grant Program has funded several research projects related to GHG reductions. The research focus called for projects that address specialty crop agriculture's contribution to adaptation and/or mitigation of climate change.	**	**
Dairy Digesters	Dairy systems generate significant amounts of methane from onsite waste lagoons. A dairy digester (or biodigester) is a technology that uses dairy waste to generate and capture methane gas which is in turn used for energy production. This process results in reduced greenhouse gas emissions from dairy systems. CDFA, U.S. Environmental Protection Agency, and U.S. Department of Agriculture will work with other relevant state and local agencies, as well as industry stakeholders, to address the technical, regulatory and economic barriers for a robust dairy digester sector in California.	**	**
Biofuels	Biofuels (fuels from plants) have been found to release less GHG compared to fossil fuels. CDFA, in partnership with scientists at UC Davis, and with funding from the California Energy Commission Public Interest Energy Research Program, have recently completed a four-year study to evaluate the economic, beneficial environmental performance of six bioenergy crops.	**	**

California Department of Food and Agriculture **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Fuel Quality and Standards	CDFA's Division of Measurement Standards is responsible for evaluating fuel quality and standards in California. The establishment and enforcement of fuel quality standards facilitates low carbon fuels to entering into the market. CDFA worked through ASTM to establish a fuel quality specification for Dimethyl Ether, a potential low carbon fuel and is leading the effort to establish the fuel quality specification for Natural Gas.	**	**
State Water Efficiency and Enhancement Program (SWEEP)	CDFA developed SWEEP in response to emergency drought legislation SB 103, which provided an initial $10 million for CDFA to disperse directly to agricultural operations to incentivize the installation of irrigation systems that save water and reduce greenhouse gas emissions. Farmers apply for grant funding for irrigation management technologies, microirrigation systems, pump efficiency, or management practices that demonstrate water savings and reduced GHG emissions.		<0.1
Short-Lived Climate Pollutants	In response to Senate Bill (SB) 605 (Chapter 532, Statutes of 2014) which required that the State of California take additional actions to inventory and reduce short-lived climate pollutant emissions, CDFA assembled a workgroup of technical experts and agricultural representatives to identify strategies to reduce greenhouse emissions from California agriculture; particularly methane.		**
CDFA NOTES:	** Emission reduction not quantified.		

California Energy Commission **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Appliance Energy Efficiency Standards	The Appliance Efficiency Regulations increase efficiency of appliances sold to California consumers and businesses. Emission reductions result from energy-efficient appliances consuming less electricity and natural gas, avoiding emissions associated with electricity generation and natural gas combustion. Using the California Energy Demand (CED) 2013 final forecast and 2007 as a base year, cumulative electricity savings for 2008 through 2013 were 8,695 GWh.1 Electricity savings in 2014 were estimated to be 2,362 GWh. Natural gas savings between 2008 and 2014 were estimated to be 177 million therms.[2]	3.0	3.9
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 alterations to existing buildings in California. The strategy is to develop, implement, and enforce standards that require and result in reductions in energy and water use in buildings. Using the CED 2013 final forecast and 2007 as a base year, cumulative electricity savings for 2008 through 2013 were 2,781 GWh. Electricity savings in 2014 were estimated to be 795 GWh. Natural gas savings were estimated to be 54 million therms in 2014, with cumulative natural gas savings from building standards between 2008 and 2014 estimated to be 130 million therms.[2]	1.2	1.6
Comprehensive Publicly Owned Utility Customer Energy Efficiency Programs	Publicly owned utilities (POU) in California have electricity efficiency (EE) programs that benefit their ratepayers. The publicly owned utilities began reporting GHG emissions reductions in 2007. Their programs achieved cumulative savings of 2,990 GWh between 2008 and 2013.[3] POU EE savings in 2014 were 625 GWh for 0.17 $MMTCO_2e$. Seven years of POU EE savings between 2008-2014 equal 3,615 GWh for 0.97 $MMTCO_2e$. All figures use a GHG factor of 588 lbs. CO_2/MWh or 0.267 $MTCO_2e$ per MWh avoided.[2]	0.8	1.0

California Energy Commission **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Alternative and Renewable Fuels and Vehicle Technology Program (ARFVTP)	The ARFVTP was established by AB 118 (Nunez, Chapter 750, Statutes of 2007) to transform California's fuel and vehicle types to help attain climate change and air quality goals of the state. The ARFVTP provides up to $100 million annually for projects and the program was extended through 2024 by AB 8 (Perea, Chapter 401, Statutes of 2013). Through July 2015 the program has awarded $589 million to projects including alternative fuel production and infrastructure, alternative fuel and advanced vehicle technologies, manufacturing and workforce training, fuel standards and equipment certifications, sustainability studies and centers for alternative fuels. The National Renewable Energy Laboratory (NREL) has estimated direct GHG emissions benefits of 71,000 metric tons in 2013 and 128,000 metric tons in 2014 from ARFVTP funded projects. NREL also estimates 1.7 million metric tons annually will be directly reduced by the year 2020 from projects within this program. Market transformation benefits are less certain but by 2020 could range from a low of 0.4 $MMTCO_2e$ to a high of 2 $MMTCO_2e$.	0.07	0.13

California Energy Commission **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
California Clean Energy Jobs Act: Proposition 39 (K-12) Program	The Energy Commission implements the California Clean Energy Jobs Act (Proposition 39 K-12 Program) as guided by SB 73 (Statutes of 2013) and California budget acts. Program implementation guidance was published in December 2014. As of September 2015, the Energy Commission has received 690 applications from Local Educational Agencies and approved 566 of the applications. Approximately $387 million in award funds have been approved for over 1,900 energy efficiency and clean energy projects. Once completed these projects are estimated to save 151,168 MWh of electricity, 1.3 million therms of natural gas, 120,000 gallons of propane, and 6,700 gallons of fuel oil. Funding allocations between 2013 and 2016 totals $973 million. Under the Prop 39 initiative up to $550 million annually can be appropriated by the Legislature for eligible projects.		0.05

CEC NOTES:

[1] The estimates are based on the California Energy Demand 2014-2024 (CED 2013) final mid-case scenario which can be found at: http://www.energy.ca.gov/2013_energypolicy/documents/demand-forecast_CMF/mid_case/

[2] Energy Commission staff use a GHG emission factor of 588 lbs. CO_2/MWh or 0.267 $MTCO_2$/MWh to estimate the GHG emission attribute of electricity savings for the period 2008 through 2014. The Energy Commission continues to work with other agencies to develop a consistent methodology for estimating GHG emission reductions from efficiency and renewable energy policies and projects in California. Estimates use a CO_2 emissions factor for each therm of natural gas combustion avoided of 0.00529 $MTCO_2e$. One therm equals 0.1 MMBtu.

[3] Cumulative electricity savings from publicly owned utility energy efficiency programs for years 2008-2014 are reported in *Energy Efficiency in California's Public Power Sector – A Status Report* (2015), page 2. The POUs use a technical manual to standardize evaluation of energy efficiency program savings. This manual can be found at: http://cmua.org/wpcmua/wp-content/uploads/2014/05/CMUA-_TRM-manual_5-5-2014_Final.pdf

California Public Utilities Commission **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
California Solar Initiative	SB1 (Murray, Chapter 132, Statutes of 2006) established a $3 billion rebate program to support the deployment of 3,000 MW of distributed solar generation capacity statewide through 2016. The CPUC's portion of this goal and associated budget is 1,940 MW and $2.4 billion. In January 2015, the CPUC reauthorized the CSI low income programs (SASH and MASH) with $108 million in new funding to run until the additional incentives are claimed or until 2021.[1,2]	0.6	0.7
California Solar Initiative – Thermal Program (Solar Water Heating)	The CPUC's California Solar Initiative (CSI)-Thermal program offers incentives based on the amount of natural gas or electricity displaced by solar water heaters. Incentives are available for residential, multifamily, and commercial applications. The program was created in January 2010. CSI-Thermal systems installed and operating through 2014 annually avoid a total of 2.7 million therms of natural gas and 13.35 MWh of electricity.[3]	<0.1	<0.1

California Public Utilities Commission **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Self-Generation Incentive Program	In 2014 the California Legislature passed and the Governor signed SB 861 (Chapter 35, Statutes of 2014) extending SGIP through 2020, with an annual budget of $83 million for each of the five additional years.	0.3	TBD[4]
Investor-Owned Utilities Energy Efficiency Programs	The CPUC funds energy efficiency (EE) programs through the resource procurement budgets of the utilities, as required by Public Utilities Code Section 454.5 (b)(9)(C). The programs developed for energy efficiency reach residential single family, residential multi-family, commercial, industrial, and agricultural customers of investor-owned electric and natural gas distribution utilities. In 2015 the CPUC issued the 2010-2012 Evaluation Report, along with ex post lifecycle savings updates, and the savings and emissions reductions from years 2006-2012 now reflect these adjustments. Reductions in 2013 and 2014 are based on gross reported savings from installed and operating measures from the 2007 through 2014 program years, including 7.8 percent assumed avoided line losses for consistency with the methodology of ARB's Climate Change Scoping Plan. Cumulative gross savings in 2014 were 20.5 million MWh of electricity (absent avoided line losses) and 38.6 million Therms of natural gas.[3] Emissions reductions (MMCO2e) for 2013 were adjusted from 6.9 to 7.5 as a result of evaluation updates.	7.5	8.25

California Public Utilities Commission **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Renewables Portfolio Standard	The California Renewables Portfolio Standard (RPS) Program was established by SB 1078 (Sher, Chapter 516, Statutes of 2002), and has been subsequently modified by SB 107 (Simitian, Chapter 464, Statutes of 2006), SB 1036 (Perata, Chapter 685, Statutes of 2007) and SB 2 (1x) (Simitian, Chapter 1, Statures of 2011-12 First Extraordinary Session). The RPS program is codified in Public Utilities Code Sections 399.11-399.20. Under SB 2 (1x), the RPS program administered by the CPUC requires each retail seller to increase its total procurement of eligible renewable energy resources so that 33 percent of retail sales are served by eligible renewable energy resources no later than December 31, 2020. Emissions reductions in 2009 through 2014 represent the increased renewable energy procurement compared to 2007 levels. Total RPS procurement by PG&E, SCE and SDG&E in 2014 was 43,095 GWh (20.156 GWh for PG&E, 17.731 GWh for SCE, and 5.2 GWh for SDG&E).[2]	4.4	6.2

CPUC NOTES:

[1] Emission reductions for 2014 are based on the cumulative systems installed and operating through 2014, which represented a total of 1,602 MW CEC-AC capacity. These systems avoid approximately 1,227,456 MWh of grid electricity annually, based on an assumed 17% capacity factor and an 7.8% avoided line loss factor.

[2] CPUC uses emission factors for investor-owned utilities based on the 2013 E3 GHG Calculator, which are lower than the statewide average: 0.26 MTCO2e for PG&E; 0.32 MTCO2e for SCE; and 0.35 MTCO2e for SDG&E.

[3] CPUC uses the weighted average emissions intensity of PG&E, SCE and SDG&E, 0.28 MTCO2e/MWh. Each avoided Therm is assumed to reduce emissions by 0.053156 MTCO2e, reflecting the CO2 that would otherwise be emitted through the combustion of natural gas.

[4] SGIP is evaluated every two years. Data on 2014 GHG emissions reductions will be available in 2016 and included in the next GHG Report Card.

