2019 Annual Report to the Joint Legislative Budget Committee on Assembly Bill 32

(Nuñez and Pavley, Chapter 488, Statutes of 2006)

The California Global Warming Solutions Act of 2006

Fulfills the Requirements of:
Supplemental Report of the 2012 Budget Act (Item 3900-001-0001 California Air Resources Board) and
Senate Bill 1018 (Committee on Budget and Fiscal Review, Chapter 39, Statutes of 2012)

CALIFORNIA
AIR RESOURCES BOARD

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Contents

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INTRODUCTION

Assembly Bill (AB) 32 (Nuñez and Pavley, Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006, designates the California Air Resources Board (CARB or Board) as the State agency charged with monitoring and regulating sources of greenhouse gas (GHG) emissions. AB 32 requires California to reduce GHG emissions to 1990 levels by 2020. The law tasks CARB with quantifying this goal, implementing a mandatory emissions reporting system, and adopting a Scoping Plan that describes the measures and other actions planned to achieve the target.

AB 32 also highlights the need to maintain and continue GHG reductions beyond 2020. Executive Order B-16-2012, which Governor Brown signed in March 2012, established zero emission vehicle benchmarks and affirmed California's long-range climate goal to reduce GHG emissions to 80 percent below 1990 levels by 2050. In April 2015, Governor Brown issued Executive Order B-30-15, to establish a midterm GHG emissions reduction target of 40 percent below 1990 levels by 2030. This 2030 target was codified in 2016 by Senate Bill (SB) 32 (Pavley, Chapter 249, Statutes of 2016), and supports CARB's commitment to achieve the emissions goal for 2050. AB 197 (Garcia, E., Chapter 250, Statutes of 2016) provides additional legislative oversight, contains provisions to make emissions data from stationary sources publicly available, and sets priorities for the most impacted and disadvantaged communities. AB 398 (Garcia, E., Chapter 135, Statutes of 2017) provided additional direction to CARB on the role and design of the Cap-and-Trade Program in achieving the SB 32 target and was passed alongside AB 617 (Garcia, C., Chapter 136, Statutes of 2017) to focus on reducing exposure in communities most impacted by air pollution.

Legislative Direction. The Supplemental Report of 2012 Budget Act Item 3900-001-0001 requires CARB to provide the Joint Legislative Budget Committee (JLBC) with multiple reports on its activities and resources to implement AB 32. These reports include:

(1) Semi-annual AB 32 updates on key climate programs, including recent developments and upcoming milestones;
(2) Annual AB 32 fiscal reports for the prior fiscal year summarizing fees and proceeds coming in, and expenditures going out; and
(3) Annual AB 32 resource reports, one prospective and one retrospective, showing staffing, operations, and contract expenses by major program area.

SB 1018 (Committee on Budget and Fiscal Review, Chapter 39, Statutes of 2012) also requires CARB and the Secretary for Environmental Protection to submit the following reports to the JLBC on proposed actions and planned expenditures by the Western Climate Initiative, Incorporated (WCI, Inc.):

(4) Semi-annual reports on any actions proposed by WCI, Inc. that affect California State government or entities located within the State, as well as advance notification of any planned CARB payments to WCI, Inc. over $150,000.

Annual Report Content. This document contains all four items listed above, with two merged semi-annual updates for (1) key climate programs and (4) WCI, Inc. Thus, items (1) and (4) will cover updates for January 1, 2018 through December 31, 2018. Upcoming milestones cover January 1, 2019 through December 31, 2019.

This document covers CARB's implementation of AB 32 and, for the most part, does not include the activities and resources of other State agencies to implement AB 32. The State Agency Greenhouse Gas Reduction Report Card (Report Card) published by the California Environmental Protection Agency (CalEPA) details the activities of each agency and department to reduce GHG emissions. For more information on the Report Card, please see http://www.climatechange.ca.gov/climate_action_team/reports/.

SECTION 1:

ANNUAL AB 32 PROGRAM UPDATES

(January–December 2018 and January–December 2019)

This report[1] is required semi-annually by the Supplemental Report of the 2012–13 Budget to highlight significant developments in the last six months and identify upcoming milestones in the next six months in CARB's implementation of AB 32. This report combines what in previous years were two reports: the July and January semi-annual reports, providing updates on AB 32 program activities for the entire calendar year of 2018, and upcoming milestones for calendar year 2019. The report format follows the Budget directive. It includes updates on major regulatory measures and supporting programs, a discussion of GHG emissions reductions, and current funds in the Greenhouse Gas Reduction Fund (GGRF).

While this program update focuses on the high profile regulations and supporting programs identified in the Supplemental Budget Report, they represent a subset of CARB's activities and resources that address climate change. Additional activities include research, air monitoring, and preparing the emission inventory (including the Mandatory Reporting Regulation), as well as the development, implementation, and enforcement of over 20 regulations that reduce GHGs as a primary objective or as a co-benefit. These other regulations affect a wide range of activities and facilities, including passenger vehicles (including their tires and air conditioners), heavy-duty trucks and the trailers they pull, ships at berth, semi-conductor manufacturing, appliance recycling, and consumer products.

I. CARB GREENHOUSE GAS EMISSIONS REDUCTION MEASURES

This section focuses on the activities of three major CARB regulatory programs to reduce GHG emissions: the Cap-and-Trade Regulation, Low Carbon Fuel Standard, and Advanced Clean Cars. Also discussed is the Landfill Methane Regulation mentioned in the supplemental budget language, and emissions reductions from oil production and natural gas operations program, and short-lived climate pollutants.

A. Cap-and-Trade Regulation

1. Background

California's Cap-and-Trade Regulation (Regulation) is the nation's first comprehensive market-based approach to reducing GHG emissions, and is one of the key measures

[1] For previous reports, see http://www.arb.ca.gov/cc/jlbcreports/jlbcreports.htm.

identified in the AB 32 Scoping Plan. The Board first finalized and adopted the Regulation in October 2011. Given the Regulation's complexity due to inclusion of many unique design concepts, we provide a lengthier background description below to aid the reader's understanding of these program updates.

Emissions Cap. The Regulation provides a firm declining limit, or cap, on approximately 80 percent of California's GHG emissions. Beginning on January 1, 2013, the cap included GHG emissions from electricity and large industrial sources. Beginning on January 1, 2015, GHG emissions from transportation fuels and residential and commercial burning of natural gas and propane were also included in the cap.

The Regulation is estimated to reduce GHG emissions by about 23 million metric tons (MMT) in 2020, about 30 percent[2] of the total needed to achieve the AB 32 target for that year. Further, the Regulation plays a key role in assuring that the 2020 and 2030 targets are met by setting a definitive statewide limit on GHG emissions. That is, in the event that the anticipated reductions from other measures are not realized, the Regulation's cap serves as a limit on GHG emissions from sources covered by the Regulation.

Compliance. To comply with the Regulation, entities subject to the Regulation (entities with one or more facilities or other sources that emit 25,000 metric tons or more of carbon dioxide equivalent (CO_2e) per year), termed "covered entities," must submit compliance instruments (i.e., allowances or offset credits) equal to their emissions. Each allowance or offset credit is equal to one metric ton of CO_2e emissions.

Each covered entity has an annual surrender obligation under the Regulation, and this obligation requires them to surrender compliance instruments equal to 30 percent of their emissions from the prior year. The Regulation's first annual surrender obligation occurred on November 3, 2014. Covered entities were required to submit compliance instruments sufficient to cover 30 percent of their 2013 emissions by that date. For this first annual obligation, all covered entities successfully transferred sufficient compliance instruments to their accounts to meet their compliance obligations. At the end of each compliance period, which is either a 2- or 3-year period, entities are required to submit compliance instruments equal to their remaining emissions (70 percent) from years covered by an annual surrender obligation, and all emissions from the final year of the compliance period. The first compliance period surrender obligation occurred on November 2, 2015. Covered entities were required to submit compliance instruments to cover the remaining 70 percent of their 2013 emissions and 100 percent of their 2014 emissions. The November 2, 2015 compliance surrender event saw a 99.8 percent compliance rate. The November 1, 2016 and November 1, 2017 annual compliance surrender events each saw a 100 percent compliance rate. In addition, all entities which were required to surrender instruments for the full second compliance period (emissions years 2015–2017) met their obligations on November 1, 2018.

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[2] Source: https://www.arb.ca.gov/cc/inventory/data/misc/2020_forecast_base0911_2015-01-22.pdf.

Allowances. CARB issues a number of allowances each year equal to the emissions cap for that year, and each allowance permits a covered entity to emit one metric ton of GHG emissions. A portion of the allowances is allocated to covered entities, with some allowances placed in a cost containment reserve, some placed in a voluntary renewable electricity reserve, and the remaining allowances auctioned. Each year, the number of allowances declines, ensuring that the Regulation achieves intended emissions reductions.

In 2013 and 2014, CARB allocated most allowances and auctioned the remainder. CARB allocated allowances to industrial covered entities to provide transition assistance and minimize leakage, and to electrical utilities to protect ratepayers from program costs and assist utilities in reducing GHG emissions. Beginning in 2015, when the program scope was expanded to include fuels, CARB also began allocating allowances to natural gas utilities to protect ratepayers from program costs. CARB has also provided transition assistance by allocating allowances to universities and public service facilities, generators with legacy contracts, and public wholesale water agencies.

As mentioned above, allowance allocation is provided to industrial entities to minimize leakage. Leakage refers to a reduction in GHG emissions within the State that results in an increase in GHG emissions outside the State. Risk of leakage is highest for industries in which production is highly "emissions intensive" (leading to high compliance costs) and trade exposed (i.e., facing competition from out-of-State producers). CARB determined leakage risk for industrial sectors based on an evaluation of industry emissions and trade exposure. The results of this analysis informed the initial calculation of allowance allocation to provide transition assistance and maintain industry production in California.

CARB staff developed two distinct methodologies to calculate allocation for industrial entities: (1) product-based, which is based on production activity and is CARB's preferred approach; and (2) energy-based, which is based on fuel use during historic baseline years and is a fallback approach that is applied to sectors for which a product-based benchmark could not be developed.

CARB developed product-based emissions intensity benchmarks that represent the average emissions efficiency of similar operations in the same industrial sector. Applying benchmarks, along with annual production data, to calculate allocation provides the more efficient facilities within a sector with more free allowances to cover a larger portion of their estimated compliance obligation as compared to less efficient facilities in the same sector. This approach recognizes early investments to improve efficiency at facilities within the covered industrial sectors.

In addition to free allocation to entities, a number of allowances were placed in the allowance price containment reserve and the voluntary renewable electricity reserve. The allowance price containment reserve account was established to provide a safety margin for the allowance price and to help mitigate potential volatility in allowance prices. The account holds a specified number of allowances removed from the total

pool of allowances at the beginning of the program. Covered entities may purchase reserve allowances at specified prices during direct reserve sales. However, no quarterly reserve sales have been held to date because no covered entities or opt-in covered entities have indicated an intent to bid for allowances or submitted a bid guarantee by the deadlines for the reserve sales offered through December 2018. Effective October 1, 2017, California offers reserve sales prior to the November 1 compliance obligation instrument surrender deadline, and in any quarter that the Current Auction held in the preceding quarter resulted in a settlement price greater than or equal to 60 percent of the lowest Reserve tier price.

The voluntary renewable electricity reserve (VRE) account was created to support purchases of renewable electricity and renewable energy credits that are not mandated by the Renewables Portfolio Standard. Purchasers of eligible voluntary renewable electricity may request retirement of allowances from the VRE account on their behalf under the Regulation.

Auctions. From November 2012 through August 2014, CARB held quarterly auctions, selling only California allowances. Prior to the certification of each auction, CARB staff and an independent Market Monitor carefully evaluated the auction, and determined that the auction process and procedures complied with the requirements of the Cap-and-Trade Regulation.

On November 25, 2014, the first joint allowance auction was conducted with Québec under the linkage agreement between CARB and Québec. The linkage agreement became effective January 1, 2014. Since then, California and Québec have held quarterly joint auctions, which include both California and Québec allowances.

Offsets. Offset credits are another type of tradable compliance instrument. Offset credits represent GHG emissions reductions or avoidance from activities outside of the capped sectors (i.e., reductions in sectors not subject to the Cap-and-Trade Regulation). Covered entities can use CARB- or Québec-issued offset credits to meet up to 8 percent of their compliance obligation for each compliance period through 2020. For example, if a covered entity has 100,000 metric tons of covered emissions, they must submit no fewer than 92,000 allowances and no more than 8,000 CARB- or Québec-issued offset credits in order to meet their compliance obligation. The ability to use offset credits is an important mechanism for cost containment under the Regulation, and helps to achieve reductions from sources not covered by the program. AB 398 required CARB to modify the offset quantitative usage limit such that covered entities can meet up to 4 percent of their compliance obligation for emissions years 2021 through 2025, and up to 6 percent for emissions years 2027 through 2030.

Offset projects are quantified under regulatory protocols that are approved by the Board and must meet the AB 32 offset criteria of being real, additional, quantifiable, permanent, verifiable, and enforceable. CARB has approved offset protocols for six project areas: forestry, urban forestry, mine methane capture, livestock digesters, the destruction of ozone-depleting substances, and rice cultivation. CARB accredits

third-party verifiers to independently verify all offset project reports. Accredited third-party verifiers have extensive background in related areas, including appropriate field and auditing experience, as well as the scientific and engineering knowledge required for verification. Third-party verifiers must work through CARB-accredited verification bodies, complete CARB's verifier training, and pass a specialized test.

CARB can also approve voluntary offset registries that meet regulatory criteria to help administer the program. Offset project registries provide general offset project guidance, reporting, and other support for verification activities. CARB does not delegate any of its oversight or enforcement authority to the verifiers or approved registries. Additionally, CARB does not issue offset credits that originate from projects located outside of the United States. However, since California and Québec have a linked Cap-and-Trade Program, CARB recognizes Québec-issued offsets for projects that are implemented in Canada using Québec's adopted offset project protocols. Québec-issued offset credits can be used by California covered entities, within the same quantitative usage limits described above, to meet a portion of their compliance obligations.

Market Tracking System. The Compliance Instrument Tracking System Service (CITSS) is a market tracking system developed to support the implementation of Cap-and-Trade Programs for California and other jurisdictions. CITSS provides accounts for market participants to hold and retire compliance instruments (allowances and offset credits) and to record transactions regarding compliance instruments (e.g., purchases or trades between account holders).

Market Oversight. CARB continues to place a high priority on market oversight to ensure successful emissions reductions and the integrity of the California carbon market. CARB also established a team focused on monitoring and oversight of market activity and market participants. CARB monitors the auctions during the three-hour bidding window and reviews submitted bids to determine if there are any indications of anti-competitive behavior. In addition to engaging in ongoing analysis and modeling, CARB collaborates with several organizations including the U.S. Commodity Futures Trading Commission (CFTC), the Federal Energy Regulatory Commission (FERC), the California Independent System Operator, and the State Attorney General's Office to anticipate, detect, and respond to market manipulation. The Regulation imposes holding limits and auction purchase limits, as well as other restrictions on auction and trading activity, to prevent participants from acquiring undue market power.

2. Recent Developments–January through December 2018

CARB's activities to support the Cap-and-Trade Program during 2018 included quarterly joint allowance auctions with Québec, ongoing issuance of compliance offset credits, and adoption of regulatory changes. Ontario participated in the February and May auctions.

A regulatory amendment package, published in September 2018, was adopted at the December 13, 2018 Board hearing. These activities are described in more detail below, along with a discussion of ongoing relevant litigation, recent legislative direction, and contracts that support the Cap-and-Trade Program.

Second Compliance Period Surrender Deadline. The second compliance period was 2015 through 2017, and the surrender deadline for the full compliance period was November 1, 2018. By this deadline, compliance instruments were required to be surrendered for any remaining balance not previously accounted for at the 2015 and 2016 surrender events, and for 100 percent of 2017 emissions. All covered entities who were required to surrender allowances met their obligations.

Adoption of 2018 Regulation Amendments. In 2018, CARB adopted amendments to the Cap-and-Trade Regulation. CARB held several public workshops and proposed amendments to the Regulation and modifications to those amendments.

On March 22, 2018, CARB approved narrow amendments to the Regulation to clarify that a successor entity after a change in ownership is responsible for the outstanding, pre-transfer compliance obligation of the predecessor covered entity. In addition, at the March 2018 Board meeting, the Board approved amendments to clarify the procedure used to reconcile differences between jurisdiction-specific Auction Reserve Price values.

CARB also commenced the public process to develop amendments to the Cap-and-Trade Regulation in response to legislative and Board direction. CARB held several public workshops and proposed amendments to the Regulation in September 2018. In November 2018, CARB continued this process by proposing a set of modifications to the Regulation amendments, reflecting public comment on the first set of revisions, discussion with stakeholders, and related analysis. The amendments were adopted by the Board on December 13, 2018 and are set to become effective on April 1, 2019.

The Board approved amendments to the Regulation to reflect legislative direction under AB 398 concerning the implementation of the Program beyond 2020. The adopted amendments establish a price ceiling and two price containment points; revise the quantitative offset usage limits in the post-2020 period; establish criteria such that at least half of the allowable quantitative offset usage limits post-2020 result in direct environmental benefits in the State of California; and specify leakage assistance factors for allowance allocation post-2020. The proposed amendments also specify leakage assistance factors for the third compliance period of the Program; make other updates to allowance allocation for certain sectors; clarify use of allocated allowance value for electric distribution utilities and natural gas suppliers; delink from the revoked Ontario Cap-and-Trade Program; streamline implementation requirements, including clarifying regulatory compliance and invalidation requirements of the compliance offset program; establish a process to assess a compliance obligation for GHG emissions in the Energy Imbalance Market; and make other changes to improve and clarify the Regulation.

Linkage with Ontario. California and Québec linked their joint Cap-and-Trade Programs with the program operated by the Province of Ontario on January 1, 2018. The three jurisdictions operated joint auctions in February and May of 2018. Following an official act taken by the Ontario government in June 2018 to suspend their program, trading of allowances between Ontario entities, with California and Québec entities was suspended. On July 3, the Ontario government filed a regulation that revoked Ontario's Cap-and-Trade Regulation and suspended all accounts registered in Ontario. California and Québec returned to the two-jurisdiction auction format beginning with the August 2018 auction.

Allowance Allocation. CARB allocated allowances to industrial facilities and utilities for the purpose of leakage prevention and ratepayer protection. In 2018, CARB allocated 43.2 million allowances to industry and 126.7 million allowances to utilities. The value of these allowances is approximately $627 million to industry and $1.81 billion to utilities (using the 2018 auction reserve price of $14.53). Detailed results of allowance allocation are available at https://www.arb.ca.gov/cc/capandtrade/allowanceallocation/publicallocation.htm.

Auctions. About $9.47 billion was raised by the sale of State-owned allowances at the 25 auctions held through November 14, 2018. During 2018, the auctions raised $3.02 billion from the sale of State-owned allowances. Funds raised at each auction are deposited into the GGRF. More information on Cap-and-Trade Auction Proceeds is provided in the California Climate Investments section of this report. Detailed results from the auctions are available at https://www.arb.ca.gov/cc/capandtrade/auction/auction.htm.

Reserve Sales. Reserve sales are scheduled to occur each quarter. Effective October 1, 2017, California will offer reserve sales as scheduled prior to the November 1 compliance obligation instrument surrender deadline, and in any quarter that the Current Auction held in the preceding quarter resulted in a settlement price greater than or equal to 60 percent of the lowest Reserve tier price. No covered entities or opt-in covered entities indicated an intent to bid for allowances or submitted a bid guarantee by the deadlines for the reserve sales scheduled through December 2018. Therefore, no reserve sales have been held.

Offsets. CARB continues to implement the offsets program, which reduces the costs of compliance with the Regulation and encourages investments in sustainable practices throughout the nation's economy. As of December 31, 2018, CARB has:

- Accredited 78 specially trained third-party offset verifiers and 17 verification bodies to serve as partners in evaluating the quality of offset projects submitted for approval;
- Continued to oversee and coordinate with the three existing approved offset project registries that help evaluate compliance-grade offset projects under the Regulation;
- Through the offset project registries, listed 368 compliance offset projects (as listing is the first step toward potential issuance of CARB compliance offset

credits), and listed 126 early action projects (the deadline to list an early action project with CARB was December 31, 2015);
- Conducted a thorough desk review of 100 percent of the compliance projects' requests for issuance; and
- Audited, either in-person or through desk review, 100 percent of the offset protocol project verifications to date.

CARB only issues compliance offset credits for verified offset projects that are developed using the 6 approved offset protocols and that are located within the United States. CARB issues compliance credits for those projects that comply with the full requirements set forth in the applicable offset protocol and in the Regulation. To date, CARB has issued over 142 million compliance offset credits.

Cap-and-Trade Litigation. In 2018, there was activity in two existing court cases involving CARB regarding the Cap-and-Trade Program.

Sowinski v. California Air Resources Board, et al.:

The plaintiff in the federal *Sowinski v. California Air Resources Board, et al.* case alleges that the Cap-and-Trade Program's auction platform infringes on a patent Dr. Sowinski obtained in 2003. The plaintiff also alleges claims of elder abuse under California Welfare and Institutions Code Section 15610.30 and a violation of California Business and Professions Code Section 17200 (the Unfair Competition Law). The plaintiff seeks both damages and injunctive relief.

On August 18, 2016, the U.S. District Court in Santa Ana, California dismissed the plaintiff's suit with prejudice. The plaintiff moved for reconsideration of the decision on September 19, 2016, and the court struck that motion. The District Court's judgment against the plaintiff became final on October 25, 2016. The plaintiff subsequently appealed to the U.S. Court of Appeals for the Federal Circuit (Federal Circuit).

On December 18, 2017, the Federal Circuit affirmed the dismissal of Dr. Sowinski's complaint, concluding that the U.S. District Court did not abuse its discretion in dismissing the case with prejudice. Dr. Sowinski did not seek rehearing before the Federal Circuit or petition for a writ of certiorari before the U.S. Supreme Court, so the Federal Circuit's dismissal is final.

Nevertheless, Dr. Sowinski refiled the same complaint in the U.S. District Court for the Northern District of California in 2018. On September 25, 2018, the district court dismissed the complaint without leave to amend. The court held that dismissal was appropriate because res judicata bars Sowinski's claims. On October 5, 2018, Sowinski filed a motion for reconsideration of the districts court's dismissal order, which the district court denied.

In re: La Paloma Generating Company, LLC:

La Paloma Generating Company, LLC (La Paloma) operated a large 1,124-megawatt natural gas power plant in western Kern County. La Paloma is a major emitter of greenhouse gases and covered by the Cap-and-Trade Program. La Paloma and two affiliated companies, La Paloma Acquisition Co, LLC, and CEP La Paloma Operating Company, LLC, (collectively the "Debtors") each filed a voluntary chapter 11 petition on December 6, 2016.

La Paloma developed a plan to sell its assets—including the power plant—to Beal Bank (a.k.a. LNV), La Paloma's first-lien creditor (i.e., the debt holder paid back before other debt holders). Because LNV and CARB could not agree on the proper treatment of La Paloma's outstanding compliance obligation, the Parties stipulated that the Bankruptcy Court would decide whether LNV would be responsible for La Paloma's outstanding (i.e., pre-sale) compliance obligation.

On November 9, 2017 the bankruptcy court ruled against CARB. The ruling held that the buyer of the La Paloma power plant, LNV, does not have successor liability for La Paloma's pre-sale compliance obligations pursuant to the Cap-and-Trade Regulation.

In early 2018, the Board adopted amendments to the Cap-and-Trade Regulation to clarify that a successor is liable for the outstanding compliance obligation of a seller after a change in ownership, which will mitigate the risk of purchasers avoiding liability for any outstanding compliance obligation. This amendment does not address any environmental effect of La Paloma Generating Company's outstanding compliance obligation due to the La Paloma sale preceding the effective date of the regulatory amendment.

Other Relevant Litigation:

CARB is also involved in ongoing bankruptcy litigation relating to a covered entity to protect its interests in ensuring full compliance with the Cap-and-Trade Regulation. See *In re: GenOn Energy, Inc.*, Case No. 17-33695 (U.S. District Court, Southern District of Texas, Bankruptcy Court).

Cap-and-Trade Program Contracts. Academic and private contractors help CARB achieve the goals of AB 32 while ensuring the cost-effectiveness of the program. Current contracting efforts are directed at accessing administrative support functions through WCI, Inc., including support for CARB's market registry, auctions and reserve sales, financial services for auctions and reserve sales, and monitoring the carbon market; and conducting a performance audit of the processes and procedures utilized by CARB staff to implement the program. Key ongoing contracts, and contracts in development are discussed in the recent developments and upcoming milestones sections below.

Cap-and-Trade Program Administration Contracts:

As part of collaborating with other jurisdictions, CARB accesses administrative support for the Cap-and-Trade Program through WCI, Inc. Section 4 of this document describes WCI, Inc. and its activities, including administrative support provided through contracts.

