Appendix B
Status of Initial Scoping Plan Measures

The initial Scoping Plan recommended specific GHG emission reduction measures in California's major economic sectors: Transportation; Electricity and Natural Gas; Water; Green Buildings; Industry; Recycling and Waste Management; Forest; High Global Warming Potential Gases; and Agriculture. This Appendix describes the implementation status of these measures. The measures are presented according to the sectors and the numbering convention used in the initial Scoping Plan. Each sector contains a summary table of the measures' statuses followed by more detailed updates. The Cap-and-Trade Regulation affects stationary sources and natural gas and fuel suppliers across various economic sectors and implementation efforts are briefly discussed upfront in this Appendix.

A. Cap-and-Trade Regulation

The AB 32 Scoping Plan recommended the development of a California Cap-and-Trade Program that links with other Western Climate Initiative partner programs to create a regional market system. In 2011, the Cap-and-Trade Regulation was approved by the Air Resources Board (ARB or Board), and on January 1, 2012, California successfully launched the most comprehensive greenhouse gas Cap-and-Trade Program in the world. Starting on January 1, 2013, the largest greenhouse gas emitters have compliance obligations for their emissions. As the emissions cap is gradually reduced over time, and as additional sources are brought under the cap to include the vast majority of emissions in the State, the program will ensure that California remains on track to continually reduce emissions and meet the 2020 limit. On January 1, 2015, the program will expand to include transportation and natural gas fuel suppliers. Looking out into the future, the Cap-and-Trade Program will play a critical role in keeping California on the right emissions reduction trajectory to meet ongoing reduction targets at the lowest possible cost. The program is also sending a clear signal that investment in clean, low carbon technologies will pay off.

On January 1, 2014, California linked its Cap-and-Trade Program with Québec's. By successfully linking cap-and-trade programs across jurisdictions and increasing opportunities for emission reductions, this linkage represents another important step in California's efforts to collaborate with other partners around the globe to address climate change.

ARB has held six successful auctions to date. More detailed information on the Cap-and-Trade Program can be found on the ARB webpage at:
http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm

B. Transportation Sector

The status of each transportation measure in the initial Scoping Plan is summarized in Table 1 below.

Table 1: Status of Transportation Measures

Transportation Measures		**Status of Measure/Board Consideration Dates**
T-1	Advanced Clean Cars	January 2012
T-2	Low Carbon Fuel Standard	April 2009 (early action item)
T-3	Regional Transportation-Related Greenhouse Gas Targets	Targets Approved September 2010. Seven regions, including the four major urban regions, have adopted Sustainable Communities Strategies (SCSs) that meet, and in some cases exceed, the targets.
T-4	Vehicle Efficiency Measures 1. Tire Pressure 2. Fuel Efficiency Tire Program 3. Low Friction Oil 4. Solar Reflective Automotive Paint and Window Glazing	 March 2009 (early action items) Under consideration by United States Department of Transportation Part of Advanced Clean Cars program Part of Advanced Clean Cars program
T-5	Ship Electrification at Ports (Shore Power)	December 2007 (early action item)
T-6	Goods Movement Efficiency Measures 1. Port Drayage Trucks --- 2. Transportation Refrigeration Units Cold Storage Prohibition 3. Cargo Handling Equipment, Anti-Idling, Hybrid, Electrification 4. Goods Movement Systemwide Efficiency Improvements 5. Commercial Harbor Craft Maintenance and Design Efficiency 6. Clean Ships 7. Vessel Speed Reduction	 December 2007 (early action item) --- Sub-measures 2–7 and others are being considered in the development of the 2014 Sustainable Freight Strategy
T-7	Heavy-Duty Vehicle GHG Emission Reduction • Tractor-Trailer GHG Regulation • Heavy Duty Greenhouse Gas Standards for New Vehicle and Engines (Phase I)	 December 2008 (early action item) December 2013
T-8	Medium- and Heavy-Duty Vehicle Hybridization Voucher Incentive Project	April 2009 (early action item)
T-9	High-Speed Rail	Construction contract awarded August 2013

Transportation Sector - Measures Identified in Scoping Plan

T-1: Advanced Clean Cars Program

Background

The Board approved the Advanced Clean Cars (ACC) program in January 2012. The ACC program closely aligns the Low Emission Vehicle, Zero Emission Vehicle (ZEV), and greenhouse gas light duty vehicle standards to lay the foundation for the next generation of ultra-clean vehicles. The Program includes more stringent GHG emission standards, tighter criteria pollutant standards, and increased ZEV production requirements from 2017-2025 in passenger cars and trucks.

ARB's Advanced Clean Cars program, developed in part through collaboration with the United States Environmental Protection Agency (U.S. EPA) and the National Highway Traffic Safety Administration (NHTSA) will cut GHG emissions from new passenger vehicles in 2025 by half, compared to today's fleet mix.

The ACC program also includes an updated Zero Emission Vehicle rule, which requires plug-in electric or hydrogen fuel cell vehicles to account for about 15 percent of new vehicle sales in California by 2025.

Executive Order (EO) B-16-12, issued by Governor Brown in 2012, established a 2050 GHG reduction target for the transportation sector of 80 percent from 1990 levels. The EO called for 1.5 million zero emission vehicles on California's roadways by 2025, along with zero emission vehicle purchasing requirements for State government fleets.

Status

In October 2012, U.S. EPA finalized similar GHG emission standards while NHTSA finalized similar fuel economy standards. Subsequently, in November 2012 the Board approved amendments to the Advanced Clean Cars regulations that allowed vehicle manufacturers to demonstrate compliance with ARB regulations based on compliance with the federal standards, providing a path for vehicle manufacturers to meet a single set of national GHG emission standards through the 2025 model year.
On December 27, 2012, U.S. EPA approved ARB's request for a waiver under the Clean Air Act, giving California the green light on its Advanced Clean Cars package of regulations.

In 2013, the Governor's Office released the ZEV Action Plan identifying specific strategies and actions that State agencies will take to meet milestones of the Executive Order. California currently has 40,000 ZEVs on its roadways, more than any other state.

To ensure hydrogen fueling infrastructure is in place for the market launch of fuel cell vehicles, the Legislature authorized up to $20 million per year in funding for at least 100 hydrogen stations as part of Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013), which reauthorized funding for alternative fuels and vehicle rebates.

More information on the Advanced Clean Cars program can be found at:
http://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/consumer_acc.htm

Transportation Sector - Measures Identified in Scoping Plan

T-2: Low Carbon Fuel Standard Regulation

Background

The Board approved the Low Carbon Fuel Standard (LCFS) regulation in April 2009. LCFS sets declining carbon intensity (CI) targets between 2011 and 2020 and is designed to reduce the GHG emissions intensity of transportation fuels used in California by at least 10 percent by 2020.

The regulation establishes annual performance standards that fuel producers and importers must meet beginning in 2011. The standards are “back-loaded,” in which greater reductions are required in the last five years than the first five years. This schedule allows for the development of advanced fuels that are lower in carbon than today’s fuels and the penetration of plug-in hybrid electric vehicles, battery electric vehicles, fuel cell vehicles, and flexible fuel vehicles. The LCFS applies, either on a compulsory or opt-in basis, to all fuels used for transportation in California. These transportation fuels include California reformulated gasoline, California ultra-low-sulfur diesel fuel, biodiesel, renewable diesel, E85, compressed or liquefied natural gas, biogas, electricity, and compressed or liquefied hydrogen.

Status

Providers of transportation fuels must demonstrate that the mix of fuels they supply meets LCFS CI standards for each annual compliance period. Each fuel in the mix is assigned a CI value, based on the “life cycle” GHG emissions associated with the production, transportation, and use of fuels in motor vehicles. Each fuel's complete life cycle, from "well-to-wheels" (or from "seed-to-wheels" for biofuels made from crops), represents that fuel's "fuel pathway." To date, there are more than 200 individual fuel pathways that regulated parties can use to describe the GHG emissions associated with their fuels.

ARB is closely monitoring the status of regulated parties in the reporting tool. As of the end of Quarter 3 in 2013, there are approximately 2.04 million “excess” credits in the system—that is, more total credits than deficits. This means that regulated parties are over-complying with the LCFS, generating additional LCFS credits that can be used for future compliance when the standard becomes more stringent. In addition to the banked credits, regulated parties have begun trading credits.

On July 15, 2013, the State of California Court of Appeal, Fifth Appellate District (Court) issued its opinion in POET, LLC versus California Air Resources Board (2013) 218 Cal.App.4th 681. The Court held that the LCFS would remain in effect and that ARB can continue to implement and enforce the 2013 regulatory standards while it corrects the California Environmental Quality Act and Administrative Procedures Act shortcomings associated with the original adoption of the LCFS regulation. To address

the ruling, ARB staff is proposing to re-adopt the LCFS regulation in 2014 along with a suite of amendments to offer additional flexibility, update critical technical information, and provide for improved efficiency and enforcement of the regulation.

ARB is continuing its collaboration with stakeholders to evaluate the CI for crude oils, and working with interested parties on technical assessments related to low-energy-use refining, pursuant to the Board's direction. ARB is also continuing to analyze and recommend for approval numerous lower-CI fuel pathways for which fuel producers have applied, confirming that innovation is occurring in the production of these fuels. Furthermore, ARB is working with various universities to update the indirect land use change (iLUC) values for corn ethanol, sugarcane ethanol, and soy biodiesel, while also developing iLUC values for palm oil, canola oil, and sorghum. Recommendations on iLUC values will undergo independent academic review. Finally, ARB staff is looking at including a cost-containment provision for the LCFS and a methodology that would allow refineries to generate credits for investments at the refinery that reduce GHG emissions.

More information on the LCFS can be found at: http://www.arb.ca.gov/fuels/lcfs/lcfs.htm

Transportation Sector - Measures Identified in Scoping Plan

T-3: Regional Transportation-Related Greenhouse Gas Targets

Background

In September 2010, the Board approved per-capita passenger vehicle GHG emission reduction targets for 2020 and 2035 for each of the 18 federally-designated Metropolitan Planning Organization (MPO) regions in California as required by the Sustainable Communities and Climate Protection Act of 2008 (SB 375; Steinberg, Chapter 728, Statutes of 2008). The goal of SB 375 is to reduce GHG emissions from passenger vehicles through better-integrated regional transportation, land use, and housing planning that provides easier access to jobs, services, public transit and active transportation options. Regional and local planning agencies are responsible for developing Sustainable Communities Strategies (SCS) as part of the federally-required Regional Transportation Plan and also responsible for developing State-required general plan housing elements. SCSs are intended to promote more travel and housing choices through greater access to alternative forms of transportation (including public transit, biking, and walking) and development patterns where people can live, work, and play without having to drive great distances. Implementation of these strategies hinges on local actions to realize the GHG emission reductions envisioned in the regional SCSs. SB 375 implementation strategies are designed to support local development of "transit priority projects," or transit-oriented development (TOD).

Each MPO is required to adopt and submit to ARB an SCS with its quantification of the region's forecasted per-capita passenger vehicle GHG emissions. ARB must accept or reject an MPO's determination that its SCS would, if implemented, meet the targets. In July 2011, ARB staff released a methodology that details how ARB will evaluate

regional SCSs in order to fulfill its responsibility under the law. An MPO must develop an alternative planning strategy if its SCS fails to meet ARB targets.

Status

MPOs are now in the process of developing and adopting their SCSs as part of their regular Regional Transportation Plan updates. Seven MPOs have adopted their first SCSs, all of which have demonstrated that they could meet or exceed their targets. These seven are the San Diego Association of Governments (adoption 2011), the Southern California Association of Governments (2012), the Sacramento Area Council of Governments (2012), the Bay Area Metropolitan Transportation Commission (2013), the Tahoe Metropolitan Planning Organization (2012), the Butte County Association of Governments (2012) and the Santa Barbara County Association of Governments (adoption 2013).

In mid- to late 2014, SCSs will be completed and adopted by the eight MPOs in the San Joaquin Valley, and by smaller MPOs including those for the Shasta, San Luis Obispo, and Monterey Bay regions. As each of these MPOs adopts its SCS, ARB staff will evaluate the plan to determine whether it, if implemented, would achieve the GHG emission targets. Meanwhile, the MPOs in the San Diego, Southern California, and Sacramento regions are already beginning work on their next Regional Transportation Plan updates which will entail updating their SCSs.

In January 2014, the Board received a briefing on the status of SB375 implementation, and directed staff to evaluate the need for revising the GHG reduction targets and return with recommendations in the fall 2014 timeframe. Staff's evaluation process will involve significant input from a wide range of stakeholders through a roundtable process beginning in the spring of 2014.

More information on the Sustainable Communities Program can be found at: http://www.arb.ca.gov/cc/sb375/sb375.htm.