Department of General Services (DGS) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
Green Buildings - LEED	This measure reduces GHG emissions associated with the design and construction of state-owned or state-leased buildings. During 2014, 14 new, renovated, or existing buildings totaling 408,399 sq. ft. were completed and LEED certified. This included six leased buildings. These buildings all exceed current Title 24 code requirements, for an estimated total reduction of 474.6 $MTCO_2e$. 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	<0.1
Green Buildings – Distributed Generation	This measure reduces GHG emissions associated with the installation of clean on-site renewable generation. By the end of 2014, a total of 38 MW had been installed at State facilities, with more being installed in 2015 and 2016. Efforts continue to expand distributed generation programs further, including a Request for Proposals for wind generation.	<0.1	<0.1
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. No Retro-commissioning projects have taken place since 2011 due to budget constraints, however, DGS is now moving forward with developing a monitoring-based commissioning (MBCx) program. The first MBCx project was scheduled to be installed in 2015.	0	0

Department of General Services (DGS) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
High-Performance Schools	The State provided incentives for high-performance schools through Prop 1D administered through the Office of Public School Construction (OPSC) and verified by the Division of the State Architect (DSA), through the end of 2014. Total reported savings result from 16 High Performance Incentive Grants issued in 2014. The estimated energy reductions associated with these projects total 111,450 MMBtu/year, which equals 5,900 $MTCO_2e$/year of avoided CO_2 emissions.	<0.1	<0.1

California Department of Water Resources (DWR) **Program Title**	**Description of Measures**	**Emission Reductions, $MMTCO_2e$**	
		2013	**2014**
End Use Water Conservation & Efficiency	SBX7-7, the Water Conservation Act of 2009 (Steinberg, Chapter 4, Statutes of the 2009-2010 Seventh Extraordinary Session), mandates a 20 percent reduction in statewide per capita urban water use by the year 2020 ("20x2020").	**	**

DWR NOTES:

** Emission reduction not quantified.

TABLE 2: GHG EMISSION REDUCTION MEASURES, AND REDUCTIONS EXPECTED IN 2020

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

MMTCO$_2$e - Million Metric Tons of CO2 Equivalent

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] (MMTCO$_2$e)	Activities since last Report Card or Implementation Timeline
	AIR RESOURCES BOARD (ARB) MEASURES				
	AGRICULTURAL SECTOR				
A-1	ARB, CDFA	Methane Capture at Large Dairies	This measure encourages voluntary installation of anaerobic digesters at large dairies through economic incentives such as marketable carbon offset credits (offsets), favorable utility contracts, or renewable energy incentives. Emissions reductions from offset projects approved and issued by ARB are attributed to reductions under the Cap-and-Trade Program. In addition, ARB is collaborating with CDFA, the State Water Board, and other stakeholders to identify and reduce barriers to greater digester use. This collaboration is also shown under those being implemented by CDFA.	1[3]	ARB issued offset credits to four compliance projects and 50 early action projects. Additional projects are currently under review. As this protocol is applicable across the US, not all of these projects are in California.
	ELECTRICAL AND NATURAL GAS SECTOI				
E-3	CPUC, CEC, ARB	Renewables Portfolio Standard	This measure, required by SB 2 (1x) (Simitian, Chapter 1, Statutes of 2011-12 First Extraordinary Session), increases the use of renewable electricity required by the Renewables Portfolio Standard (RPS). California electric utilities must obtain 33 percent of their electricity from eligible renewable energy resources by 2020.	Reduction included in CPUC totals.	ARB is working with CPUC and CEC on implementation.
	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	This regulation requires a self-sealing valve on small cans of refrigerant, and a deposit and recycling program for the cans.	0.4	Implementation ongoing including certification of a product, conducting can leak testing, distributing a public survey to understand consumer behavior, and conducting a public workshop to propose amendments to the regulation.
H-2	ARB	SF_6 Limits in Non-Utility and Non-Semiconductor Applications (Discrete Early Action)	This regulation places restrictions on nonessential end uses of SF_6, where feasible alternatives are available.	< 0.1	Implementation ongoing including compilation of annual reports, elimination of SF6 in magnesium casting, processing and reviewing exemption requests.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
H-3	ARB	High GWP GHGs Emissions Reduction from Semiconductor Operations (Discrete Early Action)	This regulation requires semiconductor operations (operations) to use process optimization, alternative chemistries, and abatement technologies in combination or separately to reduce GHGs. The emission standards apply to operations that emit more than 0.0008 MMTCO2e per year.	0.2	ARB is collaborating with local air districts on implementation.
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)	This regulation requires setting GWP limits on specific consumer products.	0.2	Implementation ongoing.
H-5	ARB	High GWP Reductions from Mobile Sources: 1) Low GWP Refrigerants for New Vehicle Air Conditioning Systems	Measure provides credit incentives for using low GWP refrigerants with the air conditioning systems on new vehicles. This measure has been integrated into the Advanced Clean Cars Measure and therefore reductions from this activity are not counted toward the 0.6 $MMTCO_2e$ in reductions for H-5.	0.6	Part of Advanced Clean Cars program. Implementation Timeline: Model year 2017.
		2) Air Conditioner Refrigerant Leak Test During Vehicle Smog check	Proposes the addition of a refrigerant leak check on motor vehicle air conditioning systems when smog check is required.		Measure not feasible at this time.
		3) Refrigerant Recovery from Decommissioned Refrigerated Shipping Containers	Addresses the recovery of refrigerants from decommissioned refrigerated shipping containers.		Measure not feasible at this time.
		4) Enforcement of Federal Ban on Refrigerant Release during Servicing or Dismantling of Motor Vehicle Air Conditioning Systems	Enforcement of federal ban on refrigerant release during servicing or dismantling of motor vehicle air conditioning systems.		Measure not feasible at this time.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
H-6	ARB	High GWP Reductions from Stationary Sources: 1) High-GWP Refrigerant Management Program for Stationary Sources Refrigerant Registration /Reporting/Repair Program	Measure 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.	5.9	Implementation ongoing.
		2) Specifications for Commercial and Industrial Refrigeration Systems	Measure to reduce both direct emissions of high GWP refrigerants resulting from the design and installation and indirect emissions resulting from energy consumption of large supermarket refrigeration systems.		Adopted by CEC and CBSC. Implementation ongoing.
		3) Foam Recovery and Destruction Program	Measure for the collection of foam followed by recycling or destruction of high GWP gases.		Measure not feasible at this time.
		4) SF6 Emission Reductions from Gas Insulated Switchgear	Measure to set maximum SF_6 emission rate for gas insulated switchgear.		Implementation ongoing.
		5) Alternative Fire Suppressants	Use of leakage reduction methods and/or lower GWP fire suppression agents.		Measure not feasible at this time.
		6) Residential Refrigeration Early Retirement / Voluntary Program	ARB works with utilities to encourage recovery of high GWP materials from residential refrigerators at end of life.		Measure not feasible at this time.
H-7	ARB	Mitigation Fee on High GWP Gases	This regulation proposes establishment of an upstream fee on high GWP gases based on their GWP.	N/A	To be evaluated as part of planned Short-Lived Climate Pollutant plan; research proposal approved by Board Dec 2014.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	INDUSTRY SECTOR				
I-1	ARB	Energy Efficiency and Co-Benefits Assessments for Large Industrial Sources	This regulation requires major industrial facilities to conduct an assessment of the potential to reduce GHG emissions, and reductions of criteria air pollutants and toxic air pollutants as possible co-benefits.	N/A	All five industrial sector public reports have been released. **ARB Findings report to be released by the end of 2015.**
I-2	ARB	Oil and Gas Extraction GHG Emission Reduction	This measure would require controls to minimize the venting and fugitive emissions of methane from crude oil and natural gas production, processing, and storage operations.	0.6	Regulatory development ongoing.
I-3	ARB	GHG Leak Reduction from Natural Gas Transmission and Distribution	Replace pipelines, as well as improve operations at meter and regulating stations, to minimize fugitive and venting emissions of methane and carbon dioxide from natural gas transmission and distribution.	0.5	Continuing to evaluate. Currently working with CPUC on implementing SB 1371 (Leno, Chapter 525, Statutes of 2014).
I-4	ARB	Refinery Flare Recovery System Improvement	This measure proposed 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.	N/A	Measure no longer being considered. Equivalent measure implemented by local air districts.
I-5	ARB	Incorporation of Methane into Air District Rules for Major Industrial Sources to Reduce Fugitive Emissions/Leaks	This regulation proposes to remove existing fugitive methane exemptions from the regulations applicable to equipment and sources employed in California's refineries and other major industrial sources.	.	Under evaluation in collaboration with local air districts.
	RECYCLING AND WASTE MANAGEMENT				
RW-1	ARB	Landfill Methane Control Measure (Discrete Early Action)	This regulation requires enhanced control of methane emissions from municipal solid waste (MSW) landfills and requires owners and operators to install gas collection and control systems at smaller and other uncontrolled landfills. Affected landfills are required to implement advanced methane monitoring requirements. ARB is working with local air districts on implementation and enforcement.	1.5	Implementation ongoing.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	TRANSPORTATION SECTOR				
T-1	ARB	Pavley I and Advanced Clean Cars	On May 19, 2009, the Obama administration announced an agreement to enact national GHG standards for cars and light trucks. This agreement among the U.S. Environmental Protection Agency (EPA), National Highway Transportation Safety Administration (NHTSA), California, and the major auto manufacturers has several key parts. EPA and NHTSA agreed to conduct a joint rulemaking establishing a national GHG and fuel economy standard for 2012 – 2016. California amended its new passenger motor vehicle GHG emission standards for model years 2012-2016 to permit compliance based on federal GHG emission standards. The automakers agreed to drop their lawsuits. EPA granted California the requested waiver. California's program went into effect with the 2009 model year, and all parties agreed to maintain all existing authorities. The Advanced Clean Cars Program will achieve additional GHG reductions from passenger vehicles for model years 2017-2025. This Program represents a new approach to passenger vehicles – cars and light trucks -- by combining the control of smog-causing pollutants and GHG emissions into a single coordinated package of standards known as Low Emission Vehicles (LEV) III. The new approach also includes efforts under the Zero-Emission Vehicle Program to support and accelerate the numbers of plug-in hybrids and zero-emission vehicles in California.	23.8	Pavley I: Implementation ongoing. Advanced Clean Cars: Implementation 2017-2025.
T-2	ARB	Low Carbon Fuel Standard (LCFS) (Discrete Early Action)	This regulation requires fuel providers in California 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.	15	LCFS Implementation ongoing. Board approved the revised LCFS regulation on September 25, 2015. The implementation of the improved program begins on January 1, 2016.
T-3	Local Governments / ARB / CalTrans / HCD / OPR / Regional Planning Agencies	Regional Transportation-Related Greenhouse Gas Targets	ARB set regional passenger vehicle GHG reduction targets to implement SB 375 (Steinberg, Chapter 728, Statutes of 2008) in September 2010, developed a methodology to review Metropolitan Planning Organizations (MPO) sustainable communities strategies (SCS) in July 2011, and is reviewing MPO SCSs as regions develop them. SB 375 enhances California's ability to reach its AB 32 (Nunez, Chapter 488, Statutes of 2006) goals by promoting effective planning with the goal of more sustainable communities. SB 375 also establishes incentives to encourage implementation of a SCS or alternative planning strategy (APS) to meet the targets. Developers can get relief from certain environmental review requirements under the California Environmental Quality Act (CEQA) if their new residential and mixed-use projects are consistent with a region's SCS (or APS) that meets the target.	3.0	Working with MPOs on Sustainable Communities Strategies.
T-4	ARB	Tire Pressure Program (Discrete Early Action)	This strategy requires specified automobile servicing businesses to ensure proper tire inflation at the time of service, as well as public education about proper tire inflation.	0.7	Implementation ongoing.
T-5	ARB	Ship Electrification at Ports (Discrete Early Action)	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.	0.2	Implementation ongoing. Implementation Timeline: 2010-2020.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
T-6	ARB	Goods Movement Efficiency Measures:		3.5	On July 17, 2015 Governor Brown issued Executive Order B-32-15 which requires the development of an integrated action plan that establishes targets to improve freight efficiency and a transition to zero emission technologies. The action plan further requires the identification of policies, programs, and investments to achieve those targets.
		1) Port Drayage Trucks	This regulation requires the reduction of GHG, diesel particulate matter (PM), and oxides of nitrogen (NOx) emissions from drayage trucks operating at California's ports and rail yards through retrofits and turnover of pre-2007 trucks.		Continuing to evaluate and expand the focus to zero and near-zero technology options.
		2) Transport Refrigeration Units Cold Storage Prohibition	Transport Refrigeration Units (TRUs) are powered by external combustion engines. This measure would limit the amount of time TRU engines could run for extended cold storage at facilities including distribution centers and grocery stores.		Continuing to evaluate and expand the focus to zero and near-zero technology options.
		3) Cargo Handling Equipment, Anti-Idling, Hybrid, Electrification	ARB will investigate and potentially develop a new measure to restrict unnecessary idling of cargo handling equipment, which would reduce fuel consumption and associated emissions of GHGs, criteria pollutants, and toxic air contaminants.		Continuing to evaluate and expand the focus to zero and near-zero technology options.
		4) Goods Movement System-Wide Efficiency Improvements	The System-Wide Efficiency Improvement actions may provide emission reductions from California's freight transport system through development and implementation of efficiency strategies that reduce fuel usage and provide continued progress toward a lower carbon, more sustainable freight transport system.		A multi-agency, academic, industry, and environmental working group is currently evaluating efficiency improvement opportunities to be included in the California Sustainable Freight Action Plan.
		5) Commercial Harbor Craft Maintenance and Design Efficiency	This measure proposes to facilitate reduction of fuel consumption and associated CO2 emissions through a variety of technologies and strategies that improve vessel efficiency.		Continuing to evaluate and expand the focus to zero and near-zero technology options.
		6) Clean Ships	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.		Continuing to evaluate and expand the focus to zero and near-zero technology options.
		7) Vessel Speed Reduction	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.		Continuing to evaluate and expand the focus to zero and near-zero technology options.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
T-7	ARB	Phase I and Tractor-Trailer Heavy-Duty Vehicle GHG Emission Reduction Measures; TTGHG + Phase I (above 8,500 lbs. GVWR)	Tractor-Trailer Greenhouse Gas regulation reduces GHG emissions from 53-foot or longer box-type trailers and the tractors that pull them by increasing their fuel efficiency through improvements in aerodynamic drag and tire rolling resistance. It requires (i) model year 2010 and older tractors to be retrofitted with U.S. EPA SmartWay verified tires, (ii) 2010 and older model year trailers with U.S. EPA-verified aerodynamic technologies and tires with low rolling resistance, and (iii) 2011+ model year trailers and 2011 through 2013 model year tractors to be U.S. EPA SmartWay designated. Phase 1 standards align with the federal Phase 1 Regulation, adopted by U.S.EPA in 2011. The adoption provides nationwide consistency for engine and vehicle manufacturers, and allows ARB to enforce the requirements.	2.6	Impact of Phase 1 was added. Tractor-Trailer Greenhouse Gas Regulation was adopted Dec-2008; Amended Dec-2010; Amended Dec-2013; Implementation 2010-2019. Implementation Timeline of Tractor-Trailer Greenhouse Gas Regulation: 2010-2019. Implementation Timeline of Phase 1: 2014-2018.
T-8	ARB	Medium- and Heavy- Duty Vehicle Hybridization: 1) Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP)	HVIP reduces the GHG emissions of urban, stop-and-go vehicles, such as parcel delivery trucks and vans, utility trucks, garbage trucks, transit and school buses, and other vocational work trucks, through the use of hybrid and zero-emission technology. HVIP provides increased incentives for vehicles that provide benefits to disadvantaged communities. Incentives of $78.8 million, in the form of vouchers for hybrid and zero-emission trucks and buses, are available.	0.4	1) Board approved $9.8 million in FY 2014-15 for hybrid and zero-emission trucks and buses from AQIP and Low Carbon Transportation.
		2) Zero-Emission Truck and Bus Pilot Projects	These projects would place a significant number of zero-emission trucks and buses in a handful of strategic "hubs," encouraging advanced technology clusters with infrastructure, marketing, workforce training, and other synergies. The technology hub or ecosystem concept, when fully implemented, can help address many of the deployment challenges we see today by supporting economies of scale in manufacturing, workforce training, vehicle maintenance and repair, and infrastructure issues.	N/A	2) Board approved $25 million for zero-emission truck and bus pilots (no GHG quantification yet). Implementation Timeline: 2015-2016.
	OTHER SECTORS / STRATEGIES				
Appendix C, Sections 3 and 4	ARB	Cool Communities	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. These efforts also increase albedo, thus reflecting sunlight radiation back to space and resulting in local cooling.	N/A *	Implementation ongoing.
Scoping Plan Chapter IV, Section B	ARB	Small Business Toolkit	This toolkit provides 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.	N/A *	Implementation ongoing.
Appendix C, Section 3	ARB	Local Government Toolkit	Local governments can use this toolkit to help California meet its AB 32 targets through climate action planning. The toolkit was designed to provide guidance and resources to help cities and counties reduce GHG emissions and save money.	N/A *	Implementation ongoing.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
Scoping Plan Chapter II, Section B	ARB	Local Government Operations Protocol	This protocol provides a standardized set of guidelines to assist local governments in quantifying and reporting GHG emissions associated with their government operations. It allows cities to track their own emissions over time, but it is not intended to be used to compare one city's emissions to another city's emissions.	N/A *	Implementation ongoing.
Scoping Plan Chapter II, Section C.1.	ARB	Cap-and-Trade Program	The California Cap-and-Trade Program is a market-based approach that provides a firm limit, or "cap," on GHG emissions from the electricity, industrial, commercial, and residential fuels and transportation fuels sectors. The California program may link with other Western Climate Initiative Partner programs to create a regional market system that will achieve greater environmental and economic benefits for the State. Part of the GHG emission reductions under this program are expected to come from the use of offsets (qualified projects outside of sectors under the cap). Offset protocols that are in effect under the Cap-and-Trade Program include: 1) U.S. forest projects, 2) urban forests, 3) livestock manure (digesters), 4) ozone depleting substances (ODS), and 5) mine methane capture. These protocols can be used in any of the lower 48 states to generate offsets in the California Cap-and-Trade Program. ARB is continuing to hold quarterly auctions for allowances and held the first joint auction with linked jurisdiction Québec on November 25, 2014. Amendments to the regulation were approved by the Board Apr-2014 (went into effect Jul-2014) and Sep-2014 (expected to go into effect Jan-2015). An additional offset protocol and changes to an existing offset protocol were heard by the Board Dec-2014 and will go through additional public process and changes before expected adoption in late 2015.	23**	Implementation ongoing.
Total Reductions Expected from ARB Led Strategies				**82.1**	

