Cap-and-Trade Auction Proceeds Second Investment Plan:

Fiscal Years 2016-17 through 2018-19

January 2016

State of California

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Cap-and-Trade Auction Proceeds
Second Investment Plan:
Fiscal Years 2016-17 through 2018-19

PROGRAM WEBPAGE

For more information on this topic,
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DOCUMENT AVAILABILITY

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PUBLIC INPUT

Seven workshops were held during August 2015 in Sacramento, Fresno, Oroville, Oakland, Fontana, Los Angeles, and San Diego to obtain public input in response to the July 2015 Draft Concept Paper for the Cap-and-Trade Auction Proceeds Second Investment Plan for Fiscal Years 2016-17 through 2018-19.

Three additional workshops were held during November 2015 in Sacramento, Fresno, and Los Angeles to obtain further public input on the Cap-and-Trade Auction Proceeds Draft Second Investment Plan for Fiscal Years 2016-17 through 2018-19.

The Air Resources Board held a public hearing on December 17, 2015, in Sacramento to obtain public input on the Cap-and-Trade Auction Proceeds Revised Draft Second Investment Plan for Fiscal Years 2016-17 through 2018-19.

Written comments submitted for the workshops and hearing are available at: http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/investmentplan.htm.

The Final Second Investment Plan is due to the Legislature January 2016.

LIST SERVE FOR DISTRIBUTION OF NOTICES

To receive notices of upcoming meetings or availability of documents, please subscribe to the electronic list serve through the link displayed below the “Staying in Touch” section on the program webpage at: http://www.arb.ca.gov/auctionproceeds.

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EXECUTIVE SUMMARY

Cap-and-Trade auction proceeds provide an opportunity for the State to invest in projects that help California achieve its climate goals and provide benefits to disadvantaged communities. These investments are collectively referred to as California Climate Investments and are funded by the State proceeds from Cap-and-Trade auctions. State law requires the Department of Finance (Finance), in consultation with the Air Resources Board (ARB) and other State agencies, to develop and submit to the Legislature a three-year Investment Plan for auction proceeds. This document is the Cap-and-Trade Auction Proceeds Second Investment Plan for Fiscal Years 2016-17 through 2018-19 (Second Investment Plan).

The purpose of this Second Investment Plan is to identify opportunities for greenhouse gas (GHG) emission reductions, and identify potential State investment priorities to help achieve GHG emission reduction goals, benefit disadvantaged communities, and yield valuable co-benefits. Inclusion of a recommended investment concept does not guarantee that funding will be proposed for that concept. The Final Second Investment Plan will be provided to the Legislature as required by Assembly Bill (AB) 1532[1] to serve as a resource for investment decisions as part of the 2016-17 and later State Budgets.

In 2012, the Legislature passed and Governor Edmund G. Brown Jr. signed into law three bills—AB 1532, Senate Bill (SB) 535,[2] and SB 1018[3]—that provide the framework for how the Cap-and-Trade auction proceeds will be appropriated and expended. These bills also established the Greenhouse Gas Reduction Fund (GGRF), where the State's portion of the proceeds are deposited.

These statutes require that the GGRF allocations be used to facilitate the achievement of GHG emission reductions and, where applicable and to the extent feasible, to further the additional goals of AB 32, the California Global Warming Solutions Act of 2006.[4] Funds are proposed by the Governor and appropriated by the Legislature, consistent with the three-year Investment Plan. Statute requires that a portion of these investments benefit disadvantaged communities and meet other requirements. Statute also directs ARB to hold public workshops in different regions of the State and a public hearing on the Investment Plan prior to submittal to the Legislature.

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1 Pérez, John A. Assembly Bill No. 1532, Chapter 807. California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund. September 30, 2012. http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201120120AB1532

2 De León, Kevin. Senate Bill No. 535, Chapter 830. California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund. September 30, 2012.