Other Cap-and-Trade Program Contracts:

On June 30, 2018, CARB concluded a 2-year contract with Sjoberg Evashenk (SEC), which conducted a performance audit of CARB's processes and procedures to implement the Cap-and-Trade and Mandatory Reporting of GHG Emissions Regulations during 2015 and 2016. SEC provided recommendations on opportunities to improve efficiencies, and found that, in general, program activities were completed by CARB staff with a reasonable assurance of security and accuracy.

CARB finished a contract with GP Strategies to make its offset verifier training available via online training modules. The training modules will replace the in-person training sessions that were offered less than once a year, which will provide potential verifiers improved access to training. GP Strategies continues to offer training on a fee basis.

3. Upcoming Milestones–January through December 2019

The following is a brief summary of some of the upcoming milestones for the Cap-and-Trade Regulation during 2019. More information on CARB activities and upcoming public meetings related to the Cap-and-Trade Program can be found at https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm.

- In adopting the 2018 amendments to the Cap-and-Trade Regulation, the Board directed CARB in Board Resolution 18-51 to finalize the rulemaking documents and to submit the final regulatory package to the Office of Administrative Law so the amendments can take effect in April 2019.

- Pursuant to Board Resolution 18-51, CARB will hold a public workshop in 2019 to discuss potential methods to evaluate the volume of unused allowances from 2013–2020 so CARB can submit a report to the Board by December 31, 2021.

- CARB will conduct a solicitation process and select members for the Compliance Offset Protocol Task Force as required by AB 398.

- CARB has two new contracts that will begin in 2019 for the offsets program. The first will be a new contract with GP Strategies to update the training to reflect the adopted regulatory amendments, and experiences from the first year of online training. The second contract is a contract with the U.S. Forest Service Forest Inventory and Analysis section to provide CARB a report on the state of the art for remote sensing technologies, such as satellite imagery; and light imaging, detection, and ranging (LIDAR) techniques.

- CARB will continue to hold quarterly joint auctions with Québec as scheduled in the Regulation (February, May, August, and November 2019).

- CARB will continue to implement the Regulation, including through the annual compliance period surrender event in November 2019.

B. Low Carbon Fuel Standard

1. Background

CARB approved the Low Carbon Fuel Standard Regulation (LCFS) in 2009 with requirements to reduce the carbon intensity (CI) of gasoline and diesel fuels by at least ten percent by 2020. In 2011, the Board approved amendments to the regulation to clarify, streamline, and enhance certain provisions of the regulation. In 2015, the Board re-adopted the LCFS to comprehensively improve the regulation while addressing court direction as explained below. In 2018, the Board approved amendments to the regulation, which strengthened declining annual targets to achieve at least a twenty percent CI reduction by 2030.

LCFS requires regulated entities to submit quarterly progress and annual compliance reports to CARB. To this end, CARB developed the LCFS Reporting Tool and Credit Bank & Transfer System (LRT-CBTS), a secure, interactive, web-based system, through which all regulated entities must report data on fuel volumes and CI. The Credit Bank & Transfer System has been integrated online with the LCFS Reporting Tool to handle the recording of LCFS credit transfers. To date, more than 320 regulated entities report in the LRT-CBTS. Through their reports, 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 its production, transportation, and use in motor vehicles. Each fuel's complete life cycle from "well-to-wheels" (or "seed-to-wheels" for biofuels made from crops) represents that fuel's "fuel pathway."

Each LCFS credit or deficit represents one metric ton of CO_2e emissions below or above, respectively, the annually declining CI standard. At the end of 2018, credit and deficit data through the second quarter of 2018 was available. Cumulatively through the end of the second quarter of 2018, regulated entities generated a total of about 39.4 million credits and 30.6 million deficits, which results in a net total of about 8.8 million credits.[3] This excess means that regulated entities are over-complying with LCFS, generating additional LCFS credits that can be used for future compliance when the standard becomes more stringent.

[3] Reference: *2018 LCFS Reporting Tool (LRT) Quarterly Data Summary – Report No. 2*, available at https://www.arb.ca.gov/fuels/lcfs/dashboard/quarterlysummary/20181031_q2datasummary.pdf.

Despite these positive indicators, the petroleum refining industry remains concerned about compliance with LCFS in future years when the standard becomes more stringent. The petroleum refining industry believes that the lower-CI liquid biofuels they prefer to blend with conventional gasoline and diesel fuels are not being developed quickly enough in commercial quantities, and will not be able to meet future CI standards. Staff continues to believe that the availability of these advanced biofuels will grow sufficiently to meet demand. Additionally, liquid biofuels are just one of several paths that refiners can take to comply with LCFS. They can also purchase LCFS credits in the marketplace from producers of lower-CI fuels (e.g., electricity, natural gas, biogas, and hydrogen), or they can invest in the production of these fuels to generate their own LCFS credits.

Alternative Diesel Fuel Regulation. The Alternative Diesel Fuel (ADF) Regulation is distinct from LCFS, but its implementation helps to mitigate any pollutant increases that may occur as a result of fuels used to comply with LCFS. The ADF Regulation established a comprehensive, three-stage process governing the commercialization of new alternative diesel fuels in California:

- The first stage is a pilot program which consists of a screening analysis and would allow limited sales of a regulated alternative diesel fuel while it undergoes an initial evaluation.
- The second stage is fuel specification development, an intermediate stage with expanded sales governed by enhanced monitoring, testing, and a multimedia evaluation.
- The third stage has full-scale commercial sales and provisions designed to maintain environmental and public health protections as needed.

In addition to the three-stage commercialization process, the regulation contains specific provisions for biodiesel to address potential NOx emissions increases associated with its use.

The ADF rulemaking effort followed several years of research and analysis to determine the air emissions and other environmental impacts of both renewable diesel and biodiesel as viable petroleum diesel fuel replacements. These two fuels are currently used in blends containing conventional petroleum-based diesel fuel and, as they become more prevalent in the market, will serve to displace petroleum-based diesel fuel. Renewable diesel is chemically indistinguishable from petroleum diesel and, thus, is subject to the current petroleum diesel regulations and is not covered by the ADF Regulation. Conversely, biodiesel is chemically different from petroleum diesel fuel and, as such, the ADF Regulation establishes in-use requirements and fuel specifications for biodiesel.

2. Recent Developments–January through December 2018

- On April 27, 2018, staff brought the LCFS amendments, along with limited amendments to the ADF regulation, to the Board for consideration. The amendments included the following:

- Strengthen the CI benchmarks through 2030 in order to help achieve the SB 32 2030 GHG emissions reduction target;
- Expand the fuel types to which LCFS applies in order to encourage additional actions in areas where reductions will be needed to meet long-term GHG goals;
- Improve accuracy and add flexibility to incent the installation of additional low-CI electricity supply coupled with the expansion of zero-emission vehicle fueling infrastructure;
- Adopt accounting and permanence protocols to enable credit generation for carbon capture and sequestration projects;
- Further ensure accuracy of the data that underlie the LCFS program and associated market;
- Simplify and streamline application and reporting requirements for regulated entities to encourage greater participation and assist participant compliance;
- Update regulatory values (e.g., energy economy ratio, energy densities) and life cycle analysis modeling tools to use more detailed or recent data;
- Include an independent third-party verification and verifier accreditation program to ensure accuracy of LCFS reported data, and reduce requirements for regulated entities to submit pathway demonstrations and document submittals for CARB staff review;
- Address court direction;
- Make minor updates to the rule that do not materially affect requirements, such as correcting typographical errors, making clarifications, and otherwise reorganizing regulatory provisions; and
- Adjust the ADF regulation sunset provision to ensure long-term NOx mitigation from biodiesel use.

- At its initial April 27, 2018, public hearing, staff gave the Board an overview of the amendments to the LCFS and ADF regulations. The Board did not take action on the proposal, but directed the Executive Officer, through Resolution 18-17, to determine if additional conforming modifications to the regulation were appropriate and to make any proposed modified regulatory language available for public comment, with any additional supporting documents and information, for a period of at least 15 days. In response, CARB released Notices of Public Availability of Modified Text and Availability of Additional Documents and Information (15-Day Notices) on June 20, 2018, and August 13, 2018, which notified the public of additional documents added into the regulatory process, recorded and presented additional modifications to the regulatory text. These notices were respectively released after consultation with stakeholders at two workshops held on June 11, 2018, and August 8, 2018.

- On September 27, 2018, staff presented these LCFS and ADF amendments to the Board, and the Board approved the amendments.

- After Board approval, staff conducted a public work group meeting focused on co-processing of low-carbon feedstocks in conventional petroleum refineries on October 19, 2018, and a workshop to discuss implementation of the 2018 amendments on November 28, 2018.

Low Carbon Fuel Standard Litigation. The following section discusses existing court cases related to LCFS.

POET, LLC v. California Air Resources Board:

POET I. Pursuant to the Modified Writ of Mandate issued by the Fresno Superior Court (Superior Court) on October 18, 2017, CARB conducted supplemental analysis to address potential NOx emissions from biodiesel as part of the 2018 Amendments to the LCFS and ADF regulations. CARB approved these amendments in September 2018. CARB filed a return to the modified writ on October 11, 2018, and the Superior Court issued an order discharging the writ on November 27, 2018. On December 7, CARB notified the LCFS market that, pursuant to the discharge of the writ, the standards for diesel and diesel substitutes will revert to the schedule specified in the LCFS regulation beginning on January 1, 2019.

POET II. On January 23, 2018, the Fresno County Superior Court entered judgment on the pleadings for CARB in the POET II litigation. On March 6, 2018, POET filed notice of appeal. Parties stipulated to extend the due date for appellant's opening brief until January 22, 2019.

Rocky Mountain Farmers Union (RMFU) v. Corey:

This federal court lawsuit was originally filed against the original version of LCFS in December 2009. Fossil fuel and biofuel industry plaintiffs claim that LCFS is preempted by federal statute and violates the United States Constitution. In the LCFS federal court litigation, *RMFU v. Corey*, the District Court entered judgment in CARB's favor after granting CARB's motion to dismiss the majority of the plaintiff's claims on June 16, 2017, and then granting the plaintiff's motions to voluntarily dismiss their remaining claims on August 14, 2017. On September 13, 2017, the plaintiffs filed notices of appeal in the Ninth Circuit. Following written briefings throughout 2018, the Ninth Circuit hosted oral argument on the appeal on September 26, 2018.

3. Upcoming Milestones–January through December 2019

Below is a brief summary of upcoming milestones for LCFS and related programs in 2019. More information on activities and upcoming public meetings can be found at https://www.arb.ca.gov/fuels/lcfs/lcfs.htm.

- On January 1, 2018, the ADF NOx mitigation provisions for biodiesel took effect. The regulation requires all biodiesel blends above the NOx control levels (usually B5) be NOx mitigated by using additives or NOx-mitigating fuel formulations. In 2019, a program review will be conducted to evaluate efficacy of the in-use requirements, and findings will be reported to the Board.

- Pending approval by the Office of Administrative Law, the amendments to the LCFS Regulation are expected to become effective on January 1, 2019.

- In 2019, the Ninth Circuit Court of Appeals will likely release a decision on the second RMFU appeal.

- CARB plans to continue implementation of corrective action to address potential historical NOx emissions from biodiesel throughout 2019. This corrective action—the Voluntary NOx Remediation Measure—involves the provision of grant funds to the air districts to administer an emissions reduction program similar to the Carl Moyer Program.

C. Advanced Clean Cars

1. Background

CARB developed the Advanced Clean Cars Program (ACC) to achieve long-term GHG emissions reductions from the transportation sector and to provide a comprehensive approach to further reduce criteria pollutant and GHG emissions from light-duty vehicles beyond 2016. ACC is supported by State incentives and lays the foundation for the next generation of ultra-clean vehicles. The program includes two key elements:

- Low-emission vehicle light-duty vehicle standards (both criteria pollutant and GHG emission regulations); and
- the Zero-Emission Vehicle (ZEV) Regulation.

ACC establishes more stringent GHG emissions standards, tighter criteria pollutant standards, and increased ZEV production requirements for passenger cars and light-duty trucks through the 2025 model year (MY). This suite of regulations will reduce GHG emissions by about 3.1 $MMTCO_2e$ in 2020, which is approximately four percent of the total needed to achieve the AB 32 target for that year. These regulations support California's near- and long-term climate goals, as well as attainment of ambient air quality standards.

Zero-Emission Vehicle Regulation. In 1990, California embarked on a mission to accelerate vehicle emission reductions with the adoption of the ZEV program provisions in the first Low Emission Vehicle (LEV) regulation. Today, the ZEV program is part of CARB's ACC package of coordinated standards that controls smog-causing pollutants and GHG emissions from passenger vehicles in California. In January 2012, CARB approved ACC and, as part of this rulemaking, the ZEV Regulation was amended to

strengthen its requirements over time. The ZEV Regulation focuses on commercialization of battery electric vehicles, hydrogen fuel cell electric vehicles, and plug-in hybrid electric vehicles. Under current requirements, these vehicles are estimated to comprise about 8 percent of new sales in 2025. This regulation will continue as a distinct but complementary program in California and the 9 other states that have also adopted it. The program is also critical to transform the light-duty vehicle fleet to achieve the requirements of SB 32, and the goal established by Executive Order B-16-2012, which respectively set targets to reduce GHG emissions by 40 percent below 1990 levels by 2030, and in the transportation sector by 80 percent below 1990 levels by 2050.[4]

Light-Duty Vehicle GHG Standards. Following California's pioneering light-duty vehicle GHG emissions standards for MY 2009–2016, the U.S. Environmental Protection Agency (U.S. EPA) and the National Highway Traffic Safety Administration (NHTSA) jointly developed federal GHG requirements for MYs 2012–2016 that were equivalent in stringency to California's regulations. This action enabled California to accept compliance with the federal GHG standards as an alternative to complying with California's regulations for these model years, thereby creating "one national program."

In 2012, CARB adopted its second generation of GHG emission standards for light-duty vehicles as part of the Low-Emission Vehicle III (LEV III) program. Later that year, with the involvement of CARB, U.S. EPA and NHTSA adopted federal passenger vehicle GHG standards and fuel economy standards that were consistent with the California standards. This allowed for continuation of the "one national program." Absent any changes to the federal GHG standards, this national program is expected to reduce CO_2e emissions of new MY 2025 vehicles by about 36 percent for cars and about 32 percent for light trucks, compared to their MY 2016 counterparts using available and emerging technologies for light-duty vehicles.

Due to the long-term nature of these standards, California committed to conduct a midterm review, as did the federal agencies (U.S. EPA and NHTSA), to reassess the appropriateness of the 2022-2025 MY standards. In advance of these reviews, the agencies published a joint technical assessment report in July 2016, which found that the previously assumed technologies used to lower emissions could still be deployed cost effectively. California's midterm review also committed to examine particulate matter (PM) standards and the ZEV Regulation. The joint technical assessment report is posted online at https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas#TAR. In January 2017, CARB released its final midterm review of the ACC program, available at https://www.arb.ca.gov/msprog/acc/acc-mtr.htm.

[4] Executive Order S-03-05 originally established the economy-wide GHG 2050 target, whereas Executive Order B-16-2012 further established that the transportation sector meet its equal share of the reductions.

Also in January 2017, U.S. EPA released a final determination on the appropriateness of the GHG standards for MY 2022–2025 light duty-vehicles. This final determination concluded that the GHG standards remain appropriate and should not be changed. However, on March 22, 2017, the new U.S. EPA Administrator and Department of Transportation Secretary published a notice in the Federal Register announcing its intent to reconsider the final determination of the GHG standards, despite the robust record on which it is based.

About the same time, on March 24, 2017, CARB staff presented results of the California-specific midterm review to the Board at a public hearing in Riverside. CARB agreed with U.S. EPA's final determination, concluding that the originally projected California GHG emissions benefits in 2025 will still be achieved at the same or lower cost to manufacturers. The Board found that all standards remain appropriate and directed staff to begin developing future light-duty vehicle regulations. On August 21, 2017, U.S. EPA solicited comment on the reconsidered Final Determination.[5]

In other aspects of the program, CARB continued to pursue several contracts to support overall implementation of ACC. In July 2017, CARB contracted with the University of California (UC) Davis to research new ZEV model household-level usage and refueling behavior in order to quantify emissions benefits. The project, "Emerging Technology ZEV Household Travel and Refueling Behavior," has completed household recruitment and vehicle logger installation and is currently collecting data.

In September 2017, CARB's contract with the University of California, Los Angeles (UCLA) to evaluate trends in the emerging ZEV market relative to policy and market factors was completed. The final report, *Factors Affecting Plug-In Electric Vehicle Sales in California*, is available at https://www.arb.ca.gov/research/single-project.php?row_id=65197.

Clean Vehicle Rebate Program (CVRP). This program supports broad ZEV adoption by providing consumer rebates for the purchase or lease of new, eligible plug-in hybrid electric, battery electric, and hydrogen fuel cell electric vehicles. The project aims to help California meet ZEV deployment, air quality, and GHG emissions reduction goals. CVRP has grown from a $4 million dollar project in 2010 to a $200 million project in the 2018–19 timeframe. Over the life of the program, nearly 280,000 vehicle owners have received rebates totaling over $620 million. Of these totals, over 10,000 rebates totaling over $41 million have been issued to low- and moderate-income consumers. To support consumer adoption of ZEVs, CARB continues to implement CVRP.

CARB staff have also continued to implement CVRP and several pilot projects to increase the deployment of advanced technology vehicles, including ZEVs, in disadvantaged communities. These pilots include the Financing Assistance for Lower-

[5] 82 Fed. Reg. 39,551 (Aug. 21, 2017). CARB's comments are at Docket No. EPA-HQ-OAR-2015-0827-9197. U.S. EPA held a hearing on September 6, 2017, at which CARB testified. 82 Fed. Reg. 39,975 (Aug. 23, 2017).

Income Consumers in Disadvantaged Communities (Financing Assistance), Clean Mobility Options for Disadvantaged Communities, CVRP increased rebates for lower-income consumers, and the Enhanced Fleet Modernization Program (EFMP) Plus-Up. More information can be found at https://www.arb.ca.gov/msprog/aqip/aqip.htm.

2. Recent Developments–January through December 2018

Below is a brief summary of some recent developments in 2018. More information on staff's activities and public meetings for its clean cars programs and the ACC program specifically can be found at https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program and https://www.arb.ca.gov/msprog/acc/acc.htm.

Regulatory Developments.

- On April 13, 2018, U.S. EPA issued a notice withdrawing its previous Final Determination for the midterm evaluation of the federal passenger vehicle regulations and issuing a revised Final Determination that the federal standards are not appropriate, "may be too stringent," and should be changed.[6] U.S. EPA's revised Determination was only 11 pages, did not properly explain why it was departing from the extensive evidence within the Technical Assessment Report, and was issued by the agency without sharing any data or analysis with CARB.

- CARB, along with the Attorney General, several other states, and many others, filed petitions in the United States Court of Appeals for the D.C. Circuit challenging the reconsidered Final Determination. This suit was brought to defend the initial Determination and the current emission standards. California was joined in this suit by Connecticut, Delaware, the District of Columbia, Illinois, Iowa, Maine, Maryland, the Commonwealth of Massachusetts, Minnesota, New Jersey, New York, Oregon, the Commonwealth of Pennsylvania, Rhode Island, Vermont, the Commonwealth of Virginia, and Washington. Complementary petitions have also been filed by the National Coalition for Advanced Transportation; Center for Biological Diversity with several environmental, public health, and consumer advocates; Consolidated Edison Company of New York; National Grid USA, the New York Power Authority; and the City of Seattle.[7] This suit remains pending.

- On August 24, 2018, continuing the error of U.S. EPA's new Final Determination, the Acting Administrator for U.S. EPA and the Deputy Administrator for NHTSA published a joint Notice of Proposed Rulemaking for their Safer Affordable Fuel-Efficient Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks. This proposal would profoundly weaken the federal GHG emission and

[6] 83 Fed. Reg. 16,077 (April 13, 2018).
[7] *See* Case No. 18-1114, consolidated with Nos. 18-1118 and 18-1139.

corporate average fuel economy standards for these vehicles, withdraw California's existing waiver of federal preemption under the Clean Air Act for its GHG emission regulations, and find that California's authority to regulate GHG emissions from motor vehicles was preempted by federal fuel economy law.[8] CARB and the California Attorney General, along with many states, consumer, environmental, and public health organizations, and industry filed comments opposing this proposal.[9] If the federal agencies proceed with this proposal, CARB, and others have stated they intend to challenge it in court.

- As an additional protection against a weakened federal program, CARB amended its own passenger vehicle GHG emission regulations to no longer accept compliance with federal standards if they are changed. Those amendments became effective December 13, 2018. The other states that have adopted California's standards under Section 177 of the Clean Air Act have amended their regulations to conform to these changes, or are in the process of doing so. Of particular note, Colorado adopted California's criteria pollutant and GHG emission standards under its ACC program, and is preparing to consider adopting California's ZEV regulations. Taken together, these actions are intended to ensure that California will continue meeting its climate and other goals to protect public health.

Incentives and Outreach.

- In January 2018, The Center for Sustainable Energy launched the Rebate Now pilot program for low-income consumers in the San Diego area. Rebate Now is intended to bring the rebate closer to the point of sale by providing low-income consumers with the opportunity to be preapproved for a CVRP rebate prior to purchasing or leasing an eligible vehicle.

- In June 2018, the Financing Assistance for Lower-Income Consumers pilot project launched statewide. The program provides vehicle price buy-downs (grants) and low-interest loans to eligible consumers who buy or lease new or used eligible hybrids, plug-in hybrid electric vehicles, or battery electric vehicles. The initial $5 million allocation was reserved by November 2018. A new solicitation with an additional $18 million is in process.

- In August 2018, CARB selected the company GRID Alternatives to administer the One-Stop-Shop Pilot Project. The project will provide a single application for low-income consumers to apply and qualify for CARB's existing low carbon

[8] 83 Fed. Reg. 42,986 (Aug. 24, 2018).
[9] *See*, e.g., CARB cover letter and detailed comments, available at: https://www.regulations.gov/document?D=NHTSA-2017-0069-0575; https://www.regulations.gov/document?D=NHTSA-2018-0067-11873; https://www.regulations.gov/document?D=NHTSA-2017-0069-0575; see also States' comments, available at: https://www.regulations.gov/document?D=NHTSA-2018-0067-12295; https://www.regulations.gov/document?D=NHTSA-2018-0067-11735; https://www.regulations.gov/document?D=NHTSA-2017-0069-0682.

transportation projects (e.g., Financing Assistance, Clean Mobility Options for Disadvantaged Communities, EFMP Plus-Up pilot project, and CVRP increased rebates for lower-income consumers). This pilot will also provide coordinated community-based outreach to promote advanced technology vehicle adoption in low-income households and communities. The streamlined application is anticipated to launch in mid-2019.

Research Contracts.

- In April 2018, CARB's contract with UC Davis, "The Dynamics of Plug-in Electric Vehicles in the Secondary Market and their Implications for Vehicle Demand, Durability, and Emissions," to examine the State's used plug-in electric vehicle market, was completed. The final report is available at https://www.arb.ca.gov/research/apr/past/14-316.pdf.

- In June 2018, CARB contracted with UC Davis to model the emissions expected under different deployment of automated vehicles and policy scenarios in a project titled "Emission Impacts of Connected and Automated Vehicle Deployment in California."

- In November 2018, CARB contracted with UC Davis to assess the impact of CVRP in a project titled, "Impact of the Clean Vehicle Rebate Project on California's Zero Emission Vehicle Market: White Papers for Assembly Bill 615 Report."

3. Upcoming Milestones–January through December 2019

- NHTSA contends that by no later than April 1, 2019, it is required to promulgate passenger vehicle fuel economy standards for model years 2022–2025. If NHTSA and U.S. EPA finalize weakened standards as proposed, California and others expect to challenge them in court.

- CARB staff expects the One Stop Shop Pilot Project to launch by late-2019.

- CARB will include an update to the Three-Year Plan for Light-Duty Vehicle and Transportation Equity Investments in the FY 2019–20 Funding Plan for Clean Transportation Incentives in fall 2019. This plan will update previous efforts to determine when California will have a sustainable ZEV market and the required funding investment needed to meet our ZEV deployment goals.

- In the first half of 2019, a statewide survey will be fielded for CARB's contract with UCLA, "Designing Light-Duty Vehicle Incentives for Low- and Moderate-Income Households." The contract will evaluate different clean transportation incentives and vehicle retirement decisions in low- and moderate-income households.

- In 2019, CARB staff will propose new regulations to implement the Electric Vehicle Charging Stations Open Access Act created by SB 454 (Corbett, Chapter 418,

Statutes of 2013). Implementation is expected to make charging plug-in electric vehicles at public charging stations more accessible to consumers regardless of membership status to a charging network.

Research Contracts.

- In March 2019, CARB's contract with UCLA, "Designing Light-Duty Vehicle Incentives for Low- and Moderate-Income Households," which will evaluate different clean transportation incentives and vehicle retirement decisions in low- and moderate-income households, will be completed.