ARB NOTES: * These measures facilitate reductions through voluntary actions.
** Set at a level needed to help achieve the GHG emission reduction target for 2020.

Note: The term "approved" indicates the Board's action at the hearing. This is an interim step in the administrative process; final action by ARB to adopt a regulation occurs after the hearing, and a regulation does not become legally effective under California law until it has been approved by the Office of Administrative Law.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	CAL FIRE / BOARD OF FORESTRY MEASURES				
	FOREST SECTOR				
F-1 (Substrategies Below)	CAL FIRE / BOARD OF FORESTRY	Sustainable Forests *	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.	TBD**	On-going
F-1: Substrategy 1	CAL FIRE / BOARD OF FORESTRY	Conservation Forest Management	Maintain and enhance forest stocks on timberlands through forest management practices subject to the Forest Practice Act.	TBD**	Implementation Timeline: 2005-2020.
F-1: Substrategy 2	CAL FIRE / BOARD OF FORESTRY	Forest Conservation	Prevent conversion of forestlands through publicly and privately funded acquisitions and easements.	TBD**	Forest Legacy Program conserved 49,576 acres. Implementation Timeline: 2005-2020.
F-1: Substrategy 3	CAL FIRE / BOARD OF FORESTRY	Fuels Management/Biomass	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.	TBD**	California Forest Improvement Program and Vegetation Management Program funded manual or mechanical fuels reduction on >7,000 acres and prescribed burned >1,000 acres. Implementation Timeline: 2005-2020.
F-1: Substrategy 4	CAL FIRE / BOARD OF FORESTRY	Urban Forestry	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).	TBD**	Implementation Timeline: 2005-2020.
F-1: Substrategy 5	CAL FIRE / BOARD OF FORESTRY	Afforestation/Reforestation	Reforest state, private and federal lands to produce sequestration benefits.	TBD**	California Forest Improvement Program and Vegetation Management Program funded reforestation of 436 acres. Implementation Timeline: 2005-2020.
Total Reductions Expected from CAL FIRE Led Strategies				**TBD****	

CAL FIRE NOTES:

* CAL FIRE 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.

**TBD – CAL FIRE anticipates revisions to the estimate of carbon sequestration in California forests with recently revised estimates from Forest Inventory and Analysis data (FIA) that are currently under review by CAL FIRE and the Forest Climate Action Team (FCAT). New estimates should be made available by June, 2015.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	CALRECYCLE MEASURES				
	RECYCLING AND WASTE MANAGEMENT				
RW-1	ARB, CalRecycle	Landfill Methane Control Measure (Discrete Early Action)	This regulation requires enhanced control of methane emissions from municipal solid waste landfills and requires owners and operators to install gas collection and control systems at smaller and other uncontrolled landfills. Affected landfills are required to implement advanced methane monitoring requirements.	1.5 *	CalRecycle continues to work with ARB, other agencies, and external stakeholders as new data and scientific methodologies become available, to ensure that California has the most up-to-date and scientifically accurate estimates of fugitive methane emissions.
RW-2	CalRecycle	Increasing the Efficiency of Landfill Methane Capture	Per the Statewide GHG emissions inventory, the largest emissions from the Recycling and Waste Management sector come from landfills and are in the form of methane, which is produced when materials placed in landfills decompose over time. Often, decades elapse and methane is still produced from this decomposition. Although methane is captured currently at many large landfill sites, there are still active landfill operations and closed landfill sites that continue to emit methane that could be captured. In addition, methane capture can also reduce air quality impacts by capturing and destroying volatile organic compounds and other landfill gases that are emitted during the decomposition process.	TBD	CalRecycle continues to pursue strategies to reduce landfill methane emissions above and beyond what is required under RW-1. CalRecycle continues investigations regarding the adequacy of compliance wells installed around the perimeter of landfills to monitor for potential landfill gas migration. In February 2015, CalRecycle published Landfill Gas Investigations at Former Landfills and Disposal Sites; this guidance document provides a compilation of experience and lessons learned from conducting landfill gas investigations at various locations in California. The purpose of the guidance document is to assist regulators, consultants, property owners, developers, and legal firms in planning, implementing, and estimating costs for landfill gas investigations at former landfills and disposal sites. CalRecycle is assisting ARB in the development of a Short-Lived Climate Pollutant Strategy to address methane emissions from landfills.
RW-3 (Sub strategies listed below)	CalRecycle	Zero Waste - High Recycling	Detailed description of related measures below.	Reductions detailed below	

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
RW-3: Sub strategy 1	CalRecycle	Anaerobic Digestion	Anaerobic digestion (AD) uses engineered in-vessel systems to accelerate the decomposition of organic materials to produce biogas production, soil amendments and reduce waste. Diverting organic waste from landfills to beneficial use provides significant reduction of GHG emissions through landfill methane avoidance. This strategy will also result in substantial renewable energy production that will aid in meeting the Renewable Portfolio Standards goal and compliance with the Low Carbon Fuel Standard. Additionally, AD provides employment opportunities and other co-benefits to the communities where the facilities are located.	2.0 **	CalRecycle continues to increase the sustainable use of organic waste, expand research and development of bioenergy facilities, reduce permitting and regulatory challenges, and address economic barriers to bioenergy development: • Awarded three Greenhouse Gas Reduction Fund grants to AD projects. • Working with ARB to develop additional Low Carbon Fuel Standard pathways as well as AD-specific Emission Reduction Factors. • Collaborates with the California Energy Commission on the Alternative and Renewable Fuel and Vehicle Technology program; and the Public Interest Energy Research and Electric Program Investment Charge programs for AD project development. • Provides technical and permitting support to jurisdictions and stakeholders deploying AD projects in California. • Developing in-vessel digestion regulations. • Participates in the California/Federal Dairy Digester Working Group to encourage the development of anaerobic digesters at dairies. Full implementation by 2020.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
RW-3: Sub strategy 2	CalRecycle	Mandatory Commercial Recycling Regulation	The commercial recycling measure focuses on increased commercial waste diversion. Commercial businesses in California generate roughly 75 percent of the statewide solid waste. Reductions in GHG emissions can be realized from solid waste management by recovering traditional recyclable materials from the commercial waste stream with the goal to remanufacture these materials, thus reducing the GHG emissions from multiple phases of product production including extraction of raw materials, preprocessing and manufacturing. Traditional recyclable materials have significant intrinsic energy value that displaces fossil fuel energy requirements when introduced back into the manufacturing cycle. Benefits from the commercial recycling measure include avoided methane emissions from landfill disposal by recycling any organic materials from the waste stream.	5.0 **	In accordance with AB 341 (Chesbro, Chapter 476, Statutes of 2011), CalRecycle reviews jurisdiction annual reports to assess implementation progress; recent review of 19 jurisdictions found them in compliance. CalRecycle also promotes a climate calculator to assess the financial, climate change, and waste reduction/environmental benefits of reducing and recycling discarded materials. CalRecycle conducted a statewide waste characterization study in 2014/15 to assess statewide goals; final report currently being drafted. The mandatory commercial recycling program was expanded in October 2014 when AB 1826 (Chesbro, Chapter 727, Statutes of 2014) was chaptered, requiring businesses, including State agencies, to recycle their organic waste on and after April 1, 2016. CalRecycle conducted numerous workshops, revised its Enforcement Policy, and developed outreach materials and case studies in anticipation of implementation. Full implementation by 2020.

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RW-3: Sub strategy 3	CalRecycle***	Extended Producer Responsibility (EPR)	Extended producer responsibility (EPR) laws place shared responsibility on producers and all entities in a product life cycle for reducing health and environmental impacts that result from supply chain, production, use, and end-of-life management. By implementing extended producer responsibility, GHG emission reductions can be realized from avoided energy use in the extraction of resources as recovered materials are recycled back into new products.	TBD	**These laws follow producer responsibility principles to ensure programs that are sustainably funded and properly manage leftover or discarded products generated in California.** **Carpet (AB 2398 - J. Perez, Chapter 681, Statutes of 2010):** In the 2014-2015 fiscal year, 20,250 tons of new raw materials were generated from old carpets and since July 2011, 77,000 tons of materials have been recycled through various applications. Carpet America Recovery Effort estimates GHG emission reductions as 36,000 MTCO2E in the 2014 calendar year and 145,000 MTCO2E from July 2011 through the 2014 calendar year. **Mattresses (SB 254 – Hancock, Chapter 388, Statutes of 2013):** The Office of Administrative Law approved the regulations governing the Used Mattress Recovery and Recycling Program (CCR sections 18959-18971) in July 2015. The collection and recycling program, expected to begin by December 30, 2015, could reduce GHG emissions by 130,000-190,000 MTCO2E per year. These reductions would be achievable by recycling 4.2 million mattresses and box spring units instead of landfilling them. **Paint (AB 1343 - Huffman, Chapter 420, Statutes of 2010):** In the 2013-2014 fiscal year, 2 million gallons of postconsumer paint were processed through the paint stewardship program, resulting in GHG emission reductions. Full implementation by 2020.