3 Budget and Fiscal Review Committee. Senate Bill No. 1018, Chapter 39. June 27, 2012. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB1018

4 Nunez, Fabian. Assembly Bill No. 32, Chapter 488. California Global Warming Solutions Act of 2006. September 27, 2006. http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf

Benefits. All California Climate Investments must further the objectives of AB 32 to reduce the GHG emissions that contribute to climate change, and achieve additional objectives such as reducing other forms of air pollution, including pollution within disadvantaged communities.

The availability of auction proceeds provides a unique opportunity to make investments that both further the purposes of AB 32 and yield significant benefits for disadvantaged communities. The intent of SB 535 is to direct resources to the State's most impacted and disadvantaged communities to provide economic and health benefits. SB 535 requires that at least 25 percent of the annual GGRF proceeds be allocated to projects that benefit disadvantaged communities and at least 10 percent be allocated to projects located within disadvantaged communities. Investments to date have been exceeding those targets.

Current investments are spurring progress toward the goals and actions outlined in the 2014 Scoping Plan Update,[5] and other State climate and energy plans. At the same time, these investments are delivering jobs and public health benefits, while providing Californians with expanded mobility options, more sustainable goods and services, and enhanced natural resources. Additional information on the co-benefits of these investments can be found in the Annual Report to the Legislature on Investments of Cap-and-Trade Auction Proceeds.[6]

Whether it is the California Climate Credit[7] some consumers receive twice a year on their electric utility bill, a rebate for an electric car or energy efficient washer, a weather-proofed home with lower energy costs, or the potential for a new job and job training for installing solar panels or building High Speed Rail, there are multiple examples of direct economic benefits to California residents in the current program. Communities may also see gains from improvement projects such as: expanded affordable housing and transit options, safer pedestrian and biking access, "greener" streets and public spaces, city operations that are more energy and water efficient, and cleaner freight hubs that cut local air pollution and health risk.

Both small and large businesses are eligible for California Climate Investment funds for projects, such as: cleaner, more efficient freight or construction equipment, energy efficiency upgrades in low-income rental housing, forest health and conservation activities, agricultural water-energy programs, and infrastructure to process waste diverted from landfills. To implement these projects, businesses may also be contracted to perform such services as: design or build affordable housing units, install

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5 California Air Resources Board. Climate Change Scoping Plan. http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

6 Department of Finance. Annual Report to the Legislature on Investments of Cap-and-Trade Auction Proceeds (Greenhouse Gas Reduction Fund Monies). March 2015. http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/2015ggrf-annual-report-to-legislature.pdf

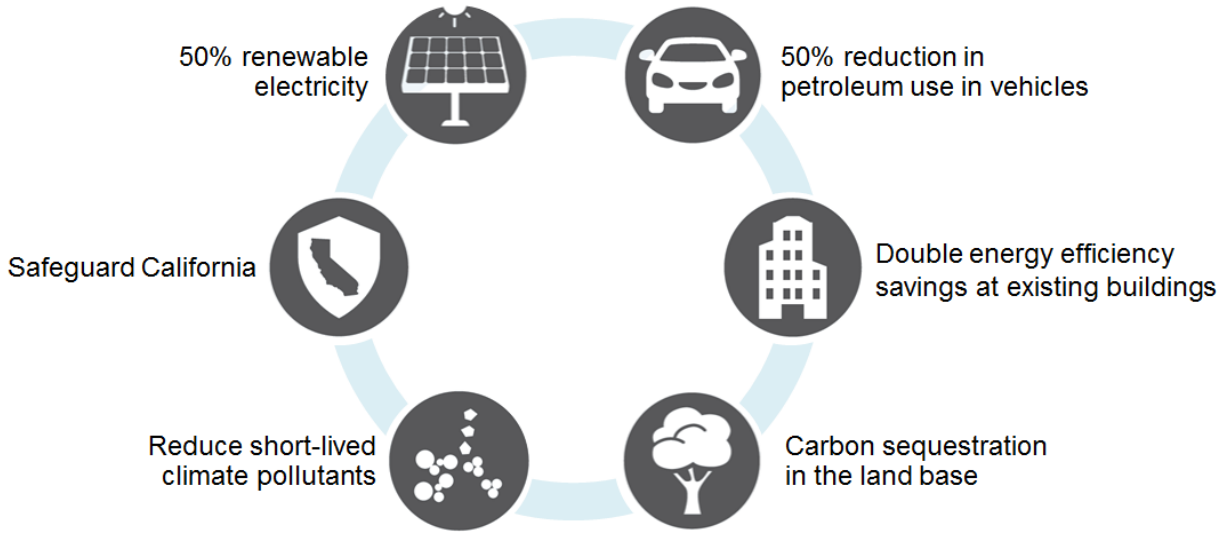
7 California Public Utilities Commission and California Energy Commission. Energy Upgrade California. www.energyupgradeca.org/climatecredit