- In summer 2019, CARB's contract with UC Davis, "Advanced Plug-in Electric Vehicle Travel and Charging Behavior," to conduct research on household-level plug-in electric vehicle usage and charging behavior, will be completed.

- CARB will jointly fund the California Vehicle Survey with the California Energy Commission (CEC) in order to assess the shifts in consumer preferences within the light-duty market. The survey will target residential and commercial fleets and will include a targeted survey of zero-emission vehicles.

- CARB will contract with UC Davis to synthesize research findings related to the greenhouse gas impacts of ride-hailing services along with identifying the first users of electric, shared, and automated vehicles in a project titled, "White Papers on California's Changing Transportation Landscape."

- CARB will contract with UC Davis to study the impact of vehicle miles traveled by zero-emission vehicle households in a project titled, "The Rebound Effect of ZEV-Owning Households in California."

- CARB will contract with UC Davis to study the awareness of electric vehicles in a project titled, "California and Section 177 State Household Valuation of Electric Vehicles."

D. Landfill Methane

1. Background

On June 25, 2009, the Board approved the Methane Emissions from Municipal Solid Waste Landfills Regulation (Landfill Regulation), which reduces methane emissions from municipal solid waste (MSW) landfills. This regulation took effect on June 17, 2010, and requires owners and operators of certain uncontrolled MSW landfills to install gas collection and control systems, and requires existing and newly installed gas collection and control systems to operate in an optimal manner. The regulation is a discrete early action measure to reduce GHG emissions in California as described in AB 32.

The Landfill Regulation allows the local air districts to enter voluntarily into a Memorandum of Understanding (MOU) with CARB to implement and enforce the Landfill Regulation and to assess fees to cover their costs. CARB developed the MOU template in consultation with representatives from the California Air Pollution Control Officers Association (CAPCOA). Upon signing the MOU, primary enforcement authority is transferred to the local air district. CARB retains its right to enforce the Landfill Regulation, if necessary. To date, 23 air districts have signed the MOU. CARB continues to assist these air districts with implementation and enforcement of the Landfill Regulation. To date, CARB has provided implementation and enforcement training to 21 of these districts.

Having local air districts participate in the enforcement process capitalizes on their expertise (air districts regulate criteria and toxic emissions from landfills), takes advantage of their close proximity to these sources, and reduces the State's cost to implement the Landfill Regulation. This collaboration is an example of a partnership between CARB and the local air districts, working together to achieve the goals of AB 32. More information on the Landfill Regulation, including recent activities can be found at https://www.arb.ca.gov/cc/landfills/landfills.htm.

Litigation. U.S. EPA promulgated updates to the *Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills*, 40 CFR, Part 60, Subpart Cf (Emission Guidelines) on August 29, 2016, which became effective on October 28, 2016. On May 30, 2017, CARB submitted its State plan to U.S. EPA to demonstrate that CARB's Landfill Regulation is equivalent to, or more stringent than the Emission Guidelines. To develop California's compliance plan, CARB worked with CAPCOA, air districts, U.S. EPA Region 9, and interested stakeholders to ensure any concerns with using the Landfill Regulation to comply with U.S. EPA's rule were addressed. The Emission Guidelines requirements include a lower applicability threshold, enhanced surface monitoring and emissions controls, and enhanced record keeping and reporting. On May 23, 2017, U.S. EPA sent a letter to industry informing industry that it would be issuing a stay of the Emission Guidelines and on May 31, 2017, published a formal 90-day administrative stay of the rule (Stay of Standards of Performance for Municipal Solid Waste Landfills and Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills, 82 Fed. Reg. 24878 (May 31, 2017)). CARB and several states filed suit in California based on U.S. EPA's failure to approve already submitted state plans or impose federal plans within the mandatory timeframes required by the Clean Air Act and implementing regulations. This case is still working its way through court.

Landfill methane emissions reductions also play a key role in the State's effort to reduce short-lived climate pollutants. For more information, see the Short-Lived Climate Pollutants section of this document.

2. Recent Developments–January through December 2018

- On October 23, 2018, U.S. EPA published a proposed rule that would extend the current timelines for submittal of State plans and approvals with an aggregated delay

of over five years. CARB and several states will submit comments on January 3, 2019 urging U.S. EPA to withdraw the proposed delay rule.

- CARB and the Department of Resources Recycling and Recovery (CalRecycle) continued the joint research study with California Polytechnic State University through the "Landfill Gas Collection System Efficiencies" contract to better understand statewide gas collection efficiencies. The contract will help refine emissions reduction estimates and better gauge the efficacy of the Landfill Regulation.

- CARB is continuing to assist CalRecycle in its rulemaking to divert organics normally disposed of at landfills. CalRecycle staff were instructed in December 2018 to begin the formal rulemaking process with goals that are consistent with SB 1383. This legislation requires CalRecycle, in consultation with the Board, to adopt regulations that achieve specified targets to reduce methane emissions from landfills as part of the State's Short-Lived Climate Pollutant Reduction Strategy. SB 1383 requires a 50 percent reduction in organics disposal in landfills by 2020 and 75 percent reduction by 2025, both relative to 2014 levels.

- In 2018, CARB continued to partner with the local air districts to ensure successful implementation of the Landfill Regulation.

3. Upcoming Milestones–January through December 2019

- CARB and CalRecycle will continue to co-manage and monitor progress of the "Landfill Gas Collection System Efficiencies" contract to better understand landfill gas collection efficiencies.

- CARB will continue to conduct audits through inspections and document reviews, and will also continue to coordinate with local air districts to ensure compliance with the Landfill Regulation.

- CARB will continue to monitor compliance with the Landfill Regulation at landfills located in districts that have not signed an MOU and take enforcement action if necessary.

- CARB will continue to assist CalRecycle in its rulemaking on organics disposal reductions at landfills.

- CARB will continue to work with U.S. EPA to obtain approval of the submitted State plan for compliance with the Emission Guidelines and oppose any efforts aimed at reducing the stringency of the rule.

E. Crude Oil and Natural Gas Production, Processing, and Storage

1. Background

The initial Scoping Plan proposed the development of a measure that reduces venting and fugitive GHG (methane) emissions associated with oil and gas production, processing, and storage. By definition, intentional releases of gases such as methane or CO_2 into the atmosphere are called "vented emissions." Unintentional releases are called "fugitive emissions." In 2009, CARB undertook a survey of the industry to improve the emissions inventory for this sector. The survey results showed that about 1.3 $MMTCO_2e$ come from vented and fugitive methane emissions in the oil and natural gas production, processing, and storage sector. These emissions come from various sources, such as storage tanks, compressor seals, and leaking components including valves, flanges, and connectors.

On March 23, 2017, CARB staff presented the proposed regulation for the Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities (Oil and Gas Methane Regulation) to the Board. This was the second of two Board hearings on the proposed regulation. The Board adopted the proposed regulation with staff's recommended changes.

2. Recent Developments–January through December 2018

- CARB staff completed and signed Memoranda of Agreement with local air districts to clarify the implementation, enforcement, and information-sharing roles between CARB and the districts.

- CARB purchased additional methane leak detection equipment. Some of the methane leak detection equipment is intended to be used by CARB enforcement staff, but most of the equipment will be loaned to air district enforcement staff.

- Under the requirements of the Oil and Gas Methane Regulation, on January 1, 2018:
    - Leak detection and repair inspections began;
    - Underground natural gas storage facilities' monitoring plans were submitted; and
    - Equipment reporting and tank flash testing data were submitted.

- CARB staff completed review of underground natural gas storage facilities' monitoring plans before the July 1, 2018 deadline. The plans subsequently went through several revisions by operators based on CARB and district comments.

- CARB began distributing $2,000,000 among the districts according to a distribution allotment approved by CAPCOA to assist with the first year of regulation implementation.

- CARB staff worked with a contractor to develop a web-based reporting tool to replace the reporting spreadsheet that was developed by CARB staff in 2017. The new reporting tool was completed and tested in 2018.

- CARB staff worked with operators to develop a technology assessment for recirculation tank control approaches.

- CARB staff assisted district staff in understanding how to enforce the regulation.

- CARB staff assisted operators in understanding how to comply with the regulation.

- CARB staff submitted the Oil and Gas Methane Regulation into the California State Implementation Plan (SIP) on December 4, 2018 to comply with U.S. EPA requirements outlined in the Control Techniques Guidelines for the Oil and Natural Gas Industry. The SIP submittal was approved by the Board on October 25, 2018.

3. Upcoming Milestones–January through December 2019

- Under the requirements of the Oil and Gas Methane Regulation, on January 1, 2019:
    - Vapor collection will be installed on uncontrolled tanks that exceed the regulation's threshold;
    - High-bleed pneumatics will be changed out to no-bleed; and
    - Compressor seal leaks will be controlled to meet the regulation's thresholds.

- CARB staff will send out invitations to facility owners and operators to register for the web-based reporting tool developed in 2018.

- By July 1, 2019, facility owners and operators will report the following information to the web-based reporting tool:
    - Leak detection and repair inspection reports;
    - Reciprocating and centrifugal natural gas compressor data;
    - Low-bleed pneumatic device data;
    - Natural gas well liquids unloading data; and
    - Well casing vent emission flow rate data.

- By July 1, 2019, CARB will decide, based on the recirculation tank technology assessment, whether such tanks need to have vapor recovery installed.

- CARB will distribute $1,000,000 among the districts according to a distribution allotment approved by CAPCOA to assist with the second year of regulation implementation.

- CARB will arrange multiple training sessions throughout the State for air district staff on how to use leak detection equipment.

- CARB will initiate a detection equipment loan out program to district staff.

- CARB staff will continue to assist district staff in understanding how to enforce the regulation.

- CARB staff will continue to assist operators in understanding how to comply with the regulation.

F. Short-Lived Climate Pollutants

1. Background

In 2017 CARB staff developed and the Board approved a Short-Lived Climate Pollutant (SLCP) Reduction Strategy. The SLCP Strategy was developed in coordination with other State agencies pursuant to SB 605 (Lara, Chapter 523, Statutes of 2014) and SB 1383. SLCPs include methane, black carbon, and fluorinated gases including hydrofluorocarbons (HFC). These pollutants are very powerful climate forcers that remain in the atmosphere for much less time than CO_2. Reducing these pollutants will prevent their outsized impact on climate change in the near term, thereby providing immediate benefits.

The SLCP Strategy identifies current measures to reduce SLCP emissions and additional measures to meet specific targets required by SB 1383, including a 50 percent reduction in anthropogenic black carbon emissions, and a 40 percent reduction in methane and HFC emissions, all from 2013 levels by 2030. These measures include reducing black carbon emissions from inefficient home heating devices, reducing methane emissions from dairy and livestock operations and landfills, and reducing HFC emissions from refrigeration and air-conditioning systems.

Nearly three-quarters of in-State methane comes from the dairy and livestock sector and landfills. CARB and other agencies have been working on a number of efforts to address existing hurdles to developing projects to put these waste streams to beneficial use as a substitute for fossil natural gas in transportation and stationary sources. SB 1383 contains detailed requirements for the reduction of methane emissions from landfills and the dairy and livestock sector. CalRecycle, in consultation with CARB, must develop regulations that reduce landfill disposal of organic waste by 50 percent by 2020 and 75 percent by 2025, measured against a 2014 baseline. By 2030, California must reduce methane emissions from the dairy and livestock sector by 40 percent from 2013 levels. This will be accomplished through a combination of actions such as incentives, research, collaboration to overcome barriers, and policies that encourage renewable gas production. SB 1383 also requires State agencies to implement and promote in-State production and use of renewable gas, and CARB to provide guidance on credits generated under the LCFS program and the Cap-and-Trade Program Compliance Offset Livestock Protocol.

SB 1383 requires CARB, in partnership with the California Department of Food and Agriculture (CDFA), to develop and implement regulations that reduce manure methane

emissions from the dairy and livestock sector if certain conditions are met. These regulations cannot go into effect before January 1, 2024. SB 1383 requires that CARB, prior to adopting these regulations, must consult with other State agencies and stakeholders to develop a manure management strategy that promotes voluntary emissions reduction projects at California dairy and livestock operations. To meet this requirement, in May 2017, CARB, CDFA, CEC, and the California Public Utilities Commission (CPUC) convened a Dairy and Livestock GHG Reduction Working Group (Working Group), composed of the principals from four State agencies (CEC, CDFA, CPUC, and CARB). The purpose of the working group was to provide a forum for agencies to collaborate with a broad range of stakeholders to identify and address barriers to future dairy and livestock methane emissions reduction projects. The Working Group formed stakeholder-led subgroups at the May 2017 public meeting to develop policy recommendations in three specific areas: Fostering Markets for Non-Digester Projects (Subgroup #1); Fostering Markets for Digester Projects (Subgroup #2); and Research Needs, Including Enteric Fermentation (Subgroup #3). The subgroups met several times in 2017, throughout 2018, and concluded their efforts in December 2018. For more information, see https://www.arb.ca.gov/cc/dairy/dairy.htm.

CARB has been acting to reduce high-global warming potential (GWP) climate pollutants since 2009, when the Board adopted a regulation creating the Refrigerant Management Program. Recent global action to control HFC refrigerant use resulted in the 2016 Kigali Amendment to the Montreal Protocol. For the U.S., the agreement specifies a phasedown to 15 percent of baseline by 2036, with the first step-downs in 2019 and 2024. In California, CARB staff analysis has determined a more rapid reduction in HFC use is required than specified in the Kigali Amendment in order to reach the 40 percent emission reduction target for HFCs by 2030.

2. Recent Developments–January through December 2018

- The Dairy and Livestock Working Group held their second meeting on January 5, 2018. Agencies involved in dairy- and livestock-related work gave brief updates on this work, and each of the three subgroups presented their progress to date on developing recommendations.

- Each of the three dairy subgroups held multiple public meetings in various locations around the State during 2018, for a total of 16 meetings, all of which were open to the public both in-person and remotely. Each meeting included an opportunity for public comments. In December, the Dairy and Livestock GHG Reduction Working Group released its final policy recommendations to help develop solutions to barriers to methane emissions reduction projects.

- In November 2018, CARB posted the Final Pilot Financial Mechanism White Paper[10] to fulfill SB 1383's direction to CARB to develop a financial mechanism designed to

[10] https://arb.ca.gov/cc/shortlived/final_sb1383_financial_pilot_mechanism_whitepaper.pdf

reduce the economic uncertainty associated with the value of environmental credits, including credits pursuant to the LCFS regulation from dairy-related projects producing low-carbon transportation fuels, to ensure that these revenue streams are predictable enough to allow project developers to secure private development financing. At that point in time, compressed natural gas produced from animal waste had the lowest CI value in the LCFS Program.

- In September and October 2018, CARB deployed four state-of-the-art flux towers designed to measure methane emissions from dairy lagoons and settling basins at three California dairies. This research will enable evaluation of the effectiveness of three alternative manure management practice projects by quantifying differences in methane production before and after project implementation.

- Throughout 2018, CARB provided technical expertise and assistance reviewing and scoring grant applications for two incentive programs administered by CDFA, namely the Dairy Digester Research and Development Program (DDRDP) and the Alternative Manure Management Program (AMMP). CARB also provided technical expertise and assistance in evaluating CPUC's Dairy Biomethane Pilot Projects, which provide funding to facilitate the interconnection of dairy digester biogas piping to the natural gas pipeline system.
    - CDFA awarded $72.4 million to 42 projects under its DDRDP Program in July.
    - CDFA awarded $21.6 million to 40 projects under its AMMP Program in September.
    - In December, CPUC, CARB, and CDFA announced $319 million in rate-recoverable funding over the next 20 years for six dairy biomethane pilot projects to demonstrate the feasibility of pipeline injection.

- Throughout 2018, CARB staff supported CalRecycle's informal organic waste diversion rulemaking process to reduce methane emissions at landfills. For more information visit http://www.calrecycle.ca.gov/Climate/SLCP/.

- The implementation phase of the Fiscal Year (FY) 2016–2017 appropriation of $5 million for the Woodsmoke Reduction Program began in June 2018. Twenty-four air districts, located primarily in rural and mountain regions of northern and central California, received awards ranging from $50,000 to $425,000. The amount of funding reflects individual district's specific needs and their ability to implement the Woodsmoke Reduction Program. Between June and December, districts implemented $1.3 million in incentives to 400 households for replacing old, uncertified wood burning devices with cleaner burning and more energy efficient home heating alternatives. These replacements are expected to reduce black carbon emissions by 15 tons over their lifetime. About 95 percent of funds implemented through December 2018 benefited priority populations, as defined by the California Climate Investments Program.

- On December 5, 2018 CARB released the draft Program Guidelines for the $3 million FY 2018–2019 appropriation for the Woodsmoke Reduction Program for

public comment. To further reduce black carbon emissions from wood stoves, pellet stoves and heat pumps were added to the list while replacement wood burning devices were limited to those with $PM_{2.5}$ emissions not exceeding 2.0 grams per hour. Starting on May 15, 2020, the requirement for wood burning devices will be tightened even further by allowing only devices certified by the U.S. EPA as Step 2 compliant.

- On February 2018, California State Senator Lara introduced SB 1013, "The California Cooling Act," to adopt by reference previous U.S. EPA regulations to prohibit high-GWP HFCs in new refrigeration equipment, chillers, foams, and aerosol propellants. SB 1013 was introduced because the U.S. EPA lost its authority to regulate HFCs as a result of the District of Columbia Circuit Court's August 8, 2017 ruling in *Mexichem-Fluor Inc. v. Environmental Protection Agency* that U.S. EPA had no authority to prohibit HFCs.

- In March 2018, the Board approved a regulation to prohibit high-GWP HFCs in new refrigeration equipment and in insulating foams. These prohibitions had previously been regulations from the U.S. EPA's Significant New Alternatives Policy Program to reduce ozone-depleting substances and their substitutes. Although SB 1013 duplicated all HFC prohibitions in the March 2018 CARB regulation, the passage of SB 1013 could not be guaranteed; therefore, CARB continued rulemaking through the Board adoption phase from regulations first proposed in 2017.

- On September 13, 2018, SB 1013 (Lara, Chapter 375, Statutes of 2018) was signed into law to lock in climate-friendly technologies that prohibit use of certain ozone-depleting substances and HFCs in refrigerants.

- On October 9, 2018, the U.S. Supreme Court declined to hear the appeal to *Mexichem-Fluor Inc. v. Environmental Protection Agency*.

- On October 27, 2018, CARB held a workshop to propose additional high-GWP HFC prohibitions in new stationary refrigeration and stationary air-conditioning equipment. The proposed additional HFC prohibitions would be more stringent than the SB 1013 prohibitions previously adopted, by further decreasing the allowable GWP in new refrigeration and air-conditioning equipment.

3. Upcoming Milestones–January through December 2019

- CARB will provide technical expertise and assistance evaluating grant applications for the 2019 DDRDP and AMMP programs administered by CDFA.

- Throughout 2019, CARB will continue to collect methane flux data at three dairies and will begin analyzing and interpreting the results in conjunction with other monitoring efforts on the associated AMMP projects.

- Throughout 2019, CARB will continue monitoring the progress made by the dairy and livestock sector in achieving the goals identified in the SLCP Reduction Strategy

and SB 1383. This analysis must be completed by July 1, 2020 and is required to assess whether sufficient progress has been made to overcome technical and market barriers, as identified in the SLCP Reduction Strategy and SB 1383.

- Throughout 2019, CARB will continue to monitor research and industry-led efforts to produce feed additives designed to reduce dairy and livestock methane emissions from enteric fermentation.

- CARB will strive to implement 75 percent of $5 million of the FY 2016–17 appropriation for the Woodsmoke Reduction Program by the end of 2019.

- CARB will release the Final Program Guidelines for FY 2018–2019 appropriation of $3 million for the Woodsmoke Reduction Program in mid-February and the grant agreements will be signed during March and April. Districts are expected to begin funding projects in May of 2019.

- Throughout 2019, CARB will work with stakeholders to develop regulations that prohibit HFC refrigerants in new stationary refrigeration and air-conditioning equipment to meet the SB 1383 target of a 40 percent reduction in HFC emissions from 2013 levels by 2030. The proposed regulations are expected to go before the Board for approval in late 2019 for air-conditioning equipment, and early 2020 for refrigeration equipment.

- Throughout 2019, CARB will support CalRecycle's formal organic waste methane emissions reduction rulemaking process and the development of its final regulation for adoption by Office of Administrative Law.

II. CARB ACTIVITIES TO SUPPORT AB 32

This section focuses on major AB 32 support activities identified in the supplemental budget language, including updates to the AB 32 Scoping Plan, coordination with entities outside California, implementation of Sustainable Communities Plans, and the use of Cap-and-Trade Auction Proceeds. Also included are developments on minimizing community health impacts from freight, which will further provide significant benefits for climate, regional air quality, and localized health risk reduction.

A. Scoping Plan

1. Background

AB 32 requires CARB, in close coordination with other State agencies, to prepare and adopt a Climate Change Scoping Plan that describes how the State will reduce GHG emissions to 1990 levels by 2020. The initial Scoping Plan was first approved by the Board in December 2008, and contained a range of GHG emissions reduction actions. These actions included direct regulations, alternative compliance mechanisms, monetary and nonmonetary incentives, voluntary actions, market-based mechanisms

such as a Cap-and-Trade Program, and an AB 32 implementation fee to fund the program.

Since 2008, CARB has worked with other State and local agencies to implement the climate change programs needed to meet State GHG emissions reduction targets outlined in the Scoping Plan. California has launched the first-in-the-nation economy-wide Cap-and-Trade Program, began implementing the LCFS in 2011, has been controlling smog-causing pollutants and GHGs under the ACC Program, and continues to work with the State's metropolitan planning organizations on Sustainable Communities Strategies that align transportation, housing, and land use decisions toward achieving GHG emissions reduction targets set by CARB. More information on the Cap-and-Trade Program, LCFS regulation, ACC, and Sustainable Communities Strategies is available in each of their respective sections in this document.

AB 32 further requires CARB to update the Scoping Plan at least every five years, and to convene an Environmental Justice Advisory Committee (EJAC) to advise the Board during Scoping Plan development. The Board approved the first update to the Scoping Plan (First Update) in May 2014. The First Update reflected public input and recommendations from business, environmental, environmental justice, and community-based organizations. Throughout its development, CARB worked with EJAC to advise on climate change policies that may impact disadvantaged communities. The First Update also highlighted the need for a 2030 midterm target to establish a continuum of actions to reduce emissions, not just for 2020 and 2050[11], but also for the years in between.

2030 Target and 2017 Climate Change Scoping Plan Update. On April 29, 2015, Governor Jerry Brown issued Executive Order B-30-15 to establish a California GHG emissions reduction target of 40 percent below 1990 levels by 2030 (2030 Target), subsequently codified by SB 32. The 2030 Target aligned with the 2014 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report's scientific consensus of GHG emissions reductions needed to limit global warming to 2 degrees Celsius above preindustrial levels. Scientists determined that this threshold, if exceeded, will create more catastrophic climate disruptions including extreme droughts, major sea level rise, more frequent and intense wildfires and heat waves, more severe smog, and more extensive harm to agricultural productivity, natural and working lands (NWL), and public health. Additionally, GHG emissions reductions from gases other than CO_2 and from land use are necessary to mitigate climate change. California's 2030 Target aligns with the goals of the United Nations Framework Convention on Climate Change agreement reached in Paris on December 2015, which reaffirmed the goal of limiting global temperature increase well below 2 degrees Celsius while urging efforts to limit the increase to 1.5 degrees. The 28-nation European Union

[11] Executive Order S-3-05 sets a goal for a reduction in GHG emissions of 80 percent below 1990 levels by 2050.

established the same GHG emissions reduction target for 2030 in October 2014. In June 2017, in response to federal inaction on climate, California joined other states in the U.S. Climate Alliance to affirm commitment to the Paris Agreement.[12]

Executive Order B-30-15 also directed CARB to update the Scoping Plan to reflect a path to achieve the 2030 Target. Along with SB 32, two additional statutes, AB 197 and AB 398, passed during the Scoping Plan update process, provided further legislative direction on the types of policies and programs to include in the Plan. AB 197 requires CARB, when adopting rules and regulations to achieve the 2030 GHG emissions reduction target, in addition to preexisting requirements, to consider of the social costs of GHG emissions and prioritize measures resulting in direct emission reductions. AB 398 directed CARB to update the Scoping Plan to achieve the 2030 Target no later than January 1, 2018, and to designate the Cap-and-Trade Program as the rule for petroleum refineries and oil and gas production facilities to achieve their GHG reductions.

Following Executive Order B-30-15 and related legislation, CARB undertook a two-year process to develop and adopt the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan Update), focusing on measures designed to reach the State's 2030 GHG Target. The 2017 Scoping Plan Update incorporated concurrent efforts contained in major State plans and measures such as increasing energy efficiency in existing buildings, reducing SLCPs, increasing the sustainability of freight, investing in GGRF, and maintaining and improving forest and soil health.