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RW-3: Sub strategy 4	CalRecycle	Increase Production & Markets for Compost	CalRecycle continues efforts to divert organic materials from landfills by increasing the production of and markets for compost, mulch, and biofuels/energy. Organic materials diversion from landfill disposal can provide a significant GHG reduction through landfill methane avoidance. When compost and mulch products are applied to soils, including agricultural crop lands, additional GHG emission reductions may be achieved through reduced water consumption, resulting in energy savings in pumping irrigation water. Additional GHG benefits can be realized through reduced manufacturing and transport of fossil-fuel-derived fertilizers, and reduced off-gassing of those fertilizers once applied to agricultural land. CalRecycle's efforts to increase the production and markets for compost include compost-based best management practices; development of compost specifications for agriculture; participating in key cross media working groups, and research covering a range of composting uses. Ongoing CalRecycle research will help clarify GHG emissions from compost production and compost use in agriculture, including compost impacts on agricultural N20 emissions.	2.0 **	CalRecycle continued support of research projects related to compost production and markets, including: • **Research** on GHG emissions from composting piles, GHG impacts of compost application on agricultural land, and GHG impacts of direct land application of uncomposted green materials. • **Continuing collaboration**: - Air Resources Board and local Air Districts to address emissions related to compost facilities; - State Water Resources Control Board and Regional Water Boards on water quality concerns including development of Statewide General Order for Waste Discharge Requirements for Composting; - Department of Pesticide Regulation identifying and addressing pesticides of concern affecting compost; - USEPA to promote the "Food Recovery Challenge" that is encouraging programs to help reduce food waste; - Caltrans on compost/mulch specification development and increasing product use. • Formal CalRecycle rulemaking process is underway for Title 14 and 27 regulation updates regarding compostable materials, transfer/processing, permit application form, and permit exemptions. • California Department of Food and Agriculture and CalRecycle are lead agencies for the Healthy Soils Initiative. Goals for this initiative include encouraging compost use in agriculture for increased soil organic matter. • CalRecycle conducted a Food Waste Survey for the California Department of Corrections and Rehabilitation to quantify the amount of pre-consumer food waste generated. The results assisted the California Department of Corrections and Rehabilitation on a Scope or Work for a Master Contract for a Food Waste program. • CalRecycle assists state agencies in implementing the State Agency Buy Recycled Campaign (SABRC). SABRC requires State agencies and the Legislature to purchase recycled-content products (RCP), including compost. CalRecycle reviews state agency RCP programs, makes recommendations on improvements, and believes there continues to be an opportunity for increased procurement of RCPs. Full implementation by 2020.

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Appendix C, Section 4.E.	CalRecycle, DWR	Watershed Friendly Landscape Guidelines	CalRecycle works with the River Friendly Landscape (RFL) Coalition, a collaboration between public agencies, non-profit organizations, designers, private landscape architects, and contractors in the Greater Sacramento Region, in promoting and the use of the "RFL Benefits Calculator". The calculator is for homeowners, landscape professionals and anyone else who wants to see how much water, time and money can be saved by creating a river-friendly landscape. Also, this tool will estimate the amount of greenhouse gases that can be reduced by using river-friendly principles.	TBD	The calculator was released in early 2012 and is continually updated for improvements. The RFL Coalition host monthly training programs and landscape events. CalRecycle has expanded its work to include the California Urban Water Conservation Council to promote the benefits of compost and mulch applications to reduce water consumption. CalRecycle collaborated with the Department of Water Resources on the update to the Model Water Efficient Landscape Ordinance. Workshops are scheduled for local agencies and landscape professional throughout the State for a better understand of the role of compost/mulch plays in healthy successful landscapes. Full implementation by 2020.
Appendix C, Section 9. C.	CalRecycle	Liquefied Natural Gas from Landfill Gas Measure	This activity implements grant-funded projects at two landfills to demonstrate commercial scale technologies for converting landfill gas to LNG vehicle fuel. Recovery of landfill methane that is combusted through flaring can be captured as a biomass renewable energy source. Executive order S-06-06 directs State agencies participating in the Bio-energy Interagency Working Group to enhance the sustainable management and development of biomass resources for electricity generation and production of alternative fuels (bio-fuels). However, substantial financial and technical barriers exist for in-state production of LNG from landfill gas. The technology transfer from these commercial projects could provide significant GHG reduction opportunities.	1.0	The Gas Technology Institute received Public Interest Energy Research Program (PIER) funding to clean and convert landfill gas into liquefied natural gas (LNG) at the Altamonte Landfill for use as transportation fuel. Built in 2009, the facility continues to produce over 4 million gallons of LNG biofuel annually. Full implementation by 2020.
Not in Scoping Plan	CalRecycle	Achieved 50 Percent Statewide Recycling Goal (Accomplished prior to Scoping Plan development)	Increasing the amount of solid waste that is recycled, reused, or composted will reduce GHG emissions primarily by: 1) reducing the energy requirements associated with the extraction, harvest, and processing of raw materials; and 2) using recyclable materials that require less energy than raw materials to manufacture finished products. Increased diversion of organic materials (green and food waste) will also reduce GHG emissions by redirecting this material to processes that use the solid waste material to produce vehicle fuels, heat, electricity, or compost. [NOTE: The 3 $MMTCO_2e$ figure for this strategy reflects the GHG reduction at the 54 percent level for recycled materials which was accomplished in 2006.]	3 [5]	CalRecycle provides assistance to local jurisdictions, businesses and the public with their recycling efforts. In 2014, a per-resident disposal rate of 4.5 pounds/resident/day was calculated using SB 1016's measurement system; the per-resident "diversion rate equivalent" was 65 percent.
Not in Scoping Plan	CalRecycle, CEC, ARB, CPUC	Waste Technology Demonstration & Development	This measure will 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. CalRecycle, through its Recycling Market Development Zones and the new Organics Loan Program, continued to provide low interest loans and technical and permitting assistance to eligible biofuel and renewable electricity projects that utilize municipal solid waste.	TBD	With a total of $3 million in Recycling Market Development Zone (RMDZ) loans, Clean World Partners continues to anaerobically digest organic waste at Sacramento's South Area Transfer Station to produce transportation fuel, generate LCFS credits, and make payments on the loan. Full implementation by 2020.
Not in Scoping Plan	CalRecycle	AB 341 – California's 75 Percent Recycling Initiative	Signed by the Governor in October 2011, AB 341 (Chesbro, Chapter 476, Statutes of 2011) set an ambitious 75 percent statewide recycling goal of California's solid waste by 2020 which means that roughly 20 million tons per year of materials currently disposed in landfills will be recycled resulting in significant GHG reductions.	TBD	The Report to the Legislature required by AB 341 was published in August 2015 and provides strategies to achieve the 75 percent statewide recycling goal. Full implementation by 2020.

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Not in Scoping Plan	CalRecycle	Greenhouse Gas Reduction Grants & Loans Program	The Greenhouse Gas Reduction Fund (GGRF) was established in 2012 by AB 1532, SB 535, and SB 1018. The GGRF receives Cap-and-Trade auction proceeds which are appropriated by the Legislature and Governor for projects that support the goals of AB 32. CalRecycle established the GHG Reduction Grant and Loan Program to provide financial incentives for capital investments in composting/digestion infrastructure and recycling manufacturing facilities that will result in reduced greenhouse gas emissions. The purpose of this grant and loan program is to lower overall greenhouse gas emissions by expanding existing capacity or establishing new facilities in California that use California-generated organics, postconsumer recycled fiber (paper, textiles, carpet, or wood), plastic, or glass to manufacture products.	TBD	The Governor's 2014-15 Budget included $25 million in Fiscal Year 2014–15 funds for CalRecycle to administer. CalRecycle awarded five projects for the 2014/15 Organics Grant Program. By 2025, these projects are estimated to reduce GHG emissions by 1.6 MMTCO2e; divert 2.7 million tons organics from landfills; and create 140 temporary and 43 permanent jobs. CalRecycle awarded three projects for the 2014/15 Fiber, Plastic, and Glass Grant Program. By 2025, these projects are estimated to reduce GHG emissions by 320,000 MTCO2e; divert 400,000 tons recyclable materials from landfills; and create 160 permanent jobs. CalRecycle provided two Loans for the 2014/15 Organics Loan Program projects. By 2025, these projects are estimated to reduce GHG emissions by 26,000 MTCO2e; divert 63,000 tons from landfills; and create 5 permanent jobs. Full implementation estimated by 2025.
Total Reductions Expected from CalRecycle Led Strategies				**10*****	

CalRecycle NOTES:

* Reduction included under ARB's totals

** GHG emission reduction estimate in Scoping Plan

*** Split responsibility for Substrategy 3: CalRecycle is lead for EPR, and DGS is lead for EPP.

****Achieved 65 percent in 2010; 65 percent in 2011; 66 percent in 2012; 65 percent in 2013; 65 percent in 2014

***** The total includes RW 3-Substrategy 1 (Anaerobic Digestion), RW 3-Substrategy 2 (Mandatory Commercial Recycling), RW-3 Substrategy 4 (Increase Production & Markets for Compost), and Appendix C. Section 9. C (Liquefied Natural Gas). The total does not include RW 1 (Landfill Methane Control Measure) because its reduction is included under ARB's reductions. Also total does not include "Achieve 50 Percent Statewide Recycling Goal" because it pre-dates the Scoping Plan. The Greenhouse Gas Reduction Fund grants & loans are not included in the total.

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	CALTRANS MEASURES				
	TRANSPORTATION SECTOR				
Not in Scoping Plan	CalTrans	Alternative Employee Commuting Strategies	Caltrans has many employee commute programs in place that reduce the need to drive to work. These include monthly bus passes, emergency ride home vouchers, subsidies for vanpools, carpool matching services, and secure-access bicycle parking.	0.007	Annual GHG emission reductions are approximately 6,000 MTCO2.
Not in Scoping Plan	CalTrans	Fleet Greening and Fuel Diversification	The Caltrans Fleet Greening Program was formally initiated in August 2000 to reduce emissions from the fleet. Current turnover of the fleet to alternative fuel and hybrid vehicles is exceeding requirements of Executive Order B-16-12.	0.052	Today the Director's policy continues to promote an efficient fleet mix and use of efficient, low emission vehicles to lower Caltrans' use of petroleum as well as reduce emissions of criteria air pollutants and greenhouse gases. Caltrans Division of Equipment purchased 54 Battery-Electric Vehicles in FY 14/15. Through a combination of regulation compliance, state purchasing policies, and innovative demonstrations we've implemented hybrid passenger vehicles, solar-powered equipment, propane-fueled vehicles, low dust street sweepers, diesel particulate filters on heavy-duty, diesel-powered vehicles, two hydrogen demonstration vehicles, renewable diesel purchases, and an E-85 fuel ethanol demonstration project. Implementation Timeline:2020.
Not in Scoping Plan	CalTrans	LED Retrofits	Caltrans is replacing traditional streetlights with energy saving LEDs.	0.046	Since 2010, Caltrans has reduced the emissions from streetlights by over 60 percent by retrofitting traditional bulbs to LEDs. Implementation Timeline: 2020.
	INDUSTRY SECTOR				
Not in Scoping Plan	CalTrans	Alternative Asphalt Strategies	Caltrans' use of alternatives to hot mix asphalt reduces operational GHG emissions.	0.060	N/A
Not in Scoping Plan	CalTrans	Alternative Cement and Concrete Strategies **	This strategy reflects Caltrans cement consumption only. The measure includes both the 2.5 percent limestone cement mix and up to 25 percent supplementary cementitious material. 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. Since 2009, Caltrans cement standards allow 5 percent limestone and up to 50 percent supplementary cementitious material which is expected to improve the CO2 emission savings correspondingly. The Scoping Plan has identified the Cement Sector as falling under Cap & Trade.	0.050	N/A

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	OTHER				
Not in Scoping Plan	CalTrans	Facility Efficiency and Energy Conservation	Caltrans has improved the energy efficiency of existing Caltrans buildings and has constructed new facilities that meet LEED standards. Several of the most widely-deployed strategies to reduce GHG emissions at Caltrans facilities include LEED certified buildings, data center upgrades, energy efficient lighting, and low flow toilets and water fixtures.	0.010	Caltrans continues to work towards reaching the goals articulated in Executive Order B-16-2, and Executive Order B-18-12 to support the state's renewable power statutes. These include energy and water conservation, and updated Leadership in Energy and Environmental Design (LEED) standards.
Total Reductions Expected from CalTrans Led Strategies				**0.225**	

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	CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA) MEASURES *				
	AGRICULTURAL SECTOR				
A-1	CDFA, ARB	Methane Capture at Large Dairies (Enteric Fermentation, Dairy Digesters)	State and Federal Agencies continue to work on addressing regulatory, (including permitting), technical and financial barriers to a widespread voluntary adoption of anaerobic digesters on dairies. CDFA organized the Dairy Digester Working Group to address some of the pending issues. More information about implementation of this measure and the protocol for measuring compliance can be found in the 'Agricultural Sector' listing on the ARB section of this document.	0.138	CDFA received $12 million to establish the Dairy Digester Research and Development Program. In July 2015, $11.1 million was awarded for the development of five dairy digester projects. $500,000 is allocated for research projects which are currently under agency review.
Not in Scoping Plan	CDFA. ARB. SWRCB, DWR	Incentives for farmers to utilize efficient management practices	The State Water Efficiency and Enhancement Program provides incentives in the form of grants to agricultural operations for improvements to irrigation systems that both save water and reduce greenhouse gas emissions.	0.052	CDFA received $10 million from the Greenhouse Gas Reduction Fund in response to emergency drought legislation. These activities have been initiated in coordination with the ARB. Two application rounds occurred in 2014-2015 resulting in 133 projects being awarded. An additional $10 million was designated for 2015-2016. Recently the Governor signed SB 101, (Chapter 321, Statutes of 2015) which appropriates an additional $40 million dollars from the Greenhouse Gas Reduction Fund to continue the State Water Efficiency and Enhancement Program.
Early Action Item	CDFA, ARB, CEC	Agricultural Research - Nitrous Oxide Reduction	CDFA has engaged in efforts with ARB and CEC during the past several year to coordinate research activities on reducing nitrous oxide emissions from nitrogen fertilizer applications.	N/A [4]	CDFA committed to funding $150,000 on baseline agricultural nitrous oxide emissions. CDFA funded research on this topic will continue though 2015. CDFA committed to funding $270,000 on the effect of different management regimes on nitrous oxide emissions through 2018.
Not in Scoping Plan	CDFA	Hydrogen Fuel Quality and Quantity	CDFA – Division of Measurement Standards (DMS) continues to work with the CEC, ARB, and hydrogen station developers in the testing and certification of dispensers. Retail hydrogen fuel quality will be monitored and tested by the DMS on an ongoing basis to ensure the safe and effective operation of FCEV's. ARB's 2014 report forecasts 18,500 FCEV on California's roadways by 2020.	0.05	CDFA – Division of Measurement Standards has established fuel quality standards and test methods essential to the commercialization of zero-emission fuel cell electric vehicles (FCEV).The Division has also developed the metrological standards and test methods for evaluating hydrogen dispenser accuracy leading to successful California Type Approval of various hydrogen dispensers being installed in the state - thereby enabling the introduction of manufacturers vehicles to the marketplace.