infrastructure for transit or vehicle charging/fueling, build zero emission equipment, remove dead and dying trees from forests, or site new composting facilities.

Looking Ahead. Priorities for California Climate Investments come from the State's broader climate strategy, including the requirements established in California's suite of climate legislation and the Governor's Executive Orders, as well as California's plans to reduce GHG emissions.

The Governor identified key climate change strategy pillars in his January 2015 Inaugural Address.[8] These pillars (illustrated in Figure 1) show that several major areas of California's economy will need to reduce emissions in order to meet the target of reducing GHGs 40 percent below 1990 levels by 2030.

Figure 1. Governor's Key Climate Change Strategies



Achieving the Governor's goals will require accelerating current programs and projects as well as pursuing additional innovative strategies across sectors—all while providing the opportunity for California to adapt to the impacts of climate change and delivering a multitude of other tangible benefits to Californians.

This document describes the overarching goals and considerations that have guided identification of the investment priorities to meet the climate targets. It also discusses two new cross-cutting concepts that could involve multiple project types for additional investment—one outlining a potential approach to implement a community climate action program, and one to consolidate access to loans or other innovative financial instruments.

[8] Edmund G. Brown Jr. Inaugural Address. January 5, 2015. https://www.gov.ca.gov/news.php?id=18828

This Second Investment Plan reviews the current gaps in our climate strategies and links those to potential investment concepts for transportation and sustainable communities, clean energy and energy efficiency, and natural resources and waste diversion.

Since the publication of the First Investment Plan, State and other funding sources have emerged to complement GGRF programs. For example, Proposition 1 supported programs to alleviate issues emerging from prolonged drought. Proposition 39 supported energy efficiency gains in educational institutions. There are still gaps to be met to realize all of the State's goals. The Legislature established continuing appropriations totaling 60 percent of the GGRF proceeds (beginning in 2015-16) to benefit High Speed Rail, affordable housing and sustainable communities, transit capital, and transit operations. Therefore, this Second Investment Plan focuses on priorities for investment of the remaining 40 percent of GGRF proceeds.

This Second Investment Plan complements the First Investment Plan that was released in 2013 and posits a more diversified approach to achieve our climate targets. These investments all lead to GHG emission reductions, but also emphasize co-benefits such as disadvantaged community support, public health, water quality and supply, urban and rural greening, climate resilience, and habitat protection. This Second Investment Plan suggests a strategic investment portfolio intended to support measures that will deeply reduce emissions in the near term, but also facilitates ongoing emission reductions in the mid- and long-term.

Figure ES-1 shows the continuing and new programs that are recommended for investment.

Figure ES-1. Summary of Investment Concepts for 2016-17 through 2018-19

Transportation & Sustainable Communities

- Public transit (e.g., rail, bus, ferry), affordable housing, active transportation, and sustainable communities (this includes investments funded by the existing 60% continuous appropriation).
- Zero emission vehicles and equipment, plus charging and fueling infrastructure.
- Innovative efficiency strategies for freight and passenger transportation (e.g., connected vehicles, information technology solutions for logistics, reduction of non-productive moves, etc.).
- Ultra-low carbon fuels.