California has already implemented several recommendations in the First Update, as well as additional recommendations that are incorporated into the 2017 Scoping Plan Update. See the sections in this report on ACC, the Cap-and-Trade Program, California Climate Investments (Cap-and-Trade Auction Proceeds), Crude Oil and Natural Gas, LCFS, Sustainable Communities Strategies, Sustainable Freight, and SLCPs for current activities related to each of these programs.

Pollution Mapping Tool. AB 197 also required CARB to make available online, at least annually, data on the emissions of GHGs, criteria air pollutants, and toxic air contaminants for each facility that reports to the Board and air districts. CARB must present an informational report on those emissions from sectors covered by the Scoping Plan at a hearing of the Joint Legislative Committee on Climate Change Policies on an annual basis.

To address AB 197 requirements, CARB released a publicly available Pollution Mapping Tool in 2017 that allows users to search for individual facility data by name, industrial sector, year, type of facility and pollutant type. In 2018, CARB updated the Mapping Tool to include GHG, criteria pollutant, and toxic air contaminant emissions data for every facility subject to mandatory reporting of GHG emissions. The Mapping

[12] In June 2017, President Trump announced the U.S. will withdraw from the Paris climate agreement, which will take effect in 2020.

Tool is available online at https://www.arb.ca.gov/ei/tools/pollution_map/pollution_map.htm.

Forest Carbon Plan, Healthy Soils Program, and Natural and Working Lands Implementation Plan. The development of the 2017 Scoping Plan Update included careful consideration of NWL efforts, such as the Forest Carbon Plan and Healthy Soils Program. In August 2014, as recommended by the First Update, the Forest Climate Action Team (FCAT) was assembled with the primary purpose of developing a Forest Carbon Plan that discusses how to manage our forest landscapes in a changing climate. In 2015, the FCAT held public scoping workshops around the State and released a concept paper in spring 2016, followed by stakeholder meetings to gather more detailed regional input. In early 2017, the FCAT released a full draft of the Forest Carbon Plan for public review, including review by a team of scientists.

In 2017, CDFA began administering the Healthy Soils Program, which provides financial incentives to California growers and ranchers to implement conservation management practices that sequester carbon, reduce GHGs, and improve soil health. The program also provides financial incentives to demonstration projects that showcase these management practices. CDFA estimates GHG benefits using quantification methodology and tools developed by CARB, CDFA, and the U.S. Department of Agriculture's Natural Resources Conservation Service.

The 2017 Scoping Plan Update placed a renewed focus on the role NWL play in meeting our long-term GHG emissions reduction goals. In addition to infill development and improved mobility strategies that are part of SB 375 Sustainable Communities Strategies planning, other land-based strategies that focus on carbon sequestration are a critical component of the State's GHG emissions reduction strategy. At the time of the 2017 Scoping Plan Update development, there was still ongoing work to better quantify this biologically complex sector. As a result, the 2017 Scoping Plan Update did not incorporate a firm target for NWL into the 2030 strategy. Instead, the Plan outlined framing objectives for the sector to:

- Maintain lands as a resilient carbon sink, achieving net zero or negative GHG emissions;
- Minimize net greenhouse gas and black carbon emissions;
- Set a preliminary goal for sequestration and avoided emissions of at least 15–20 $MMTCO_2e$ by 2030 through existing pathways and new incentives; and
- Develop a Natural and Working Lands Implementation Plan.

2. Recent Developments–January through December 2018

The following describes developments in 2018 related to the 2017 Climate Change Scoping Plan Update.

- In 2018, the Board took several actions to improve vehicle emissions and performance, including the following:

- In February, CARB adopted new, more stringent California Phase 2 GHG emission standards for medium- and heavy-duty vehicles and trailers that largely align with the federal Phase 2 GHG standards with some minor differences including allowing CARB to verify and enforce the standards, leading to higher levels of compliance.
- In March, the Board approved funding guidelines for the FARMER Program. The $135 million available will provide funding for harvesting equipment, heavy-duty trucks, tractors, and other equipment used in agricultural operations;
- In May, the Board approved amendments to the Heavy-Duty Vehicle and Smoke Inspection programs that lower the opacity limit for heavy-duty vehicles and establish reporting requirements for the Smoke Inspection Program and smoke tester training requirements; and
- In December, the Board approved Innovative Clean Transit regulation, which requires transit agencies to gradually transition their buses to zero-emission technologies while enhancing services.

- In January 2018, the California Natural Resources Agency (CNRA) and CARB held two webinars to discuss the California Natural and Working Lands Carbon and Greenhouse Gas Model (CALAND) to meet the requirements of SB 859 (Committee on Budget and Fiscal Review, Chapter 368, Statutes of 2016) to establish a carbon accounting framework for NWL.

- In May, the State released the final Forest Carbon Plan[13] which describes goals and related actions to improve overall forest health, enhance carbon storage resilience, increase sequestration, and reduce GHG emissions. The plan also provides principles and policies to guide and support those actions.

- In May, CARB, CNRA, CalEPA, CDFA, and the Strategic Growth Council released the California 2030 Natural and Working Lands Climate Change Implementation Plan Concept Paper and held a public workshop to solicit input on the development of the NWL Implementation Plan and 2030 intervention-based goal for carbon sequestration. From June through August, CNRA, CARB, CDFA, and CalEPA held nine regional public meetings on development of the NWL Implementation Plan. In November, the Board heard an update on the work completed to date on the NWL Implementation Plan. For information on activities related to NWL in the Scoping Plan, see https://arb.ca.gov/cc/natandworkinglands/natandworkinglands.htm.

- In July 2018, CARB approved 2030 GHG planning target ranges for the electricity sector and for each retail electricity provider as required by SB 350. The 2030 electricity sector planning target range, 30–53 MMTCO_2e, was informed by the

[13] http://resources.ca.gov/wp-content/uploads/2018/05/California-Forest-Carbon-Plan-Final-Draft-for-Public-Release-May-2018.pdf

sector range in the 2017 Scoping Plan Update. In September, the Legislature passed SB 100 (De Leon, Chapter 312, Statutes of 2018), which increased the RPS from 50 percent to 60 percent by 2030. CARB, CEC, and CPUC have been working together on the adopted integrated resource plan (IRP) targets which remain valid under the new SB 100 RPS 2030 targets Based on the modeling results from the 2017 Scoping Plan Update analysis, increasing the RPS to 60 percent will narrow the GHG planning target range in 2030 for the electricity sector. The 2017 Scoping Plan Update reflected a doubling of energy efficiency, relative to 2015 levels in these sectors as required by SB 350. CEC leads efforts in this area, and there are a wide range of actions being implemented to achieve the SB 350 mandate to double energy efficiency savings.

- In 2018, utilities continued pursuing robust efforts to reduce energy demand. The CPUC is conducting a proceeding to identify methods to integrate energy efficiency as a resource in utility IRPs.
- In December, the California Building Standards Commission adopted standards for the 2019 California Building Standards Code, which require solar photovoltaic systems for new homes. For the first time, the standards establish requirements for newly constructed healthcare facilities. On the residential side, the standards also encourage demand responsive technologies including battery storage and heat pump water heaters; and improve the building's thermal envelope through high performance attics, walls and windows to improve comfort and energy savings. In nonresidential buildings, the standards update indoor and outdoor lighting making maximum use of LED technology. For residential and nonresidential buildings, the standards enable the use of highly efficient air filters to trap hazardous particulates from both outdoor air and cooking, and improve kitchen ventilation systems.
- Food Production Investment Fund – AB 109 (Ting, Chapter 249, Statutes of 2017) provided $66 million from the GGRF to CEC; of this, $60 million is directed to establish the Food Production Investment Fund that provides grants, loans, or financial incentives to food processors to implement projects that reduce GHG emissions. CEC launched the funding program in 2018 with two primary goals: (1) help replace high energy consuming equipment and systems in the food processing industry with market-ready and advanced technologies and equipment, and (2) accelerate the adoption of state-of-the-art energy technologies that can substantially reduce energy use and costs and the associated GHG emissions.
- State agencies are collaborating via interagency working groups to investigate fuel substitution, green building concepts, and zero emission buildings. The focus over the last decade has been on advancing zero-net-energy buildings, however the focus is now shifting to zero-emission buildings to better integrate buildings with the low carbon electricity grid.
- Passage of AB 3232 (Friedman, Chapter 373, Statutes of 2018) sets a target to reduce building GHG emissions 40 percent below 1990 levels by 2030. Efforts to decarbonize buildings include evaluating electrification of space and water heating and ensuring use of refrigerants with low global warming

potential, in conjunction with intelligently shifting energy consumption to match renewable energy supply. Reducing building-related GHG emissions will facilitate more robust consideration of fuel substitution and low carbon gas supply in addition to traditional approaches to reducing energy demand.

- On September 10, 2018, Governor Brown issued Executive Order B-55-18, which calls for statewide carbon neutrality by 2045. In addition, both the 2018 IPCC 1.5 °C Special Report and U.S. Fourth National Climate Assessment find that global warming of 2 degrees Celsius (°C) above pre-industrial levels poses greater risks than previously believed. The climate will continue to change as a result of emissions over the last couple centuries. Without substantial and sustained global efforts to reduce emissions and to adapt to our new climate, risks to health, livelihoods, food security, water supply, and economic growth increase. Although there are numerous mitigation and adaptation efforts underway, globally and in the United States, the scale and speed of these actions is not considered sufficient to avoid substantial damages. These risks can be substantially reduced by limiting warming to 1.5 °C. Although California's carbon neutrality executive order has yet to be implemented, it is anticipated that it will build on current successes in reducing CO_2 from fossil-fuel combustion, but also emphasizes the need to focus on the State's natural and working lands.

Scoping Plan Litigation. In 2018, there was activity in one court case against CARB challenging content included in the 2017 Scoping Plan Update.

The Two Hundred, et al. v. California Air Resources Board:

In this writ action, filed in April 2018, The Two Hundred, "an unincorporated association of civil rights leaders," requested that the court declare certain elements of the 2017 Scoping Plan Update to be unlawful, and invalidate them. The specific elements petitioners object to include discussion of potential future reductions of vehicle miles traveled, and future per capita GHG emissions reductions necessary to meet California's future GHG emissions reductions target. The lawsuit argues that this non-binding discussion within the 2017 Scoping Plan creates new and unlawful mandates that will exacerbate California's existing housing crisis, and disproportionately harm disadvantaged and minority communities, thus violating federal civil rights law, CEQA, the Administrative Procedure Act, and other laws.

On August 31, CARB filed a demurrer to nine out of eleven of The Two Hundred's claims. After the court sustained CARB's demurrer without leave to amend as to petitioners' conceded ninth cause of action, and sustained the demurrer with leave to amend as to five of petitioners' claims, The Two Hundred filed an amended complaint on November 21, 2018.

3. Upcoming Milestones–January through December 2019

Through 2019, CARB and other lead State agencies will continue to develop and implement recommendations laid out in the 2017 Climate Change Scoping Plan Update, which include the following information that is not covered elsewhere in this report:

- Staff anticipates that the final Draft NWL Implementation Plan will be published in January 2019, and that State agencies will implement the plan by continuing to coordinate the development of quantification approaches, including methods to understand and assess cross-sector interactions. Information collected through implementation of the conservation, restoration, and management activities identified in the Plan will inform the State's next Climate Change Scoping Plan Update.

B. Coordination with Other Entities Outside of California

1. Background

AB 32 requires CARB to:

> "…consult with other states, the federal government, and other nations to identify the most effective strategies and methods to reduce greenhouse gases, manage greenhouse gas control programs, and to facilitate the development of integrated and cost-effective regional, national, and international greenhouse gas reduction programs."

Pursuant to this requirement, and in the spirit of expanding international action to address global climate change, CARB engages with interested jurisdictions outside of California.

CARB works closely with other entities at the local, State, regional, national, and international levels to guarantee that the rigorous standards established by California are understood, and to encourage participation from other jurisdictions. Where other states and nations develop or implement their own GHG emissions reduction programs, CARB seeks committed partners to expand actions that tackle global climate change together. By sharing California's programs, policies, and best practices, other entities can design programs that complement California's efforts.

One focus of CARB's efforts is to work with partner jurisdictions to build an integrated, regional carbon market and expand cost-effective emissions reduction opportunities. These efforts have included developing the administrative support activities managed by WCI, Inc. Another partnership is the linked Cap-and-Trade Program with the Canadian province of Québec.

Like California, Québec has enacted legislative requirements to reduce economy-wide GHG emissions. Each jurisdiction has adopted GHG emissions reduction targets and is

implementing a portfolio of programs, including a comprehensive Cap-and-Trade Program, to meet those targets. Since linkage in 2014, California and Québec have implemented successful Cap-and-Trade programs. Linkage enables compliance instruments to be traded and used interchangeably across the linked programs; expands the market; enhances compliance flexibility for program participants; and allows for centralizing administrative functions, which improves efficiencies and offers the potential to reduce governmental costs. See the Cap-and-Trade Program section of this document for more information.

In collaboration with California and Québec and with support from WCI, Inc., Ontario launched its own Cap-and-Trade Program in July 2016. On January 1, 2018, Ontario linked programs with California and Québec. However, in July 2018, Ontario took official action to rescind its Cap-and-Trade Program and de-link from California and Québec. Ontario no longer has a linked Cap-and-Trade Program with California and Québec.

2. Western Climate Initiative, Inc.

WCI, Inc. is a nonprofit corporation that focuses solely on providing administrative support. WCI, Inc. coordinates administrative services to Cap-and-Trade Programs developed and implemented by states and provinces. In the start of 2018, the Board of Directors for WCI, Inc. included officials from the provinces of Québec, Ontario, and British Columbia, and the State of California. In May 2018, the WCI, Inc. by-laws were amended to include Nova Scotia as a participating jurisdiction and define the methodology for how Nova Scotia will name their Directors. In October 2018, the WCI, Inc. by-laws were amended to remove Ontario as a participating jurisdiction. At the end of 2018, the Board of Directors for WCI, Inc. included officials from the provinces of Québec, Nova Scotia, and British Columbia, and the State of California. The services provided by WCI, Inc. can be expanded to support jurisdictions that join in the future.

WCI, Inc. is solely administrative in nature. All policymaking and regulatory authority for each jurisdiction's program is retained by each jurisdiction. According to the WCI, Inc. bylaws, its administrative activities must "…conform to the requirements of State and Provincial programs…." The requirements are defined by the participating jurisdictions, such that WCI, Inc. must execute its administrative role in conformance with the requirements established by CARB and the other jurisdictions.

Please see Section 4 of this report, which provides the annual update to the Legislature on the activities of WCI, Inc.

3. Federal and State Governments

This section discusses CARB's activities with federal and state governments outside of California. CARB coordinates with state and federal entities that develop similar climate-related programs to ensure that important provisions are as consistent as possible, and to facilitate broadening of policies to other jurisdictions. CARB works

closely with federal agencies including U.S. EPA, the U.S. Department of State, the U.S. Agency for International Development, U.S. CFTC, and FERC on climate change issues.

Federal Government. CARB works with the federal government on multiple efforts, some of which are described here. Accomplishments include the Mandatory GHG Reporting Regulation which is modeled on and periodically updated to maintain consistency with U.S. EPA's GHG reporting rule. The Compliance Instrument Tracking System Service (the market registry and emissions trading system (ETS) for California and Québec's linked Cap-and-Trade Programs) was built in cooperation with U.S. EPA and modeled on the framework used in other ETSs, including the federal Acid Rain Program and the Northeast states' Regional Greenhouse Gas Initiative. CARB also coordinates with U.S. CFTC and FERC to strengthen carbon and related energy market monitoring, oversight, and enforcement.

Another important endeavor CARB has undertaken is compliance with the federal Clean Power Plan. In August 2015, U.S. EPA finalized its first federal limitations on GHG emissions from existing power plants under the federal Clean Air Act, Section 111(d). The final rules, known as the Clean Power Plan, set state GHG targets for 2030 along with an interim target applicable from 2022–2029. U.S. EPA identified the best system of emissions reductions as consisting of an array of efforts already underway in states and the power sector, including efficiency improvements, fuel switching, and use of zero-carbon energy resources that can displace GHG emissions at fossil fuel-fired power plants. For flexibility, states may use these or other measures, including ETSs, to comply with the Clean Power Plan. Each state would be required to submit a federally enforceable plan to attain the federal targets.

State plans were originally due in September 2016, with the possibility of one- to two-year extensions, but these deadlines have been stayed, pending resolution of litigation against the Clean Power Plan. Namely, the Clean Power Plan and the corresponding new source rules have been challenged in federal court, and California has intervened to defend them. Both cases are in abeyance, pending U.S. EPA's proposals to revise the rules. CARB continues to defend the original rules, and is actively participating in U.S. EPA administrative proceedings to urge the continuation of these important programs.

Despite the stay, CARB is planning for compliance. Accordingly, CARB worked with an interagency group to finalize California's compliance plan which the Board approved on July 27, 2017. In summer 2017, CARB submitted California's Clean Power Plan compliance plan to U.S. EPA.

However, in fall 2017, U.S. EPA proposed to repeal the Clean Power Plan. Additionally, in September 2018, U.S. EPA proposed a replacement to the Clean Power Plan with a less protective rule called the Affordable Clean Energy (ACE) Rule. The ACE Rule would replace the more protective framework of the Clean Power Plan with a rule that would only require minor heat rate improvements at coal-fired power plants. The ACE

Rule may even increase GHG emissions because the slight efficiency gains at the plants mean that the plants will be dispatched more often and thereby emit more GHGs.

In response, CARB submitted extensive comments against the proposed repeal rule and the ACE Rule. CARB Board Chair Nichols has provided testimony to the U.S. Senate Committee on Environment and Public Works in support of the plan, and CARB's Executive Office and CPUC executive staff have also provided testimony to FERC in support of the plan.

Nationally, the Clean Power Plan would provide many critical public health benefits, since power plants account for roughly one-third of all domestic GHG emissions. By 2030, U.S. EPA projects that its plan would result in reducing CO_2 emissions from the power sector by 32 percent below 2005 levels nationwide. It would reduce emissions that lead to smog and soot by more than 25 percent, which will improve public health. On the other hand, the ACE Rule would barely decrease emissions compared to a scenario with no regulation at all, and would even lead to emissions increases in certain scenarios. California has therefore opposed the ACE Rule, and is actively supporting the Clean Power Plan in the underlying litigation. The legal and regulatory debate is expected to continue throughout 2019.

Supporting the Clean Power Plan is one of California's efforts to sustain and shape federal policy. CARB has also filed litigation for other programs, as appropriate, to support timely and effective federal action on climate change. CARB has litigated to ensure that federal methane rules for oil and gas sources remain in force, and has filed extensive comments supporting continued rigorous federal programs for stationary and mobile sources. U.S. EPA and CARB routinely coordinate on advanced transportation and fuels, as well. This includes the relationship between the federal Renewable Fuels Standard and the California LCFS, and CARB's work with U.S. EPA and its federal partners to develop ACC.

Other State and Provincial Governments. Some of CARB's work with other state and provincial governments includes sharing insights gained from developing and implementing California's LCFS. In October 2013, Governor Brown signed the Pacific Coast Action Plan on Climate and Energy with Oregon, Washington, and British Columbia. Among other activities, the agreement commits each jurisdiction to reduce GHG emissions by putting a price on carbon, transforming markets for energy efficiency, and adopting or maintaining low carbon fuel standards.

To further these objectives, CARB staff continues to collaborate with staff in British Columbia and Oregon on their low carbon fuel standard programs. CARB staff and Executive Office members have met several times and participated in multiple conference calls with their counterparts within the Pacific Coast Collaborative to discuss the design elements and challenges of a low carbon fuel standard. In 2019, CARB staff plans to engage with representatives from both the Washington state government and the Puget Sound Clean Air Agency to assist them in developing their own program, whether it be at the state or regional level.

4. International

California is working with foreign governments and international coalitions to combat climate change. A central part of AB 32 is the mandate to facilitate global GHG emissions reductions. CARB, in collaboration with California agencies and offices, including the Governor's Office, CalEPA, CEC, and other state agencies, is pursuing these mandates through several strategies, including:

- Development of an effective, efficient, and economic portfolio of emission-reducing policies that can serve as a model for federal and international policy;
- Direct consultation and coordination with other state, federal, and international jurisdictions to help develop their programs; and
- Analysis and advocacy to support federal and international policy regimes that respect and build on California's program.

Internationally, California's successful climate change programs are a model for other jurisdictions to emulate. Our climate efforts (and portfolio approach) to date have demonstrated that working "from the bottom up" is a successful way to achieve GHG emissions reductions. Many other jurisdictions (national and subnational governments alike) have looked to California's portfolio approach as a model for their own climate regimes.

California shares its experiences through both multilateral platforms and over 50 bilateral agreements. The most prominent results of our bilateral engagement have been through MOU and Declarations of Intent with China, Mexico, the European Union, and subnational governments signed onto the Under2 Coalition.

CARB also participates in several international initiatives and multilateral coalitions to support and motivate climate action, including the 38-member Governors' Climate and Forest Task Force, the International Zero-Emission Vehicle Alliance, the World Bank's Partnership for Market Readiness, and the International Carbon Action Partnership.

In June 2017, when the Trump Administration announced its intent to withdraw from the Paris Agreement, California co-founded the U.S. Climate Alliance and the America's Pledge effort. California also signed onto the "We Are Still In" Coalition. CARB's engagement through these three politically-geared platforms allows California to reassure the international community that, despite the Trump Administration's posture on climate, California is leading progress towards our decarbonized economy.

In addition to the above efforts, CARB hosts many delegations from around the world each year at its facilities in Sacramento and El Monte. Activity has increased since 2013 due to the State's continued support for international collaboration and CARB's continued leadership in air quality and climate change. During 2018, CARB received 91 foreign delegations to discuss climate change policies, including delegations from China, France, Japan, and South Korea, among others. This section outlines CARB's

global influence and international partnerships and initiatives to reduce GHG emissions, and strengthen California's ability to compete in the global economy.

Global Climate Action Summit and Paris Agreement. In September 2018, California Governor Jerry Brown, United Nations (UN) Special Envoy for Climate Action Michael Bloomberg, Executive Secretary of the UN Framework Convention on Climate Change Patricia Espinosa, Chairman of the Mahindra Group Anand Mahindra, Chinese Special Representative on Climate Change Xie Zhenhua, and UN Special Envoy for Youth Jayathama Wickramanayake held a Global Climate Action Summit in San Francisco in support of the Paris Agreement. The Summit generated over 500 commitments to additional climate action from leading subnational jurisdictions, businesses, cities, investors and civil society. CARB was heavily involved in the planning and execution of the Summit. CARB also offered technical expertise to several important reports that were launched at the Summit. Those include the Annual Report from the U.S. Climate Alliance (as mentioned above) and the Phase II Report of America's Pledge. Governor Brown, as co-chair of both efforts, was instrumental in their success.

Under2 Coalition. The Under2 Coalition is a global community of subnational governments publicly committed to long-term deep decarbonization and support of the Paris Agreement. The coalition brings together signatories of the Subnational Global Climate Leadership Memorandum of Understanding, or "Under2 MOU." On May 19, 2015, California entered into the Under2 MOU with Baden-Württemberg, Germany; Acre, Brazil; Catalonia, Spain; Wales, United Kingdom; and several Mexican states and Canadian provinces. Central to the agreement is that all signatories agree to reduce their GHG emissions 80 to 95 percent, or limit emissions to 2 metric tons CO_2e per capita, by 2050. The Under2 Coalition is comprised of more than 220 governments, representing over 1.3 billion people and 43% of the global economy. Members of the Under2 Coalition meet regularly to exchange knowledge and best practices, and to build capacity. CARB is providing technical expertise to knowledge exchanges facilitated by the Under2 Coalition.

México. California has advanced several strategic national and international partnerships, including an MOU with México. This MOU, which was signed by the Governor in México City on July 28, 2014, provides for cooperation on climate change and the environment. The MOU is a four-year effort with four priority action areas: climate change, air quality, wildfires, and clean vehicles. CARB is the California lead for three of the four workgroups that are organizing the work under the MOU: climate change, air quality, and clean vehicles.

Climate change work between California and México is largely implemented through the Climate Change Working Group of the Climate Change and Environment MOU. Over the course of the MOU, the Climate Change Working Group (Group) made great strides toward meeting the MOU goals of discussing rigorous monitoring, reporting, and verification framework to support emissions trading systems (ETS), sharing experiences in developing climate change programs that also enable economic growth, and advancing the important role of forestry in addressing climate change through information sharing. The technical exchange largely took place through regularly scheduled calls and periodic in-person workshops in Sacramento (2015, 2018) and in México (2016, 2017). The inclusion of Québec on the biweekly call starting in 2017 enabled the Group to have deeper discussions on the technical requirements that were necessary for harmonization between jurisdictions in a linked ETS.