Transportation Sector - Measures Identified in Scoping Plan

T-4-1: Tire Pressure

Background

In March 2009, the Board approved the Under Inflated Vehicle Tires regulation. This program reduces GHG emissions by reducing the consumption of fuel from passenger vehicles operating with under inflated vehicle tires. Proper tire inflation decreases the tire rolling resistance and reduces fuel consumption. The Regulation became effective in September 2010.

More information on this program can be found at: http://www.arb.ca.gov/cc/tire-pressure/tire-pressure.htm.

Transportation Sector - Measures Identified in Scoping Plan

T-4-2: Fuel Efficiency Tire Program

Background

This program would develop a statewide tire energy efficiency program for replacement tires on passenger cars and light-duty trucks.

This program is on hold. The United States Department of Transportation (National Highway Traffic Safety Administration) may propose a national fuel efficient tire program. If and when federal action is taken, a state program will be adopted.

More information on this program can be found at:
http://www.energy.ca.gov/transportation/tire_efficiency/index.html.

Transportation Sector - Measures Identified in Scoping Plan

T-4-3: Low Friction Oil

Background

This measure would require the use of low friction engine oils in passenger cars to reduce engine load and fuel use. ARB staff expects engine manufacturers to design their engines to accommodate the use of low friction oil to meet the Advanced Clean Cars requirements.

More information on the Advanced Clean Cars program can be found at:
http://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/consumer_acc.htm

Transportation Sector - Measures Identified in Scoping Plan

T-4-4: Solar Reflective Automotive Paint and Window Glazing

Background

ARB staff initiated a Cool Cars rulemaking in 2009, but ceased rulemaking activities in 2010 due to insufficient time remained on the rulemaking calendar to achieve consensus on the rule. In its place, staff incorporated a performance-based approach to cooling vehicle interiors into the advanced clean cars regulations which were approved by the Board in January 2012.

More information on the Advanced Clean Cars program can be found at:
http://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/consumer_acc.htm

- Measures Identified in Scoping Plan

T-5: Ship Electrification at Ports (Shore Power)

Background

In December 2007, the Board approved the Shore Power Regulation, which requires the reduction in emissions of oceangoing vessels while at-berth at a California port. The regulation affects operators of container vessels, passenger vessels, and refrigerated-cargo vessels that berth at the ports of San Diego, Los Angeles, Long Beach, Hueneme, Oakland, and San Francisco. Operators of terminals servicing these vessels while at these ports are also affected.

The regulation provides vessel fleet operators visiting affected ports two options to reduce at-berth emissions from auxiliary engines: 1) turn off auxiliary engines for most of a vessel's stay in port and connect the vessel to some other source of power, most likely grid-based shore power, or 2) use alternative control technique(s) that achieve equivalent emission reductions. Each option has specific compliance requirements and dates. Most shipping companies will comply with the regulation using the reduced onboard power generation option.

Status

Beginning January 1, 2014, affected fleets were required to reduce emissions from auxiliary engines while at-berth by 50 percent per quarter. For most affected fleets, this is the first time that they will have reduced emissions while at-berth.

Annual compliance statements for affected fleets are due to the ARB starting April 1, 2015. Beginning 2017, fleet emission reduction requirements increase to 70%. The regulation will reach full implementation by 2020 when the fleet emission reduction requirements increase to 80%.

More information on the Shore Power regulation can be found at: http://www.arb.ca.gov/ports/shorepower/shorepower.htm.

Transportation Sector - Measures Identified in Scoping Plan

T-6: Goods Movement Efficiency Measure

Background

The Goods Movement Efficiency Measure includes measures to reduce emissions from the equipment or vehicles transporting freight to and from ports, intermodal rail yards, and distribution centers. The measure envisioned additional reductions from ships, port trucks, long-haul trucks, commercial harbor craft, cargo handling equipment, transport refrigeration units, and locomotives, as well as system-wide reductions from overall improvements in freight movement efficiency. Work has been completed or is underway on various elements of T-6 including implementation of the drayage truck regulation, and efforts to introduce more efficient engines (like hybrids) to freight transport, conducting a technical analysis of vessel speed reduction programs, bringing cleaner ships to California, reducing idling of cargo equipment, reducing emissions

through incentive programs, and transitioning away from use of diesel powered refrigeration units for cold storage. Because ARB is on course to reach its 2020 GHG emission limit without the full reductions from Measure T-6, efforts to achieve transformative reductions from this sector are being folded into a broader ARB Sustainable Freight Strategy (Strategy) that will look beyond 2020.

The 2014 Strategy is a concentrated, one-year effort to produce a document developed in the context of a broader Sustainable Freight Initiative—which is a multi-decade effort to develop, fund, and implement the changes necessary to achieve a sustainable freight system—and represents the next milestone in defining what is necessary to move California toward a sustainable freight system. Building a coalition of freight stakeholders is a primary focus of the Strategy, and will ultimately be a significant driving force behind affecting change in areas outside of ARB's sphere of influence, including advocating at the federal level and acquiring public and private funding for implementation.

Status

The South Coast Zero-Emission Freight Transport Technology Symposium and ARB's Haagen-Smit Symposium in mid-2013 provided early input into the sustainable freight effort. Currently, there are a number of existing venues led by both public and private entities where California freight issues are being discussed. The California Freight Advisory Committee, established in 2013 to inform Caltrans' California Freight Mobility Plan, is one of the venues ARB is participating in with a focus on transportation infrastructure.

In January 2014, the Board received a briefing on the Strategy and directed staff to complete the following:

- Engage stakeholders to provide input on the development of a Strategy document that will be presented to the Board in late 2014. The document should identify and prioritize actions to move California towards a sustainable freight transport system and build a coalition to affect change outside of ARB's immediate sphere of influence.
- Complete sector-based technology assessments; undertake a systems analysis; consider "well-to-wheels" pollution impacts; and use the stakeholder outreach to identify techniques for improving efficiency at the business, sector, and system levels. This work will inform the Strategy and future State Implementation Plan and Scoping Plan development.
- Identify and implement near-term actions to reduce localized risk in communities near freight facilities. Begin development of broad principles and criteria for new and expanded freight facilities.
- In coordination with Caltrans and the California Freight Advisory Committee, develop principles and criteria that establish air quality and climate benefits as equal metrics to established transportation/mobility metrics in determining the priority of freight-related transportation projects.

- Coordinate planning with State energy agencies to meet the energy requirements of a sustainable freight system.
- In coordination with the local air districts, evaluate and implement opportunities to prioritize transformative zero and near-zero emission technologies for incentive funding programs.

More information on the Sustainable Freight Transport Initiative can be found at: http://www.arb.ca.gov/gmp/sfti/sfti.htm.

Transportation Sector - Measures Identified in Scoping Plan

T-7: Heavy-Duty Vehicle GHG Emission Reduction Regulation

Background

The Heavy-Duty Vehicle GHG Emission Reduction Regulation (Tractor-Trailer GHG Regulation) was approved by the Board in December 2008. The purpose of the regulation is to reduce GHG emissions from certain long-haul tractor-trailer combinations that operate in California by requiring them to utilize technologies that result in improved fuel efficiency.

The regulation requires owners of long-haul tractors as well as 53-foot or longer box-type trailers to replace or retrofit their affected vehicles with compliant aerodynamic technologies and low rolling resistance tires. These requirements pertain to all applicable tractors and box-type trailers that operate on California highways regardless of where the vehicles are registered, although there are provisions specific to large and small fleets. All aerodynamic and tire technologies must be verified by the United States Environmental Protection Agency's SmartWay program.

In September 2011, U.S. EPA adopted a new regulation for controlling GHG emissions from new medium and heavy-duty engines and vehicles, known as the federal Phase 1 GHG regulation. The federal Phase 1 GHG regulation is currently in the implementation phase, with compliance requirements beginning with the 2014 model year and increasing in stringency through the 2018 model year. Manufacturers are expected to comply with Phase 1 with use of more efficient engines, use of auxiliary power units, mass reduction, low rolling resistance tires, improved aerodynamics, improved transmissions, and reduced accessory loads.

Status

Trailer fleet registrations for both Large Fleet Compliance Plan options and the Small Fleet Compliance Plan have been completed. A total of 310 large fleets with approximately 234,000 trailers and 2,237 small fleets with 7,325 trailers are registered and participating in the compliance plans. To date, 50 percent of the trailers registered in Option 1 of the Large Fleet Compliance Plan, 60 percent of the trailers registered in Option 2 of the Large Fleet Compliance Plan, and 25 percent of the trailers registered in the Small Fleet Compliance Plan were required to comply with the aerodynamic

technology requirements. Also, 2011 and later model year sleeper cab tractors and box-type trailers were required to comply as of January 1, 2010.

In December 2013, ARB approved new regulations to align California's GHG emission standards and test procedures with those of the federal Phase 1 GHG regulation. ARB also modified the Tractor-Trailer GHG Regulation to be consistent with the federal Phase 1 GHG regulation, including sunsetting the requirements for new 2014 and newer sleeper cab and day cab tractors. This will provide nationwide consistency for engine and vehicle manufacturers, and allow ARB to both certify new motor vehicles and new motor vehicle engines to GHG standards and to enforce those requirements.

U.S. EPA and NHTSA are now at work on a next round of stricter GHG standards for new medium and heavy-duty engines and vehicles, called Phase 2, which the federal agencies plan to propose in 2015 and which may include new national GHG emission reduction requirements for trailers. ARB staff is working closely with U.S. EPA and NHTSA to develop Phase 2. ARB expects that Phase 2 of the regulation will be considered for adoption by the Board in 2016.

More information on the Tractor-Trailer GHG Emission Reduction Regulation can be found at: http://www.arb.ca.gov/cc/hdghg/hdghg.htm. More information on ARB harmonizing with the federal Phase 1 GHG regulation can be found at: http://www.arb.ca.gov/msprog/onroad/phaselghg/phaselghg.htm.

Transportation Sector - Measures Identified in Scoping Plan

T-8: Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP)

Background

The Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) was first approved by the Board in April 2009 as part of the Air Quality Improvement Program (AQIP) Funding Plan for Fiscal Year 2009-10. The AQIP was established by the California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007 (Assembly Bill 118, Statutes of 2007, Chapter 750). The purpose of HVIP is to accelerate the California deployment of commercialized hybrid and zero-emission medium and heavy-duty vehicles.

HVIP provides vouchers on a first-come, first served basis to help California fleets purchase an eligible new hybrid or zero-emission truck or bus. Vouchers are provided for approximately half of the incremental cost of the advanced technology vehicle.

Status

HVIP was launched in February 2010 and plays a critical role in accelerating early market penetration of hybrid and zero-emission truck and bus technology. The use of these advanced technology trucks results in GHG and criteria pollutant emission reduction benefits; increased fuel efficiency and fuel savings for fleets; and the creation of jobs related to vehicle production.

To date, nearly 1,700 vouchers have been issued over the life of the program (over 1,300 for hybrid trucks and nearly 400 for zero emission trucks). HVIP funding was exhausted in spring 2013. However, $5 million in additional HVIP funding was approved as part of the AQIP Funding Plan for Fiscal Year 2013-14, along with an additional one time $10 million appropriation from the Legislature (Senate Bill 359; Corbett, Chapter 415, Statutes of 2013), and HVIP will re-launch in spring 2014.

More information on the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project can be found at: http://www.arb.ca.gov/msprog/aqip/hvip.htm.

Transportation Sector - Measures Identified in Scoping Plan

T-9: High Speed Rail

Background

The California High-Speed Rail Authority (Authority) is responsible for planning and constructing an intercity high-speed rail system that would link the state's major population centers. The Authority is working with local transit, agriculture entities, northern and southern California railroads, small businesses, and cities and counties to upgrade and seamlessly connect other transit networks with the high-speed rail system to create and reinforce clean transportation options for Californians.

Capital funding to develop the high-speed rail project will come from federal, state, local and private sources. These funds will be available at different times based on the development timeline of the system.

Status

The Authority's 2012 Business Plan laid the foundation for a statewide rail modernization program that calls for parallel strategic investments in urban, commuter, and intercity rail systems, which will provide improved connectivity to the high speed rail system. The 2012 Business Plan outlines the timeline for the high-speed rail system implementation. The phased sections of the project are, the Initial Operating Section (IOS), Bay to Basin, and Phase 1 Blended.

In 2008, voters approved Proposition 1A, authorizing nearly $10 billion in state bonds for the United States' first high-speed rail (HSR) line, which would connect the San Francisco Bay Area with Los Angeles. The first construction contract to begin

California's high-speed rail system was awarded in August 2013, for work in the Central Valley. Additionally, environmental work is proceeding to electrify the Caltrain corridor in the Bay Area by 2019 as part of the high-speed rail system. The Authority will continue construction of the HSR system, beginning with completion of all station-area planning by 2017 followed by completion of the IOS in 2022. By 2029, HSR will run from San Francisco to Los Angeles.

More information on the high speed rail program can be found at: www.hsr.ca.gov.