Clean Energy & Energy Efficiency

- Energy efficiency and clean energy projects, including energy-water conservation.
- Renewable energy generation.
- Low Global Warming Potential refrigerant systems.
- Residential woodsmoke reduction (through woodstove replacement and utilization of biomass waste).
- Carbon capture and sequestration.

Natural Resources & Waste Diversion

- Conservation and improved management strategies for achieving net climate benefits and long-term carbon sequestration on natural and working lands.
- Planting trees in urban areas and greening the built environment to sequester carbon.
- Waste and residue utilization (e.g., energy from dairy, farm, forest, or organics residues).

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I. CALIFORNIA CLIMATE INVESTMENT GOALS

California Climate Investment goals come from California's broader climate strategy, including the requirements established in California's suite of climate legislation and Governor's Executive Orders, California's GHG emission reduction plans, State agency input, and public recommendations. They identify high-level opportunities to fund GHG emission reduction strategies that will help California meet the mid-term targets and other objectives. This chapter describes the overarching goals of the program that influenced the investment concepts in this Second Investment Plan—these goals and investment concepts are also summarized in Appendix A.

A. Reducing Greenhouse Gases

AB 32 requires California to reduce GHG emissions to 1990 levels by 2020, and to maintain and continue reductions beyond 2020. To further the vision of AB 32, Governor Edmund G. Brown Jr. issued Executive Order B-30-15,[9] in April 2015. In this Executive Order, the Governor called for a reduction in GHG emissions to 40 percent below 1990 levels by 2030 as a mid-term target to support California's long-term target of reducing GHG emissions of 80 percent below 1990 levels by 2050. In October 2015, the Governor signed SB 350,[10] which requires the State to double building energy efficiency and increase renewable energy to 50 percent by 2030. These targets will also complement the State's efforts to reduce GHG emissions to 40 percent below 1990 levels by 2030.

Executive Order B-30-15 requires all State agencies with jurisdiction over sources of GHG emissions to implement measures to achieve GHG emission reductions to meet the 2030 and 2050 targets. ARB was directed to update the AB 32 Climate Change Scoping Plan to reflect the mid-term target and is moving forward with the update process. The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue driving down GHG emissions.

Short-lived climate pollutants are estimated to be responsible for about 40 percent of current net climate forcing (the heating effect caused by GHG emissions in the atmosphere). Short-lived climate pollutants include methane, black carbon (soot), and fluorinated gases. The investment concepts in this Second Investment Plan would reduce a range of GHGs, including short-lived climate pollutant emissions.

Projects funded in 2016-17 through 2018-19 will realize benefits beyond 2020 and should be focused on helping deliver successes in meeting the State's mid- and long-

[9] Executive Order No. B-30-15. 2030 Greenhouse Gas Reduction Goal. April 2015. https://www.gov.ca.gov/news.php?id=18938

[10] De León. Senate Bill No. 350, Chapter 547. Clean Energy and Pollution Reduction Act of 2015. October 7, 2015.

term climate goals. Therefore, this document encourages investment in programs and projects that lay the groundwork for the approaches to zero and near-zero emission transportation systems with enhanced mobility options, low carbon energy, and resource and waste management that are needed to meet the State's long-term reduction targets. For example, investing in forest conservation easements today can protect existing carbon stock and result in long-term carbon sequestration to help the State meet its 2050 GHG emission reduction target. And public and privately-partnered demonstrations and deployments can help identify which clean technologies or strategies deliver effective carbon reduction investments and economic returns—creating climate benefits and jobs long after the funds have been spent.

B. Benefiting California's Most Disadvantaged Communities

California's climate strategy has always emphasized the importance of considering and addressing impacts and benefits to California's most vulnerable communities. These communities are disproportionately impacted by all types of environmental pollution and face many other challenges. Many are also at risk from the impacts of climate change, with fewer resources to respond and adapt to these impacts.