To support the development of México's national ETS, the Group continued to dedicated time in 2018 on topics that are critical to designing a robust ETS. The Group also shared progress made on broader climate change policies and program implementation in California and México. Following a successful ETS simulation that took place in October 2017, the Méxican Congress amended the General Law on Climate Change to align the legal framework with the National Determined Contribution and establish the legal basis for a mandatory national ETS. México aims to begin a three-year long ETS pilot phase in 2020. The pilot phase is expected to cover large industrial facilities, petroleum and natural gas systems, petroleum refining, electricity generation, and other stationary combustion sources. The coverage threshold is 100,000 metric tons CO_2 per data year.

CARB continued to engage with the Méxican National Forestry Commission (CONAFOR) on México's National Strategy to Reduce Emissions from Deforestation and Forest Degradation (ENA-REDD+). CONAFOR has been an integral part of the Climate Change Working Group discussions and a driving force in advancing the role of forestry and indigenous engagement related to climate change. Through the regularly scheduled calls, CONAFOR kept the Group informed of its forestry policy efforts throughout México. CARB and CONAFOR also exchanged information on California's forestry offsets protocol under the Cap-and-Trade Program, as well as the potential for international sector-based offset crediting under California's Program. In 2018, the discussions focused on approaches and requirements to effectively structure subnational programs within the national climate policy framework.

Through the MOU, the Group had built solid relationships and gained understanding of the policy choices that each jurisdiction had to consider, and to appreciate the challenges that were shared or unique to each jurisdiction in developing and implementing effective climate change programs. While the term of the MOU ended in July 2018, the Group values this multi-year collaboration and has agreed to continue holding discussions.

The air quality workgroup continues to coordinate air quality planning efforts for airsheds along the California-México border. This coordination includes sharing technical knowledge and information and improving the comparability of data collected in California and México. The clean vehicles workgroup aims to improve Mexican vehicle emissions standards for criteria pollutants and GHGs to align with U.S. standards, and also to advance México's compliance and enforcement of vehicle standards.

China. Governor Brown, CARB, and other agencies including CalEPA and CEC have also been working with several entities in China to advance efforts to reduce GHG emissions and combat air pollution. China has become the world's leading emitter of GHG emissions and, as such, is a critical partner in addressing global climate change. At the same time, many cities in China are suffering from hazardous air pollution, some of which drifts across the ocean to California. Sharing California's leading expertise on reducing air pollution can provide benefits to China, California, and the global climate.

In November 2017, China launched a national GHG ETS after launching local ETS programs in seven cities and provinces in 2013. CARB has participated in many meetings with officials from the National Development and Reform Commission, several provincial governments, consultants, and university researchers regarding the design of China's provincial pilot ETS programs and to discuss details of California's Cap-and-Trade Program. In January 2018, CARB participated in a forum in Huzhou, China to discuss ETS and international carbon markets.

CARB also continued to support the goals of California's MOUs with China for clean air collaboration. California's clean car and truck policies, including ZEVs, are having a significant positive influence on China's policies. At the national level, China is looking to California for cutting-edge requirements for car diagnostics and policies that promote zero emission vehicles like California's ZEV plans. At the provincial level, Beijing has moved its programs even closer to those in California by adopting our vehicle emissions standards and a number of other progressive environmental regulations.

In 2018, California signed an MOU with the Chinese Ministry of Environment and Ecology to strengthen collaboration on climate change and the environment. Pursuant to this MOU, CARB hosted 56 meetings with delegates from various provinces and government agencies in China, including Qindao Government, Beijing Environmental Protection Bureau, China Automotive Technology and Research Center, China Ministry of Ecology and Environment, and the Chinese Research Academy of Environmental Sciences. These visits covered a wide range of issues, including emissions reduction measures and trading systems, ZEVs, and policy framework for mitigating pollution. In 2018, CARB focused on supporting existing MOUs and work with the Governor's Office to engage Chinese provincial delegations in the 2018 Global Climate Action Summit.

The European Union. The European Union (EU) ETS covers approximately 45 percent of EU GHG emissions in some 31 countries, has been in operation since 2005, and is set to deliver a reduction of 43 percent in EU emissions from the covered sectors by

2030. In September 2018, California and the EU confirmed their view that greater alignment of carbon markets is in the interests of both. Aligning carbon markets could maximize and leverage climate action for economic transformation while ensuring real progress on reducing GHG emissions. In addition, both emphasized the need to engage other jurisdictions with similar and emerging programs to foster broader dialogue.

In 2019, officials from the EU and California will increase the frequency of conversations, including on principles for alignment and the role of carbon pricing in the following areas: sending near- and long-term investment signals for transformative technologies, addressing economic competitiveness, and maximizing public benefits of program revenues use. These officials also agreed to review, assess, and report on progress in these exchanges in twelve months.

Governors' Climate and Forests Task Force. The Governors' Climate and Forests Task Force (GCF) is a subnational partnership aimed at designing jurisdiction-wide programs that reduce deforestation, benefit local communities, and protect the climate. The GCF commenced in 2008–2009, and now includes 38 states and provinces from around the world including Brazil, Colombia, Ecuador, Indonesia, Ivory Coast, México, Nigeria, Peru, Spain, and the United States. A majority of its members are also signatories of the Under2 MOU. In 2018, California and the Méxican states of Campeche, Quintana Roo, and Yucatán, cohosted the 10th Annual Meeting of GCF in San Francisco.

CARB continues to engage in discussions with governmental agencies outside of California to share information and experiences about the design of programs aimed to reduce emissions from deforestation and forest degradation, and to evaluate whether and how such programs could potentially be included in California's Cap-and-Trade Regulation in the future.

In September 2018, CARB released a draft California Tropical Forest Standard, which specifies criteria to assess jurisdictional sector-based offset crediting programs that reduce emissions from tropical deforestation for immediate use by jurisdictions across the globe that are taking action to reduce GHG emissions from tropical deforestation as well as potential future inclusion within a Cap-and-Trade Program. While CARB did not adopt the draft California Forest Standard in its December 2018 public hearing, the Board plans to consider the item in 2019. CARB will continue to coordinate and exchange information with GCF partners in 2019.

Partnership for Market Readiness. CARB has also participated in meetings of the Partnership for Market Readiness (PMR), a multilateral World Bank initiative that brings together more than 30 developed and developing countries to share experience and build capacity for climate change mitigation efforts, particularly those implemented using market instruments. CARB became a Technical Partner of PMR in November 2014 and has continued to participate and support the activities organized by PMR.

International Carbon Action Partnership. Recognizing that many efforts around the world are underway to use market forces to motivate GHG emissions reductions, California worked with more than 15 other government leaders to establish the International Carbon Action Partnership (ICAP) in 2007. ICAP provides a forum for sharing experiences and knowledge among jurisdictions that have already implemented or are actively pursuing market-based GHG programs. CARB will serve as a co-chair of ICAP in 2019.

International Zero-Emission Vehicle Alliance. In August 2015, California launched the International Zero-Emission Vehicle Alliance (ZEV Alliance) with the Netherlands and Québec to accelerate global adoption of ZEVs. By January 2019, the alliance had grown to include 16 members: Baden-Wurttemberg, British Columbia, Germany, Netherlands, Norway, Québec, United Kingdom, California, Connecticut, Maryland, Massachusetts, New York, Oregon, Rhode Island, Vermont, and the State of Washington. In alignment with the Paris Agreement, the ZEV Alliance announced a goal to make all passenger vehicle sales in their jurisdictions ZEVs as quickly as possible and no later than 2050. The ZEV Alliance also participated in the Conference of Parties 23 in Bonn, Germany, highlighting the importance of ZEVs for climate mitigation. Each year, the ZEV Alliance selects several focus areas for in-depth exchange, webinars, and best practices reports. Accomplishments include 13 published research papers, 8 webinars, 4 in-person assemblies, broad communication and outreach with other key international groups, and regular monthly member calls. CARB plays a key role in the ZEV Alliance on policy and technical matters.

Low Carbon Fuels. In 2018, CARB staff continued supporting Oregon's implementation of their Clean Fuels program by sharing the updates to the LCFS Data Management System (LRT-CBTS and AFP) with the Oregon program. Staff also continued to engage with the governments of Canada and Brazil to explain the LCFS provisions and help them make decisions regarding implementation details of their own federal programs. Staff participated in a conference call with a German delegation to share general information on California's LCFS Program.

In 2019, CARB staff plans to engage with representatives from both the Washington state government and the Puget Sound Clean Air Agency to assist in developing their own LCFS program, whether it be at the state or regional level. Staff will also continue to engage with representatives from Oregon as they implement their program; and with Canada and Brazil as they develop their programs.

Climate and Clean Air Coalition. California became the first subnational (state) to join the Climate and Clean Air Coalition (CCAC) in 2018. CCAC is the UN body that tackles short-lived climate pollutants. Given California's leadership and effective programs on short-lived climate pollutants, CCAC has invited CARB to engage with many other partners addressing emissions from methane, black carbon, and hydrofluorocarbons.

C. SB 375: Sustainable Communities and Climate Protection Act

1. Background

SB 375 (Steinberg, Chapter 728, Statutes of 2008), also known as the Sustainable Communities and Climate Protection Act, focuses on incentivizing regional and local planning and building in ways that bring people and destinations closer together, with low carbon, alternative, and convenient ways to get around. Regions across the State have responded by creating Sustainable Communities Strategies (SCS) and characterizing the many benefits SCS implementation would bring to their regions, including the following: improved public health, more mobility and housing choices, lower housing and transportation costs, increased accessibility to daily destinations, natural resource and farmland conservation, social equity, lower building energy and water use, and economic opportunities.

SB 375 directs California's 18 Metropolitan Planning Organizations (MPO), which comprise 98 percent of the State's population, to develop and incorporate SCSs into their federally mandated Regional Transportation Plans. These SCSs must align transportation, housing, and land use decisions to achieve GHG emissions reduction targets set by CARB, if implemented. Plan development requires information sharing between cities, counties, and local transportation agencies within a region on important land use decisions, housing, infrastructure investments, transportation, and environmental programs. An SCS balances these elements to achieve the climate and community benefits mentioned above.

CARB is required to adopt targets for each of the State's MPOs every 8 years, with an optional update every 4 years. The original targets were set in 2010 following an 18-month-long collaborative process that involved input from the Regional Targets Advisory Committee, MPOs, and numerous other stakeholders. More information is on the Regional Planning Targets webpage at https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets.

SB 150: Tracking Regional Progress. SB 150 (Allen, Chapter 646, Statutes of 2017) requires CARB to prepare a report to the Legislature starting in 2018, and every four years thereafter, to discuss progress related to SB 375 implementation. This report must assess progress toward meeting the regional GHG emission reduction targets, provide data-supported metrics about the strategies used to meet the targets, identify best practices and challenges to achieving greater reductions, and discuss the impact of State policies and funding.

Sustainable Communities Research Contracts. CARB provides funding for several research projects that support land use and transportation planning. Contracts currently underway include research to identify indicators that can track progress of meeting goals in SB 375 and research on the travel patterns and vehicle miles traveled of residents in affordable housing in transit-oriented developments.

More details on these research projects as well as information on completed and future research may be found at https://ww2.arb.ca.gov/research/research-land-use-and-transportation-planning.

2. Recent Developments–January through December 2018

- In January and February of 2018, CARB staff conducted a set of workshops in Fresno, Los Angeles, Sacramento, and San Diego, to present revisions on the *Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets* staff report, which contained proposed GHG emissions reduction targets for each MPO. In March 2019, CARB staff published the *Updated Final Staff Report on the Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets* on the regional GHG emission reduction targets. At the March Board Meeting, CARB adopted the proposed update to the SB 375 GHG emissions reduction targets and environmental analysis.

- In March 2018, CARB updated the SB 375 regional GHG emissions targets for the first time since the program's inception. Those targets were increased for most of the MPOs, and the Board also directed staff to shift the way the SB 375 program and SCSs are evaluated. The goal of this new approach is to place greater attention on the strategies, key actions, and investments committed, and ensure that MPOs continue to innovate, while emphasizing implementation and accountability. These programmatic changes are now being incorporated into new SCS Program and Evaluation Guidelines. More details on the SCS Program and Evaluation Guidelines may be found at https://ww2.arb.ca.gov/resources/documents/scs-evaluation-resources.

- In March 2018, UCLA completed a CARB-funded sustainable communities research project that identifies indicators for tracking progress of goals in SB 375. In addition to identifying indicators and the data needed to construct them, UCLA piloted the indicators for Los Angeles County to test the calculation process and compare the results with other empirical data. The California Department of Transportation (Caltrans) is currently funding the complementary Phase 2 portion of this project, which will scale up the work from Phase 1 to the statewide level.

- In April 2018, CARB staff solicited input on draft data metrics from the public to inform the *2018 Progress Report on California's Sustainable Communities and Climate Protection Act* as directed by SB 150. The bill requires CARB to prepare a report to the Legislature starting in 2018, and every four years thereafter, that discusses regional changes in GHG emissions, as well as best practices and challenges to achieve greater GHG reductions under SB 375. This report used data-supported metrics to assess progress, and the effect of State policies and funding programs.

- In June 2018, CARB staff conducted a set of workshops regarding the development of the *2018 Progress Report on California's Sustainable Communities and Climate*

Protection Act as directed by SB 150 and updated *SCS Program and Evaluation Guidelines* in San Diego, Los Angeles, Fresno, and Sacramento. The *SCS Program and Evaluation Guidelines* include information on how the SCS evaluations are conducted, and what information and data from the MPOs are necessary to make a determination on whether the SCS, if implemented, would meet the GHG emissions reduction targets.

- In November 2018, as directed by SB 150, CARB staff published the *2018 Progress Report on California's Sustainable Communities and Climate Protection Act*. The report concludes that California is not on track to meet GHG emissions reductions expected under SB 375, based on CARB's analysis of 24 data-supported indicators and interviews with MPOs, state agencies, local governments, academics, industry experts, and advocates. The report highlights over 60 regional best practices and other important progress that has been made, such as the passage of SB 1 (Beall, Chapter 5, Statutes of 2017). Through consultation with MPOs and other affected stakeholders, it also identifies eight challenge areas for SCS implementation. California will not achieve the necessary GHG emissions reductions to meet mandates for 2030 and beyond without significant changes to how communities and transportation systems are planned, funded, and built. The report outlines the need for structural changes and additional work by all levels of government to achieve state climate goals and the other important public health, equity, economic, mobility, housing, and other benefits that SB 375 SCSs are expected to deliver. To meet this challenge, it offers suggestions on ways to overcome these challenges. More details including the SB 150 Report, may be found at https://ww2.arb.ca.gov/sites/default/files/2018- 11/Final2018Report_SB150_112618_02_Report.pdf. In December 2018, CARB staff presented the findings of the report at the second Joint CARB/California Transportation Commission (CTC) meeting.

- In December 2018, CARB staff published a draft of the *SCS Program and Evaluation Guidelines* report and held a workshop in Sacramento presenting the report to kick-off the public comment period.

- During 2018, CARB staff worked with 13 MPOs whose SCSs were being updated to review and approve for adoption. CARB's Executive Officer accepted GHG determinations for four affected MPOs on behalf of the Board.

- During 2018, UC Davis began work on a CARB-funded sustainable communities research project that assess the emission impact of connected and automated vehicle deployment in California. This project will continue through 2019.

- The Regional Transportation Plan/SCS updates occur on a rolling four-year schedule. By the end of 2018, 17 MPOs adopted their second SCS, and 1 more is working on its second SCS. CARB is currently in the process of receiving the data needed from the MPOs for review and approval. CARB has accepted the GHG quantifications for 8 MPOs' second SCSs. All four of the major MPOs (located in the

Southern California Area, San Diego, San Francisco Bay Area, and Sacramento) are currently developing their third SCS subject to the 2018 targets.

3. Upcoming Milestones–January through December 2019

As each MPO adopts a new SCS, CARB staff evaluates the plan to determine whether the SCS, if implemented, would achieve the GHG emissions reduction targets. CARB periodically reports to the Board on these actions. More information on staff's activities and upcoming meetings can be found at https://www.arb.ca.gov/cc/sb375/sb375.htm.

- In January 2019, the public comment period on the *SCS Program and Evaluation Guidelines* will close. CARB staff will incorporate comments into the draft and will release an updated version of the document in March.

- In February and March, the UC Davis Institute of Transportation Studies, in consultation with CTC, will hold roundtable discussions across California on the transition to innovative mobility options. The purpose of these roundtables is to develop a plan to guide these innovations toward the public interest.

- At the March 2019 Board Meeting, CARB staff will present an informational update on CARB response to the *2018 Progress Report on California's Sustainable Communities and Climate Protection Act* findings.

- In April, staff will hold a public workshop around the updated *SCS Program and Evaluation Guidelines* and publish the final *SCS Program and Evaluation Guidelines* toward in November.

- In April, CARB will continue its joint meetings with CTC to coordinate achieving California's transportation and air quality goals. Areas of focus will include each agency's efforts to address the findings from the *2018 Progress Report on California's Sustainable Communities and Climate Protection Act* and freight topics.

- In July 2019, San Luis Obispo Council of Governments intends to adopt its second SCS. Thereafter, CARB will review the SCS for approval.

- Between June and August 2018, the eight MPOs within the San Joaquin Valley—Fresno Council of Governments, Kern Council of Governments, Kings County Association of Governments, Madera County Transportation Commission, Merced County Association of Governments, San Joaquin Council of Governments, Stanislaus Council of Governments, and Tulare County Association of Governments—adopted their second SCSs. The San Joaquin Valley MPOs will continue working on completing their data submittal to CARB staff for review and approval.

- During 2019, Shasta Regional Transportation Agency plans to complete its second SCS data submittal to CARB staff for review and approval.

- Through a CARB funded contract, UC Berkeley is expected to complete its final report on assessing the travel demand and co-benefit impacts of affordable transit-oriented developments in 2019.

- Through contracts funded by CARB, UCLA will kick-off a research project which will investigate a screening method and map for evaluating transportation access disparities and other built environment related social determinants of health along with a UC Berkeley research project which will explore estimating induced travel from capacity expansions on congested corridors.

- CARB staff will continue to engage with the California Department of Housing and Community Development, CTC, Caltrans, and the Strategic Growth Council on SB 1 transportation funding, recent housing bills, and GGRF revenues appropriated for SCS program implementation, to help enable GHG emissions reductions, along with numerous community and environmental co-benefits.

D. California Climate Investments: Cap-and-Trade Auction Proceeds

1. Background

A portion of the allowances required for compliance with the Cap-and-Trade Regulation are sold at quarterly auctions and reserve sales. The auctioned allowances are a mix of State-owned allowances, Québec-owned allowances, and allowances consigned to auction by publicly owned and investor-owned utilities. The proceeds from the sale of State-owned allowances are deposited into the GGRF, for appropriation by the Governor and Legislature, to invest in projects that support the goals of AB 32 and subsequent related legislation. These projects are known as California Climate Investments. Strategic investment of proceeds furthers AB 32 implementation and supports long-term, transformative efforts to improve public and environmental health and develop a clean energy economy.

State-Owned Allowances: In 2012, the Legislature passed and Governor Brown signed into law three bills—AB 1532 (Pérez, Chapter 807, Statutes of 2012), SB 535 (De León, Chapter 830, Statutes of 2012), and SB 1018—that established that the GGRF will receive the State's portion of the auction proceeds. Subsequent legislation, such as AB 398 and AB 1550 (Gomez, Chapter 369, Statutes of 2016), modifies existing requirements and identifies priorities for investments. This legislation also provided the framework for how those auction proceeds will be allocated, by establishing broad categories of GHG emission-reducing projects that may be funded, including investments in:

- Clean and efficient energy;
- Low-carbon transportation;
- Natural resource conservation and management and solid waste diversion; and
- Strategic planning and sustainable infrastructure.

In addition to reducing GHG emissions in California, the implementing legislation established the following goals for this funding, where applicable and feasible:

- Maximize economic, environmental, and public health benefits;
- Create jobs;
- Complement efforts to improve air quality;
- Invest in projects that benefit disadvantaged communities;
- Provide opportunities for businesses, public agencies, nonprofits, and others to participate in efforts that reduce GHG emissions; and
- Lessen the impacts and effects of climate change.

AB 398 reauthorizes the State's Cap-and-Trade Program through 2030 and also identifies legislative priorities for allocating auction revenue proceeds, to include but not be limited to:

- Air toxic and criteria air pollutants from stationary and mobile sources;
- Low- and zero-carbon transportation alternatives;
- Sustainable agricultural practices that promote transition to clean technology, water efficiency, and improved air quality;
- Healthy forests and urban greening;
- Short-lived climate pollutants;
- Climate adaptation and resiliency; and
- Climate and clean energy research.

AB 1550 modifies the existing disadvantaged community investment requirements in SB 535, and provides new investment targets for low-income households and communities. SB 535 required at least 25 percent of program funding be directed to projects that provide benefits to disadvantaged communities and at least 10 percent of program funding be spent on projects located in disadvantaged communities. Under the AB 1550 investment requirements, at least 35 percent of the available monies for California Climate Investments must be allocated as described below:

- Allocate a minimum of 25 percent to projects located within the boundaries of, and benefiting individuals living in, disadvantaged communities;[14]
- Allocate an additional minimum 5 percent to projects that benefit low-income households or to projects located within the boundaries of, and benefiting individuals living in, low-income communities located anywhere in the State; and
- Allocate an additional minimum 5 percent to projects that benefit low-income households that are outside of, but within ½-mile of, disadvantaged communities, or to projects located within the boundaries of, and benefiting individuals living in, low-income communities that are outside of, but within ½-mile of, disadvantaged communities.

[14] "Disadvantaged Communities" must still be determined in accordance with SB 535's statutory requirements, per Health and Safety Code Section 39711.

AB 1532 established a two-step process for allocating proceeds from the sale of State-owned allowances. The two-step process involves developing an investment plan and then appropriating the funds through the annual Budget Act, in accordance with that investment plan.

1. *Three-Year Investment Plan*: The Department of Finance, in consultation with CARB and other State agencies, develops and submits to the Legislature a three-year Cap-and-Trade Auction Proceeds Investment Plan (Investment Plan). This Investment Plan identifies priority programs for investment of proceeds to support the State's GHG emissions reduction goals. The Department of Finance submitted the first three-year Investment Plan in May 2013, and the second in January 2016. The Investment Plans can be accessed at http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/investmentplan.htm.

2. *Annual Budget Appropriations:* Funding is appropriated by the Legislature and Governor through the annual Budget Act, consistent with the Investment Plan.

Funds are appropriated to State agencies through the annual Budget Act and continuous appropriations enacted by SB 862 (Committee on Budget and Fiscal Review, Chapter 36, Statutes of 2014). SB 862 requires 60 percent of GGRF monies to be appropriated each year, beginning in FY 2015–16, to High Speed Rail, affordable housing and sustainable communities, transit capital projects, and low carbon transit operations. The first appropriations in FY 2013–14 provided over $70 million from the GGRF. Subsequent appropriations in FY 2014–15 included over $860 million, and set in motion a significant expansion of existing programs that provide GHG emissions reductions and further the objectives of AB 32. The Legislature and Governor appropriated almost $1.7 billion in FY 2015–16, more than $1.1 billion in FY 2016–17, $1.5 billion in FY 2017–18, and $1.5 billion in FY 2018–19. Recent appropriations have created a suite of new programs across the investment sectors.

Total appropriations, as of January 1, 2019, are listed in Table 1-2. Prior to expending funds, each department must complete an Expenditure Record pursuant to SB 1018. CARB reviews these expenditure records and posts them online at https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/expenditurerecords.htm.

Table 1-2: Appropriations for Greenhouse Gas Reduction Fund Programs (as of January 1, 2019)			
Administering Agency	**Program**	**2018–19 ($M)**	**Total ($M)**
Transportation and Sustainable Communities			
California Air Resources Board	Agricultural Equipment	$112	$197
	Community Air Protection	$290	$556
	Low Carbon Transportation	$462	$1,725
Department of Transportation	Active Transportation Program	--	$10
	Low Carbon Transit Operations Program*	5%	$379
High Speed Rail Authority	High Speed Rail*	25%	$2,023
State Transportation Agency	Transit and Intercity Rail Capital Program*	10%	$869
Strategic Growth Council	Affordable Housing and Sustainable Communities*	20%	$1,452
	Sustainable Agricultural Lands Conservation[15]		$103
	Climate Research	$18	$29
	Technical Assistance	$2	$4
	Transformative Climate Communities	$40	$190
Clean Energy and Energy Efficiency			
California Air Resources Board	Woodsmoke Reduction	$3	$8
Department of Community Services and Development	Low-Income Weatherization Program	$10	$202
Department of Food and Agriculture	Alternative Renewable Fuels	--	$3
	State Water Efficiency and Enhancement Program	--	$66
Department of Water Resources	State Water Project Turbines	--	$20
	Water-Energy Grant Program	--	$50
Energy Commission	Renewable Energy in the Agricultural Sector	$4	$10
	Food Production Investment	$64	$124
	Transportation Technology and Fuels	$13	$13

[15] The Strategic Growth Council determines what portion of their 20 percent continuous appropriation will be allocated to the Sustainable Agricultural Lands Conservation program.