C. Electricity and Natural Gas Sector

The status of each electricity and natural gas measure in the initial Scoping Plan is summarized in Table 2 below:

Table 2: Status of Electricity and Natural Gas Measures

Electricity and Natural Gas Measures		Status of Measure
E-1	1. Building Energy Efficiency – Electricity	2013 Building standards adopted and begin implementation July 1, 2014.
	2. Appliance Energy Efficiency Standards – Electricity	CEC adopted and implemented standards for many types of appliances. Most recently for battery chargers and television sets. New standards for other appliances are currently under development.
	3. Utility Energy Efficiency Programs – Electricity	Programs being implemented.
CR-1	1. Building Energy Efficiency – Natural Gas	2013 Building standards adopted and begin implementation July 1, 2014.
	2. Appliance Energy Efficiency – Natural Gas	New standards under development.
	3. Utility Energy Efficiency Programs – Natural Gas	Programs being implemented.
CR-2	Solar Water Heating (CSI Thermal Program)	Program being implemented. 1,800 projects to date.
E-2	Combined Heat and Power	AB1613, enacted in 2007, being implemented. CPUC adopted standard contracts for CHP systems and set targets for CHP procurement.
E-3	33 Percent Renewable Portfolio Standard	SBx1 2, enacted in 2011, being implemented by CPUC, CEC, and publicly-owned utilities.
E-4	Senate Bill 1 Million Solar Roofs (California Solar Initiative, New Solar Home Partnership, Public Utility Programs) and earlier solar programs.	More than 2,000 MW installed to date.

Electricity and Natural Gas Sector - Measures Identified in Scoping Plan

E-1 and CR-1: Building Energy Efficiency Standards (electricity and natural gas)

New Buildings

The California Energy Commission (CEC)'s Building Energy Efficiency Standards provide a host of environmental benefits for the State. The Building Energy Efficiency Standards are updated on an approximate three-year cycle. The 2013 Standards will continue to improve upon the current 2008 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2013 Standards will go into effect on July 1, 2014. The new standards are 25 percent more efficient for residential construction and 30 percent more efficient for non-residential construction.[1]

Existing Buildings Retrofits

Assembly Bill 758 (Skinner, Chapter 470, Statutes of 2009), requires CEC to develop and implement a comprehensive energy efficiency program for all of California's existing buildings. CEC has conducted a pilot of different energy efficiency and finance programs using American Recovery and Reinvestment Act (ARRA) funds. The CEC is currently drafting an AB 758 Action Plan to accomplish the following:

- Improve code compliance rates with Title 24 Building Standards for existing building upgrade projects.
- Develop energy disclosure approaches and programs that build on existing efforts and expand the types of applicable buildings, including State buildings in alignment with Governor Brown's Executive Order B-18-12.[2]
- Collaborate with the real estate and property management industries to craft aggressive, but practical, solutions to achieve efficiency upgrades in existing buildings.
- Enhance usability of Title 24 Building Standards as applied to additions and alterations of existing buildings.

Zero Net Energy

In 2008, the California Public Utilities Commission (CPUC) set forth ZNE goals in its long-term Energy Efficiency Strategic Plan and implementation roadmap for the Big Bold Energy Efficiency Strategies. CPUC's Big Bold Energy Efficiency Strategies, later updated in 2011, states that all new residential buildings shall be ZNE by 2020, new commercial buildings shall be ZNE by 2030, and half of existing commercial buildings shall be retrofitted to ZNE by 2030.

[1] Computed from *California Energy Demand, 2012–2022 Final Forecast*, June 2012, Form 2.2 on Committed Energy Impacts.
[2] Executive Order B-18-12, issued on April 25, 2012. See http://gov.ca.gov/news.php?id=17508

CEC has made progress toward achieving the state's ZNE goals for new residential and new commercial buildings through triennial updates to the State's building energy efficiency standards. Working with CPUC, CEC developed a definition for ZNE Code compliant buildings that was published in the 2013 Integrated Energy Policy Report. Additionally, CEC and CPUC released the New Residential Zero Net Energy Action Plan in October 2013, which is designed to build a foundation for the development of a robust and self-sustaining ZNE market for new homes over the next seven years and to meet the State's goal that all new homes are zero net energy beginning in 2020.

More information on these programs can be found at:
Building Energy Efficiency Standards: http://www.energy.ca.gov/title24/.
AB 758: http://www.energy.ca.gov/ab758/.
Zero Net Energy:
http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/eesp/res_zne_action+plan.htm.

Electricity and Natural Gas Sector - Measures Identified in Scoping Plan

E-1 and CR-1: Appliance Energy Efficiency Standards (electricity and natural gas)

Background

CEC regulates appliances sold in California through the following procedures:

- Sets maximum energy or water usage levels.
- Sets minimum energy efficiency design requirements.
- Maintains a database of certified appliances.
- Prohibits the sale of noncompliant and noncertified appliances.

The appliance energy efficiency standards apply to all state and federally regulated appliances sold or offered for sale in California with the exception of appliances sold wholesale in California with final retail sale outside the State and appliances designed and sold exclusively for use in recreational vehicles or other mobile equipment. Any entity purchasing such appliances will be affected by the program.

Status

Recent appliance standards adopted by CEC include:

- 2009 television energy efficiency standards.
- 2012 battery charger energy efficiency standards.

CEC is currently considering additional appliance types for coverage under California's appliance energy efficiency standards. Appliances being considered include:

- Consumer electronics (including computers, displays, game consoles, and network equipment.

- Lighting (fluorescent dimming ballasts, light-emitting diodes, and multifaceted reflector lamps).
- Water appliances (faucets, toilets, urinals, and water meters).
- Other appliances (commercial clothes dryers, air filter labeling, residential pool pumps and motors, portable electric spa labeling).

The Federal Department of Energy occasionally elevates California standards that are proven feasible to be national standards, thus significantly increasing the impact of California's efforts.

More information on CEC's Appliance Energy Efficiency Standards can be found at: http://www.energy.ca.gov/appliances/.

Electricity and Natural Gas Sector - Measures Identified in Scoping Plan

E-1 and CR-1: Publicly-Owned Utilities Efficiency Programs (electricity and natural gas)

Background

Energy efficiency is the State's number one priority for procuring new energy resources to meet California's electricity and natural gas demand. Assembly Bills 2021 (Levine, Chapter 734, Statutes of 2006) and 2227 (Chapter 606, Statutes of 2012) directed CEC, CPUC, and the State's publicly-owned electric utilities (POUs) to develop statewide estimates of all potentially achievable cost-effective electricity and natural gas efficiency savings and establish targets in order to reduce total state forecasted electrical energy consumption by ten percent over ten years.

Status

Utilities collect funding for their energy efficiency programs through a public goods charge which varies by utility, and some utilities make investments beyond the public benefits fund. CEC collects information on POU investments in energy efficiency and demand reduction programs, similar to information CPUC collects from the investor-owned utilities (IOUs).

More information on CEC's Energy Efficiency programs can be found at: http://www.energy.ca.gov/efficiency/.

Electricity and Natural Gas Sector - Measures Identified in Scoping Plan

E-1 and CR-1: Investor-Owned Utilities Efficiency Programs (electricity and natural gas)

Background

The IOU energy efficiency portfolio provides approximately $1 billion in annual funding for a range of activities to promote market transformation of energy efficiency as well as direct resource acquisition of energy savings. The programs account for approximately 1000 gigawatt hours (GWh) of additional energy savings installed annually, which is roughly enough electricity to power 100,000 homes. The portfolio of programs covers all customer sectors—residential, commercial, agricultural, and industrial sectors with a wide range of initiatives. These include:

- Customer rebates for all cost-effective energy efficiency measures
- Energy audit programs
- Marketing outreach and education
- Financing programs
- Emerging technology programs
- Codes and standards advocacy
- Workforce education and training programs
- Government partnership programs and independently administered programs through regional energy networks
- Lighting and heating, ventilation and air-conditioning (HVAC) market transformation programs
- Third party programs to reach specialized markets
- Program pilots to test new approaches and delivery mechanisms

CPUC is currently coordinating with CEC in the planning and implementation of AB 758 to identify strategies that apply to IOU programs.

Status

Evaluation of the 2010 – 2012 program cycle is expected to be released in early 2014. Funding for 2015 is expected to be approved in June 2014.

The energy efficiency evaluation reports can be found at: http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/EM+and+V/.

Performance statistics on California's Energy Efficiency Programs can be found at: http://www.eestats-beta.com/.

Electricity and Natural Gas Sector - Measures Identified in Scoping Plan

CR-2: California Solar Initiative--Thermal Program

Background

The California Solar Initiative-Thermal (CSI-Thermal) program was implemented to develop a market for solar water heating and other solar thermal technologies in California via financial incentives, standards, marketing, and outreach. The goal of the

program is to install the equivalent of 200,000 residential solar water heating systems by 2018 within IOU service areas.

The CSI-Thermal program was authorized by Assembly Bill 1470 (Huffman, Chapter 536, Statutes of 2007), which allocates $250 million collected from natural gas ratepayers for solar thermal systems that offset natural gas use, and Senate Bill 1 (Murray, Chapter 132, Statutes of 2006), which authorizes up to $100.8 million for solar thermal systems that offset electric use. The sunset date for the program is December 31, 2017.

Status

The CSI-Thermal program administrators are required to submit quarterly program implementation reports to CPUC. To date, the program has incentivized over 1,800 projects with roughly $30 million in incentives committed to systems displacing natural gas and $40,000 to systems displacing electricity or propane.

In addition, CPUC has recently issued a report on the CSI-Thermal Program and its progress towards statutory goals pursuant to AB 2249 (Buchanan, Chapter 607, Statutes of 2012). The report issued February 1, 2014, finds that there has been moderate success with multi-family and commercial installations, but very little participation among single-family customers, despite incentive levels being raised by the Commission in 2012. It also notes that achievement of the overall goal is unlikely, although the new offering of incentives for non-single-family swimming pools may spur greater program participation.

In response to AB 2249, CPUC modified the program to allow funding for non-single-family residence solar pool heating. That program was launched in January 2014, with no participation data yet available.

More information on the CSI-Thermal Program can be found at: www.csithermal.com.

Electricity and Natural Gas Sector - Measures Identified in Scoping Plan

E-2: Combined Heat and Power (CHP) Systems

Background

Through the implementation of the 2007 Waste Heat and Carbon Emissions Reduction Act (AB 1613; Blakeslee, Chapter 713, Statutes of 2007), CEC and CPUC have taken steps to create efficiency guidelines and market pricing incentives for small (<20 MW) CHP system owners by creating a market for the purchase of any excess electricity generation (that is beyond the operational needs of the host facility and available for export to the grid) through utility provided feed-in tariff pricing. The Act applies to highly efficient CHP systems with 20 megawatts (MW) or less of generating capacity installed on or after January 1, 2008.

CPUC adopted the CHP "Settlement Agreement" in 2010, which created a new CHP program requiring that California's three largest IOUs procure a minimum of 3,000 MW of CHP capacity by 2015 and additionally to reduce GHG emissions by 4.8 MMTCO2e through contracts with CHP facilities by 2020. CPUC may authorize the procurement of additional capacity in its 2014 Long Term Procurement Planning proceeding to meet the GHG emission reduction target or the remainder of the 2015 MW target.

Status

CEC approved efficiency and certification guidelines for eligible systems under AB 1613 in January 2010, and in 2011, CPUC adopted standardized contracts and pricing for the purchase of electricity from CHP customers operating within the IOUs' service areas.

Under CPUC Settlement Agreement, the IOUs submit semi-annual reports to document progress toward the MW and GHG emission reduction targets. As of March 2013, the IOUs have executed agreements with CHP Facilities for 2,067 MW of capacity and 1.46 MMTCO2e of GHG emission reductions. These procurements represent progress of 69 percent and 30 percent, toward the two respective targets.

More information on the status of the AB 1613 program and the CHP Settlement Agreement can be found at: www.cpuc.ca.gov/PUC/energy/CHP/.

Electricity and Natural Gas Sector - Measures Identified in Scoping Plan

E-3: 33 Percent Renewable Portfolio Standard

Background

The State's original Renewable Portfolio Standard (RPS) program, initiated in 2002, required the State's IOUs and other electric retail sellers to procure at least 20 percent of the electricity sold to their retail customers from eligible renewable energy resources by the year 2017, which was later accelerated to 2010. The original RPS mandate encouraged but did not require local POUs to do the same. In 2011, SBx1 2 (Simitian, Chapter 1, Statutes of 2011) modified the program to increase the targets and extend the requirements to local publicly-owned utilities with the goal of the program being that at least 33 percent of a utility's annual retail sales are procured from renewable resources by the year 2020.