Investment strategies that emphasize both GHG emission reductions and benefits to disadvantaged communities are priorities for California Climate Investment funding. Once program and project types for GHG emission reductions have been identified, the next focus is to prioritize program structures and project types that benefit disadvantaged communities. Many of the investment recommendations in this Second Investment Plan have been identified by community representatives as priority projects (e.g., increased urban forestry, weatherization, and mobility options) or have the potential to yield environmental, economic, or public health benefits to disadvantaged communities. For example, an affordable housing project, located in a disadvantaged community near transit and paired with a clean car sharing program, can provide affordable housing, mobility, and air quality benefits for disadvantaged community residents.

SB 535 requires that the three-year Investment Plan allocate a minimum of 25 percent of the annual GGRF proceeds to projects that benefit disadvantaged communities and a minimum of 10 percent to projects located within disadvantaged communities. To continue meeting or exceeding these investment targets, State agencies are establishing funding targets for projects located within and benefiting disadvantaged communities for each program. Many disadvantaged communities have interest in applying for funds, but some lack the awareness of available programs and/or the capacity to competitively engage in the application processes. There is a need to assist these communities to raise awareness, as well as to understand the range of funding opportunities and the Program application requirements. For example, community residents cite the Department of Forestry and Fire Protection's urban forestry experts as a model—they offer substantial help in understanding and applying for grant funding.

To expand the level of assistance to disadvantaged communities, the following two paths are being pursued:

- Increase outreach and awareness of all funding programs. ARB will hire a contractor(s) to conduct outreach to disadvantaged communities and improve the availability of assistance. The contractors will act as the first point of contact for community representatives to help them determine which GGRF programs may be most responsive to needs identified by the community, and connect those representatives with the appropriate liaison(s) at the agencies administering those programs for general assistance. The Strategic Growth Council (SGC), High Speed Rail Authority (HSRA), ARB, Community Services and Development (CSD), and Caltrans each received funding in the 2015-16 Budget to hire one staff liaison for this purpose. Based on the level of resources available and concerns regarding potential conflicts of interest in competitive programs, we do not expect that this assistance will include State agency preparation of proposals or completion of applications on behalf of disadvantaged community applicants.

  ARB staff will coordinate with community advocates and the liaisons at each administering State agency to prioritize the work of the contractor(s), develop outreach strategies to maximize the effectiveness of the contractor(s), and facilitate information sharing to keep the contractor(s) up to date on program opportunities. In addition, all agencies will seek community feedback to analyze the effectiveness of the disadvantaged community assistance and outreach efforts, and to implement improvements as necessary.

- The 2015 Budget, provided $500,000 to SGC for a pilot project to provide a deeper level of technical assistance to disadvantaged communities, specific to its Affordable Housing and Sustainable Communities Program. SGC is developing its approach, which will include technical support for development of proposals and applications in a very limited number of disadvantaged communities that were unsuccessful applicants in last year's round of funding. The lessons learned from this pilot project will inform a potential expansion of technical assistance for this and other GGRF programs, if funding is available for this purpose in future years.

C. <u>Increasing Rural Community Participation</u>

Providing more opportunities for rural communities to help advance the State's climate mitigation efforts could bring both economic and health benefits. These communities also have a critical role to play, as they are often home to agricultural lands, rangelands, grasslands, and forested lands where GHG emission reductions and carbon sequestration activities intersect. Protection and sustainable management of these lands and resources to achieve GHG emission reductions and develop resilient carbon storage will be pivotal in meeting climate goals.

To expand the opportunities available and increase participation of rural communities in climate investments, the State may need to consider additional programs or expansion of current programs. For example, an emphasis on reducing methane and black carbon emissions from California's waste, natural and working lands, and the agricultural sector brings with it an opportunity to grow renewable energy and clean jobs in these areas. Applying compost to agricultural lands can further the State's Healthy Soils Initiative[11] and sequester carbon. Programs to reduce woodsmoke from residential heating, and to divert wood waste and other organic waste to bioenergy or biofuel facilities, can bring reductions of GHG emissions, black carbon, and criteria air pollutants in rural communities throughout the State.