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Not in Scoping Plan	CDFA	Biodiesel Blends Renewable Diesel	CDFA-DMS is an active partner in ongoing development of national standards under ASTM (American Society for Testing of Materials) International for biodiesel, renewable diesel fuels, and diesel substitutes such as dimethyl ether. Under a grant from the California Energy Commission, DMS is researching test methods needed for the development of a greater than 20 percent biodiesel blend standard.	N/A [4]	Active partner in ongoing development of national standards
Not in Scoping Plan	CDFA	Ethanol Flex Fuel, Gasoline-Ethanol Blends, and other alcohols	CDFA-DMS promotes the use of Ethanol based fuels by the establishment of specifications and regulations which allow the sale of Ethanol Flex Fuel and higher Gasoline Ethanol blends.	N/A [4]	DMS is participating with ASTM International in the development of national standards for butanol based fuel. Regulations are in place to permit the sale of Bio-butanol and other Bio-alcohol fuels as these products are brought into the market. The California Type Approval Program has established clear guidelines for approval of any new alternative fuel metering devices.
Not in Scoping Plan	CDFA	Developmental Fuels	CDFA's developmental engine fuel variance program allows alternative fuels that currently have no National Standard to be used in limited applications for the purpose of developing a National Standard.	N/A [4]	DMS is actively working with the California Air Resource Board to identify new fuels that meet California's goals of lower fossil carbon emissions, reduced air pollution, energy independence, and increased use in renewable fuels. Theses fuel will provide California agriculture new opportunities to develop crops for alternative fuels and even greater opportunity for transforming agriculture waste into green fuel.
Not in Scoping Plan	CDFA, CEC	Energy Crops	Coordinate with the CEC on research on energy crops.	N/A	CDFA, in partnership with scientists at UC Davis, and with funding from the California Energy Commission Public Interest Energy Research Program, has recently completed a four-year study to evaluate the economic, beneficial environmental performance of six bioenergy crops.
Not in Scoping Plan	CDFA	Specialty Crop Block Grants	Several research projects related to GHG reductions were funded under the 2012 SCBGP. The results of the funded research projects are expected to have a direct impact on the current understanding of GHG from agriculture and potential offset strategies. This research is critical in addressing knowledge gaps in GHG emissions for California specialty crops. More information on this and other funded projects can be found at www.cdfa.ca.gov/grants.	N/A	The 2012 Specialty Crop Block Grant Program (SCBGP) funded projects are ongoing. All 2012 SCBGP projects must be completed by June 2015.
Total Reductions Expected from CDFA Led Strategies				**0.2**	

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	CALIFORNIA ENERGY COMMISSION (CEC) MEASURES				
	ELECTRICAL AND NATURAL GAS SECTOR				
E-1	CEC	Comprehensive Publicly Owned Utilities Efficiency Program	Over the next few years, the POUs will implement relevant energy efficiency components of SB 350 (De Leon, Chapter 547, Statutes of 2015), AB 802 (Williams, Chapter 590, Statutes of 2015), and SB 758 (Skinner, Chapter 470, Statutes of 2009) to reduce energy consumption and associated GHG emissions.	1.8*	The POUs continue to use the technical resource manual that provides the methods, formulas, and default assumptions for estimating energy savings and peak demand impacts from energy efficiency measures and projects. The POUs hope that over time this tool provides consistent and transparent energy savings estimates.
E-1	CEC	Building Energy Efficiency Standards in Place	Every three years the Energy Commission establishes minimum standards of efficiency for new building design, construction, and operation that are technically and economically feasible. The *Building Energy Efficiency Standard*s were first adopted in 1978 and are developed through a public process to solicit stakeholder input. California's leading *Building Energy Efficiency Standards* are moving the state closer to achieving its zero-net energy (ZNE) goals, whereby all newly constructed low-rise residential buildings are to be ZNE by 2020 and all new commercial buildings by 2030. The Energy Commission published the proposed *2016 Building Energy Efficiency Standard*s in February 2015 and adopted those standards in July 2015. California Building Standards Commission could approve these standards in December 2015. The 2016 Building Standards would become effective on January 1, 2017. The Energy Commission will begin a new three-year cycle to update the building energy efficiency standards in 2016. The Energy Commission will implement the *Existing Buildings Energy Efficiency Action Plan* . The Energy Commission will implement AB 802 and it will establish a public benchmarking program for the state with time-certain disclosure requirements.	4.5 **	Working closely with the CPUC and others on strategies to achieve zero net energy (ZNE) buildings. Continuing programs to support education and workforce training related to energy efficiency. Worked on the *2016 Building Energy Efficiency Standards* rulemaking and proposed standards were published in February 2015. The Energy Commission adopted the statewide *Existing Buildings Energy Efficiency Action Plan* in September 2015. This document was called for under AB 758 (Skinner, Chapter 470, Statutes of 2009) and provides a roadmap to all state agencies, industry representatives and the public for doubling energy efficiency in existing buildings by 2030. Energy Commission advocated for a comprehensive benchmarking program under AB 802 (Williams, Chapter 590, Statutes of 2015) which was signed into law on October 8, 2015. AB 802 will enable whole building data access for all nonresidential buildings and for residential buildings with five or more service accounts.

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E-1	CEC	Appliance Energy Efficiency Standards in Place	The Energy Commission is mandated to create energy efficiency standards for all new appliances not covered by federal energy efficiency standards. To develop these standards, the Energy Commission seeks information from manufacturers, industry associations, energy efficiency advocates, energy utilities and other stakeholders. Once standards are approved, they are included within the state's *Appliances Energy Efficiency Database* that contains listings for all appliances certified by the Energy Commission as meeting current standards. The Commission will continue pre-rulemaking activity on computers, computer monitors, pool pumps, and commercial clothes dryers. The Commission plans to seek public input on further opportunities to improve appliance energy efficiency.	7.4 **	The Energy Commission conducted pre-rulemaking efforts on computers, computer monitors, led lamps, small diameter directional lamps. Initiated formal rulemaking for air filter labels, heat-pump water-chilling packages, toilets, urinals, faucets, dimmable fluorescent ballasts. The Energy Commission adopted the standards for toilets, urinals, faucets, showerheads, dimmable fluorescent ballasts, air filter labels, and heat-pump water-chilling packages in early 2015. The Energy Commission will initiate a formal rulemaking and potential adoption of the rulemaking for LED and small diameter directional lamp efficiency standards.
	TRANSPORTATION SECTOR				
T-4	CEC	Fuel-Efficient Tires	Review federal actions with fuel efficiency of replacement tires. Reducing the rolling resistance of replacement tires through consumer information and minimum standards promises fuel savings and reductions in GHG emissions. A fact sheet on tire efficiency measures can be found at: http://www.whitehouse.gov/the-press-office/2014/12/09/fact-sheet-increasing-safety-and-efficiency-while-saving-money-pump	TBD ***	Monitor activities of the National Highway Traffic Safety Administration on tire fuel efficiency strategies and metrics.
Total Reductions Expected from CEC Led Strategies				**1.8******	

CEC NOTES: * Estimate of POU EE Program energy savings is based upon a 2015 status report to the Legislature; average of the last 7 years is used to project savings through 2020. The POUs now use a standardized approach to assessment of efficiency program savings. This manual can be found at: http://cmua.org/wpcmua/wp-content/uploads/2014/05/CMUA-_TRM-manual_5-5-2014_Final.pdf

** Building and appliance standards pre-date the Scoping Plan and are not included in AB32 reduction totals, but shown here to document on-going efforts. Savings based on CA Energy Demand (CED 2013) final mid-case forecast and 588 lbsCO2/MWh for avoided electricity consumption and 0.00529 MTCO2E per MMBtu.

*** NHTSA (US DOT) has a goal to finalize a rule by 2017 that provides a consumer information program on tire fuel efficiency. NHTSA created a webpage on tire fuel efficiency: http://www.safercar.gov/tires/pages/tires_fuelefficiency.html

**** The only strategy that contribute to this total is Comprehensive Publicly Owned Utilities Efficiency Program.

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	CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC) MEASURES *				
	ELECTRICAL AND NATURAL GAS SECTOR				
E-1	CPUC	IOU Energy Efficiency Programs	Energy savings reflect EE program reductions in investor-owned utility (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": 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) Heating, ventilation, and air conditioning (HVAC) industry will be reshaped to ensure optimal equipment performance; 4) All eligible low-income homes will be energy-efficient by 2020.	11.7	Decision adopted in October 2014 established 2015 energy efficiency (EE) savings goals and budgets, opened proceeding to implement EE "rolling portfolio" cycles and identified continued collaboration with Energy Commission on Proposition 39 program guidelines; Database for Energy Efficient Resources (DEER) 2015 Code Update (April 2014); Completed Statewide Impact Evaluations for 2010-12 EE program cycle (October 2014); Decision adopted enabling Community Choice Aggregators to administer EE programs (January 2014); Implementation of Energy Upgrade California (Decision adopted December 2013); Continued collaboration with Energy Commission on AB 758 Action Plan (draft released in May 2013); Collaboration with Energy Commission on adopting Zero Net Energy Code Building definition (January 2014)
E-2	CPUC, CEC	Customer-Installed Combined Heat and Power systems (non SGIP)	In December 2010, the CPUC approved a comprehensive CHP program with several procurement options for CHP facilities. This program establishes a requirement that the utilities procure 3,000 MW of CHP by November 2015 and achieve 4.8 MMT of GHG emission reductions by 2020. During the LTPP, CPUC considered input from the CHP industry, ratepayer advocates, and utilities involved with the original Settlement Agreement. CPUC concluded that a reduced GHG target of 2.72 MMT would be robust enough to achieve policy objectives (other than GHG reductions), including considerations of costs and need. Decision 15-06-028 also clarified the GHG accounting methodology to permit existing facilities to count as emission reduction credits. Additionally, the Commission is implementing a CHP Feed-in-Tariff program for highly-efficient CHP facilities 20MW in capacity and smaller, pursuant to AB 1613 (Blakeslee, Chapter 713, Statutes of 2007). CPUC is also deliberating upon a SoCalGas proposal to operate and install 20 MW or under systems via a Distributed Energy Resources Tariff.	2.72	CPUC continued implementation of the Qualifying Facility and Combined Heat and Power (CHP) Settlement, effective November 2011. As of September 2015, the IOUs have concluded eight CHP-only competitive solicitations and received offers for the ninth solicitation mandated to be held by November 2015. The utilities have executed contracts for over 3,000 MW of CHP Settlement-eligible facilities, resulting in approximately 2.1 MMT of GHG emission reduction credit (according to the Settlement's accounting rules). Beginning July 2014, CPUC used the Long Term Procurement Planning Proceeding (R.13-12-010) to consider program modifications for the Second Program Period that operates until 2020 and released D.15-06-028.
E-2	CPUC	Electricity Sector Carbon Policy	The Emissions Performance Standard (EPS) ensures that baseload generation used to serve California consumers is from power plants that have an emissions intensity no greater than a combined cycle gas turbine plant.	N/A **	