The RPS program is implemented collaboratively by CEC and CPUC. CEC determines the RPS resource eligibility and procurement verification. CEC also establishes regulations to enforce the RPS program for the State's local POUs, with ARB responsible for determining appropriate penalties for any noted violations. CPUC determines RPS procurement targets, procurement and compliance rules and monitors and enforces program compliance for the State's IOUs and other electric retail sellers (i.e., electric service providers and community choice aggregators).

Status

To date, CEC and CPUC have accomplished the following tasks in implementing the revised program:

- *RPS Eligibility Guidebook*: CEC is currently using the seventh edition of the RPS Eligibility Guidebook, which was adopted in April of 2012. A scoping workshop was held in January 2014 to identify issues that may be addressed in an eighth edition of the guidebook.

- *Regulations for the Enforcement of the Renewables Portfolio Standard for Local Publicly Owned Electric Utilities*: Final regulations for the enforcement of the RPS for local POUs were adopted by CEC in June 2013 and approved by the Office of Administrative Law's Notice Register in August of 2013. The regulations became effective in October of 2013.

- *RPS Verification Report:* This non-mandated report conveys to CPUC CEC's findings on eligible resource procurement for the RPS. The most recent report was transmitted to CPUC in late 2013 and covered procurement from 2008 through 2010.

- CPUC has adopted several Decisions implementing SB1x 2. Decisions (D.) 11-12-020 established RPS procurement quantity requirements, or targets, for retail sellers. D.11-12-052 defined and implemented new RPS procurement content categories. D.12-06-038 adopted new RPS compliance rules and reporting requirements for the retail sellers under CPUC's jurisdiction. In July 2013, CPUC released a rule requesting comments on a proposed methodology to limit the retail seller's procurement expenditures for the RPS. A proposed decision is anticipated in mid-2014. In November 2013, CPUC adopted D.13-11-024 authorizing the three large IOUs to hold solicitations for RPS procurement.

- CPUC has an active proceeding to implement the new RPS cost limitation and a feed-in tariff for new RPS-eligible bioenergy resources (SB 1122; Rubio, Chapter 612, Statutes of 2012).

California has made substantial progress in developing new in-state renewable generating resources to support the RPS goals. The State's operating renewable energy capacity increased from 14,100 MW in 2012 to 17,400 MW in 2013[3]. A total of 3,300 MW of renewable capacity came online during 2013, increasing California's renewable capacity by more than 20 percent. California is now the nation's second largest producer of wind power and home to the nation's largest wind facility.[4] [5]

[3] California Energy Commission, Renewable Tacking Progress, revised January 15, 2014.
[4] Wiser, Ryan, and Mark Bolinger. 2012. 2011 Wind Technologies Market Report. Lawrence Berkeley National Laboratories. U.S. Department of Energy. DOE/GO-102012-3472. August.
[5] California Energy Commission, Clean Energy Tour.

More information on the RPS program can be found at:
http://www.cpuc.ca.gov/PUC/energy/Renewables/.
http://www.energy.ca.gov/portfolio/index.html.

Electricity and Natural Gas Sector - Measures Identified in Scoping Plan

E-4: Million Solar Roofs

Background

The State's Million Solar Roofs program enacted by Senate Bill 1 in 2006 (Murray, Chapter 132) provides up to $3.3 billion in financial incentives for the installation of residential, commercial, and institutional solar PV systems. The program set a target for 3,000 MW of self-generative solar, including solar water heating, by 2017. The program is divided into three distinct program components each with a portion of the statewide budget and installation goals.

- The California Solar Initiative (CSI) implemented by CPUC with a $2.37 billion allocation, provides incentives for solar PV systems installed on existing residential and certain new and existing non-residential buildings within IOU service territories. The CSI program has a goal to install 1,940 MW of new solar by the end of 2016. The program provides solar consumers with up-front incentives for smaller systems or prorates incentives over five years for larger systems.

- The New Solar Homes Partnership (NSHP), with a $400 million allocation administered by CEC, provides financial incentives to customers within IOU service areas to install solar systems on new residential buildings. The NSHP has a goal of achieving 360 MW of installed solar electric capacity in California by the end of 2016.

- The local publicly-owned utility component of the program, with a $784 million allocation, requires the POUs to offer financial incentives for solar systems to customers within their service areas with a goal for installing 700 MW of solar by the end of 2016.

Status

The components of the million solar roofs program are administered by the Go Solar California campaign. To date, more than 2,000 MW of self-generating solar capacity has been installed under the incentives provided by this program and previous solar programs. To date, CPUC's CSI portion of the program has seen more than 1,400 MW of rooftop solar capacity installed.

More information on solar incentive programs can be found at:
www.gosolarcalifornia.ca.gov.

D. Water Sector

The status of each water measure in the initial Scoping Plan is summarized in Table 3 below:

Table 3: Status of Water Measures

Water Measures		Status of Measure
W-1	Water Use Efficiency	State agency actions to reduce water usage.
W-2	Water Recycling	State Water Resources Control Board (SWRCB) is funding recycled water development projects.
W-3	Water System Energy Efficiency	CEC has adopted standards for water efficiency. CPUC has ordered IOUs to invest in energy and water efficiency.
W-4	Reuse Urban Runoff	SWRCB is funding numerous stormwater reuse projects.
W-5	Renewable Energy Production	DWR is contracting from renewable energy projects. CEC is researching biogas technologies.
W-6	Water Public Goods Charge	The program has been evaluated but is not being implemented at this time.

Water Sector - Measures Identified in the Scoping Plan

W-1: Water Use Efficiency

Background

This measure promotes greater use of water conservation activities, including best management practices, and the implementation of the 2009 Water Conservation Act (Senate Bill x7-7; Steinberg, Chapter 4, Statutes of 2009). In November 2009, the Legislature passed SB x7-7 as part of a five-bill legislative package designed in part to improve the declining Sacramento-San Joaquin Delta's ecosystem and to increase the reliability of water export from the Delta. SBx7-7 specifically addresses urban and agricultural water conservation. The key urban provision is the establishment of a statewide goal to reduce urban per capita water use by 20 percent by 2020 (20x2020 project).

The California Department of Water Resources (DWR) is the lead State agency on the 20x2020 project. SB x7-7 directed DWR to develop guidelines and methodologies for suppliers to use in calculating per capita water use. If the State is not on track to achieve the goal, DWR will provide recommendations on steps the State could take to meet the goal in 2020.

SB X7-7 also directs urban water suppliers to calculate baseline per capita water use and set water use targets for 2015 and 2020. Suppliers not meeting their water use targets are ineligible for State water management grants and loans. Water suppliers report their baseline and target per capita water use in Urban Water Management Plans which are submitted to DWR every five years.

Status

To date, 407 total urban water suppliers have submitted urban water management plans to DWR representing close to 80 percent of California's population (DWR received 396 plans required from a total of 440). The statewide average baseline water use was 196 gallons per capita per day (gpcd). The State's 20 percent by 2020 goal is 164 gpcd, which if achieved, will result in an estimated 1.8 million acre feet of annual potable water demand reduction.

In April 2012, Governor Brown signed Executive Order B-18-12 requiring among other actions, State agencies to reduce agency-wide water use 10 percent by 2015 and 20 percent by 2020 as measured against a 2010 baseline. The Green Building Action Plan, which accompanies the Executive Order, directs DWR to develop guidelines and criteria by January 1, 2013. DWR has developed the guideline used by State agencies to improve water use efficiency and to recommend a third-party database for reporting and monitoring State facilities water use.

More information on DWR's Water Use-Efficiency program can be found at: http://www.water.ca.gov/wateruseefficiency/sb7/.

Water Sector - Measures Identified in the Scoping Plan

W-2: Water Recycling

Background

In 2009, the State Water Resources Control Board (SWRCB) passed a Recycled Water Policy that set ambitious goals to advance safe and reliable development of recycled water. The primary goals of this policy include:

- Increase the use of recycled water over 2002 levels by at least one million acre-feet per year by 2020 and by at least two million acre-feet per year by 2030.
- Adopt Salt and Nutrient Management Plans to ensure water quality is maintained.
- Streamline permitting processes to facilitate recycled water development.

Status

In 2009, SWRCB conducted a survey to determine how much water is being reused statewide and for what purposes. The survey results indicated that 669,000 acre-feet of water had been recycled and used for various purposes.

SWCRB has awarded over $1 billion in loans and grants to date for recycling and stormwater capture infrastructure, and projects are coming online. In addition, DWR's Integrated Regional Water Management Grant Program includes funding support to facilitate recycled water development.

CEC provided funding for five research projects concerned with developing unconventional water resources as a replacement for fresh water in industrial processes, evaluating technologies that could reduce the energy required to treat wastewater, and using recycled water for renewable energy generating activities. The research is designed to help meet SWRCB-adopted recycled water and stormwater goals, and mitigate the challenges water districts will face from uncertain water supplies resulting from climate change.

More information can be found at:
http://www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/index.shtml.
http://www.water.ca.gov/irwm/grants/.
http://www.energy.ca.gov/research.

Water Sector - Measures Identified in the Scoping Plan

W-3: Water and Energy Conservation

Background

This measure was designed to achieve GHG emission reductions by reducing the amount of energy, or carbon content of the energy, used to transport, use, and treat water within California. DWR, CEC, and CPUC have each pursued implementation activities under this measure.

Status

DWR has updated the California Water Plan, to include actions to: (1) exceed SB7X7 agricultural and urban water conservation and efficiency targets; (2) expand funding for water use efficiency research, development and implementation programs; (3) increase

water and energy efficiency coordination efforts; and (4) promote local conservation ordinances. In addition, DWR did not renew its partial interest in a Nevada coal-fired power plant, which supplied power for operation of the State Water Project. Instead, DWR is obtaining replacement power from a much lower emitting California-based natural gas-fired power plant, along with renewable energy from certified geothermal and landfill gas plants.

CEC funded 13 projects to improve water system energy efficiencies, evaluate water conservation strategies, and reduce the emissions associated with the treatment of water and wastewater. These projects have separate schedules with various phases of completion and separate milestones.

CPUC initiated a pilot program directing IOUs to develop partnerships with local water agencies and implement specific water conservation and energy efficiency programs, and measure the embedded energy savings, to better understand potential opportunities in the residential, commercial and industrial sectors. A calculator was also developed to determine the cost-effectiveness of each program, based on embedded energy savings potential. Nine Pilot projects were conducted in total; two to three projects by each IOU. These included, large commercial audits, high efficiency toilet installation (low income), emerging data technologies, emerging technologies for cooling towers, system wide leak/loss detection at a large water utility, and emerging technologies for outdoor landscaping.

CPUC also conducted a series of studies to better understand the energy intensity of different stages of the water use cycle in California, and to qualify and quantify the "energy embedded in water" during supply/conveyance, distribution/ treatment, and end use.

More information on the California Water Plan can be found at: http://www.waterplan.water.ca.gov/.
More information about CPUC's Water and Energy Conservation program can be found at: http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Water-Energy+Nexus+Programs.htm.
More information about these CEC research efforts can be found at: http://www.energy.ca.gov/research.

Water Sector - Measures Identified in the Scoping Plan

W-4: Storm Water Reuse

Background

The State's Stormwater Reuse program is designed to maximize the capture and infiltration of stormwater to increase local water supplies through the promotion of low-impact development. The State and Regional Water Quality Control Boards used their regulatory and funding programs to advance the goals of the program.

Status

The State and Regional Boards adopted permits for municipalities and industrial facilities, as well as Caltrans and general construction projects that improve water quality and generate additional infiltration. To date, SWRCB has awarded over $100 million in funding for numerous storm-water infiltration and reuse projects.

More information on the low-impact development and stormwater programs can be found at: http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/index.shtml.

Water Sector - Measures Identified in the Scoping Plan

W-5: Renewable Energy Production from Water

Background

This program was designed to propose opportunities for developing renewable energy projects on lands associated with California's State and local water infrastructure.

Status

CEC recently financed public interest research and demonstration projects that focus on developing and demonstrating biogas technologies at wastewater plants to meet on-site electricity demand and supply the local electricity grid with excess generation. The research supports several efforts to improve renewable energy generation from wastewater treatment plants. For example, a hybrid combined heat and power project operated by the San Bernardino Municipal Water Department reforms biogas into a hydrogen-rich gas which is then blended with non-reformed biogas to create a fuel for reciprocating engines that will meet air quality standards.

Research has also been funded to improve the efficiency of existing hydropower generating facilities by employing real-time reservoir inflow forecasts at five northern California reservoirs. These reservoirs are major elements of both the federal Central Valley Project and California's State Water Project and represents almost 1,600 MW of hydropower capacity. This demonstration project is showing that through such an approach, hydropower generation can be increased substantially.

More information on this research can be found at: http://www.energy.ca.gov.

Water Sector - Measures Identified in the Scoping Plan

W-6: Public Goods Charge for Water

Background

The concept for this proposed program was to assess a fee on water district customers and apply the proceeds towards financing various water-related energy use reduction efforts. The proposed programs to be financed included the water efficiency, conservation, reuse and recycling programs discussed above, and which were included in the initial Scoping Plan.