Projects that utilize waste as a resource can provide substantial climate benefits and small scale projects offer opportunities for local economic development as well. Examples of small scale projects might include: a cooperative of dairy digesters located in close proximity and providing renewable natural gas for trucks or other heavy equipment in the Central Valley; or a clean, efficient biomass plant located close to forestry activities that uses dead or diseased trees removed for fuel as an alternative to open burning the waste in slash piles.

Additionally, in the 2015-2016 Draft Public Review Guidelines of the Affordable Housing and Sustainable Communities Program, SGC is considering a proposal to target 10 percent of funds for rural areas, in consideration of the unique characteristics of rural communities and the roles they play in reducing GHG emissions.

D. Maximizing Co-Benefits to Public Health, the Environment, and the Economy

AB 32 requires consideration of overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health. AB 1532 further clarifies that GGRF proceeds be used to achieve reductions of statewide GHG emissions and, to the extent feasible, maximize co-benefits to the State. Many investments can provide GHG emission reductions and environmental, economic, and public health co-benefits, while also preparing California for the impacts of climate change.[12] For example, weatherization and energy efficiency investments, such as CSD's Low-Income Weatherization Program, reduce GHG emissions, help consumers save money on energy costs, provide job and job training opportunities, and can help safeguard Californian's against the impacts of a changing climate by improving building heating and cooling comfort. The Funding Guidelines for

[11] California Department of Food and Agriculture. Healthy Soils Initiative. 2015. https://www.cdfa.ca.gov/EnvironmentalStewardship/HealthySoils.html

[12] The Governor's Executive Order B-30-15 requires State agencies to "take climate change into account in their planning and investment decisions, and employ full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives."

Agencies Administering California Climate Investments[13] (Funding Guidelines) promote job creation and job training as a component of GHG reduction projects, where possible.

Investments made to-date are spurring progress toward the goals and actions outlined in the 2014 Scoping Plan Update, and other State climate and energy plans. These investments all lead to GHG emission reductions, but also emphasize co-benefits such as disadvantaged community support, public health, water quality and supply, urban and rural greening, climate resilience, and habitat protection. They are also providing Californians with more lifestyle choices—from expanded mobility options, to more sustainable goods and services, to enhanced natural resources. Additional information on the co-benefits of investments can be found in the Annual Report to the Legislature.

[13] Air Resources Board. Cap-and-Trade Auction Proceeds Funding Guidelines for Agencies Administering California Climate Investments - Proposed September 2015. http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/funding_guidelines_public_proposed_draft_09-04-2015.pdf

II. CLIMATE TARGETS AND GREENHOUSE GAS EMISSIONS

A. Climate Targets

In addition to the AB 32 requirement to adopt GHG emission limits and measures to reduce GHG emissions to 1990 levels by 2020 and to maintain and continue reductions beyond 2020, the State has established numerous related goals and targets to reduce California's contribution to climate change, cut conventional air pollution, improve energy security, support clean and renewable energy, and increase energy efficiency. Figure 2 shows several key milestones and quantitative targets for California's climate change, mitigation, and energy programs that reduce GHG emissions.