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
E-3.1	CPUC, CEC	33 Percent RPS	The RPS program establishes a minimum amount of renewable energy the IOUs and POUs must procure from renewable sources to serve their retail customers by 2030. During the first compliance period (2011-2013), approximately 20 percent of the three large IOUs' energy deliveries were from renewable resources. The "Expected GHG Emission Reductions in 2020" value shown here reflects the total anticipated annual avoided GHG emissions resulting from all renewable capacity installed pursuant to the RPS program since 2007.	19.3	CPUC is implementing SB 2 (1x) (Simitian, Chapter 1, Statutes of 2011-12 First Extraordinary Session), which codified the 33 percent RPS mandate (CPUC Proceeding R.15-02-020).The CPUC oversees utility procurement of renewables including those described in more detail below: Renewable Auction Mechanism for system-side renewable distributed generation, Renewable SB 32 Feed-In Tariff Program, and Renewable SB 1122 Feed-In Tariff.
E-4	CPUC, CEC	Senate Bill 1 - GoSolarCalifornia (previously titled - 'Million Solar Roofs')	The goal of GoSolarCalifornia is to facilitate the deployment of 3,000 MW of rooftop solar via provision of rebates to help buy-down the up front cost of rooftop solar PV on residential and commercial buildings. The CPUC portion of GoSolarCalifornia is known as the California Solar Initiative (CSI). The CPUC is responsible for 1,940 MW of retro-fit projects.	2.2	Decision (D.14-03-041) established a transition period pursuant to AB327 for customers enrolled in NEM tariffs. The CPUC issued a decision (D.14-11-001) to transfer responsibility for collecting solar statistics from the CSI to the net energy metering interconnection process. The CPUC issued a decision (D.15-01-027) to extend the CSI MASH (Multifamily Affordable Solar Housing) and SASH (Single-family Affordable Solar Homes) programs through the end of 2021.
CR-1	CPUC, CEC	Energy Efficiency: 800 mil. therms reduced consumption.	This strategy includes: utility energy efficiency programs; building and appliance standards; and additional efficiency and conservation programs.	4.3	See above (E-1) for IOU EE program activities overseen by the CPUC.
CR-2	CPUC	Increased Use of Solar Water Heating	In January 2010, the CPUC approved the California Solar Initiative (CSI) Thermal Program, which provides up-front incentives toward the purchase of solar water heaters and other solar thermal technologies in the territories for customers electric and gas investor-owned utilities in California. Within the IOU service territories, this program provides customer rebates to support the deployment of gas displacing solar water heating systems on homes and businesses sufficient to displace 585 million therms (equivalent to 200,000 single-family residential systems) as well as support the deployment of electric displacing systems to displace 276 million kWh (equivalent to 100,800 single-family residential systems).	0.1	In January 2015, the program was modified to increase incentive levels for the single-family and multifamily sub-programs, reallocate funding across sub-programs, and institute project caps for multifamily / commercial and solar pool heating projects. Implementation Timeline: 2016.
Not In Scoping Plan	CPUC	Self Generation Incentive Program	Within the IOU service territories, this program provides customer rebates to support the deployment of clean customer side generation including wind, fuel cells, and storage. Pursuant to SB 412 (Kehoe, Chapter 182, Statutes of 2009), in 2011, the CPUC issued a decision modifying the program to focus more specifically on technologies that provide for net GHG emission reductions.	TBD	The Commission is working to comply with SB 861 (Chapter 35, Statutes of 2014), which modified some eligibility criteria and measurement and evaluation guidelines. The Commission is also reviewing the program to ensure continued effectiveness through the end of the program in 2020.

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Scoping Plan Chapter II, Section C.1.	ARB, CPUC	Cap-and-Trade Program	The California Cap-and-Trade program is a market-based approach that will provide a firm limit, or "cap," on GHG emissions from the electricity, industrial, commercial, and residential fuels and transportation fuels sectors. The Commission's role in the Cap-and-Trade program is to determine appropriate uses of the proceeds utilities receive from participation in the program. Additionally, the Commission reviews and approves the utilities' procurement authorities, strategies and associated costs to comply with the Cap-and-Trade Program.	Reduction included in ARB totals.	The CPUC adopted rules and procedures for the electric utilities to distribute GHG allowance proceeds to emissions-intensive and trade-exposed customers in addition to the residential and small business customers that currently receive Climate Credits. Additionally, the CPUC continued oversight of utility procurement of GHG compliance instruments. The CPUC is also working on a rulemaking (R.14-03-003) to address how natural gas utilities will distribute GHG allowance proceeds to customers. The CPUC will continue to consider customer outreach and education efforts to increase awareness and understanding of the program.
Not In Scoping Plan	CPUC, CalRecycle, ARB	Renewable Auction Mechanism for system-side renewable distributed generation	The Renewable Auction Mechanism (RAM) is a simplified, market-based procurement mechanism for renewable distributed generation (DG) projects on the system side of the meter. The Commission adopted RAM as the primary procurement tool for system-side renewable DG to promote competition, elicit the lowest costs for ratepayers, encourage the development of resources that can utilize existing transmission and distribution infrastructure, and contribute to RPS goals in the near term. To begin the program, the Commission authorized the utilities to procure 1,330 megawatts through RAM. On November 20, 2014 the Commission modified the RAM program by adopting D.14-11-042. D.14-11-042 mandated one final RAM 6 auction to close by June 30, 2015. Beyond RAM 6, the Decision directs IOUs to outline their plans to use RAM as a procurement process in their 2015 and beyond RPS procurement plans. IOUs now have the flexibility to use RAM as an optional procurement process to meet a CPUC identified capacity or system need or a legislative mandate.	Is included in goal for 33 percent RPS	The Commission has overseen five RAM auctions for facilities between 3MW and 20MW in capacity to procure a targeted 1,330 MW .The IOUs held a fifth RAM auction which closed on June 27, 2014 and are currently seeking Commission authorization to procure 418 MW of capacity through the auction. D.14-11-042 mandated a RAM 6 which closed on August 21, 2015. The IOUS filed their respective RPS plans on August 4,2015 which included their proposals for future RAM auctions. The Commission will decide on these plans in the 2015 RPS Decision.
Not In Scoping Plan	CPUC	Renewable SB 32 Feed-In Tariff Program	The purpose of the FIT program is to promote the development of small-scale renewable Distributed Generation, under 3 MW, by streamlining the process for generators to sell wholesale generation to the IOUs without having to engage in time-consuming contract negotiations and solicitations. Re-MAT provides a starting FIT market price for the three RPS product categories: baseload, peaking, and non-peaking resources. Sellers may then subscribe to sell RPS-eligible generation at the given Re-MAT market price via a Commission approved standard contract. Re-MAT prices may increase or decrease for each product type on a bi-monthly basis based on seller subscription levels.	Is included in goal for 33 percent RPS	Effective July 24, 2013, the AB 1969 (Yee, Chapter 731, Statutes of 2006) Feed-In Tariff (FIT) program was replaced by the SB 32 (Negrete, Chapter 328, Statutes of 2009) FIT program, featuring the renewable market adjusting tariff (Re-MAT). Between November 2013 and October 2015 , the Commission has overseen 12 auctions.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
Not In Scoping Plan	CPUC	Renewable SB 1122 Feed-In Tariff	In September 2012, Gov. Brown signed SB 1122 (Rubio, 2012) into law, requiring an incremental 250 MW of renewable Feed-In Tariff (FIT) procurement from small-scale bioenergy projects that commence operation on or after June 1, 2013. The statute requires that each of California's three large investor owned utilities (PG&E, SCE, and SDG&E) procure a share of the statute's 250 MW requirement based on the ratio of each utility's peak demand to statewide peak demand. Additionally, the statute orders the CPUC to allocate the 250 MW procurement requirement among the following categories: (i) For biogas from wastewater treatment, municipal organic waste diversion, food processing, and codigestion, 110 megawatts. (ii) For dairy and other agricultural bioenergy, 90 megawatts. (iii) For bioenergy using byproducts of sustainable forest management, 50 megawatts. The Commission implemented SB 1122 through D.14-12-081 , which sets procurement targets for each IOU for each bioenergy category, identifies the required characteristics of each fuel type to be used, and sets the mechanism for determining the tariff price of generation. The Commission voted on Decision 15-09-004 to adopt the tariffs and the standard contract for SB 1122.	Is included in goal for 33 percent RPS	On December 18,2014, the Commission implemented the provisions of SB 1122 (Rubio, Chapter 612, Statures of 2012) through D.14-12-081. In the first quarter of 2016 he Commission will oversee IOU procurement of mandated quantities of RPS-eligible generation from facilities using specified types of bioenergy through a feed-in-tariff auction known as BioMAT.
Not In Scoping Plan	CPUC	Green Tariff Shared Renewables (GTSR) Program	SB 43 enacted the Green Tariff Shared Renewables (GTSR) Program. The GTSR Program is intended to (1) expand access to all eligible renewable energy resources to all ratepayers who are currently unable to access the benefits of onsite generation and (2) create a mechanism whereby institutional customers, commercial customers and groups of individuals can meet their needs with electrical generation from eligible renewable energy resources. The statute further provides that the GTSR Program should provide support for enhanced community renewables programs to facilitate development of eligible renewable resource projects located close to the source of demand. The statute requires the utilities to permit customers to subscribe to the GTSR Program until there is state-wide 600 megawatts of customer participation.	Incremental to 33 percent RPS goals. TBD	On January 29, 2015, the Commission implemented the provisions of SB 43 (Wolk, Chapter 413, Statures of 2013) setting a formal requirement for the three large electrical utilities to implement the Green Tariff Shared Renewables (GTSR) Program. As envisioned by statute, the GTSR Program includes both a Green Tariff Option (allowing customers to purchase energy with a greater share of renewables) and an enhanced community renewables option (allowing customers to purchase renewable energy from community-based projects). The Commission set procurement targets for the IOUs and also set 110.5 megawatts of minimum advanced procurement goals for 2015.
Not In Scoping Plan	CPUC	Alternative Fuel Vehicles (Natural Gas and Electric Vehicles)	Executive Order B-16-2012 set a statewide goal to install infrastructure to support 1 million Plug-In Electric Vehicles by 2020, to deploy 1.5 million plug-in electric vehicles (PEVs) on the roads by 2025, and to reduce transportation GHG 80% below 1990 levels by 2050. More recently, Executive Order B-30-15 set a goal to reduce petroleum use in transportation 50 percent by 2030 and SB 350 established that Transportation Electrification is a principal goal for the utilities. The IOUs' charging infrastructure proposals and Low Carbon Fuel Standard incentives will support these policy objectives by lowering barriers to adopting and recharging PEVs. The CPUC is responsible for ensuring that vehicles' energy use is consistent with electric system conditions to maintain reliability and integrate renewable energy. To ensure these goals are met, CPUC will be designing rates, education programs, and regulations that ensure vehicle and infrastructure technologies are able to effectively communicate with the utilities.	TBD	After CPUC launched the Alternative Fuel Vehicles Rulemaking, SDG&E and SCE requested to install charging infrastructure to facilitate adoption of Plug-In Electric Vehicles. In D.14-12-079, CPUC permitted the utilities to propose infrastructure programs and reaffirmed that any impacts to competitive markets would be counterbalanced with regulatory protections. Subsequently, PG&E filed an application, which increased the proposed IOU investment to $1.1 billion for 60,600 chargers. In D.14-05-021 and D.14-12-083, CPUC authorized the utilities to sell LCFS credits and return the revenue from credit sales to low carbon fuel drivers. The Vehicle-Grid Integration working group coordinates CPUC, CEC, CAISO, and ARB research and market development efforts to facilitate the use of vehicles as distributed resources. Infrastructure Decisions expected in Q4 2015 (SDG&E & SCE) and Q2 2016 (PG&E). LCFS rebates expected Q3 2016.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	WATER SECTOR				
W-3	CPUC	Water Energy Communications Nexus	Proceeding (opened in response to a petition by CPUC's Office of Ratepayer Advocates) will develop a partnership framework between investor owned energy utilities and the water sector to co-fund programs that reduce energy consumption by the water sector in supplying, conveying, treating, and distributing water, and examine the role of telecommunications in water management, use and public safety. Through this proceeding, the Commission will adopt tools that calculate the embedded energy in water and avoided water capacity cost, to be used as part of the CPUC's existing Energy Efficiency calculator and cost benefit tests.	TBD	Proceeding R.13-12-011 is addressing the Water Energy Communications Nexus.
Total Reductions Expected from CPUC Led Strategies				**40.3**	

CPUC NOTES: * GHG Reduction goals for PUC measures are taken from ARB's AB 32 Scoping Plan. Unless otherwise noted, values represent statewide reductions for the measures and are not prorated to the CPUC jurisdictional utilities' share.