Table 1-2 (continued): Appropriations for Greenhouse Gas Reduction Fund Programs (as of January 1, 2019)			
Administering Agency	**Program**	**2017–18 ($M)**	**Total ($M)**
Natural Resources and Waste Diversion			
Coastal Conservancy, Coastal Commission, San Francisco Bay Conservation and Development Commission	Climate Ready and Coastal Resilience Programs	$6	$11
Conservation Corps	Training and Workforce Development Program	$14	$24
Department of Fish and Wildlife	Wetlands and Watershed Restoration	$5	$47
Department of Food and Agriculture	Dairy Methane	$99	$260
	Healthy Soils	$5	$13
Department of Forestry and Fire Protection	Wildfire Protection and Forest Health	$28	$105
	Prescribed Fire	$25	$25
	Sustainable Forests (Urban and Community Forestry and Forest Health)	$160	$457
Department of Resources Recycling and Recovery	Waste Diversion	$25	$137
Natural Resources Agency	Regional Forest Health	$20	$20
	Urban Greening Program	$20	$126
Office of Emergency Services	Wildfire Response and Readiness	$25	$50
Wildlife Conservation Board	Climate Adaptation and Conservation Easements	--	$20
Total Program Funding		**60% + $1,453**	**$9,332**

*These agencies are continuously appropriated a percentage of revenue from each quarterly auction pursuant to SB 862. The actual dollar amounts are not known until after the quarterly auctions close. The total amount shown reflects auctions held through 2018.

CARB is responsible for the fiscal management of the GGRF, while the Legislature and Governor authorize these expenditures through legislation. Table 1-3 shows the proceeds deposited into the GGRF from the auctions (from the sale of California-owned allowances), including the auctions held jointly with the Canadian province of Québec and, for the February and May 2018 auctions only, with the Canadian province of Ontario.

Table 1-3: Proceeds from the Sale of State-Owned Allowances Deposited in the Greenhouse Gas Reduction Fund (as of January 1, 2019)	
November 2012 Cap-and-Trade auction 1	$55,760,000
February 2013 Cap-and-Trade auction 2	$83,923,548
May 2013 Cap-and-Trade auction 3	$117,580,484
August 2013 Cap-and-Trade auction 4	$138,494,503
November 2013 Cap-and-Trade auction 5	$136,799,446
February 2014 Cap-and-Trade auction 6	$130,706,470
May 2014 Cap-and-Trade auction 7	$71,140,023
August 2014 Cap-and-Trade auction 8	$98,741,583
November 2014 Cap-and-Trade joint auction 1 (Québec)	$135,983,387
February 2015 Cap-and-Trade joint auction 2 (Québec)	$629,516,452
May 2015 Cap-and-Trade joint auction 3 (Québec)	$626,534,995
August 2015 Cap-and-Trade joint auction 4 (Québec)	$645,330,534
November 2015 Cap-and-Trade joint auction 5 (Québec)	$656,779,307
February 2016 Cap-and-Trade joint auction 6 (Québec)	$516,987,990
May 2016 Cap-and-Trade joint auction 7 (Québec)	$10,036,672
August 2016 Cap-and-Trade joint auction 8 (Québec)	$8,387,910
November 2016 Cap-and-Trade joint auction 9 (Québec)	$364,310,763
February 2017 Cap-and-Trade joint auction 10 (Québec)	$8,163,884
May 2017 Cap-and-Trade joint auction 11 (Québec)	$511,052,645
August 2017 Cap-and-Trade joint auction 12 (Québec)	$642,137,265
November 2017 Cap-and-Trade joint auction 13 (Québec)	$862,813,992
February 2018 Cap-and-Trade joint auction 14 (Québec & Ontario)	$726,603,479
May 2018 Cap-and-Trade joint auction 15 (Québec & Ontario)	$681,619,980
August 2018 Cap-and-Trade joint auction 16 (Québec)	$798,153,505
November 2018 Cap-and-Trade joint auction 17 (Québec)	$812,970,072
State Auction Proceeds Total	**$9,470,528,889**

2. Recent Developments–January through December 2018

Activities related to Cap-and-Trade Auction Proceeds in 2018 are provided below.

Electric Distribution Utility and Natural Gas Utility Auction Proceeds:

- For utility auctions held through the end of November 2018, investor-owned utilities received a total of $5.5 billion, and publicly owned utilities received a total of $815 million, from the sale of allocated allowances.

- Investor-owned electric utilities continued to provide a credit to ratepayers on utility bills as part of implementing the CPUC decision pursuant to SB 1018. This credit appears on utility bills twice per year, in April and October. Information on the California Climate Credit is available at: http://www.cpuc.ca.gov/climatecredit/.

State-Owned Allowance Auction Proceeds:

- In March, the Department of Finance submitted the *2018 Annual Report to the Legislature on Cap-and-Trade Auction Proceeds.* Each year the Department of Finance is required to submit an annual report to the Legislature on the status and outcomes of the investment of Cap-and-Trade Auction Proceeds, referred to as California Climate Investments, pursuant to AB 1532. Past reports can be found at http://www.caclimateinvestments.ca.gov/. Developed by CARB, the report describes the status of funded programs. It also provides estimates of the GHG emissions reductions expected from project investments and provides key statistics on benefits to disadvantaged and low-income communities and households, demand for funding, and the leveraging of additional funding sources.

- In June, CARB started reporting data on a semi-annual basis. CARB works with administering agencies to collect and compile data on project outcomes. These data are used to update an online project map and project list to provide information to the public on the status and outcomes of implemented California Climate Investments projects. The online project map is available at https://webmaps.arb.ca.gov/ccimap/. Summary statistics on outcomes are also available on the Administration's Climate Investments page at http://www.caclimateinvestments.ca.gov/. Cumulative outcomes as of May 2018 are shown in Figure 1.

- In June, the Legislature and Governor enacted SB 840 (Committee on Budget and Fiscal Review, Chapter 29, Statutes of 2018) and SB 856 (Committee on Budget and Fiscal Review, Chapter 30, Statutes of 2018), which appropriated FY 2018–19 funds to administering

agencies. The appropriations directed funding to existing programs, continued funding for fire prevention activities within State Responsibility areas, and created new programs, including: the Regional Forest Health program administered by California Natural Resources Agency, the Low-Carbon Fuels Program administered by California Energy Commission, and the Prescribed Fire Program administered by CAL FIRE. In September 2018, the Legislature and Governor enacted SB 901 (Dodd, Chapter 626, Statutes of 2018), which revised the FY 2018–19 State Budget to specify that two separate appropriations, one for $165,000,000 and one for $35,000,000, shall be made in each Budget Act through the 2023–24 fiscal year from the GGRF to CAL FIRE for investments in forest health, fire prevention, and fuel reduction. SB 901 also established a wildfire smoke monitoring program to be administered by CARB.

- In June, CARB finalized 8 co-benefit assessment methodologies to quantify the additional co-benefits beyond GHG emissions reductions to individuals, households, businesses, and communities that come from California Climate Investments. Co-benefit assessment methodologies are posted on CARB's website at www.arb.ca.gov/cci-cobenefits.

- In June, CARB executed a contract to design, develop, and implement a set of web-based tools that automate existing quantification methodologies.

- In July, CARB Board approved the release of the *2018 Funding Guidelines for Agencies Administering California Climate Investments* (Funding Guidelines) and supplementary materials, including guidance for providing benefits to priority population and reporting requirements. CARB develops Funding Guidelines in its statutory role to provide guidance for agencies receive appropriations from the GGRF. In 2018, CARB updated the Funding Guidelines in response to legislation passed in 2017 that provided new direction and signaled a shift in prioritizing programs that achieve multiple benefits, particularly for vulnerable communities. As part of the development of the Funding Guidelines, CARB staff participated in 13 public events in 8 cities across the State attended by over 500 people, held a public workshop with a webcast and audio in English and Spanish, received 51 comment letters, and held dozens of meetings with community representatives and advocates. The Funding Guidelines and supplementary materials are available at www.arb.ca.gov/cci-fundingguidelines.

- On December 27, CARB submitted the Draft Cap-and-Trade Auction Proceeds Third Investment Plan (Third Investment Plan) to the Department of Finance. The Third Investment Plan recommends that the Legislature continue to invest in existing programs and prioritize programs that have a community focus, achieve near-term climate and health benefits, and contribute to long-term transformation to low-carbon communities and ecosystems that are adaptable and resilient. The Third Investment Plan also emphasizes the importance of providing funding certainty over multiple years for programs to better support Legislative priorities. CARB received feedback during two public workshops, a CARB Board hearing in November 2018, and

digitally as part of two public comment periods. In total, there were 34 in-person and 25 webcast attendees across the workshops and over 60 comments were submitted digitally. The Third Investment Plan is currently available at https://ww2.arb.ca.gov/resources/documents/cci-investment-plan.

- CARB is responsible for providing the quantification methodologies to estimate GHG emissions reductions from projects receiving auction proceeds. To date, CARB has developed over 35 quantification methodologies for programs or subprograms. Additional work on quantification methodologies is ongoing. Completed quantification methodologies are posted on CARB's website at www.arb.ca.gov/cci-quantification.

- CARB's contract with the Foundation for California Community Colleges (FCCC) continued to support agency outreach efforts statewide in order to raise awareness, build partnerships, utilize resources, and strengthen community capacities to successfully apply for GGRF funds. FCCC continued its development and maintenance of outreach materials, including a California Climate Investments website, a telephone hotline, a social media campaign, a newsletter, and printed materials for each agency's programs in English and Spanish. CARB and FCCC have been attending two to five community meetings each month to educate the general population on opportunities and community benefits of auction proceeds.

3. Upcoming Milestones–January through December 2019

- CARB staff will continue to collect information from administering agencies on the status and outcomes of California Climate Investments projects and release this information publicly through an online project map and project list.

- CARB will compile data collected from agencies to develop the 2018 *Annual Report to the Legislature on Investments of Cap-and-Trade Auction Proceeds*, scheduled for release in March 2019.

- CARB staff will continue to work with administering agencies, outside experts, and academic partners to develop and/or update project-level quantification methodologies to capture additional information on environmental, public health, and economic benefits of the California Climate Investments projects.

- CARB staff will continue to work with contractors and administering agencies to expand and enhance outreach activities across the State with an emphasis on disadvantaged communities, low-income communities, and low-income households.

E. Minimizing Community Health Impacts from Freight

1. Background

The trucks, locomotives, ships, harbor craft, aircraft, cargo handling equipment, and transport refrigeration units (TRU) that carry and move freight in California are significant sources of air pollution. Freight transport equipment and associated facilities such as ports, rail yards, airports, freeways, distribution centers, and border crossings contribute over 6 percent (and growing) of the GHG emissions in the State, as well as a significant portion of the black carbon emissions that also contribute to climate change. Currently, freight equipment accounts for about half of the statewide diesel particulate matter emissions, and approximately 45 percent of the statewide NOx emissions.

California's freight transport system has already successfully undergone major improvements toward shared efficiency and environmental objectives. Proposition 1B, passed by voters in 2006, provided almost $20 billion in funding for California's transportation infrastructure, with over $2 billion dedicated to the improvement of the State's freight network and $1 billion in funding for cleaner freight vehicles and equipment. Local and regional groups such as seaport commissions and metropolitan planning organizations are also taking action to improve freight operations. Large seaports have adopted Clean Air Action Plans, and many regional planning organizations have adopted regional freight plans that prioritize infrastructure improvements and improve land use to better operationalize logistics activities in their region. Industry has made substantial investments to transition its mostly diesel-fueled freight equipment to cleaner models, while refineries retooled to produce cleaner fuels. These approaches have enabled CARB, industry, and State, local, and federal agency partners to reduce harmful air pollution from freight-related activities.

Despite this progress, California needs to transform the freight transport system to further reduce the localized health risk around freight facilities, meet State and federal air quality standards, and achieve long-term climate goals. Without further action, the cancer risk to residents living near major freight hubs will remain elevated.

In 2013, CARB launched the Sustainable Freight effort to develop a sustainable freight strategy for California. CARB staff conducted outreach with freight industry representatives; local, State and federal government agencies; and community and environmental advocates to discuss the need for transformation and to seek input on a collaborative process throughout 2014. CARB staff participated in over 180 individual meetings and conference calls with over 220 organizations representing local, State, national, and international interests to identify, prioritize, and discuss various concepts that will move California towards a sustainable freight transport system.

In 2014, CARB also began technology assessments to evaluate the current state and projected development over the next five to ten years of mobile source technologies and fuels. These technology and fuels assessments support State-level planning and regulatory efforts, including State Implementation Plan (SIP) development, CARB's

mobile source control program, and the sustainable freight discussion document discussed below.

In April 2015, CARB staff released the *Sustainable Freight Pathways to Zero and Near-Zero Discussion Document* (Discussion Document), which sets out CARB's vision of a clean freight system, together with the immediate and near-term steps that CARB will take to support use of zero and near-zero emissions technology. Caltrans and CEC completed complementary planning activities. Caltrans focused on infrastructure needed to help develop a California Freight Mobility Plan and to meet new federal directives for freight planning, while CEC updated the Integrated Energy Policy Report (IEPR) to provide policy recommendations regarding resource conservation; environmental protection; maintenance of a reliable, secure, and diverse energy supply; and statewide economic enhancement.

On July 17, 2015, Governor Brown issued Executive Order B-32-15, which directs the secretaries of Transportation, Environmental Protection, and Natural Resources to lead other relevant State departments including CARB, Caltrans, CEC, and the Governor's Office of Business and Economic Development to improve freight efficiency and transition to zero emission technologies while continuing to support California's economy.

In July 2016, the multi-agency State partners published the *California Sustainable Freight Action Plan* (Action Plan). The Action Plan is an unprecedented effort, identifying State policies, programs, and investments to establish a high-level vision that achieves the targets specified in Executive Order B-32-15. It provides recommendations and broad direction for a high level vision, intended to integrate investments, policies, and programs across several State agencies. The Action Plan will help to realize a singular vision for California's freight transport system that serves our State's transportation, environmental, and economic interests. The plan is informed by existing State agency strategies, including the California Freight Mobility Plan, the Discussion Document, and CEC's IEPR, as well as broad stakeholder input.

In 2017, CARB adopted the 2016 State Strategy for the State Implementation Plan for Federal Ozone and PM2.5 Standards. CARB's 2012 *Vision for Clean Air: A Framework for Air Quality and Climate Planning* showed that meeting ozone health-based standards and climate goals will require similar transformative emissions reduction strategies. The success of the SIP will depend on a successful transition of the current California freight system to one with zero or near-zero emissions over the long-term.

This broad coalition of interests is needed to develop a California vision for a sustainable freight transport system, define the system changes (logistics, infrastructure, equipment) needed to implement the vision, secure support and public/private funding, and build/deploy the system. This approach offers the potential to help meet the State's air quality, climate, energy, and economic needs with a clean freight system that aligns with and supports a competitive logistics industry and associated jobs.

2. Recent Developments–January through December 2018

CARB activities in 2018 related to freight included the following:

- Throughout 2018, CARB funding programs accelerated the transition from older freight equipment and vehicles to cleaner options. Funding to support these activities was provided by the Volkswagen settlement, Proposition 1B, Low Carbon Transportation Air Quality Improvement, and Carl Moyer funding programs.

- In February, CARB held public outreach meetings to discuss how to minimize community health impacts from seaports, railyards, warehouses/distribution centers, and other freight hubs. Transitioning to a less-polluting, more efficient, modern freight transport system is essential to meet our public health mandates, climate goals, and economic needs.

- In March, CARB staff updated the Board on proposed additional actions to develop a range of actions to promote cleaner combustion technologies, including the introduction of near-zero emission technology, and to accelerate use of zero emission technologies. These actions include amendments to CARB rules for commercial harbor craft, cargo handling equipment, and drayage trucks to transition those sources to zero- or near-zero emission operation, and potential new rules for rail yards and locomotive emissions. In addition, CARB staff will develop a freight handbook that identifies best practices for the siting, design, construction, and operation of freight facilities.

- In May, CARB staff released the Draft Technology Assessment: Ocean-Going Vessels (OGVs) that provides an assessment of the current and projected development of technologies over the next five to ten years that can be used to reduce emissions from OGVs.

- In 2018, CARB staff held public workshops to discuss draft regulatory concepts for the At Berth and At Anchor Regulation, and released several documents for public comment.

- In summer 2018, CARB held informal stakeholder meetings to gather information on regulatory concepts for transitioning to zero emission technologies for transport refrigeration units.

- In June and August, CARB staff held public workshops and convened workgroups to discuss concepts and provide an overview of potential regulatory concept to accelerate the deployment of zero-emission airport ground support equipment.

3. Upcoming Milestones–January through December 2019

Throughout 2019, CARB will propose concepts and continue development of a group of new actions, including regulations that require equipment owners and facility operators to participate in the transition to zero-emission operations. Staff will continue to support any air district's facility based measures, advocate for stricter federal standards for trucks and locomotives and international standards for ships, work to protect communities near freight facilities, and support the goals of the Community Air Protection Program established under AB 617.

The 2019 actions below are in addition to the truck and fuel regulations that are summarized in the Scoping Plan and the LCFS sections of this document.

- CARB staff will finalize regulatory concepts and seek approval of the At Berth and At Anchor Regulation that will protect the communities near the ports and reduce the exposure to criteria pollutants and toxic air contaminants. In 2019, CARB staff released the Draft 2018/2019 update to Inventory for OGVs: Methodology and Results. Staff will hold additional workgroup meetings and workshops to solicit feedback from the community, ship owners and operators, ports and terminals and other stakeholders. In advance of Board consideration, CARB staff will release, for public comment, the formal regulatory proposal.

- CARB staff will hold public workshops to discuss regulatory concepts supporting the transition to zero emission operations for TRUs, in 2019.

- CARB staff will convene workgroups focused on the development of a freight handbook document that identifies best practices for the siting, design, construction, and operation of freight facilities to minimize community exposure to air pollution, incorporate the use of zero emission technologies, install any needed fueling/charging infrastructure, and maximize the capacity of freight transportation infrastructure.

- CARB staff will continue to participate in the San Pedro Bay Ports' development of gate rates that assist in the transition to zero and near-zero heavy-duty trucks operating at the ports.

- CARB funding programs will continue to replace older freight equipment and vehicles through the Volkswagen settlement, Proposition 1B, Low Carbon Transportation Air Quality Improvement, and Carl Moyer funding programs, which will collectively achieve further emissions reductions of fine particulate matter ($PM_{2.5}$), reactive organic gases, GHGs, and NO_X.

- The Mobile Source Strategy contains a measure to increase deployment of zero-emission ground support equipment, by methods to include incentives, MOU regulation, or a combination thereof. Select airport ground support equipment categories are proposed to be included a new Clean Off-Road Equipment voucher

incentive program that will begin in 2019. Staff continues to work with stakeholders to develop a comprehensive strategy to accelerate the use of zero-emission technologies at airports. The Board hearing is tentatively in 2020 for this item.

III. GREENHOUSE GAS EMISSIONS AND REDUCTIONS

CARB periodically updates estimates of GHG emissions in California, which change over time as the science advances, national and international accounting methodologies are updated, growth forecasts are revised, and California makes progress in reducing emissions. CARB and international climate change organizations use the scientifically established GWP values developed by IPCC in its Fourth Assessment Report, which includes updated GWP values for GHGs.[16] CARB expresses the emissions of all GHGs in terms of CO_2e, which factor in how long the GHG remains in the atmosphere and how strongly it absorbs energy relative to carbon dioxide.

For the First Update to the Scoping Plan, approved in May 2014, CARB adjusted the 2020 statewide GHG emissions limit[17] based on the updated GWP values from the IPCC Fourth Assessment Report and the level of 1990 GHG emissions. As a result, the 2020 emissions limit is 431 $MMTCO_2e$.

In the First Update, CARB estimated that 2020 emissions would be 509 MMT of CO_2e in a "business as usual" (BAU) scenario, without the State's intervention to reduce GHGs. Consequently, CARB estimated that California would need to reduce its emissions by 78 $MMTCO_2e$ in 2020 to stay under the 431 $MMTCO_2e$ limit. Based on analyses in the 2017 Scoping Plan Update, CARB updated the forecasted 2020 BAU GHG emissions to 416 $MMTCO_2e$, indicating that California will likely meet the AB 32 GHG emission target of 431 $MMTCO_2e$ in advance of 2020.

CARB updated its GHG inventory in 2018, with data for 2016 GHG emissions. In 2016, emissions from routine GHG emitting activities statewide were 429 MMTCO2e, 12 $MMTCO_2e$ lower than 2015 levels. This puts total emissions just below the 2020 target of 431 $MMTCO_2e$. Emissions vary from year-to-year depending on the weather and other factors, but California will continue to implement its greenhouse gas emissions reductions program to ensure the state remains on track to meet its climate targets in 2020 and beyond.[18] A decade of successful climate programs is already providing lower-carbon fuel, cleaner cars, trucks and buses, more renewable energy,

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[16] The initial Scoping Plan relied on the IPCC's 1996 Second Assessment Report to assign the GWPs of GHGs. In accordance with the UNFCCC, international climate agencies have agreed to use the GWP values in the IPCC's Fourth Assessment Report that was released in 2007. These more recent GWP values incorporate the latest available science and are therefore regarded as more accurate than the prior values.

[17] In 2010, CARB conducted a 2020 BAU scenario that used GWP values from the IPCC's Second Assessment Report. In this version, the BAU estimate was 507 $MMTCO_2e$ and the 2020 emissions limit was 427 $MMTCO_2e$, requiring a reduction of 80 $MMTCO_2e$ by 2020.

[18] For more information, see the *2000-2016 GHG Emissions Trends Report*, published with the 2018 GHG inventory update, at https://www.arb.ca.gov/cc/inventory/data/data.htm.

and more efficient homes and appliances. In addition, these emissions reductions are keeping California on track to meet the 2030 Target of 260 $MMTCO_2e$ while setting the State's economy on a trajectory to achieve greater GHG emissions reductions needed to limit global temperature rise below 2 degrees Celsius in this century.

CARB maintains and updates the statewide GHG emission inventory to track California's progress toward its statewide emissions limits. When the 2020 statewide emissions limit was first developed in 2008, the target was quantified using statewide, top-down data. As AB 32 programs are implemented and data are collected directly from those programs, CARB incorporates the data directly into the GHG inventory process to track progress towards meeting the State's 2020 emissions limit. The same applies to the 2030 statewide emissions limit. As the State develops and implements the 2017 Scoping Plan Update measures, CARB will collect and incorporate data from those programs into the GHG emission inventory process.

CARB currently estimates that GHG emissions in 2030 will be 389 $MMTCO_2e$ in a BAU scenario without further State action to reduce GHGs. To meet the 2030 Target of 260 $MMTCO_2e$, the climate programs must reduce emissions by 129 $MMTCO_2e$ in 2030.

Table 1-4 shows the GHG emissions reductions expected to result from the 2017 Scoping Plan Update measures in order to meet the SB 32 goal.

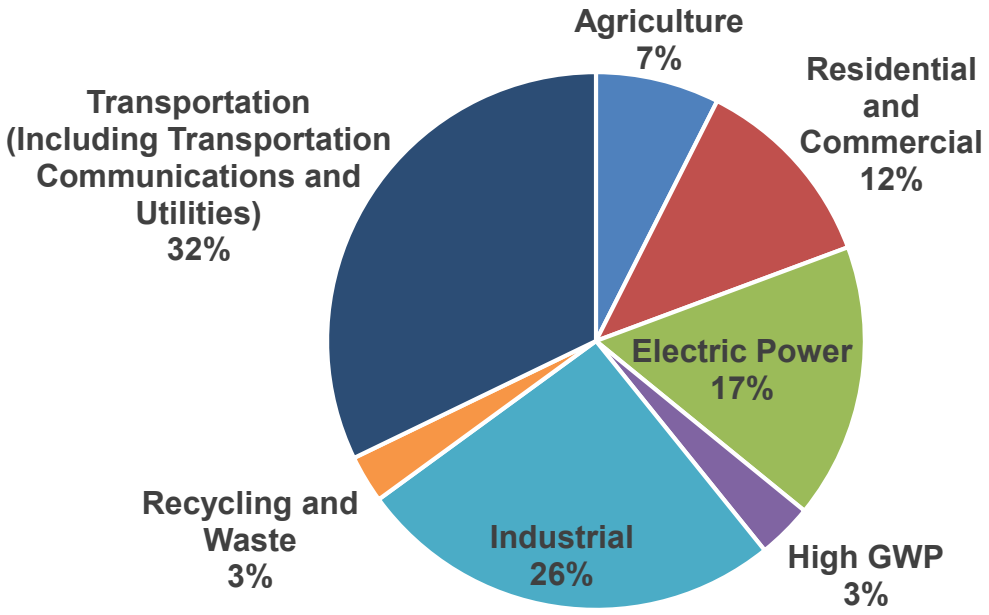
Table 1-4: Forecasted 2030 Emissions Reductions

Category	**2030 GHG Emissions ($MMTCO_2e$)****
SB 32 Baseline 2030 Forecast Emissions (2030 BAU)	389
Expected Reductions from Sector-Based Measures	
Agriculture	12
Residential and Commercial	3
Electric Power	9
High GWP	18
Industrial	6
Recycling and Waste	2
Transportation	19
Cap-and-Trade Program	60*
2030 Emissions Limit	260

*Cap-and-Trade Program emissions reductions depend on the emission forecast.
**Based on forecast from 2017 Climate Change Scoping Plan Update.