Status

This program has not been implemented due to concerns raised about the feasibility of effectively structuring and implementing the program.

More information on this measure can be found at: http://www.waterboards.ca.gov.

E. Green Buildings

The status of each green buildings measure in the initial Scoping Plan is summarized in Table 4 below:

Table 4: Status of Green Building Measures

Green Building Measures		Status of Measure
GB-1	1. State Green Building Initiative: Leading the Way with State Buildings (Greening New and Existing State Buildings)	Green Buildings Executive Order B-18-12, signed April 2012.
	2. Green Building Standards Code (Greening New Public Schools, Residential and Commercial Buildings)	California Building Standards Commission adopted the 2010 CALGreen Code. 2013 CALGreen Code became effective January 1, 2014.
	3. Beyond Code : Voluntary Programs at the Local Level (Greening New Public Schools, Residential and Commercial Buildings)	Over 100 local governments have adopted green building standards that are more stringent than State standards.
	4. Greening Existing Buildings (Greening Existing Homes and Commercial Buildings)	Over 500 buildings have been certified to LEED-EB: O&M green building rating system.

Green Buildings - Measures Identified in the Scoping Plan

State Green Building Initiative

Background

In April 2012, Governor Brown signed Executive Order B-18-12 directing State agencies and departments to take immediate action for state government buildings to serve as models for green building. The EO requires State agencies to:

- Reduce grid-based energy purchases by at least 20 percent by 2018.
- Reduce entity-wide GHG emissions by 10 percent by 2015 and 20 percent by 2020.
- Participate in demand-response programs to reduce energy use in State-owned or leased facilities.
- Achieve Leadership in Energy and Environmental Design (LEED) “Silver” certification for new and renovated State-owned and leased buildings.
- Retrofit half of the existing buildings to be ZNE buildings by 2025.
- Install electric vehicle charging stations to accommodate future infrastructure demand.

Status

Since 2008, over 100 State buildings have achieved LEED certification. State agencies have been able to achieve a four percent reduction in total energy use and an 18 percent reduction in energy use intensity compared to a 2003 baseline, despite a 12 percent increase in State building square footage over that time.

In February 2013, a Sustainable Building Working Group initiated monthly meetings to provide technical assistance to implement the Governor's green building Executive Order and Action Plan goals. The working group reports to the Sustainability Task Force which provides executive level oversight. Department of General Services (DGS) created an Existing Building Policy Workgroup to develop specific policies and guidelines for existing state buildings. Each workgroup outlined high level policies for inclusion in the State Administrative Manual. All state agencies that own and operate buildings have also completed a Road Map that outlines the path forward to achieve all of the green building EO goals.

More information on the State Green Buildings Initiative can be found at: http://www.green.ca.gov.

Green Buildings - Measures Identified in the Scoping Plan

Green Building Standards Code

Background

This measure addresses the development of consistent mandatory green building standards for all building types. The California Building Standards Commission (CBSC) adopts and implements the Building Standards Code (Title 24, California Code of Regulations). The Green Building Standards (CALGreen) Code is a subpart of the California Building Standards Code.

Multiple agencies assist in the development of the CALGreen Code. CBSC develops building standards for commercial buildings. The California Department of Housing and Community Development (HCD) develops the green building standards for residential

construction. The Division of the State Architect (DSA) develops building standards for school construction. The Office of Statewide Health Planning and Development (OSHPD) develops green building standards for hospitals. CEC is responsible for developing the energy efficiency standards portion of the CALGreen code for residential and nonresidential.

Status

Originally adopted in 2008, the CALGreen Code included all voluntary standards that went beyond the basic building code requirements and introduced new standards for reducing water use, provisions for reducing and recycling construction and demolition waste, criteria for site development to locate buildings near public transit, and measures for improving indoor air quality to protect the health of building occupants. In 2010, the CALGreen Code became mandatory on a statewide basis. The 2010 code, as amended, included provisions for additions and alterations for non-residential buildings, but it still only applied to new construction for low-rise residential buildings. For the 2013 code, effective January 2014, the scope of the CALGreen Code was expanded to all residential buildings, including high-rise residential, as well as to additions or alterations with increases in conditioned space. In addition to mandatory standards, the CALGreen Code still includes voluntary standards, also known as Tiers, that offer model building code language available for local adoption.

More information on CALGreen can be found at:
http://www.bsc.ca.gov/Home/CALGreen.aspx.

Green Buildings - Measures Identified in the Scoping Plan

Beyond Code: Voluntary Programs at the Local Level

Background

The “Beyond Code” measure encourages voluntary efforts to go beyond mandatory building codes and standards for new residential and commercial buildings. In some cases, cities are adopting ordinances to exceed the Energy Code by fifteen or thirty percent. Some local governments are adopting the CALGreen voluntary tiers as mandatory. Other cities and counties are taking a third-party verified approach and adopting “beyond code” ordinances to mandate LEED for all new commercial construction and/or GreenPoint Rated for all new residential buildings. CEC approves “beyond code” ordinances adopted by local governments that are filed with the CBSC.

Similar to cities and counties, school districts have taken the initiative to achieve “beyond code” high performance standards. Many districts have passed resolutions for

all new construction to be certified to the Collaborative for High Performance Schools (CHPS) Criteria. CHPS criteria fundamentally changes the design, construction and operation of schools to conserve energy, water, and other natural resources as well as reduce waste, pollution, and environmental degradation. The State's higher education systems are also leaders in designing and constructing green buildings on their campuses.

Status

Over one hundred local governments have adopted "beyond code" green building standards. Twenty of those cities adopted building standards to exceed the Building Energy Efficiency Standards by 15 or 30 percent. About 50 cities and counties have standards exceeding the minimum CALGreen Code Tiers. Over 60 local governments have mandated all new construction to achieve third-party green building certification, such as the GreenPoint Rated program and the LEED rating system. In an effort to pursue high performance standards for greening public schools, about 40 school districts have mandated CHPS certification for all new construction and major modernization. Since 2008, nearly 200 schools in California have been recognized as CHPS schools. In higher education, the University of California has established a goal to achieve carbon neutrality in its operations by 2025. Around 40 buildings in the California State University System have achieved LEED certification.

More information on the Beyond Code program can be found at: http://www.arb.ca.gov/cc/greenbuildings/beyondcode.htm.

Green Buildings - Measures Identified in the Scoping Plan

Greening Existing Buildings

Background

While building standards for new construction are useful to reduce the impacts of climate change, existing buildings offer the greatest potential to reduce building-related GHG emissions. Energy efficiency retrofit programs provide a critical starting point to address GHG emissions of existing buildings. However, the intent of this measure is to encourage voluntary actions that achieve GHG emission reductions from reducing water use, waste generation, and transportation impacts. Many voluntary efforts are pursuing green building certification as a means to achieve this goal.

Status

A comprehensive existing building upgrade program is under development by the CEC; it is focused on stimulating and creating multiple pathways to achieve significant energy savings through energy efficiency upgrades. Other voluntary efforts underway are taking a more comprehensive approach to green existing homes and commercial buildings. Over five hundred buildings in California have been certified to the LEED-EB: O&M rating system, which certifies that a building's operations follow rigorous green building standards and practices.

F. Industry Sector

The status of each industry measure in the initial Scoping Plan is summarized in Table 5 below (The Cap-and-Trade program is discussed in Chapter IV of the Proposed Scoping Plan Update).

Table 5: Status of Industry Measures

Industry Measures		Status of Measure/Board Consideration Dates
I-1	Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	July 2010
I-2	Oil and Gas Extraction GHG Emission Reduction	Expected 2014
I-3	GHG Emissions Reduction from Natural Gas Transmission and Distribution	Under evaluation
I-4	Refinery Flare Recovery Process Improvements	Equivalent measure implemented by local air districts
I-5	Work with the local air districts to evaluate amendments to their existing leak detection and repair rules for industrial facilities to include methane leaks.	Under evaluation in collaboration with local air districts

Industry Sector - Measures Identified in the Scoping Plan

I-1: Energy Efficiency and Co-Benefits Audits for Large Industrial Sources

Background

In July 2010, the Board approved the Energy Efficiency Assessment Regulation. The purpose of the regulation was for ARB staff to gather information on the full range of energy efficiency improvement projects and GHG emission reduction opportunities potentially available at California's largest industrial facilities and to identify what criteria pollutants and toxic air contaminants co-benefits could also be achieved.

The regulation requires affected facilities to conduct a one-time assessment of the facility's fuel and energy consumption, and emissions of GHG, criteria pollutants, and

toxic air contaminants. This assessment must also include the identification of potential energy efficiency improvement projects for equipment, processes, or systems that cumulatively account for at least 95 percent of the facility's total GHG emissions. The regulation affects all facilities with 2009 GHG emissions of 0.5 MMTCO2e or greater, and cement plants and transportation fuel refineries with 2009 GHG emissions of at least 0.25 MMTCO2e.

Status

43 facilities submitted assessment reports to ARB, covering five industrial sectors: refinery, cement, hydrogen production, power generation, and oil and gas/mineral production. ARB is currently developing public reports for each industrial sector, summarizing the information provided by the facilities. Two reports have been released, and the remaining three are anticipated to be released in 2014. After their release, ARB will develop preliminary findings and recommendations for all of the sectors. ARB will use these findings to identify the best approaches to secure energy efficiency improvements and the associated emission reductions at California's largest facilities.

More information on the Energy Efficiency Assessment Program can be found at: http://www.arb.ca.gov/cc/energyaudits/energyaudits.htm.

Industry Sector - Measures Identified in the Scoping Plan

I-2: Oil and Gas Extraction GHG Emissions Reduction

Background

This measure would address fugitive emissions from crude oil and natural gas production, processing, and storage operations. Oil and gas production comes from California's more than 50,000 oil wells and 1,500 gas wells, including off-shore platforms. The majority of the oil wells are located in southern California, while most of the gas fields are located in northern California. Currently, ARB staff is conducting studies aimed at evaluating potential reduction measures for GHG emissions from these operations. ARB staff has conducted a survey of the crude oil and natural gas industry to improve estimates of GHG emissions from this sector in California. Staff has also developed, in conjunction with local districts, stakeholders, and instrument manufacturers, two GHG and VOC testing procedures designed to quantify fugitive emissions from crude oil and produced water storage tank systems and leaking components.

Status

ARB undertook a survey of the industry to improve the emissions inventory for this sector. A report on the Oil and Gas Industry Survey results was released in December 2011. In June 2012, ARB staff released a new version of the test procedure for determining emissions of methane, carbon dioxide, and VOCs from crude oil and natural gas separation and storage tank systems. Staff intends to use the survey data

to explore the development of a control measure to reduce venting and fugitive GHG emissions associated with oil and gas production. These emissions come from various sources, such as compressor seals, storage tanks, and leaking components such as valves, flanges, and connectors. A proposed measure is scheduled for Board consideration in 2014.

More information on ARB's Crude Oil and Natural Gas Production, Processing, and Storage program can be found at: http://www.arb.ca.gov/cc/oil-gas/oil-gas.htm.

Industry Sector - Measures Identified in the Scoping Plan

I-3: GHG Emissions Reduction from Natural Gas Transmission and Distribution

Background

This measure addresses fugitive GHG emissions from natural gas transmission and distribution. There are about 215,000 miles of natural gas pipelines in California, consisting of approximately 13,000 miles of transmission, high pressure and large diameter pipeline, and more than 200,000 miles of distribution, low pressure and small diameter pipeline.

Status

In 2008, ARB staff surveyed entities that owned or operated gas pipelines in the State to collect activity data associated with natural gas transmission and distribution. Staff analyzed the data and identified three main emission sources: pipelines, compressor stations, and metering and regulating stations. Based on the survey, the vast majority of the GHG emissions from this sector, more than 80 percent, are from distribution pipeline leaks. Because the emission factors used to estimate these emissions are dated and not California-specific, ARB is currently updating these emission factors via field measurements of fugitive emissions from natural gas distribution pipelines in California. The field study is expected to be completed by 2015. ARB will use the study results to determine the cost-effectiveness of developing a regulation to reduce fugitive GHG emissions from these operations.

More information on the ARB's Natural Gas Transmission and Distribution program can be found at: http://www.arb.ca.gov/cc/gas-trans/gas-trans.htm.

Industry Sector - Measures Identified in the Scoping Plan

I-4: Refinery Flare Recovery Process Improvement

Background

This measure proposed to minimize GHG emissions by recovering gases before they are combusted by the refinery flare. A flare gas recovery unit 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.

Status

Using historical data, ARB had estimated in the initial Scoping Plan that GHG emission reductions could be achieved cost-effectively by installing additional flare gas recovery capacity to capture and reroute gases headed to the flare back to the refinery. However, in recent years, local air district flare emission reduction programs have significantly reduced routine flaring emissions from refineries. ARB does not believe that an additional statewide measure to address refinery flaring would be cost-effective at this time.