** The EPS prevents CA utilities from entering into long-term contracts with inefficient generation resources, which will in effect prevent such resources from being built to serve CA load. A reduction calculation would involve speculation about amount of these resources that would have been built in the absence of the EPS.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	DEPARTMENT OFGENERAL SERVICES (DGS) MEASURES				
	GREEN BUILDINGS				
GB-1	DGS	Green Buildings Initiative	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 included in substrategies described below).	Reductions specified by substrategy (below)	
GB-1: substrategy 1	DGS, State Agencies	New state buildings	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.	0.1	In 2014, 11 LEED-NC (New Construction) and LEED-CI (Commercial Interiors) certifications were received for new and existing buildings and tenant spaces 244,694 sq. ft.).
GB-1: substrategy 2	DGS, State Agencies	Existing state buildings	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. DGS also leases buildings for other state agencies that meet this criteria.	0.9	DGS enrolled in U.S. Green Building Council LEED Volume Certification to streamline LEED-EB (Existing Buildings) certification, internalize, and greatly reduce costs. Three new state leases in existing buildings were LEED-EBOM certified in 2014 (163,705 sq. ft.)
GB-1: substrategy 3	State Architect, Office of Public School Construction, Department of Education	Schools	Various activities to encourage California schools to be built and operated to high levels of energy and environmental performance. (This original estimate is based on 40 percent of California schools constructed/renovated to LEED and Collaborative for High Performance Schools standards by 2020.) The Division of the State Architect's 7x7x7 Program will select 7 architects statewide to study 7 different school buildings statewide in different climate zones, to determine measures that can be implemented to improve the energy and water conservation performance of existing schools throughout California. This program will be concluded in February 2016 with presentations and documentation of results available to all school districts in the state.	0.2	High performance school bond funding came to a close at the end of 2014. The Division of the State Architect completed 20 plan verifications for the High Performance Incentive Grant in calendar year 2014. The State Allocation Board approved 29 HPI approvals totaling $11.4 million in 2014. DSA has begun implementation of the 7x7x7 Energy Conservation Program, to assist school districts in improving their energy and water conservation efforts. DSA also developed irrigation regulations for schools to reduce their water use for site irrigation.
GB-1: substrategy 4	DGS, State Agencies	Leased Buildings	Now mandatory energy and environmental improvements for leased 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.	0.3	All new build-to-suit leases continue to be built to LEED Silver or higher certification standards, as well as large leases in existing buildings.
GB-1: substrategy 5	DGS, State Agencies, CSU/UC	Distributed Generation	Implement clean renewable energy generation projects at state facilities. It is anticipated that at least 70 MW of clean/clean renewable generation will be installed in state facilities by 2020. Installations will consist of Solar Photovoltaic, Wind and Solar Thermal generation projects.	0.2	Total contracted MW of 3rd party financed solar PV systems totaled 38MW as of 2014 and 1 MW was added in 2015.
GB-1: substrategy 6	DGS, State Agencies, CIWMB, DTSC	Environmentally Preferable Purchasing (EPP)	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. Develop metrics to help assess significance of impact reduction.	*	Identification of appropriate metric and baseline by commodity is in progress.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
GB-1: substrategy 7	California Building Standards Commission, CEC, DGS, State Architect, HCD, OSHPD	Green Building Code Development	In 2008 California adopted the first-in-the-nation Green Building Standards Code (CALGreen) which became effective August 1, 2009. It contained voluntary standards which local authorities could adopt as mandatory regulations within their jurisdictions. On January 1, 2011, the 2010 edition of the CALGreen Code went into effect. It is composed of both voluntary and mandatory measures to further promote green building standards. Since then the Building Standards Commission has continued to enhance the CALGreen Code, implementing reductions in construction waste, water use, environmental impact during and after construction and increase the efficient use of building materials. All 13 of the 2013 California Building Standards Codes, California Code of Regulations, Title 24 took effect January 1, 2014 except for Part 6 (the Energy Code) which had a delayed effective date of July 1, 2014.	2.9	CALGreen's intervening code supplement (effective July 1, 2015) moved voluntary electric vehicle infrastructure requirements to mandatory. Mandatory prescriptive fixture flow rates were added along with clarifications to the voluntary tier fixture flow rate tables and percentages. The reference standards for carpet systems and resilient flooring systems were updated. Additionally, voluntary Solar Reflective Index values were updated.
	TRANSPORTATION SECTOR				
Appendix C, Section 2.B.	DGS, State Agencies	Right-size the State Fleet	As a result of Executive Order (EO) B-2-11, the state identified 6,931 state fleet assets as cost-inefficient and/or non-mission critical.	0.2	At this time, the state has eliminated 6,895 of these assets and is 99.5 percent complete. DGS' Office of Fleet and Asset Management (OFAM) is anticipated to conclude its EO B-2-11 fleet reduction activities in FY 15/16.
Appendix C, Section 2.B.	DGS, State Agencies	Removing Higher-Polluting Vehicles from the State Fleet	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. We will continue working with other state agencies on cost effective vehicle replacement strategies which will include the institution of default compact vehicle class size for future vehicle procurements. OFAM is currently working with a consultant to develop a vehicle lifecycle methodology to replace older, higher-polluting vehicles with newer, more fuel-efficient vehicles more often.	0.4	As a result of Executive Order (EO) B-2-11, the state identified 6,931 state fleet assets as cost-inefficient and/or non-mission critical. At this time, the state has eliminated 6,895 of these assets and is 99.4 percent complete. DGS' OFAM is anticipated to conclude its EO B-2-11 fleet reduction activities in FY 15/16.
Appendix C, Section 2.B.	DGS, State Agencies	Actively manage vehicle miles traveled and reduce petroleum consumption	1. Reduce the number of vehicle miles traveled, 2. Reduce GHG emissions, criteria pollutants, and maintenance costs, and 3. Actively manage fuel consumption (meeting 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 percent or 9 million gallons of gasoline and diesel.	0.2	Vehicle allocation methodology evaluated all vehicles. Utilization will result in car sharing/reduced trips. DGS OFAM continues to reduce vehicle miles travelled and petroleum use achieved through State fleet oversight and specifically the vehicle acquisition approval process. The process allows DGS OFAM to maintain fleet sizes and promote fuel efficient vehicles where feasible. At the time of the release of the 2015 Progress Report for Reducing or Displacing the Consumption of Petroleum Products by the State Fleet - Part One, petroleum consumption was at 16.07%.
Total Reductions Expected from DGS Led Strategies				**5.3**	

DGS NOTES: * 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.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	DEPARTMENT OF WATER RESOURCES (DWR) MEASURES				
	WATER SECTOR				
W-1	DWR, SWRCB	Water Use Efficiency	Promote greater implementation of water conservation measures, including best management practices, to improve efficiency. Implement the Governor's 20x2020 Plan (20 percent reduction in water use by 2020), and implement provisions of SBx7 7, the Water Conservation Act of 2009 (Steinberg, Chapter 4, Statutes of 2009-2010 Seventh Extraordinary Session).	1.4 [3]	In 2014, the Department developed a new grant program, authorized by the 2014 drought legislation and funded by Cap & Trade auction revenues, for residential, commercial, and institutional water efficiency projects, that reduce water, energy, and GHG emissions. In 2015, DWR awarded grants totaling $28 million, to 22 entities for 25 projects. Together, these projects are expected to achieve lifetime savings of 270,000 acre-feet of water, with GHG emission reductions of 0.2 MMTCO2e. In addition, 11 projects from DWR's Agricultural Water Use Efficiency Grant program in 2014 are collectively expected to achieve lifetime GHG emissions reductions of 0.025 MMTCO2e. In 2015, DWR also initiated two consumer rebate programs to replace inefficient toilets and remove turf, including replacement of more than 10 million square-feet of lawn and more than 60,000 toilets, to further conserve water during the state's historic drought. As well, the 2015 Urban Water Management Plan guidance will provide for the voluntary reporting of the energy intensity of water systems.
W-3, W-5; Appendix, Volume 1	DWR	Reid Gardner Power Plant Divestiture/renewable energy procurement/energy efficiency	DWR's Climate Action Plan includes procurement and development of renewable energy supplies, termination of its ownership interest in Unit 4 at Reid Gardner Station, and energy efficiency improvements.	1.2	In 2015, DWR was honored with the national Climate Leadership Award for Excellence in Greenhouse Gas Management. The Department continued to implement energy efficiency and renewable energy projects for the State Water Project (SWP). For example, SWP completed two major energy efficiency projects during 2015, and has initiated three more, scheduled for completion by 2017. Further, SWP has initiated plans to procure solar energy at three more sites, also by 2017. As of 2014, DWR's carbon emissions are approximately 30% below their 1990 levels (based upon a five-year running average), and continue to be on track to be 50% below 1990 levels by 2020, the target the Department established in its Climate Action Plan.
Total Reductions Expected from DWR Led Strategies				**2.6**	

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	DEPARTMENT OF HOUSING & COMMUNITY DEVELOPMENT (HCD) MEASURES				
	TRANSPORTATION SECTOR *				
T-3: C-56	HCD	Regional, Transportation-Related Greenhouse Gas (GHG) Targets.	HCD RHNA determinations specify number of new housing units for regional and local planning entities to plan for and coordinate and integrate with the SCS and RTP for housing and transportation planning to be consistent. Regional planning entities must allocate a share of RHNA to each local gov't to plan for in updating its housing element. HCD is required to approve region RHNA Plans and local gov't housing elements that describe local land-use decisions regarding housing siting and densities, etc. and consideration of factors relevant to achieving reductions in vehicle trips and GHG emissions.	Not Applicable. Regional transportation entities provide GHG reduction information to Air Resources Board.	Over 2015 HCD approved Regional Housing Need Allocation (RHNA) plans for Kings County, Merced County, and Madera County
	LAND USE *				
C-82 **	HCD	Housing Element Technical Assistance	Housing Element Technical Assistance: HCD updated technical assistance and completed outreach efforts to include climate change and greenhouse gas emission reductions objectives in technical assistance materials and resources for local governments to use and include in updating their housing elements. This included 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.	N/A [4]	Over 2014, HCD provided technical assistance to planning directors in the San Joaquin Valley in developing effective strategies to address existing and projected housing needs. The Department has also collaborated with California Coalition for Rural Housing and University of California at Davis' Center for Regional Change to create a suite of tools and services available at no cost to jurisdictions in the San Joaquin Valley including Geographic Information Systems analysis and mapping, community mapping of various socio-economic indicators including the Regional Opportunity Index and sample analysis, policies, and programs for incorporation into the Housing Element.
C-83 **	HCD	Affordable Housing Finance Incentives	HCD added scoring criteria to 2014 funding applications for the Transit Oriented Development (TOD) housing program to support GHG reduction and energy efficiency objectives	N/A [4]	Implementation of CalGreen building standards underway. In 2014-2015, HCD provided staff support in the Development of the Affordable Housing Sustainable Communities Program. The first round of funding was completed in June. $121.9 million in competitive grants and loans were awarded to 28 housing and transit-friendly infrastructure projects that reduce greenhouse gas emissions contributing to climate change.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
C-49 **	HCD	Local Assistance on GHG Reduction Strategies	HCD staff made presentations at statewide, region, and local conferences and workshops to educate 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.	N/A [4]	Additional technical assistance and outreach efforts were completed pursuant to above description for C-82.
C-76 **	HCD	Regulatory Relief to GHG Emission Reduction Land Use Strategies	Dependent upon resources and workload, HCD intends to review information regarding regulatory barriers to housing and efficient land use strategies and prepare recommendations on how such barriers can be addressed.	N/A [4]	Since the last update, HCD reviewed 320 housing elements finding 149 local governments adequately updated land use and regulatory relief strategies to comply with State housing law as amended by SB 375.
Total Reductions Expected from HCD Led Strategies				**0.0**	

HCD NOTES:

* Transportation / Land Use Sectors: 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). HCD will play an active role in the implementation of these and related land use measures through a variety of planning efforts and programs.

** References section numbers of the Scoping Plan where the strategies are described.

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	CALIFORNIA HIGH SPEED RAIL AUTHORITY (HSR) MEASURES				
	TRANSPORTATION				
Not in Scoping Plan	HSR	Construction Recycling	The Authority has required all contractors to recycle all concrete and steel and at least 75% of all other construction waste.	<0.1	Construction underway for first construction packages and recycling has been reported
Not in Scoping Plan	HSR	Caltrain Electrification	The Authority has provided funding to Caltrain to carry out electrification of the Caltrain system between San Jose and San Francisco. Expected GHG reductions from electrification of train operations are 0.035 MMT in 2020. increased ridership is expected to reduce GHG emissions by an additional 0.044 MMT in 2020, due to replacement of passenger vehicle trips by train trips.	<0.1	Environmental planning work underway for electrification. Implementation Timeline: 2018.
Total Reductions Expected from HSR Strategies				**0.0**	

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	OFFICE OF PLANNING AND RESEARCH (OPR) MEASURES *				
	OTHER SECTORS/STRATEGIES				
Chapter II Section A	OPR	CEQA Guidelines re: GHG emissions	OPR developed California Environmental Quality Act (CEQA) guidelines to help lead agencies address greenhouse gas impacts. A comprehensive update to the CEQA guidelines will be occurring in 2015 and 2016.	N/A [4]	Ongoing
Not in Scoping Plan	OPR	Comprehensive General Plan Guidelines Update	A comprehensive update to the General Plan Guidelines is in public review draft form. The General Plan Guidelines contains recommendations for how a community should plan for future growth. The update of the General Plan Guidelines has a robust discussion on climate change evaluation and response. The update will be ongoing in to 2016.	N/A [4]	Ongoing
Chapter II Section B	OPR	Technical Advisory and Technical Assistance	OPR is developing a 'Technical Advisory' to provide advice to state and local agencies on preparing climate action plans that integrate with CEQA, planning and zoning law and climate change legislation. Other technical advisories have support distributed generation, zero emissions vehicles and other Governor/State priorities. On an on-going basis, OPR provides technical advice, including training on climate action planning and related implementation measures, to local and state agencies.	N/A [4]	Ongoing
Not in Scoping Plan	OPR	CEQA Guidelines re: Infill and transportation emissions	SB 226 (Simitian, Chapter 469, Statutes of 2011) requires OPR to develop performance standards for certain infill projects that promote, among other policy objectives, the reduction in greenhouse gas emissions. SB 743 (Steinberg, Chapter 386, Statutes of 2013) requires OPR to propose alternatives to Level of Service (LOS) as a metric for transportation which will result in metrics being changes to support activities that have a lower greenhouse gas emissions component relative to historic metrics.	N/A [4]	Ongoing
Not in Scoping Plan	OPR	Interagency Coordination	OPR engages other agencies, departments and external organizations to streamline the development of statewide measures to address climate change. This effort is ongoing.	N/A [4]	Ongoing
Not in Scoping Plan	OPR	Environmental Goals and Policy Report (EGPR)	The Environmental Goals and Policy Report (EGPR) is required by statute to be competed every four years and provides the framework for State action across a wide variety of topic areas, including climate change and greenhouse gases. Although goals and policies in the EGPR help guide the development of plans such as the AB 32 (Nunez, Chapter 488, Statutes of 2006) scoping plan, the EGPR itself does not have direct emissions reductions.	N/A [4]	Ongoing
Total Reductions Expected from OPR Strategies				**0.0 ***	
OPR NOTES: * OPR has important programmatic responsibilities but does not have emission reduction regulatory authority.					