Figure 2 shows forecasted 2030 GHG emissions by economic sector.[19,20] This forecast assumes that the 2030 Target is achieved. The economic sectors include agriculture, residential and commercial, electric power, high GWP gases, industrial, waste, and transportation.

Figure 2
Forecasted 2030 Greenhouse Gas Emissions By Sector
With Adopted Regulations and Programs



In allocating resources to its GHG emissions reduction programs, CARB seeks to prioritize programs that are likely to achieve the greatest reductions.

[19] The 2030 emissions by economic sector are estimated based on the reductions expected from the measures described in the 2017 Climate Change Scoping Plan Update.
[20] The 2017 Climate Change Scoping Plan Update model (PATHWAYS) includes transportation communications and utilities under the Transportation sector for purposes of forecasting 2030 GHG emissions in the Scoping Plan scenario. For more information see https://www.arb.ca.gov/cc/scopingplan/comparison_graphs_6cases101817.xlsm.

SECTION 2:

ANNUAL AB 32 FISCAL REPORT
(Fiscal Year 2017–18: July 2017–June 2018)

This report is required annually by the Supplemental Report of the 2012–13 Budget[21] to quantify the major revenues and expenses for CARB to implement the AB 32 program for the prior fiscal year (FY). This report focuses on FY 2017–18, and summarizes funds received from the AB 32 Cost of Implementation Fee and overall resources to implement AB 32, followed by CARB expenses for the AB 32 program as a whole, with breakdowns by specific major program area. More information on Cap-and-Trade Auction Proceeds is in its own part in Section 1 of this report.

I. FY 2017–18 FUNDS RECEIVED AND EXPENDED

This element of the report covers the FY 2017–18 funds received related to AB 32 implementation, as well as the FY 2017–18 funds expended by CARB to support activities that provide climate benefits.

Structure and Funding for Regulatory Activities. The resources estimated in this section of the report are used to support all activities that provide a climate benefit, whether as the primary objective or as a co-benefit. CARB's resources to support the climate program exceed the amount budgeted exclusively for AB 32 activities that are funded by the AB 32 Cost of Implementation Fee. CARB relies on other funding sources, and the specific source is related to the activity for two reasons.

First, CARB has several measures and program areas that were originally designed to achieve other air quality goals and rely on different funding sources, but nonetheless provide a climate co-benefit by simultaneously reducing GHG emissions. Although the

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[21] "Each year, beginning January 10, 2013, CARB shall provide the Legislature an AB 32 fiscal report. This annual report is to be retrospective and is intended to quantify the major revenue and CARB expenses for the AB 32 program for the prior fiscal year. The scope of the annual fiscal report should include: the AB 32 cost of implementation fee revenue, loans repaid, and overall AB 32 program expenses (staff, operations, and contracts) for the prior fiscal year; the total cap-and-trade auction funds; a summary of CARB AB 32 expenditures; the balance for the prior fiscal year; and allowance auction prices in order to assess trends. The annual fiscal report should include an update on activities and findings of the Market Surveillance Committee, as well as track and detail all expenses and revenues, including the following categories: all AB 32 costs, all cap-and-trade costs, low-carbon fuel standards, Renewable Portfolio Standards, Green Building strategy, and Landfill methane capture." -*Supplemental Report of the 2012–13 Budget Package*: http://www.lao.ca.gov/reports/2012/supp_report/supp_report_2012_052013.pdf.

GHG emissions reductions associated with these other measures are counted towards the State's AB 32 targets and considered as part of the climate program, those activities may not necessarily be solely funded by the AB 32 Cost of Implementation Fee. For example, the At-Berth Regulation rule was initiated to reduce the community health risk from ship pollution, but the rule also provides substantial GHG co-benefits associated with using shore-based electrical power rather than burning fuel in onboard engines when the ships are in port.

Second, CARB's regulatory program has grown and evolved to address the agency's responsibilities under State and federal law to improve air quality at the local, regional, and global levels. CARB adopts, implements, and enforces regulations focused on meeting several different objectives:

- Reducing criteria pollutants such as ozone and PM2.5 to meet health-based air quality standards in each region;
- Reducing the localized health risk from air toxics (such as benzene, hexavalent chromium, and diesel particulate matter); and
- Reducing GHG and short-lived climate pollutant emissions that contribute to global climate change.

Although the statutory foundation for each of these regulatory programs is distinct, to the extent feasible, CARB looks to develop regulations and comprehensive programs that meet two or more of these objectives simultaneously. This approach enables CARB to use resources most efficiently and benefits industry by providing a consolidated set of requirements.

A. AB 32 Cost of Implementation Fee for FY 2017–18

The expenditure of funds that support AB 32 programs at multiple agencies is established in the California Budget Act, and is referred to in the AB 32 Cost of Implementation Regulation as "required revenue." The AB 32 Cost of Implementation Regulation required revenue for FY 2017–18 is $70,500,000. Table 2-1 displays the Cost of Implementation Fee appropriations from the FY 2017–18 budget for State agencies authorized to use the AB 32 Cost of Implementation Account.

Table 2-1: AB 32 Cost of Implementation Fee Appropriations (FY 2017–18)		
Department	**Positions**	**Funding**
California Air Resources Board	204.1	$50,247,000
Department of Food and Agriculture	9	$1,862,000
Department of Forestry and Fire Protection	3	$385,000
Department of Housing and Community Development	1	$189,000
Department of Public Health	0	$358,000
Department of Resources Recycling and Recovery	12	$1,238,000
Department of Water Resources	3	$374,000
Energy Resources Conservation and Development Commission	39.5	$9,060,000
Governor's Office of Business and Economic Development	1	$227,000
Office of Environmental Health Hazard Assessment	3	$665,000
Secretary for Environmental Protection	4	$1,153,000
Secretary of the Natural Resources Agency	1	$934,000
FI$CAL Information Systems of CA (State Controller)	0	$65,000
Statewide General Administrative (Pro Rata)	0	$3,204,000
State Water Resources Control Board	2	$539,000
Total Appropriations and Adjustments	**285.5**	**$70,500,000**

Please note, the actual number of positions filled at each agency may vary. Funding amount includes all personnel costs including travel, as well as contracts and overhead.
Source: Enacted Budget Act for FY 2017–18. See the FY 2017–18 Cost of Implementation, Air Pollution Control Fund Condition Statement at http://www.ebudget.ca.gov/2017-18/pdf/Enacted/GovernorsBudget/3890/3900.pdf

Adjustments are made to the required revenue to account for any over- or under-collections from the previous fiscal years. Adjustments include discrepancies between agency positions and funding amount. This could range from an under-collection due to differences in the timing of payments to contractors and salary adjustments made after the total required revenue is determined, to an over-collection due to unfilled positions. Other adjustments include those made to invoices such as refunds or additional fees collected that occur for various reasons including, but not limited to, late discovery of misreporting of fee-covered emissions or billing errors. CARB corrects for these adjustments in subsequent year billings.

Table 2-2 shows the total required revenue, along with updated information on the regulatory fees collected for FY 2017–18, from the Budget Act for FY 2017–18. The

value of $1,981,000, listed in Table 2-2 below as "Total Adjustments," is the amount needed to fully meet the total required revenue. Total adjustments are made to the required revenue in subsequent billing cycles. The balance is likely due to unfilled vacancies from recently approved positions. The balance was subtracted from the required revenue to get the total required revenue.

Table 2-2: Total AB 32 Cost of Implementation Fee Expenses and Revenue For All Agencies (FY 2017–18)	
Total department expenditures (required revenue)	$70,500,000
Total adjustments	($1,981,000)
Total required revenue	**$68,519,000**
Fee Revenue Collected for FY 2017–18	**$68,229,000**

Explanations: For total required revenue and fee revenue collected, CARB relied on internal accounting records. All dollars are rounded to the nearest thousand.
Source: Enacted Budget Act for FY 2017–18. See the Cost of Implementation, Air Pollution Control Fund Condition Statement at http://www.ebudget.ca.gov/2017-18/pdf/Enacted/GovernorsBudget/3890/3900.pdf

B. Overall CARB FY 2017–18 Resources to Implement AB 32

Table 2-3 shows the actual FY 2017–18 expenditures for climate change programs, for CARB only. Contract expenditures include both paid costs and encumbrance balances. Total resources expended also include a pro rata cost of $3,204,000. Pro rata charges are a form of overhead, and are defined in the State Administrative Manual (SAM) 8754 as "the sharing of central service costs by funds other than the General Fund and the Central Service Cost Recovery Fund." SAM 8753 defines central service costs as "amounts expended by central service departments and the Legislature for overall administration of state government and for providing centralized services to state departments."

Original fee appropriations for CARB are listed in Table 2-1 above, and the adjusted appropriations for CARB are listed in Table 3-5.

Table 2-3: Overall FY 2017–18 Expenditures that Support AB 32 *For CARB Only*	
Category	**Funding**
Personnel and operations expenses* (salary, benefits, overhead, equipment, travel, training)	$50,008,000
Contract expenditures (includes encumbered funds)	$4,825,000
Pro rata	$3,204,000
Total Resources	**$58,037,000**

Explanations: For contract expenses, CARB relied on its records of actual and encumbered expenditures. All dollars are rounded to the nearest thousand.
*Approximately $2.2 million in funding for personnel and operations expenses other than the AB 32 Cost of Implementation Account (3237) funds were used to support AB 32 activities. These funds were transferred from the Public Utilities Commission Utilities Reimbursement Account General Fund (0462), Oil, Gas, and Geothermal Administrative Fund (3046), and Air Pollution Control Fund (0115).
Source: Personnel and operations expenses are obtained from manual monthly tracking reports submitted by CARB staff.

C. Program-Specific CARB FY 2017–18 Resources to Implement AB 32

1. Data Sources and Methodology

Historically, CARB has tracked AB 32 programs and activities to implement AB 32 in totality, not at the level of individual regulations. To comply with all mandates (State laws, regulations, and policies on fiscal programs), CARB uses the CALSTARS system, which is the State's accounting system.

In response to requests by the Legislature to see more detailed information regarding the costs to implement AB 32, CARB has committed to manually track and report on AB 32 expenditures for personnel, operations, and contracts for the major elements of the climate program. CARB began collecting information on hours worked in specific AB 32 program areas from all affected employees beginning with the October 2013 pay period. On July 1, 2015, CARB employees began tracking hours worked using specific task codes for major program areas. Starting with the 2016 Fiscal and Resource Reports, CARB is reporting on the Climate Change Program (Fund 3510), of which the majority is appropriated from the Cost of Implementation Account (Fund 3237) but also includes appropriations from other funds that support climate change activities. These include the Air Pollution Control Fund (0115), Public Utilities Commission Utilities Reimbursement Account (Fund 0462), and Oil, Gas, and Geothermal Administrative Fund (3046). Climate change programs may also receive funding from other sources that target criteria and toxic air pollutants and also reduce GHGs, and non-GHG short-lived climate pollutants.

2. Retrospective Resources by Program Area

Table 2-4 shows actual resources used to support CARB's AB 32 programs with a climate benefit, during FY 2017–18.

Table 2-4: CARB Expenditure of Funds in FY 2017–18 for Program Activities that Support AB 32

AB 32 Program Area	Personnel & Operations Expenses	Contract Dollars Expended	Total by Program Area
Air Quality Data Analysis	$164,000		$164,000
Air Quality Monitoring	$808,000		$808,000
Cap-and-Trade Program	$6,787,000	$38,000	$6,825,000
Economic Analysis	$742,000		$742,000
Emissions Testing	$795,000		$795,000
Emission Inventory Development and Emission Factors	$1,095,000		$1,095,000
Enforcement of GHG Reduction Measures	$1,566,000	$100,000	$1,666,000
Industry & Electricity (includes Energy)	$1,350,000		$1,350,000
Laboratory Analysis	$364,000	$63,000	$427,000
Landfill Methane	$1,932,000	$179,000	$2,111,000
Low Carbon Fuel Standard (LCFS)	$8,287,000	$169,000	$8,456,000
Mandatory Reporting Regulation (MRR)	$1,271,000	$460,000	$1,731,000
MRR & LCFS Data Certification and Verification	$1,301,000		$1,301,000
Oil/Gas Operations*	$1,119,000	$50,000	$1,169,000
Other AB 32 Activities	$8,238,000	$198,000	$8,436,000
Research	$3,709,000	$203,000	$3,912,000
SB 1371 (Leno, Chapter 525, Statutes of 2014) (Natural Gas Leakage)*	$188,000		$188,000
SB 375	$2,576,000	$55,000	$2,631,000
Scoping Plan	$1,321,000	$150,000	$1,471,000
Short-Lived Climate Pollutants*	$1,204,000	$160,000	$1,364,000
Western Climate Initiative	$5,191,000	$3,000,000	$8,191,000
Total	**$50,008,000**	**$4,825,000**	**$54,833,000**

Explanations: For contract expenses, CARB relied on its records of actual and encumbered expenditures. All dollars are rounded to the nearest thousand. Other AB 32 support activities include environmental justice and AB 32 Fee Regulation. Allocated costs, including those for overhead, are included for each program listed above. Table does not include pro rata of $3,204,000.

Source: Personnel and operations expenses are obtained from manual monthly tracking reports submitted by CARB staff under the Climate Change Program (Fund 3510).

*Approximately $2.2 million in funding for personnel and operations expenses other than the AB 32 Cost of Implementation Account (3237) funds were used to support AB 32 activities. These funds were from the Public Utilities Commission Utilities Reimbursement Account General Fund (0462), Oil, Gas, and Geothermal Administrative Fund (3046), and Air Pollution Control Fund (0115).

SECTION 3:

ANNUAL REPORTS ON AB 32 RESOURCES

(Fiscal Year 2017–18: July 2017–June 2018 and Fiscal Year 2018–19: July 2018–June 2019)

Item 3900-001-0001 California Air Resources Board Supplemental Report of the 2012−13 Budget[22] requires quantification and detailing of CARB's resources to implement AB 32, prospectively and retrospectively. The prospective report covers the current FY 2018–19. The retrospective report focuses on FY 2017–18 and therefore includes some of the same material previously presented in Section 2: Annual AB 32 Fiscal Report. This report quantifies AB 32 Cost of Implementation Fee appropriations and overall CARB resources to implement AB 32, followed by CARB resources for the AB 32 program as a whole, with breakdowns by specific major program area. For information on Cap-and-Trade Auction Proceeds, see page 48 of this report.

Structure and Funding for Regulatory Activities. The resources estimated in this report are those used to support activities that provide a climate benefit, whether as the primary objective or as a co-benefit. CARB's resources to support the climate program exceed the amount budgeted exclusively for AB 32 activities that are funded by the AB 32 Cost of Implementation Fee. CARB relies on other funding sources; the specific source is related to the activity for two reasons.

First, CARB has several measures and program areas that were originally designed to achieve other air quality goals and rely on different funding sources, but nonetheless provide a climate co-benefit by simultaneously reducing GHG emissions. Although the GHG emissions reductions associated with these other measures are counted towards achieving the AB 32 targets and are considered part of the climate program, those activities may not necessarily be fully funded by the AB 32 Cost of Implementation Fee. For example, the At-Berth Regulation was initiated to reduce the community health risk from ship pollution, but the rule also provides substantial GHG co-benefits associated

[22] In addition, CARB shall provide two resource reports each year to the Legislature that quantify the CARB AB 32 staffing and operations expenses and CARB contracts by major AB 32 program area. First, CARB shall provide a prospective resource report with anticipated expenses each year by January 10. Second, CARB shall provide a retrospective resource report each year on or before January 10. The scope of the resources reports is to include the CARB resources (staffing, operations, and contracts) that were used to support major AB 32 program areas (Cap-and-Trade Program, Low Carbon Fuel Standard, Cost of Implementation Fee, and the AB 32 Scoping Plan Update). In addition, CARB is to provide an estimate of the combined resources for the other climate change-related activities (implementation of adopted regulations and coordination with other agencies).

with using shore-based electrical power rather than burning fuel in onboard engines when the ships are in port.

Second, CARB's regulatory program has grown and evolved to address the agency's responsibilities under State and federal law to improve air quality at the local, regional, and global levels. CARB adopts, implements, and enforces regulations focused on meeting several different objectives:

- Reducing criteria pollutants like ozone and PM2.5 to meet health-based air quality standards in each region;
- Reducing the localized health risk from air toxics (like benzene, hexavalent chromium, and diesel particulate matter); and
- Reducing the GHG and short-lived climate pollutant emissions that contribute to global climate change.

Although the statutory foundation for each of these regulatory programs is distinct, to the extent feasible, CARB looks to develop regulations and comprehensive programs that meet two or more of these objectives simultaneously. This approach enables CARB to use its resources most efficiently and benefits industry by providing a consolidated set of requirements.

I. AB 32 PROSPECTIVE RESOURCE REPORT FOR FY 2018–19

The FY 2018–19 State Budget approved CARB to use up to $83,616,000 from the AB 32 Cost of Implementation Fund to support AB 32 climate change programs. CARB also expects to rely on other sources of funding for activities that provide a climate co-benefit.

A. AB 32 Cost of Implementation Fee for FY 2018–19

Table 3-1 displays the Cost of Implementation Fee appropriations from the Budget for State agencies authorized to use the AB 32 Cost of Implementation Fee revenue during this FY. Supplemental pension payments are a new California Public Employees' Retirement fund contribution enacted under Senate Bill 84 (Committee on Budget and Fiscal Review, Chapter 50, Statutes of 2017). The AB 32 Cost of Implementation required revenue for FY 2018–19 is $83,616,000.

Table 3-1: AB 32 Cost of Implementation Fee Appropriations (FY 2018–19)		
Department	**Positions**	**Funding**
California Air Resources Board	205.4	$52,708,000
Department of Food and Agriculture	9	$1,940,000
Department of Forestry and Fire Protection	3	$393,000
Department of Housing and Community Development	1	$200,000
Department of Public Health	0	$358,000
Department of Resources Recycling and Recovery	12	$1,395,000
Department of Water Resources	3	$396,000
Energy Resources Conservation and Development Commission	39.5	$18,940,000
Financial Information System for California	0	$7,000
Governor's Office of Business and Economic Development	1	$227,000
Office of Environmental Health Hazard Assessment	4.5	$996,000
Secretary for Environmental Protection	4	$1,181,000
Secretary of the Natural Resources Agency	1	$278,000
State Water Resources Control Board	2	$539,000
Statewide General Administrative (Pro Rata)	0	$3,454,000
Supplemental Pension Payments	0	$604,000
Total Expenditures and Adjustments	**294**	**$83,616,000**

Please note, the actual number of positions filled at each agency may vary. Funding amount includes all personnel costs including travel, as well as contracts and overhead. The $7,000 in funding allocated to the FI$CAL Information Systems of CA (State Controller) is not included in the total.
Source: Enacted Budget Act for FY 2018–19. See the Cost of Implementation, Air Pollution Control Fund Condition Statement at http://www.ebudget.ca.gov/2018-19/pdf/Enacted/GovernorsBudget/3890/3900.pdf

Funding used to support AB 32 programs at multiple agencies is established in the most recently approved California Budget Act; this is referred to by the Fee Regulation as the required revenue. Adjustments are made to the required revenue to account for any over- or under-collections from the previous FYs. Adjustments include discrepancies between agency positions and funding amount. This could range from an under-collection due to differences in the timing of payments to contractors and salary adjustments made after the total required revenue is determined, to an over-collection due to unfilled positions. Other adjustments include those made to invoices such as refunds or additional fees collected. These occur for various reasons including, but not limited to, late discovery of misreporting of fee-covered emissions and billing errors. CARB corrects for these adjustments in subsequent year billings.

Table 3-2 shows the adjusted or total required revenue, along with updated information on the revenue actually collected for FY 2018–19. The value of $1,284,000 listed in Table 3-2 under "Total Adjustments" represents the amount needed to fully meet the total required revenue. Total adjustments are made to the required revenue in subsequent billing cycles. This underage is a result of wage adjustments that occurred after the previous fiscal year's budget appropriation.

Table 3-2: Total AB 32 Cost of Implementation Fee Appropriations and Revenue For All Agencies (FY 2018–19)	
Total department appropriations (required revenue)	$83,616,000
Total adjustments	$1,284,000
Total Required Revenue	**$**84,900,000
Fee Revenue Collected for FY 2018–19*	**$84,405,000**

Explanation: All dollars are rounded to the nearest thousand. *As of January 14, 2019 there are outstanding fees of $77,000 remaining to be collected.
Source: Enacted Budget Act for FY 2018–19. See the FY 2018–19 Cost of Implementation, Air Pollution Control Fund Condition Statement at http://www.ebudget.ca.gov/2018-19/pdf/Enacted/GovernorsBudget/3890/3900.pdf.

B. Overall CARB FY 2018–19 Resources to Implement AB 32

Table 3-3 shows the estimated FY 2018–19 expenditures for CARB only. Contract expenditures include both paid costs and encumbrance balances. Total resources expended also include a pro rata cost of $3,454,000. Pro rata charges are a form of overhead. They are defined in SAM 8754 as "the sharing of central service costs by funds other than the General Fund and the Central Service Cost Recovery Fund." SAM 8753 defines central service costs as "amounts expended by central service departments and the Legislature for overall administration of state government and for providing centralized services to state departments." As noted earlier, CARB also expects to rely on other sources of funding for activities that provide a climate co-benefit.

Table 3-3: Projected Overall FY 2018–19 Resources to Implement AB 32 *For CARB Only*	
Category	**Funding**
Personnel and operations expenses (salary, benefits, overhead, equipment, travel, training)	$52,705,000
Contracts budgeted	$7,028,000
Pro rata	$3,454,000
Total	**$63,187,000**

Explanations: Costs are estimated from monthly timesheet tracking reports for the previous FY submitted by CARB staff, then adjusted to include a five percent increase in employee compensation as well as an estimated expense from Legislature-approved budget change proposals. Contract funding refers to FY 2018–19 monies that have been or will be encumbered during the FY but may be expended through June 30, 2021. All dollars are rounded to the nearest thousand.

C. Program-Specific CARB FY 2018–19 Resources to Implement AB 32

Table 3-4 provides a breakdown by major program area of resource estimates for personnel and operations, plus contract dollars allocated, for all CARB activities that provide a climate benefit to implement AB 32. The contract dollar amounts allocated show the FY 2018–19 funds that may be encumbered via existing contracts this FY, but could be appropriated up to June 30, 2021. Legislature-approved budget change proposals include approximately $3.9 million in contract funding for Building Energy Efficiency Standards Compliance Software at CEC, as well as to shifting expenditures from the AB 32 Cost of Implementation Account for OEHHA's report on the Indicators of Climate Change in California and to address CEC's Energy Resources Programs Account structural deficit. CARB's new appropriation includes $366,000 for contract funding and two permanent positions to implement transportation access recommendations identified in the Low-Income Barriers Study, and to co-lead the Senate Bill 350 Interagency Task Force.

Table 3-4: Program-Specific CARB FY 2018–19 Resources to Support AB 32			
AB 32 Program Area	**Estimated Personnel and Operations Expenses**	**Contract Dollars Allocated**	**Estimated Total by Program Area**
Air Quality Data Analysis	$172,000		$172,000
Air Quality Monitoring	$848,000		$848,000
Cap-and-Trade Program	$7,126,000	$200,000	$7,326,000
Economic Analysis	$779,000		$779,000
Emissions Testing	$835,000		$835,000
Emission Inventory Development and Emission Factors	$1,150,000		$1,150,000
Enforcement of GHG Reduction Measures	$1,644,000		$1,644,000
Industry & Electricity (includes Energy)	$1,618,000	$366,000	$1,984,000
Laboratory Analysis	$382,000		$382,000
Landfill Methane	$2,029,000		$2,029,000
Low Carbon Fuel Standard (LCFS)	$8,701,000		$8,701,000
Mandatory Reporting Regulation (MRR)	$1,335,000		$1,335,000
MRR & LCFS Data Certification and Verification	$1,366,000	$700,000	$2,066,000
Oil/Gas Operations*	$1,175,000	$2,763,000	$3,938,000
Other AB 32 Activities	$8,650,000	$486,000	$9,136,000
Research	$3,894,000		$3,894,000
SB 1371 (Natural Gas Leakage)*	$194,000		$194,000
SB 375/Advanced Clean Cars	$2,705,000		$2,705,000
Scoping Plan	$1,387,000		$1,387,000
Short-Lived Climate Pollutants	$1,264,000	$513,000	$1,777,000
Western Climate Initiative	$5,451,000	$2,000,000	$7,451,000
Total	**$52,705,000**	**$7,028,000**	**$59,733,000**

Explanations: Costs are estimated from CARB staff monthly tracking reports from the previous fiscal year. These are adjusted to include a five percent increase to employee compensation and additional expenditures from Legislature approved budget change proposals. Contract funding refers to monies for FY 2018–19 that have been or will be encumbered during the FY, but may be expended through June 30, 2021. All dollars are rounded to the nearest thousand. Other AB 32 support activities include environmental justice and AB 32 Fee Regulation. Allocated costs, including those for overhead, are included for each program listed above. Table does not include pro rata.