Industry Sector - Measures Identified in the Scoping Plan

I-5: Removal of Methane Exemption for Large Industrial Sources, including Refineries

Background

Under this measure, existing fugitive methane exemptions would be removed from local air district rules applicable to major industrial sources, including refineries. Because methane has very low photochemical reactivity, it does not contribute significantly to smog formation and has therefore been historically exempt from the local air districts' volatile organic compound (VOC) regulations, such as refinery leak detection and repair programs.

Status

Because methane is a short-lived climate pollutant, ARB is working with local air district staff to determine the benefits of incorporating amendments to their existing leak detection and repair rules to include methane leaks for refineries and other industrial sources with potential for fugitive methane emissions.

G. Recycling and Waste Management Sector

The status of each recycling and waste measure in the initial Scoping Plan is summarized below in Table 6.

Table 6: Status of Recycling and Waste Measures

Recycling and Waste Measures		**Status of Measure/ Board Consideration Date**
RW-1	Landfill Methane Control Measure	June 2009 (early action item)

Recycling and Waste Measures		**Status of Measure/ Board Consideration Date**
RW-2	Increasing the Efficiency of Landfill Methane Capture	Ongoing
RW-3: Sub strategy 1	Mandatory Commercial Recycling	Adopted by CalRecycle January 2012
RW-3: Sub strategy 2	Increase Production and Markets for Compost and Other Organics	Ongoing
RW-3: Sub strategy 3	Anaerobic/Aerobic Digestion	Ongoing
RW-3: Sub strategy 4	Extended Producer Responsibility (EPR)	Ongoing
RW-3: Sub strategy 5	Environmentally Preferable Purchasing (EPP)	Ongoing

ARB and CalRecycle have prepared six technical papers, which are the basis for the information summarized in this section. The papers are: Recycling, Reuse, and Remanufacturing; Composting and Anaerobic Digestion; Biomass Conversion; Municipal Solid Waste Thermal Technologies; Landfilling of Waste; and State Procurement. ARB and CalRecycle also developed a Waste Management Sector Plan in consultation with affected agencies and stakeholders. The Waste Management Sector Plan identifies an integrated vision for California for addressing waste-related issues, future GHG emission reductions, and the waste reduction goals outlined in AB 341 (Chesbro, Chapter 476, Statutes of 2011). The Plan and the technical papers are included in Appendix C and at http://www.arb.ca.gov/cc/waste/waste.htm.

Recycling and Waste Management Sector - Measures Identified in the Scoping Plan

RW-1: Landfill Methane Control Measure

Background

In the initial Scoping Plan, methane emissions from landfills were identified as an early action item. Subsequently, the Board approved the Landfill Methane Control Measure in 2009. The measure requires the installation of a gas collection and control system at certain municipal solid waste (MSW) landfills. The measure contains performance standards for the gas collection and control system and specifies monitoring and maintenance requirements to ensure that the system is being maintained and operated in a manner to minimize methane emissions.

Existing federal and local requirements for MSW landfills are primarily focused on reducing volatile organic compounds and non-methane organic compound emissions from larger landfills, and not methane. This measure differs from existing federal and local requirements in that it also applies to smaller landfills and has more stringent requirements for methane collection and control. Since the requirements are more stringent, they do not conflict with or impede compliance with the existing federal or local requirements.

Status

There are about 370 landfills in California which, due to their in-place or permitted volume, waste age, and other pertinent factors, are known to have the ability to generate methane emissions. About 220 of the 370 are subject to ARB's Landfill Methane Control Measure. Most of the approximately 220 landfills have previously installed landfill gas collection and control systems due to federal and local landfill gas rules. About 20 of the 220 have submitted plans to modify their existing gas collection and control systems to meet the requirements of the landfill measure. Staff anticipates that about 14 existing uncontrolled landfills will be required to install gas collection and control systems or demonstrate that their emissions are too low to support such a system. As staff obtains further information, there may be additional landfills that may be required to install controls.

More information on the Landfill Methane Control Measure can be found at: http://www.arb.ca.gov/cc/landfills/landfills.htm.

Recycling and Waste Management Sector - Measures Identified in the Scoping Plan

RW-2: Increasing the Efficiency of Landfill Methane Capture

Background

Methane is produced when organic materials placed in landfills decompose over time. Although methane is currently captured at many large landfill sites, there are still active landfill operations and closed landfill sites that continue to emit methane that could be captured.

Additional actions that could be taken to reduce GHG emissions above and beyond those in the Landfill Methane Control Measure are being evaluated. Implementation of "best management practices (BMPs)" for landfills may provide even greater reductions of GHG emissions from landfills. Such actions may include: specific requirements for gas collection system design, construction, timing, and operation; landfill unit and cell design and construction; waste placement methods; daily and intermediate cover materials and practices; use of compost or other biologically active materials in cover soils; and organic materials management. Phasing organics out of landfills, and including landfills in the Cap-and-Trade Regulation are also being considered

Status

ARB staff is working with CalRecycle staff to investigate what regulatory actions may be taken to further reduce GHG emissions from landfills. These actions may include incorporating the BMPs identified above into the landfill methane control measure. Additional rulemaking would occur in 2015, if determined to be needed.

Recycling and Waste Management Sector - Measures Identified in the Scoping Plan

RW-3-1: Mandatory Commercial Recycling

Background

The initial Scoping Plan identified Mandatory Commercial Recycling as an important measure to meet GHG emissions and waste reduction goals. The commercial recycling measure focuses on increased commercial waste diversion. Commercial businesses in California generate roughly 75 percent of the statewide solid waste. Initially, ARB and CalRecycle worked together to develop a Mandatory Commercial Recycling regulation to be adopted by ARB. Prior to Board action, the Legislature passed AB 341 which provided CalRecycle the direction and authority to adopt a Mandatory Commercial Recycling regulation and set additional waste diversion goals.

Status

The regulation was adopted by CalRecycle in January 2012 and became effective May 2012. The regulation reflects the statutory provisions of AB 341 and provides additional procedural clarifications. The regulation has requirements for both local governments and businesses. The jurisdictions must implement an education, outreach, and monitoring program that is appropriate for that jurisdiction and is designed to divert commercial solid waste from businesses. A business (includes public entities) that generates four cubic yards or more of commercial solid waste per week or is a multifamily residential dwelling of five units or more must arrange for recycling services.

CalRecycle will conduct statewide waste characterization studies in 2014/15 and 2019 to measure the effectiveness of the regulation.

More information on the Mandatory Commercial Recycling measure can be found at: http://www.calrecycle.ca.gov/recycle/commercial/.

Recycling and Waste Management Sector - Measures Identified in the Scoping Plan

RW-3-2: Increase Production and Markets for Compost and Other Organics

Background

CalRecycle continues efforts to shift 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 significant GHG emission reductions primarily (but not only) through avoided landfill methane emissions. CalRecycle's

efforts to increase the production and markets for compost include compost-based best management practices; compost specifications for agriculture; 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 N_2O emissions. As noted in the Waste Sector Plan, ARB and CalRecycle are working to identify opportunities and potential solutions for capturing organic materials for use in composting and anaerobic digestion processes.

Status

CalRecycle has completed several research projects related to compost production and markets, and has initiated several others. Completed projects include: compost-based best management practices in a field demonstration setting, and ozone-formation potential from green waste composting VOC emissions with consideration of potential BMPs to reduce ozone production. In conjunction with the San Joaquin Valley Air Pollution Control District and several stakeholders, CalRecycle completed a research project on a photovoltaic-powered aerated static pile compost system which found a 70 percent reduction in GHG emissions relative to open windrow composting. In 2010, CalRecycle published its 'Third Assessment of California's Compost and Mulch Producing Infrastructure' and is currently reviewing its composting regulations. Ongoing projects include research on the GHG emissions from compost production and GHG emission reductions from finished compost use on agricultural lands. Planned research includes a study quantifying potential air and water quality impacts from the direct application of uncomposted green wastes to agricultural lands. ARB and CalRecycle staff will continue to evaluate market strategy for end products as part of the Waste Sector Plan.

More information on the diversion of organics and composting can be found at: http://www.calrecycle.ca.gov/Climate/Organics/default.htm.

Recycling and Waste Management Sector - Measures Identified in the Scoping Plan

RW-3-3: Anaerobic and Aerobic Digestion

Background

Anaerobic digestion facilities utilize organic wastes as a feedstock from which to produce biogas (which is captured), and digestate, which is the liquid or solid material remaining after the digestion process. The methane in the biogas can be used directly as fuel or converted to other forms of energy, such as liquefied natural gas and compressed natural gas. In an aerobic system, such as composting and waste water treatment, the microorganisms access free, gaseous oxygen directly from the surrounding atmosphere. The end products of an aerobic process are primarily carbon

dioxide, water, and methane. This evaluation addresses potential actions that would promote the use of anaerobic and aerobic digestion in the State. CalRecycle policy is to encourage the development of anaerobic digestion facilities in California as an alternative to the landfill disposal of organic solid waste.

Status

One of the six technical papers developed for the Waste Sector Plan focuses on Composting and Anaerobic Digestion and identifies opportunities and challenges for waste and GHG emission reductions (see Appendix C). To better understand the role anaerobic digestion and aerobic digestion can play in meeting our GHG and waste reduction goals, staffs are reviewing research opportunities to gather data to identify how best these waste reduction options can be utilized in the future. Included in this is the development of emission reduction factors that include avoided landfill emissions. These factors will address anaerobic and aerobic digestion and composting, as well as biomass conversion and municipal waste landfill thermal technologies. The Low Carbon Fuel Standard (LCFS) program has certified a pathway for biomethane produced from the high solids anaerobic digestion of organic materials. LCFS staff is currently preparing another pathway for biomethane from the low-solids anaerobic digestion of wastewater sludge. Offset protocols for anaerobic digestion and composting are also being evaluated as a possible incentive for alternatives to landfilling. In addition, CalRecycle staff have prepared and published several reports and guidance documents to further advance anaerobic digestion technologies, including a Programmatic Environmental Impact Report (EIR) for anaerobic digestion facilities; Anaerobic Digestion Guidance document for conducting CEQA review; and a report assessing the capabilities of a new landfill-based in-situ anaerobic digester technology. CalRecycle also has assisted CEC in implementation of its AB 118 Alternative Transportation Fuels Program, which has resulted in funding of six anaerobic digestion projects. ARB is pursuing a test program with University of California, Davis and the Gas Technology Institute to add to the limited existing data on the constituents in biomethane from California sources of renewable natural gas such as the anaerobic digestion technologies (e.g. food waste). ARB and CalRecycle are also following closely the development and benefits of emerging aerobic digestion technologies and will evaluate incentive funding mechanisms to promote these technologies and infrastructure expansion.

Recycling and Waste Management Sector - Measures Identified in the Scoping Plan

RW-3-4: Extended Producer Responsibility

Background

Extended Producer Responsibility (EPR), also known as Product Stewardship, is a strategy to place a shared responsibility for end-of-life product management on the producers, and all entities involved in the product chain, instead of the general public, while encouraging product design changes that minimize a negative impact on human health and the environment at every stage of the product's lifecycle. It places primary

responsibility on the producer, or brand owner, who makes design and marketing decisions. It also creates a setting for markets to emerge that reflect the environmental impacts of a product, and to which producers and consumers respond. EPR is a waste reduction strategy. By shifting costs and responsibilities of product disposal to producers and others who directly benefit, EPR provides an incentive to eliminate waste and pollution through product design changes. Carpet and paint are two product categories where potential GHG emission reductions are targeted and stewardship programs have been established. Assembly Bill 1343, the Paint Recovery Act, and AB 2398, the Product Stewardship for Carpet Bill, were signed into law in 2010. In addition, California was the third state to introduce an industry-run statewide mattress recycling program with the passage of SB 254, the California Used Mattress Recovery and Recycling Act, in 2013.

Status

CalRecycle is implementing the requirements of the statewide Paint Stewardship Program established by AB 1343, which requires a manufacturer or designated stewardship organization to submit an architectural paint stewardship plan to CalRecycle by April 1, 2012. PaintCare, the paint stewardship organization, submitted the Architectural Paint Stewardship Program Plan to CalRecycle in 2012, (see http://www.calrecycle.ca.gov/Paint/Plans/Paintcare/June4.pdf). CalRecycle posts a list of compliant paint manufacturers and brands operating or covered under an approved paint stewardship plan at http://www.calrecycle.ca.gov/Paint/ManuBrands/default.htm. Annual update reports from PaintCare began in October 2013.

Currently, more than 1.3 million tons of carpet is landfilled annually. AB 2398, which will increase recycling of carpet, requires a carpet producer or stewardship organization to submit a carpet stewardship plan to CalRecycle with specified elements, including a funding mechanism. The mechanism must provide sufficient funds to carry out the plan, including administrative, operational, and capital costs of the plan. The California Carpet Stewardship Plan can be found at http://www.calrecycle.ca.gov/Carpet/Plans/CARE.pdf.