2008 Scoping Plan: Measure Number or Chapter / Section	Agency[1] and Sector	Name	Brief Description	Expected GHG Emission Reductions in 2020[2] ($MMTCO_2e$)	Activities since last Report Card or Implementation Timeline
	STATE WATER RESOURCES CONTROL BOARD (SWRCB) MEASURES				
	WATER SECTOR				
W-2	SWRCB, DWR, CEC, CPUC	Water Recycling	This measure proposes the production and use of additional recycled water where the recycling of treated effluent is not maximized at wastewater treatment plants located in areas where imported water is used. Implementation of water recycling projects would be prioritized for those areas 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.	0.3 [3]	In 2015, the State Water Board executed contracts for planning grants ($524,849), construction grants (approximately $4.3 million), and construction loans (approximately $147.5 million). In addition, the State Water Board approved an update of the Water Recycling Funding Program Guidelines needed to implement Prop. 1 water recycling funding as well as further align the program with the Division's Clean Water State Revolving Fund program. Implementation Timeline: 2020.
W-4	SWRCB	Storm Water Reuse	This measure proposes that Low Impact Development (LID) be required to maximize the infiltration and/or capture of storm water to increase local water supplies. Where favorable soil and geologic conditions exist, storm water would be infiltrated to increase groundwater supplies. In locations where potential infiltration is either limited or not recommended, capture and storage for on-site non-potable use would be encouraged. GHG benefits would be realized where local water would consume less energy than water obtained from existing sources.	0.2 [3]	The Water Boards worked with an active and engaged stakeholder community on the Storm Water Strategic Initiative which identifies guiding principles, issues, general approaches, and specific actions to establish the value of stormwater as a resource in California. Several projects identified are intended to evaluate existing programs and propose modifications to incentivize integrated water management, promote stormwater capture and use, as well as emphasize low impact development (LID) strategies in stormwater permits resulting in multiple benefits for California communities including, improved water quality, increased water supply, increased space for public recreation, increased tree canopy, and enhanced stream and riparian habitat area. Implementation Timeline: 2020.
Total Reductions Expected from SWRCB Led Strategies				**0.5**	

TABLE 2 FOOTNOTES:

1. Where multiple agencies are noted, the first is the lead agency and the others work in collaboration to achieve measure goals.

2. Measures shown with GHG emission reduction shown as "TBD" represent on-going or future efforts for which quantification has not been completed.

3. 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).

4. These measures will not result in direct reductions of GHG emissions but will facilitate reductions through associated voluntary actions and potential future regulatory efforts.

5. 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 - GREENHOUSE GAS (GHG) EMISSION REDUCTIONS

The following summarizes the totals from Tables 1 and 2. Reductions shown are Million Metric Tons of CO_2 equivalent ($MMTCO_2e$) and are those achieved within California during the given year. The annual figures are not cumulative and do not reflect reductions that might occur out-of-state.

TABLE 3a:
GHG EMISSION REDUCTIONS ACHIEVED

Agency	GHG Emission Reductions Achieved in 2012[1]	GHG Emission Reductions Achieved in 2013[1]	GHG Emission Reductions Achieved in 2014[1]
ARB	9.1	10.8	13.6
CAL FIRE	2.5	2.2	3.7
CalRecycle	0.0	0.0	0.0
Caltrans	<0.1	<0.1	<0.1
CDFA	0.0	0.0	0.0
CEC	4.3	5.0	6.6
CPUC	10.9	12.8	15.4
DGS [3]	<0.1	<0.1	<0.1
DWR	0.0	0.0	0.0
HCD [4]	0.0	0.0	0.0
OPR [4]	0.0	0.0	0.0
SWRCB	0.0	0.0	0.0
Additional GHG emissions reductions from previous year		4.0	8.5

TABLE 3b:
Agency GHG Targets for 2020

Agency	Expected GHG Emission Reductions in 2020 from Agency Measures [2]
ARB	82.1
CAL FIRE	0.0
CalRecycle [5]	1.0
Caltrans	0.2
CDFA	0.2
CEC	1.8
CPUC	40.3
DGS [3]	5.3
DWR	2.6
HCD [4]	0.0
HSR	0.0
OPR [4]	0.0
SWRCB	0.5
Total	**134.0**

Notes

1. The values in this column are taken from the totals in Table 1. The figures may reflect emission reductions from programs implemented before AB 32 was enacted in order to provide a broad picture of all on-going GHG related efforts. Figures for years prior to the most recent year come from previous year Report Cards.
2. The values in this column are taken from the agency totals in Table 2. These figures only reflect reductions from programs implemented since AB 32 was enacted. The total aggregate GHG reduction cannot be directly calculated from these values due to issues of double counting. Example: the Green Building measures achieve reductions, primarily, by reducing energy consumption. Such reductions would be captured in the energy sector but the measure would be implemented by non-energy sector agencies such as DGS.
3. Most of the GHG reductions from DGS measures are captured within the energy sector. The target is for measures that are not counted elsewhere.
4. These agencies have important programmatic responsibilities but do not have emission reduction regulatory authority.
5. Only 1.0 $MMTCO_2e$ of the CalRecycle total shown on Table 2 is included in the target because the balance of the reductions may occur largely out-of-state.

GHG Inventories of State Agencies

Starting with the January 2010 report card, we began including information about GHG inventories prepared by the CAT member agencies. These inventories were each prepared independently using the Climate Action Reserve's *General Reporting Protocol*.

In April of 2012, Governor Brown issued Executive Order B-18-12 which, among other things, requires all state agencies to reduce greenhouse gas emissions by 10 percent by 2012 and 20 percent by 2020, as measured against a 2010 baseline. In order to track progress, all state agencies were instructed to develop annual GHG inventories and enter them into The Climate Registry's *Climate Registry Information System*, or CRIS.

In order to avoid double counting in this state-government-wide reporting effort, starting with 2010 departments and agencies changed reporting methods for their emissions. For example, in most cases, departments and agencies occupying DGS buildings, no longer include emissions from those buildings in their inventories. Instead, DGS reports those emissions in its own inventory. For this reason, it is important to only compare emissions from calendar year 2010 forward.

Additionally, while changes in year over year GHG emissions can result from changes in the way state agencies do business, they can also be attributed to elements beyond individual agency control. In particular, California utilities rely extensively on hydropower for base-load energy generation. In dry years, more electricity will be generated using natural gas with a resultant substantial increase in GHG emissions. Similarly, weather conditions (cold or hot) can have a significant impact on building energy use. For this reason, observing longer-term, multi-year trends will prove useful for policy makers developing mid-term and long-term climate goals.

The data below is organized by Agency though many departments are reporting invidually.

Table 4: Climate Action Team - GHG Inventory Status

INVENTORY STATUS >	Member of The Climate Registry	Inventory Completed (CY)	Emissions in Metric Tons CO_2E for each year calculated				NOTES
			Year	Direct	Indirect	Total	Green indicates verified inventory
Calfornia State Transportation Agency							
The following Boards and Departments calculate emissions separately:		2007	2007	136,587	93,996	230,583	
		2008	2008	75,546	111,331	186,877	
		2009	2009	98,423	131,227	229,650	
		2010	2010	125,627	89,356	214,983	
		2011	2011	125,342	85,725	211,067	
		2012	2012	118,242	78,373	196,615	
		2013	2013	115,989	80,841	196,830	
- *CalTrans*	Yes	2014	2014	110,074	45,538	155,612	
California Environmental Protection Agency							
-Totals include inventory data for the ARB, CalRecycle, OEHHA, DPR, DTSC and SWRCB		2005	2005	2,632	4,914	7,546	
		2006	2006	3,119	4,780	7,899	
		2007	2007	3,050	5,545	8,595	
		2008	2008	3,177	5,478	8,655	
		2010	2010	2,364	4,884	7,248	
		2011	2011	2,120	4,952	7,072	
		2012	2012	1,964	4,704	6,668	
		2013	2013	2,069	4,544	6,613	
	Yes	2014	2014	1,822	3,961	5,783	

INVENTORY STATUS >	Member of The Climate Registry	Inventory Completed (CY)	Emissions in Metric Tons CO_2E for each year calculated				NOTES
			Year	Direct	Indirect	Total	Green indicates verified inventory
California Department of Food and Agriculture	Yes	2010	2010	8,133	1,974	10,107	
		2011	2011	7,952	1,966	9,918	
		2012	2012	6,740	1,948	8,688	
		2013	2013	6,157	1,603	7,760	
		2014	2014	5,737	2,386	8,124	
California Governor's Office of Emergency Services	Yes	2010	2010	107	1,125	1,232	
		2011	2011	320	990	1,310	
		2012	2012	303	904	1,207	
		2013	2013	1,354	1,261	2,615	
		2014	2014	2,109	1,570	3,679	
CA Public Utilities Commission	Yes	2004	2004	92	849	941	
		2005	2005	432	1,084	1,516	
		2006	2006	515	1,228	1,743	
		2010	2010	167	892	1,059	
		2011	2011	156	850	1,006	
		2012	2012	149	805	954	
		2013	2013	173	836	1,009	
		2014	2014	152	729	881	

INVENTORY STATUS >	Member of The Climate Registry	Inventory Completed (CY)	Emissions in Metric Tons CO_2E for each year calculated				NOTES
			Year	Direct	Indirect	Total	Green indicates verified inventory
Health and Human Services Agency		2010	2010	5,320	5,909	11,229	
		2011	2011	6,244	5,026	11,270	
		2012	2012	5,855	4,768	10,623	
		2013	2013	5,390	2,140	7,530	
- *Department of Public Health*	Yes	2014	2014	1,066	210	1,276	
Natural Resources Agency							
- *The following Boards and Departments*		2007	2007	41,882	7,460	49,342	
		2008	2008	37,222	6,044	43,266	
		2009	2009	34,273	5,620	39,893	
		2010	2010	33,832	4,916	38,748	
		2011	2011	32,916	4,587	37,503	
		2012	2012	38,355	4,664	43,019	
		2013	2013	35,536	5,540	41,076	
- *CalFire*	Yes	2014	2014	37,406	4,298	41,704	
		2003	2003	22	576	598	
		2008	2008	14	948	962	
		2009	2009	11	863	874	
		2010	2010	4	903	907	
		2011	2011	3	894	897	
		2012	2012	3	1347	1350	
		2013	2013	1	489	490	
- *CA Energy Commission*	Yes	2014	2014	1	400	401	

INVENTORY STATUS >	Member of The Climate Registry	Inventory Completed (CY)	Emissions in Metric Tons CO_2E for each year calculated				NOTES
			Year	Direct	Indirect	Total	Green indicates verified inventory
Natural Resources Agency, continued							
		2007	2007	15,716	18,303	34,019	
		2008	2008	15,175	14,597	29,772	
		2009	2009	13,557	9,026	22,583	
		2010	2010	13,223	8,483	21,706	
		2011	2011	13,793	8,490	22,283	
		2012	2012	14,447	8,318	22,765	
		2013	2013	12,060	8,263	20,323	
- *Dept. of Fish & Wildlife*	Yes	2014	2014	14,049	4,962	19,011	
		2007	2007	14,299	3,226,250	3,240,549	DWR re-verified 2010-2013 inventories after the Verifier agreed to take into account the environmental attributes of renewable energy generation resulting in lower GHG emissions. 2014 inventory is in the process of being verified
		2008	2008	9,929	2,400,211	2,410,140	
		2009	2009	11,477	2,025,807	2,037,284	
		2010	2010	864,416	1,157,503	2,021,919	
		2011	2011	740,434	1,212,373	1,952,807	
		2012	2012	929,992	1,228,365	2,158,357	
		2013	2013	470,730	783,861	1,254,591	
- *Dept. of Water Resources*	Yes	2014	2014	17,866	433,778	451,644	

INVENTORY STATUS >	Member of The Climate Registry	Inventory Completed (CY)	Emissions in Metric Tons CO_2E for each year calculated				NOTES
			Year	Direct	Indirect	Total	Green indicates verified inventory
Natural Resources Agency, continued							
		2010	2010	15,595	4,696	20,291	
		2011	2011	15,877	5,046	20,923	
		2012	2012	15,800	5,233	21,033	
		2013	2013	15,597	5,793	21,390	
- Dept. of Parks and Recreation	Yes	2014	2014	15,782	4,828	20,609	
Office of Planning & Research	Yes						OPR's inventory is included in DGS's report.
Government Operations Agency		2006	2006	56,135	80,434	136,569	The Department of General Services's inventory includes much of the operations (including buildings and vehicles) of many other agencies.
- The following Department calculates emissions separately:		2007	2007	58,124	90,739	148,863	
		2008	2008	60,256	83,678	143,934	
		2009	2009	55,324	80,009	135,333	
		2010	2010	55,144	70,272	125,416	
		2011	2011	55,342	70,225	125,567	
		2012	2012	50,048	62,340	112,388	
		2013	2013	43,767	65,778	109,545	
- Dept. of General Services	Yes	2014	2014	42,398	59,956	102,355	