*Approximately $2.6 million in funding for personnel and operations expenses other than the AB 32 Cost of Implementation Account (3237) funds were used to support AB 32 activities. These funds were from the Public Utilities Commission Utilities Reimbursement Account General Fund (0462) and Oil, Gas, and Geothermal Administrative Fund (3046).

Source: See the Department of Finance's website (http://www.dof.ca.gov/) under Budget Details for the Legislature-approved budget change proposals.

II. AB 32 RETROSPECTIVE RESOURCE REPORT FOR FY 2017–18

A. AB 32 Cost of Implementation Fee for FY 2017–18

Table 3-5 displays the adjusted appropriations for the Cost of Implementation Account for FY 2017–18 as authorized from the most recently enacted Budget (FY 2018–19). Table 2-1 shows the original fee appropriations that were used to determine the required revenue, including the statewide general administrative expenditures (pro rata) cost of $3,204,000.

Table 3-5: AB 32 Cost of Implementation Fee Adjusted Appropriations (FY 2017–18)

Department	Funding
California Air Resources Board	$52,779,000
Department of Food and Agriculture	$1,939,000
Department of Forestry and Fire Protection	$392,000
Department of Housing and Community Development	$200,000
Department of Public Health	$358,000
Department of Resources Recycling and Recovery	$1,392,000
Department of Water Resources	$395,000
Energy Resources Conservation and Development Commission	$9,286,000
Governor's Office of Business and Economic Development	$227,000
Office of Environmental Health Hazard Assessment	$695,000
Secretary for Environmental Protection	$1,180,000
Secretary of the Natural Resources Agency	$953,000
FI$CAL Information Systems of CA (State Controller)	$63,000
State Water Resources Control Board	$539,000
Statewide General Administrative (Pro Rata)	$3,204,000
Total Appropriations and Adjustments	**$73,602,000**

Source: Enacted Budget Act for FY 2018–19. See the FY 2017–18 Cost of Implementation, Air Pollution Control Fund Condition Statement at http://www.ebudget.ca.gov/2018-19/pdf/Enacted/GovernorsBudget/3890/3900.pdf.

Table 3-6 shows the required revenue, adjustments, and updated information on the revenue actually collected for FY 2017–18. At the start of each FY, adjustments are made to the required revenue to "zero" the AB 32 Cost of Implementation Account. The total adjustments account for any discrepancies between agency positions and funding amount, and for any changes made to invoices such as refunds or additional fees collected. The most recently enacted Budget for FY 2018–19 adjusted the FY 2017–18

appropriated expenditures from $70,500,000 to $73,602,000 to cover wage adjustments made after initial appropriations. The total adjustment includes an underage of $290,000. Total revenue collected was less than the total required revenue because there were fewer fees collected as a result of reporting errors and invoice adjustments. This amount will be carried over into the total required revenue adjustment for the next fiscal year.

Table 3-6: Total Adjusted Cost of Implementation Fee Expenses and Revenue (FY 2017–18)	
Total department appropriations, required revenue (Budget Year 2018–19)	$73,602,000
Total adjustments	$(290,000)
Total Required Revenue	**$68,519,000**
Fee Revenue Collected for FY 2017–18	**$68,639,000**

Explanation: Total department adjusted appropriations for FY 2017–18 are listed in the FY 2018–19 Enacted Budget.
Sources: See the FY 2018–19 Cost of Implementation, Air Pollution Control Fund Condition Statement at http://www.ebudget.ca.gov/2018-19/pdf/Enacted/GovernorsBudget/3890/3900.pdf.

B. Overall CARB FY 2017–18 Resources to Implement AB 32

Table 3-7 shows the actual FY 2017–18 expenditures for CARB only. Contract expenditures include both paid costs and encumbrance balances. Total resources expended also include a pro rata cost of $3,204,000. Pro rata charges are a form of overhead. They are defined in SAM 8754 as "the sharing of central service costs by funds other than the General Fund and the Central Service Cost Recovery Fund." SAM 8753 defines central service costs as "amounts expended by central service departments and the Legislature for overall administration of state government and for providing centralized services to state departments." Original fee appropriations for CARB only are listed in Table 2-1 and the adjusted appropriations for CARB are listed in Table 3-5.

Table 3-7: Overall FY 2017–18 Expenditures that Support AB 32 *For CARB Only*	
Category	**Funding**
Personnel and operations expenses (salary, benefits, overhead, equipment, travel, training)	$50,008,000
Contract expenditures	$4,825,000
Pro rata	$3,204,000
Total	**$58,037,000**

Explanations: For contract expenses, CARB relied on its records of actual and encumbered expenditures. All dollars are rounded to the nearest thousand. Approximately $2.2 million in funding for personnel and operations expenses other than the AB 32 Cost of Implementation Account (3237) funds were used to support AB 32 activities. These funds were transferred from Public Utilities Commission Utilities Reimbursement Account General Fund (0462), Oil, Gas, and Geothermal Administrative Fund (3046), and Air Pollution Control Fund (0115).
Source: Personnel and operations expenses are obtained from manual monthly tracking reports submitted by CARB staff.

C. Program-Specific CARB FY 2017–18 Resources to Implement AB 32

1. Data Sources and Methodology

Historically, CARB has tracked AB 32 programs and activities to implement AB 32 in totality, not at the level of individual regulations. To comply with all mandates (State laws, regulations, and policies on fiscal programs), CARB uses the CALSTARS system, which is the State's accounting system.

In response to requests by the Legislature to see more detailed information regarding the costs to implement AB 32, CARB committed to manually track and report on future AB 32 expenditures for personnel, operations, and contracts for the major elements of the climate program. CARB began collecting information on hours worked in specific AB 32 program areas from all affected employees beginning with the October 2013 pay period. CARB is using these data for current and future reports to the Legislature.

On July 1 2015, CARB employees began tracking hours worked using specific task codes for major program areas. Starting with the 2016 Fiscal and Resource Reports on AB 32 Programs, CARB is reporting on the Climate Change Program (Fund 3510), of which the majority funding is appropriated from the Cost of Implementation Account (Fund 3237), but also includes appropriations from other funds that support expenditures and resources for climate change activities. These funds include the Air Pollution Control Fund (0115), Public Utilities Commission Utilities Reimbursement Account (Fund 0462), and Oil, Gas, and Geothermal Administrative Fund (3046). However, programs primarily funded by Cost of Implementation fees may also receive funding from other sources that target criteria and toxic air pollutants (e.g., development of the Advanced Clean Cars Regulation that reduces air toxics, criteria air pollutants, and GHG and short-lived climate pollutant emissions).

2. Retrospective Resources by Program Area

Table 3-8 shows actual resources used to support AB 32 programs with a climate benefit at CARB only during FY 2017–18.

Table 3-8: CARB Expenditure of Funds in FY 2017–18 for Program Activities that Support AB 32

AB 32 Program Area	Personnel & Operations Expenses	Contract Dollars Expended	Total by Program Area
Air Quality Data Analysis	$164,000		$164,000
Air Quality Monitoring	$808,000		$808,000
Cap-and-Trade Program	$6,787,000	$38,000	$6,825,000
Economic Analysis	$742,000		$742,000
Emissions Testing	$795,000		$795,000
Emission Inventory Development and Emission Factors	$1,095,000		$1,095,000
Enforcement of GHG Reduction Measures	$1,566,000	$100,000	$1,666,000
Industry & Electricity (includes Energy)	$1,350,000		$1,350,000
Laboratory Analysis	$364,000	$63,000	$427,000
Landfill Methane	$1,932,000	$179,000	$2,111,000
Low Carbon Fuel Standard (LCFS)	$8,287,000	$169,000	$8,456,000
Mandatory Reporting Regulation (MRR)	$1,271,000	$460,000	$1,731,000
MRR & LCFS Data Certification and Verification	$1,301,000		$1,301,000
Oil/Gas Operations*	$1,119,000	$50,000	$1,169,000
Other AB 32 Activities	$8,238,000	$198,000	$8,436,000
Research	$3,709,000	$203,000	$3,912,000
SB 1371 (Natural Gas Leakage)*	$188,000		$188,000
SB 375	$2,576,000	$55,000	$2,631,000
Scoping Plan	$1,321,000	$150,000	$1,471,000
Short-Lived Climate Pollutants*	$1,204,000	$160,000	$1,364,000
Western Climate Initiative	$5,191,000	$3,000,000	$8,191,000
Total	**$50,008,000**	**$4,825,000**	**$54,833,000**

Explanations: For contract expenses, CARB relied on its records of actual and encumbered expenditures under the Climate Change Program (Fund 3510). All dollars are rounded to the nearest thousand. Other AB 32 support activities include Environmental Justice and AB 32 Fee Regulation. Allocated costs, including those for overhead, are included for each program listed above.

*Approximately $2.2 million in funding other than the AB 32 Cost of Implementation Account funds were used to support AB 32 activities. These funds were from the Public Utilities Commission Utilities Reimbursement Account, General Fund (0462), Oil, Gas, and Geothermal Administrative Fund (3046), and Air Pollution Control Fund (0115). *Source:* Personnel and operations expenses are obtained from manual monthly tracking reports submitted by CARB staff.

SECTION 4:

ANNUAL UPDATES ON WESTERN CLIMATE INITIATIVE, INC. ACTIVITIES

(January 2018–December 2018)

This report is required by the provisions of SB 1018 (Committee on Budget and Fiscal Review, Chapter 39, Statutes of 2012),[23] that require advance notice of any California Air Resources Board (CARB) payments to the Western Climate Initiative, Incorporated (WCI, Inc.) over $150,000, and semi-annual updates on the actions proposed by WCI, Inc. that affect California government or entities. This report combines what in previous years were two reports: the July and January semi-annual reports, providing updates on WCI, Inc. activities for the entire calendar year of 2018, and upcoming milestones for calendar year 2019. This update focuses on recent WCI, Inc. actions, as CARB provides separate notices to the Joint Legislative Budget Committee prior to any transfer or expenditure to WCI, Inc. over $150,000.

I. BACKGROUND: WCI, INC.

WCI, Inc. is a nonprofit corporation that focuses solely on providing administrative support for jurisdictions' Cap-and-Trade Programs, and is separate from the Western Climate Initiative. WCI, Inc. formed in 2011 to coordinate administrative services to Cap-and-Trade Programs developed and implemented by states and provinces. WCI, Inc. can also expand its administrative services to support additional jurisdictions in the future as needed. In May 2018, the WCI, Inc. by-laws were amended to include Nova Scotia as a participating jurisdiction. In October 2018, the WCI, Inc. by-laws were amended to remove Ontario as a participating jurisdiction. At the end of 2018, the Board of Directors for WCI, Inc. included officials from the provinces of Québec, Nova Scotia, and British Columbia, and the State of California. Currently, California and Québec are implementing linked Cap-and-Trade Programs to reduce GHG emissions. Nova Scotia is implementing a Cap-and-Trade Program that is not linked with California or Québec's Cap-and-Trade Programs.

The coordinated administrative support from WCI, Inc. benefits California and other participating programs in the following ways:

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[23] Government Code, Section 12894(d): "The Chairperson of the State Air Resources Board and the Secretary for Environmental Protection, as the California voting representatives on the Western Climate Initiative, Incorporated, shall report every six months to the Joint Legislative Budget Committee on any actions proposed by the Western Climate Initiative, Incorporated, that affect California state government or entities located within the state."

- Coordinated support ensures that all linked programs use the same highly secure computer program infrastructure, including the compliance instrument tracking system and auction platform.
- Coordinated support makes it possible for market monitoring in each jurisdiction to be effective and consistent across linked programs.
- Coordinated support enables linked programs to share program infrastructure maintenance and development costs, thereby reducing the costs for each jurisdiction.

WCI, Inc. provides administrative support based on each jurisdiction's specified administrative requirements. Most of the administrative support provided by WCI, Inc. is highly technical or specialized and has been developed through the use of contractors. WCI, Inc. has entered into contracts (discussed in the following section) to provide administrative support, including:

- Coordinating the development and administration of the CITSS;
- Coordinating the development and administration of an allowance auction platform used by California, Québec, and Ontario to auction emission allowances under their Cap-and-Trade Programs and to conduct reserve sales;
- Coordinating the analyses of allowance auctions and allowance and offset credit trading to support market monitoring performed by each jurisdiction; and
- Coordinating auction and reserve sale financial administration, which includes evaluation of bid guarantees and settlement (transferring payments from the auction and reserve sale purchasers to the sellers).

WCI, Inc. is solely administrative in nature. All policymaking and regulatory authority for each jurisdiction's program is retained by each jurisdiction. According to the WCI, Inc. bylaws, its administrative activities must "conform to the requirements of State and Provincial programs…." The requirements are defined by the participating jurisdictions, such that WCI, Inc. must execute its administrative role in conformance with the requirements established by CARB and the other jurisdictions.

II. UPDATE: WCI, INC.

A. Introduction

This report provides an update for WCI, Inc. activities from January 2018 through December 2018, as well as its anticipated activities in 2019. Highlights of recent activities are listed below.

At its annual meeting held on October 11, 2018, the WCI, Inc. Board:

- Adopted a budget for calendar year 2019;
- Selected its Board officers and members to standing committees;
- Amended the WCI, Inc. bylaws to remove Ontario as a participating jurisdiction;
- Approved the WCI, Inc. 2018-2021 Strategic Plan;

- Approved the procurement process to support the development of an impact assessment;
- Approved a contract amendment to the CITSS agreement; and
- Approved a contract with KAI Partners, Inc. (KAI Partners) for Enterprise Architect Services.

WCI, Inc. completed the procurement for the following services:

Independent Comprehensive Enterprise Architecture Services (EAS): In October 2018, WCI, Inc. contracted with KAI Partners to provide EAS to achieve greater alignment between information technology and business strategies and to guide the process of planning and designing the Information Technology (IT)/Information Systems (IS) capabilities of WCI, Inc.

In 2019, WCI, Inc. anticipates continuing to coordinate administrative support to the California, Québec, and Nova Scotia programs.

B. Corporate Governance

WCI, Inc. is governed by a Board of Directors according to its bylaws and the policies adopted by the WCI, Inc. Board. The current bylaws and policies are posted on the WCI, Inc. website at http://www.wci-inc.org/documents.php. Table 4-1 lists the policies that have been adopted by the WCI, Inc. Board.

- During 2018, the WCI, Inc. Board revised its bylaws. In May 2018, the WCI, Inc. by-laws were amended to include Nova Scotia as a participating jurisdiction and define the methodology for how Nova Scotia will name their Directors. In October 2018, the WCI, Inc. by-laws were amended to remove Ontario as a participating jurisdiction.

Table 4-1: WCI, Inc. Corporate Policies (as of December 31, 2017)
Accounting Policies and Procedures (Adopted May 8, 2013, Revised December 6, 2016)
Audit Committee Charter (Adopted November 3, 2011)
Employee Handbook – Québec (Adopted December 6, 2016)
Employee Handbook – U.S. (Adopted April 15, 2013)
Ethical Guidelines and Conflict of Interest Policy (Adopted November 3, 2011, Revised December 9, 2013)
Funds Management Policy (Adopted October 30, 2012, Last Revised September 29, 2016April 20, 2017)
Open Meeting Policy (Adopted May 8, 2013)
Procurement Policy (Adopted January 12, 2012, Revised October 20, 2017)
Records Availability Policy (Adopted December 9, 2013)
Retention of Business Records Policy (Adopted November 3, 2011)
Whistleblower Protection Policy (Adopted November 3, 2011)

The directors from California will have one member replaced in 2019, Matthew Rodriquez, Secretary for Environmental Protection, and the others remain unchanged as of December 2018:

- Secretary for Environmental Protection, Jared Blumenfeld;
- Chair of the California Air Resources Board, Mary Nichols;
- Assemblymember Richard Bloom, appointed by the Speaker of the Assembly (nonvoting director); and
- Mr. Kip Lipper, appointed by the Senate Rules Committee (nonvoting director).

The WCI, Inc. Board officers were selected at the October 11, 2018 annual Board meeting:

- Chair: Eric Theroux (Québec)
- Vice Chair: Mary Nichols (California)
- Treasurer: Jean-Yves Benoit (Québec)
- Secretary: Jason Hollett (Nova Scotia)

During 2018, the WCI, Inc. Board met in publicly noticed meetings on February 9, March 27, May 11, October 11, and November 14, 2018. The meeting announcements, agendas, and materials were posted on the WCI, Inc. website.

The agendas and minutes of the WCI, Inc. Board meetings are posted at http://www.wci-inc.org/documents.php.

C. Staffing and Operations

In addition to the Executive Director, WCI, Inc. staffing and operations projected expenditures include the following:

- Assistant Executive Director: WCI, Inc. has one full time Assistant Executive Director, located in Québec, to assist the Executive Director in the operation of WCI, Inc.
- Project Managers: WCI, Inc. has two full-time project managers to oversee contracts related to CITSS, the auction platform, financial administration, and market analysis.
- Business Analyst: WCI, Inc. has one full-time business analyst to support Project Managers in the documentation and coordination of cap-and-trade services.
- Operations Manager: WCI, Inc. has one full-time operations manager to support day-to-day business operations.
- Insurance and Banking: WCI, Inc. has retained insurance coverage and banking services.
- Office: WCI, Inc. has an office in Sacramento, California.
- WCI, Inc. has contracted for accounting services.
- WCI, Inc. has contracted for the services of a corporate counsel.

D. Delivery Capability

WCI, Inc. has entered into the following contracts to provide support to State and provincial programs.

CITSS Development and Hosting: In May 2012, WCI, Inc. contracted with SRA International, Inc. for the continued hosting and development of CITSS. In November 2015, CSRA acquired SRA International, Inc. In April 2018, General Dynamics Information Technology (GDIT) acquired CSRA. CITSS provides accounts to program participants to hold compliance instruments, record transactions of compliance instruments with other account holders, and to apply for each auction or reserve sale. At the October 11, 2018, meeting of the WCI, Inc. Board of Directors, the Board approved an amendment of the CITSS Agreement to extend the term of the Agreement through 2020 and increase maximum expenditures under the agreement by approximately $2 million. CITSS can be accessed by program participants online, and is currently supporting cap-and-trade programs in California, Québec, and Nova Scotia. The California Cap-and-Trade Program, Québec Cap-and-Trade System, and Ontario Cap-and-Trade Program linked on January 1, 2018, allowing mutual acceptance of compliance instruments issued by each jurisdiction and joint auction of GHG allowances. On July 3, 2018, Ontario filed a regulation revoking the Ontario Cap-and-Trade Program, effective immediately. On October 31, 2018, Ontario passed the Cap-and-Trade Cancellation Act, 2018, which formally ended the Cap-and-Trade Program in Ontario. Nova Scotia began a new Cap-and-Trade Program on January 1, 2019. Nova Scotia's Cap-and-Trade Program is not linked with California nor Québec's Cap-and-Trade Programs. Nova Scotia's activity is separated in CITSS by a "virtual wall."

Auction Platform: In June 2016, WCI, Inc. contracted with Markit Group Limited for the continued provision of Auction and Reserve Sale Services, including the hosting, development, and operation of the auction platform. The auction platform is used by

program participants to enter their bid information and to obtain auction results. Program participants access the auction platform online. California, Québec, and Ontario use the platform to monitor the auctions and reserve sales, and to ensure that all auction and reserve sale requirements are met. Ontario joined California's and Québec's linked programs on January 1, 2018, and participated in joint auctions in February and May 2018. Quarterly joint auctions after May 2018 included only California and Québec allowances. Nova Scotia is not expected to use auction services in 2019.

Market Analysis: In October 2015, WCI, Inc. entered into a contract with Monitoring Analytics, LLC to continue analyses in support of market monitoring. In 2018, the contract supported multi-jurisdictional monitoring for California, Québec, and Ontario linked auctions in February and May 2018 and California and Québec linked auctions in August and November 2018, as well as the linked or Ontario standalone market depending on the specific time frame. This work builds upon the substantial efforts by California, Québec, and Ontario for market monitoring. Starting in 2018, the contract supported multijurisdictional monitoring for the California and Québec linked auctions and linked markets and Nova Scotia's standalone market.

Auction and Reserve Sale Financial Administration: In October 2016, WCI, Inc. contracted with Deutsche Bank Trust Company Americas to continue to provide auction and reserve sale financial administration, which includes evaluation of bid guarantees and settlement (transferring the payments from the auction and reserve sale purchasers to the sellers). Ontario started using the auction and reserve sale financial administration services in 2017 with use through mid-2018.

In 2018, WCI, Inc. conducted a procurement for a qualified contractor to perform independent comprehensive EAS to achieve greater alignment between information technology and business strategies. The procurement resulted in a contract with KAI Partners to provide EAS to achieve greater alignment between information technology and business strategies and to guide the process of planning and designing the IT/IS capabilities of WCI, Inc. A Final Enterprise Architecture Governance Report is expected in early 2019.

In December 2018, WCI, Inc. started a procurement process for Canadian Financial Services for Auctions and Reserve Sales to serve joint auctions. The purpose of the procurement is to develop and provide financial services administration that are required to prepare and conduct the Canadian financial services activities for GHG allowances auctions and reserve sales.

Each of the WCI, Inc. contracts for administrative services in support of jurisdiction programs is posted to the WCI, Inc. website.[24] WCI, Inc. retains the right to terminate these contracts at any time.

E. Budget and Funding

The Budget for Calendar Year 2019 was adopted at the October 11, 2018, meeting of the WCI, Inc. Board of Directors. The Budget for Calendar Year 2019 is available on the WCI, Inc. website at https://wcitestbucket.s3.us-east-2.amazonaws.com/amazon-s3-bucket/documents/budget-2019projections20202021-20200120-en-1580248264.pdf.

Funding for WCI, Inc. in 2018 was provided by CARB, Québec, Ontario, and Nova Scotia. The share of funding being provided by each is determined in three parts:

- The cost of managing WCI, Inc. (personnel and operating costs) is divided equally among CARB, Québec, Ontario, and Nova Scotia;
- The cost of the cap-and-trade service contracts is divided based on the total emissions covered by each jurisdiction's trading program, and whether a jurisdiction uses a given service; and
- The cost of jurisdiction-specific administrative support is assigned fully to each jurisdiction.

CARB funding for 2018 and 2019 is $5 million, comprised of $4 million to obtain access to the administrative support that WCI, Inc. is developing and providing plus $1 million for California jurisdiction-specific administrative support required for the implementation of AB 398 requirements. At its February 9, 2018, meeting, the WCI, Inc. Board of Directors approved the funding agreement with CARB.[25] The agreement was subsequently approved by CARB and executed by both CARB and WCI, Inc. The fully executed funding agreement is available on the WCI, Inc. website at https://wcitestbucket.s3.us-east-2.amazonaws.com/amazon-s3-bucket/documents/en/jurisdiction-agreements/FundingAgreement-California-20182019-EN.pdf.

[24] The administrative support contracts posted to the WCI, Inc. website are available at http://www.wci-inc.org/documents.php.
[25] The minutes of WCI, Inc. Board meetings are available at: http://www.wci-inc.org/documents.php

F. Payments to WCI, Inc.

Payments to WCI, Inc. in 2018 are presented in Table 4-2.

Table 4-2: Payments from CARB to WCI, Inc. for Calendar Year 2018

Payment	Payment Date	Amount
2018 Q1 Payment	7/16/2018	$500,000
2018 Q2 Payment	11/19/2018[26]	$500,000
2018 Q3 Payment	11/13/2018	$500,000
2018 Q4 Payment	4/11/2019	$500,000

The CARB funding agreement will require CARB to pay annual membership dues of $2,000,000 over the course of two years of the contract. Dues will be billed on a quarterly basis at $500,000. Additionally, CARB will pay $1,000,000 for AB 398 implementation and CITSS support, billed in arrears and included on the quarterly invoices with the membership dues. Payments are planned for each contract year to occur quarterly in April, August, October, and January of the subsequent year at an amount of $500,000 plus expenses directly related to AB 398 implementation.

[26] Invoices for 2018 Q2 and 2018 Q3 payment were transmitted for payment at the same time and the Q3 payment was received first.