CalRecycle, working with the International Sleep Products Association, is developing regulations to implement SB 254. The Association is the mattress stewardship organization designing the EPR program for end-of-use management of used mattresses.

To better understand the full GHG emission reduction potential, ARB and CalRecycle staff are examining the need to develop emission reduction factors for carpet and other materials as appropriate.

More information on Extended Producer Responsibility can be found at: http://www.calrecycle.ca.gov/EPR.

Recycling and Waste Management Sector - Measures Identified in the Scoping Plan

RW-3-5: Environmentally Preferable Purchasing

Background

Environmentally Preferable Purchasing (EPP) is the procurement of goods and services that have a reduced impact on human health and the environment compared to competing products serving the same purpose. To reduce the quantity and toxicity of waste in California, State law requires State agencies and other public entities to purchase environmentally preferable products that consider a range of attributes, including if the product is repairable, durable, made with recycled content, and can be recycled again. As part of the initial Scoping Plan, one area to be investigated was the potential development of EPP specifications, contracts and guidelines to promote the use of commodities that lower energy use, increase recycling and reuse and reduce the emissions of greenhouse gasses.

Status

As part of ARB's Waste Sector Plan, staff developed a technical report to identify opportunities for reducing waste generated, purchasing recycled material, increasing reuse, and enhancing end of life responsibility. ARB and CalRecycle are working with DGS to identify options of increasing EPP opportunities. This may lead to meetings with other state agencies not under direct DGS authority for education about EPP benefits of using recycled and remanufactured goods.

More information on Environmentally Preferable Purchasing can be found at: http://www.calrecycle.ca.gov/EPP/, and the State Procurement technical paper in Appendix C.

H. Forests Sector

The status of the forest measure in the initial Scoping Plan is summarized in Table 7 below.

Table 7: Status of Forest Sector Measures

Forest Measure		Status of Measure
F-1	Sustainable Forest Target	Ongoing

Forests Sector - Measures Identified in the Scoping Plan

F-1: Sustainable Forest Target

Background

The initial Scoping Plan included a Sustainable Forest Target. The goal of this target was to maintain net forest sequestration. This was to be achieved using the mechanisms provided by the Forest Practice Rules, timberland conversion regulations, fire safety requirements, forest improvement assistance programs, as well as the California Environmental Quality Act (CEQA), which requires avoidance or mitigation of forest carbon losses to conversion. The initial Scoping Plan also identified other opportunities to realize additional GHG emission reductions and increased sequestration, including:

- Preventing the conversion of forestlands through publicly and privately funded land acquisitions;
- Maintaining and enhancing forest stocks on timberlands through forest management practices subject to the Forest Practice Act;
- Planting trees on lands that were historically covered with native forests;
- Establishing forest areas where the preceding vegetation was not forest;
- Planting trees in urban areas;
- Using urban forest wood waste for bioenergy; and
- Reducing vegetative fuels that could feed wildfires and using this waste for bioenergy.

Status

The Board of Forestry and Fire Protection (BoF) has been evaluating the adequacy of existing forest regulations and programs for achieving GHG emission reductions and ensuring carbon sequestration in the forest sector. In 2010, amendments to CEQA guidelines led to the requirement that timber harvest proponents subject to State regulations must analyze GHG emissions when applying for CAL FIRE permits.

There has been significant work on the GHG emissions inventory for forests since the initial Scoping Plan. In 2011, ARB contracted with researchers from the University of California (UC) Berkeley, to improve the current GHG emission inventory estimates of forest carbon stocks and emissions. Researchers are using a carbon stock change approach based on field measurements (Forest Inventory and Analysis data) and remote sensing methods. The inventory has also been expanded to include additional land types including grasslands, scrublands, and wetlands. Preliminary results from the research suggest that these natural and working lands are likely a significant source of GHG emissions rather than a net carbon sink. Specifically, the results indicate that emissions from wildfires, land use conversion, management practices, and other sources may significantly outweigh the current carbon uptake ability in this sector, as currently managed. This would make it vitally important to quickly and aggressively take steps to reverse this trend.

CAL FIRE, in conjunction with the U.S. Forest Service and researchers at UC Davis are also developing GHG inventory data for urban forests and are continuing to refine and update those data over time. Improvements to ongoing GHG reporting systems will include refinements to methods and incorporating additional relevant data sets (such as information on vegetation, forest stand treatments, and other activities) that are collected by CAL FIRE and other agencies.

On September 11, 2012, Governor Brown signed Assembly Bill 1492 (AB 1492; Blumenfield, Chapter 289, Statutes of 2012), with the first major changes in forest sector legislation in 10 years. Among other things, AB 1492 set into motion a fee on certain types of lumber and wood products in California that now help fund forest management programs related to timberlands.

I. High Global Warming Potential (High GWP) Gases Sector

The status of each High GWP measure in the initial Scoping Plan is summarized in Table 8 below.

Table 8: High Global Warming Potential Gases Measures

High GWP Gases Measures		Status of Measure/Board Consideration Dates
H-1	Motor Vehicle Air-Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing	January 2009 (early action item)
H-2	SF_6 Limits in Non-Utility and Non-Semiconductor Applications	February 2009 (early action item)
H-3	Reduction of Perfluorocarbons in Semiconductor Manufacturing	February 2009 (early action item)
H-4	Limit Use of Compounds with High Global Warming Potentials in Consumer Products	June 2008 (early action item)
H-5	1. Low Global Warming Potential Refrigerants for New Motor Vehicle Air-Conditioning Systems	Part of Advanced Clean Cars program
	2. Air Conditioner Refrigerant Leak Test During Vehicle Smog Check	Measure not feasible at this time
	3. Refrigerant Recovery 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	Measure not feasible at this time

High GWP Gases Measures		Status of Measure/Board Consideration Dates
H-6	1. Stationary Equipment Refrigerant Management Program – Refrigerant Tracking/Reporting/Repair Program	December 2009 (early action item)
	2. Stationary Equipment Refrigerant Management Program – Specifications for Commercial and Industrial Refrigeration	Energy conservation measures and leak-tight design and installation standards for supermarket refrigeration added to Title 24 Building Code January 2014
	3. Foam Recovery and Destruction Program	Measure not feasible at this time
	4. SF_6 Leak Reduction Gas Insulated Switchgear	February 2010
	5. Alternative Suppressants in Fire Protection Systems	Measure not feasible at this time
	6. Residential Refrigeration Early Retirement Program	Measure not feasible at this time
H-7	Mitigation Fee on High-GWP Gases	Under evaluation

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-1: Automotive Refrigerant Regulation

Background

The Board approved the Mobile Air Conditioning regulation in January 2009. Automotive refrigerants are highly potent GHGs, and the most commonly used automotive refrigerant is HFC-134a, with a GWP of 1,300. The regulation helps prevent unnecessary releases of refrigerants to the atmosphere and applies to automotive refrigerants with a GWP value greater than 150. It applies to the sale, use, and disposal of containers holding more than two ounces and less than two pounds of refrigerant by weight. The regulation achieves emission reductions through implementation of four requirements:

- Use of a self-sealing valve on the container.
- Improved labeling instructions.
- A deposit and recycling program for small containers.
- An education program that emphasizes best practices for vehicle recharging.

In addition, the regulation requires the recycling of container materials along with the refrigerant remaining in the used containers.

Status

The regulation became effective on January 1, 2010. Implementation began with a one-year sell-through period for uncertified products manufactured prior to January 2010. Product certification was initiated in 2009 and is on-going. Currently, two manufacturers have 26 products certified for sale in California. Additional products are being certified and it is anticipated that more manufacturers will apply for certification. Manufacturers, distributors, and retailers submitted annual reports for 2010 to 2012 to ARB. Staff is currently evaluating the reports.

Staff conducted outreach to manufacturers, associations, and regulated parties. ARB's website includes the regulation, fact sheets, executive orders for certified products, and report forms. In addition, as part of product certification, manufacturers are required to develop educational materials for use by consumers of automotive refrigerant products. This includes web pages with information and brochures that retailers can make available at the point of sale.

More information on the Mobile Air Conditioning Regulation can be found at: http://www.arb.ca.gov/cc/hfc-mac/hfcdiy/hfcdiy.htm.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-2: Sulfur Hexafluoride Limits in Non-Utility and Non- Semiconductor Applications

Background

The Board approved the Regulation for Reducing Sulfur Hexafluoride Emissions in February 2009. This regulation aims to reduce sulfur hexafluoride (SF6) emissions from non-electric and non-semiconductor applications including tracer gas testing, magnesium sand casting, magnesium investment casting, and other niche uses through a phase-out over several years. The regulation applies to any individual who buys, uses, or sells SF6 with a limited number of exemptions. It also includes a phase-in period for particular uses to allow for the identification of cost-effective alternatives that may need to be tested and proven effective and usable.

Status

The regulation became effective on January 1, 2010. Restrictions on use and sale began January 1, 2011. Distributor and research user registration, reporting, and recordkeeping requirements became effective March 30, 2010. ARB staff is currently compiling sales data reported in distributor annual reports, and assisting magnesium casters to identify and implement the use of alternative cover gases.

More information on the Sulfur Hexafluoride Emissions in Non-Semiconductor and Non -Utility Applications Regulation can be found at: http://www.arb.ca.gov/cc/sf6nonelec/sf6nonelec.htm.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-3: Reduction of Perfluorocarbons in Semiconductor Manufacturing

Background

The Board approved the Semiconductor Operations Regulation in February 2009. This regulation applies to owners or operators of a semiconductor or related devices operation that uses fluorinated gases or heat transfer fluids. This includes, but is not limited to, the processing of diodes, zeners, stacks, rectifiers, integrated microcircuits, transistors, solar cells, light-sensing devices, and light-emitting devices. The regulation includes emission standards, and reporting and recordkeeping requirements. Semiconductor operations that emit more than 0.0008 MMTCO2E per calendar year are subject to the emission standards. The emission standards are tiered, and vary depending on the quantity of wafers (thin semiconductor material from which integrated circuits or "chips" are made) processed at an operation.

Status

The regulation became effective on January 1, 2010. All owners and operators are subject to the reporting and recordkeeping requirements of the regulation. The regulation required owners and operators to submit an initial emissions report to the permitting agency (local air district) no later than March 1, 2011. This report quantified the monthly and annual carbon dioxide equivalent emissions from semiconductor operations conducted during the 2010 calendar year. Thereafter, owners and operators must submit an annual report by March 1st of each calendar year that quantifies emissions occurring in the previous calendar year.

All owners and operators are required to maintain records on quantities of fluorinated gases and heat transfer fluids purchased or delivered, as well as records of emission control equipment malfunctions and failures. All records must be maintained at the facility and be readily accessible for inspection for at least three years.

ARB staff continues to work with local air districts to gather annual emissions data. ARB staff aggregates and analyzes data gathered to determine implementation status and update emission inventories.

Staff developed the Semiconductor Emissions Estimate Calculator to help owners and operators benchmark and calculate their GHG emissions from semiconductor operations. Staff also developed the Semiconductor Operations Reporting Form to simplify reporting for industry, promote consistency in reports, and lessen the review time for air district personnel.

More information on the Semiconductor Operations Regulation can be found at: http://www.arb.ca.gov/cc/semiconductors/semiconductors.htm.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-4: Limit High Global Warming Potential Use in Consumer Products

Background

In June 2008, September 2009, and November 2010, the Board approved amendments to the California Consumer Products Regulation. The amendments prohibit the use of compounds with GWP values of 150 or greater in specified consumer product categories including double phase aerosol air freshener, flying bug insecticide, furniture maintenance product, several types of lubricant, metal polish or cleanser, multi-purpose solvent, paint thinner, pressurized gas duster, spot remover, and wasp or hornet insecticide. The regulation applies to any person who sells, supplies, or offers for sale (e.g., manufactures and distributors) regulated consumer products in California. The GWP limits for the other consumer products will not achieve additional reductions but will prevent the introduction of products containing high GWP GHGs.

Status

The GWP limit for Pressurized Gas Dusters required products using HFC-134a to reformulate with HFC-152a, and went into effect on December 31, 2010. The sell-through period for remaining high GWP GHG containing Pressurized Gas Duster products ended December 31, 2011.

More information on the California Consumer Products Regulation can be found at: http://www.arb.ca.gov/consprod/regact/ghgcp/ghgcp.htm.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-5-1: Low Global Warming Potential Refrigerants for New Motor Vehicle Air Conditioning Systems

Background

This measure incentivizes auto manufacturers to use low-GWP refrigerants in new motor vehicle air conditioning (MVAC) systems.

Previous California regulations (Pavley and Environmental Performance Label) relied on a credit system to encourage auto manufacturers to use low-GWP refrigerants in new vehicles and to improve the leak-tightness of new systems that utilize the current high-GWP refrigerant, HFC-134a. The credit system also encourages auto manufacturers to reduce indirect CO_2 emissions from fuel consumption to run the MVAC systems through a number of proven technologies. The U.S. EPA adopted a similar credit system approach for a national program that has become effective from model year 2012 through model year 2016.

The current measure is part of the Low Emission Vehicle (LEV III) regulation. The measure uses a more refined credit system as compared with the one in the Pavley and Environmental Performance Label regulations to continue encouraging auto manufacturers to use low-GWP refrigerants in new MVAC systems. The credit system

also encourages the improvement of leak-tightness of the systems, regardless of the type of the refrigerant, and the reduction of indirect CO_2 emissions.

Status

The previous MVAC credit system covering model years 2009 through 2016 is part of the Pavley regulation, which was approved in September 2004. It has been adopted (with modification) into a federal program covering model years 2012-2016. The new measure covering model years 2017 through 2025 is part of the LEV III regulation under the Advanced Clean Cars program, which was approved by the Board in January 2012. It is aligned with a new federal program covering model years 2017-2025.

More information on the Low Global Warming Potential Refrigerants for New Motor Vehicle Air Conditioning Systems measure can be found at: http://www.arb.ca.gov/cc/hfc-mac/mvac-gwp/mvac-gwp.htm.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-5-2: Air Conditioner Refrigerant Leak Test during Vehicle Smog Check

Background

This measure proposed to explore the addition of a new motor vehicle air conditioning (MVAC) system leak test and repair requirement to the existing California Smog Check program for HFC-based MVAC systems. Under this proposal, all vehicles that pass Smog Check would have MVAC systems that are either nearly leak-free or empty and excluded from further use of the MVAC systems unless the leak is repaired. Vehicles that are determined to have unacceptable leak rates would be required to be repaired as a condition for registration. The measure required considerable cooperation with the Bureau of Automotive Repair of the Department of Consumers Affairs before mandating that a new procedure be integrated into the statewide Smog Check program.

Status

This measure was determined not to be feasible at this time. Staff determined that it would be difficult for Smog Check technicians to acquire the necessary training, certification, and equipment to perform vehicle air conditioning leak checks and repairs. Also, the benefit of the measure would be limited to older vehicles since newer air conditioning systems are tighter and use less refrigerant, and future vehicles are expected to use low GWP refrigerants.

More information on the addition of AC Leak Test and Repair Requirements to the Smog Check Program can be found at: http://www.arb.ca.gov/cc/hfc-mac/acsmogcheck/acsmogcheck.htm.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-5-3: Refrigerant Recovery from Decommissioned Refrigerated Shipping Containers

Background

This measure proposed to address the recovery of refrigerants from decommissioned refrigerated shipping containers. Perishable refrigerated items are the largest, most profitable, and fastest growing sector of international trade, and refrigerated shipping containers (RSCs) serve as the primary system to transport frozen and refrigerated items for the retail, pharmaceutical, and food service industries throughout the world. GHG emissions from RSCs occur during various stages including leakage of refrigerant during decommissioning, leakage of refrigerant during normal use and indirect CO_2 emissions from diesel engines.

Status

This measure was determined not to be feasible at this time. Staff found the emission reductions to be relatively small, and that multiple participants in the cold chain used and decommissioned RSCs making it difficult to implement the measure.

More information on the Refrigerant Recovery from Decommissioned Refrigerated Shipping Containers measure can be found at: http://www.arb.ca.gov/cc/hfc-mac/rsc-ghg/rsc-ghg.htm.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-5-4: Enforcement of Federal Ban on Refrigerant Release During Dismantling of Motor Vehicle Air Conditioning Systems

Background

This measure proposed to enforce the federal ban on refrigerant release during servicing or dismantling of motor vehicle air conditioning systems. The goal of this non-regulatory strategy was to improve compliance with a regulation of U.S. EPA (40 CFR 82.154) that prohibits the venting of certain types of refrigerant, including HFCs, to the atmosphere when MVAC equipment is serviced or dismantled. Venting is avoided by recovering refrigerants with specialized equipment.

Status

This measure was determined not to be feasible at this time. Staff found the estimated emission benefits of this measure to be relatively small. Also, the benefit of the measure would be limited to older vehicles since newer air conditioning systems use less refrigerant and future vehicles are expected to use low-GWP refrigerants.

More information on the Enforcement of Federal Ban on Refrigerant Release During Dismantling of Motor Vehicle Air Conditioning Systems can be found at: http://www.arb.ca.gov/cc/hfc-mac/mvac-dismant/mvac-dismant.htm

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-6-1: High Global Warming Potential Refrigerant Management Program

Background

The Board approved the Stationary Equipment Refrigerant Management Program in December 2009. This regulation reduces emissions of high GWP refrigerants resulting from the installation, use, servicing, and dismantling of larger refrigeration systems. The Refrigerant Management Program regulation requires facilities with 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; additionally, such facilities must register their systems and submit annual refrigerant use reports. The regulation also applies to any person who installs, services, or disposes of any appliance that utilizes a high-GWP refrigerant, as well as refrigerant wholesalers, distributors, and reclaimers.

Status

The regulation became effective on January 1, 2011, and the measure implementation is currently on track. The regulation includes a phased in registration, reporting and annual implementation fee approach depending on the size of the refrigeration system used at the facility. Facilities with large refrigeration systems with 2,000 pounds or more of high-GWP refrigerant began registration and reporting in 2012. Facilities with medium refrigeration systems with 200 pounds or more, but less than 2,000 pounds, of a high-GWP refrigerant are required to register and report beginning in 2014. Staff continues to conduct comprehensive outreach and implementation activities to increase compliance with the regulation.

More information on the Refrigerant Management Program can be found at: http://www.arb.ca.gov/StopRefrigerantLeaks.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-6-2: Commercial Refrigeration Specifications

Background

This measure proposes to reduce both direct and indirect GHG emissions from large supermarket refrigeration systems. Direct emission reductions of high GWP refrigerants would occur from the improved design, installation and use of such systems, while indirect emissions reductions would result from energy conservation measures applied to the systems.

Due to high cost, feasibility issues and probable energy penalties associated with the initial requirement to use secondary cooling loops or alternative refrigerant systems in supermarkets, the proposed measure had to be significantly revised. The revised measure includes design and installation standards as well as energy conservation measures for new supermarket refrigeration systems. Staff developed these measures in close collaboration with CEC (primary agency for energy efficiency measures) and CBSC (primary agency for green building standards).

Status

CEC adopted the energy conservation measures in 2012, which have become part of the 2013 Title 24 Building Energy Efficiency Standards to go into effect July 1, 2014. In 2013, CBSC adopted the design and installation standards into the 2013 Title 24 Green Building Standards that went into effect January 1, 2014. CEC is now the lead agency for the energy conservation measures.

More information on the Commercial Refrigeration program can be found at: http://www.arb.ca.gov/cc/commref/commref.htm

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-6-3: Foam Recovery and Destruction Program

Background

This measure would mitigate high GWP greenhouse gas emissions from waste insulation foam used in refrigerators, freezers, and buildings. Insulating foams with high-GWP GHGs include rigid poly foams made from polyurethane, polyisocyanurate, and extruded polystyrene board stock and panels (fiberglass insulation does not contain GHGs and was not included in this measure). The foam recovery and destruction program was proposed to further study and assess the feasibility of reducing GHG emissions from waste insulation foam. The measure required the collection of insulating foam and the subsequent recycling or destruction of high GWP gases.

Status

Staff determined that the measure was not feasible at this time due to cost effectiveness. Additionally, based on the biological attenuation of foam in landfills and the capture and combustion of GHGs by landfill gas collection systems, the assumed emissions from landfilled waste foam are not as great as originally estimated in 2008. In June 2012, ARB awarded a research contract to investigate and measure GHG emissions from waste foam, and results are expected in 2015. The measure may be revisited based on the research findings.

More information on the Foam Recovery and Destruction Program can be found at: http://www.arb.ca.gov/cc/foam/foam.htm.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-6-4: Sulfur Hexafluoride from Gas Insulated Switchgear

Background

This measure achieves GHG emission reductions by reducing SF6 emissions from Gas Insulated Switchgear (GIS).

The Regulation requires GIS owners to reduce their SF6 emission rate by one percent per year over a ten year period, from 2011 to 2020. The initial maximum annual emission rate is set at 10 percent of a GIS owner's nameplate capacity of non-hermetically sealed GIS. The annual emission rate decreases one percent per year until 2020. Beginning January 1, 2020, the maximum annual emission rate is set at one percent. The measure also requires GIS owners to: (1) annually report their SF6 emissions; (2) report the emission rate; (3) provide a complete inventory of all gas insulated switchgear and their SF6 capacities; (4) produce a SF6 gas container inventory; and (5) keep all information current for ARB enforcement staff inspection and verification.

Status

By June 1, 2012, and June 1st of each year thereafter, each GIS owner must submit an annual report to the Executive Officer for emissions that occurred during the previous calendar year. The first two required annual reporting years (2011 and 2012) for this measure have been completed.

More information on the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear can be found at: http:/www.arb.ca.gov/cc/sf6elec/sf6elec.htm.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-6-5: Alternative Suppressants in Fire Protection Systems

Background

This measure would require the use of leakage reduction methods and/or lower GWP fire suppression agents, to the extent that safe, technically feasible, and cost-effective alternatives are available.

Status

This measure was determined to be not currently feasible due to low emissions reductions, which are expected to further decline.

More information on the Alternative Suppressants for Fire Protection System can be found at: http://www.arb.ca.gov/cc/altsup/altsup.htm.

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-6-6: Residential Refrigeration Early Retirement Program

Background

Under this measure, ARB would work with utilities to encourage and incentivize recovery of high-GWP materials from residential refrigerators at end-of-life.

Status

This measure was determined not to be feasible at this time. Foam recovery for 15 percent of the state's appliances is subsidized through the electric utility public goods charge to implement energy-saving programs, including early retirement of older appliances. The current public goods charge is insufficient to expand existing program.

More information on the Residential Refrigeration Early Retirement can be found at: http://www.arb.ca.gov/cc/residref/residref.htm

High Global Warming Potential Gases Sector - Measures Identified in the Scoping Plan

H-7: Mitigation Fee on High GWP Gases

Background

This measure proposed establishment of an upstream fee on high GWP gases based on their global warming potential.

Status

The measure is currently under evaluation for feasibility and cost-effectiveness.

I. Agriculture Sector

The status of the agriculture measure in the initial Scoping Plan is summarized in Table 9 below.

Table 9: Status of Agriculture Measure

Agriculture Measure		Status of Measure
A-1	Methane Capture at Large Dairies	Under evaluation

Agriculture Sector - Measures Identified in the Scoping Plan

A-1: Methane Capture at Large Dairies Utilizing Anaerobic Digestion

Background

The installation of manure digesters to reduce methane emissions was included as a voluntary strategy for the agricultural sector in the initial Scoping Plan.

Status

The voluntary installation of anaerobic digesters at dairies in California has not increased as expected. This is due to the recent economic recession, increased feed and fuel prices, lack of sufficient financial incentives, and insufficient utility contracts. ARB is working with federal, state, and local agencies, as well as industry stakeholders, to remove obstacles to digester installations. Critical to this is the continued effort to evaluate the many co-benefits of manure management through digesters. The evaluation will examine the potential for successful voluntary efforts to be more widely adopted in the State. As new information becomes available, ARB will work with stakeholders to determine whether and how the program should become mandatory and/or more strongly incentivized.

The initial Scoping Plan also called for research on baseline nitrous oxide (N_2O) emissions from the use of fertilizers to improve the GHG inventory. ARB, CEC, and the California Department of Food and Agriculture (CDFA) have been coordinating and funding research to determine baseline N_2O emissions from a variety of soil types, crops, and farming techniques used throughout California. Research began in 2009 and is expected to be completed by the end of 2014.

A number of other potential voluntary GHG-reduction activities were mentioned in the initial Scoping Plan, including improving agriculture water use efficiency, increasing the efficiency of or electrifying agricultural water pumps, using biomass-based fuels, and increasing carbon sequestration on agricultural lands.

CDFA, in partnership with scientists at UC Davis and with funding from CEC, are evaluating the economic, beneficial environmental factors, and costs of biofuel feedstock crops. Outcomes will focus on cropping systems for California with best management practice recommendations; estimates of direct environmental costs such as water use, input levels, and effects; and potential off-farm environmental consequences. CDFA is working with ARB to expand use of biomass-based transportation fuels as a regulatory pathway under the Low Carbon Fuel Standard.

CDFA is also supporting projects that address GHG mitigation through its Specialty Crop Block Grant Program (SCBGP). Results of funded research projects provide knowledge and tools to help growers reduce GHG emissions and increase carbon sequestration.