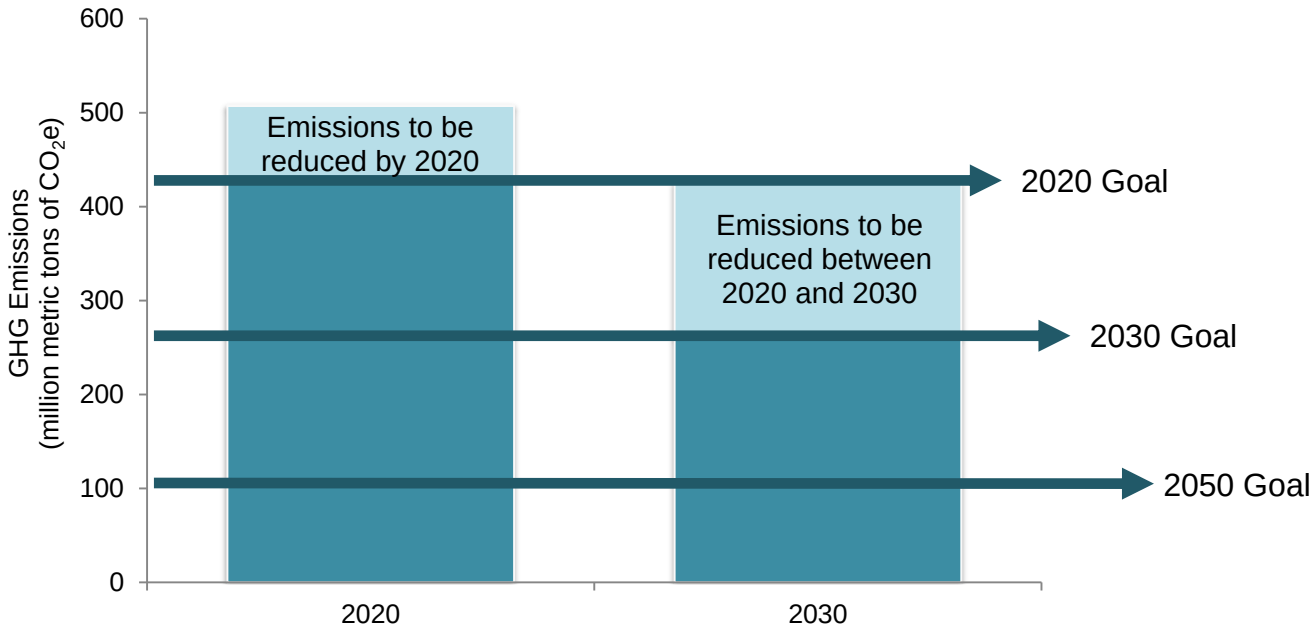
Figure 2. Major Goals and Targets for Greenhouse Gas Reductions

Climate Change	• 2020: GHG emissions will be reduced to 1990 levels • 2030: GHG emissions will be 40% lower than 1990 levels • 2050: GHG emissions will be 80% lower than 1990 levels
Sustainable Communities	• 2010: ARB sets GHG emission reduction goals for metropolitan areas • 2020: Metropolitan areas meet first GHG emission reduction targets • 2035: Metropolitan areas meet second GHG emission reduction targets
Vehicles and Fuels	• 2020: California infrastructure will support 1 million zero emission vehicles (ZEVs) • 2020: 10% reduction in the carbon intensity of transportation fuels • 2025: 15% of new car sales will be ZEVs • 2025: 1.5 million ZEVs will be operating in California • 2030: 50% reduction in petroleum use in vehicles
Renewable Electricity	• 2020: 33% of electricity from renewable sources • 2030: 50% of electricty from renewable sources • 2020: 12,000 megawatts of distributed generation after 2010
Green Buildings	• 2018: State agency energy purchases will be 20% lower than 2003 • 2020: State agency GHG emissions will be 20% lower than 2010 • 2025: 50% of State buildings will be Zero Net Energy • 2030: Double energy efficiency savings in existing buildings
Solid Waste Reduction	• 2020: 75% recycling, composting, or source reduction of solid waste • 2025: 90% of organics from landfills diverted through source reduction and organics recycling
Carbon Storage	• 2020: Maintain 5 $MMTCO_2e$ storage levels in forests • 2030: Manage farms, forests, wetlands, and rangelands to store carbon and serve as carbon sinks

B. California Greenhouse Gas Emissions

AB 32 established 1990 as the baseline year for determining California's GHG emissions. According to ARB's updated emission inventory, 1990 emission levels were equal to 431 million metric tons of carbon dioxide-equivalent ($MMTCO_2e$). Figure 3 shows the GHG emission reduction goals for 2020, 2030, and 2050. Significant investments from several sources of both public and private entities are needed to support the transformative technologies that are essential to reach both the 2030 and 2050 goals.

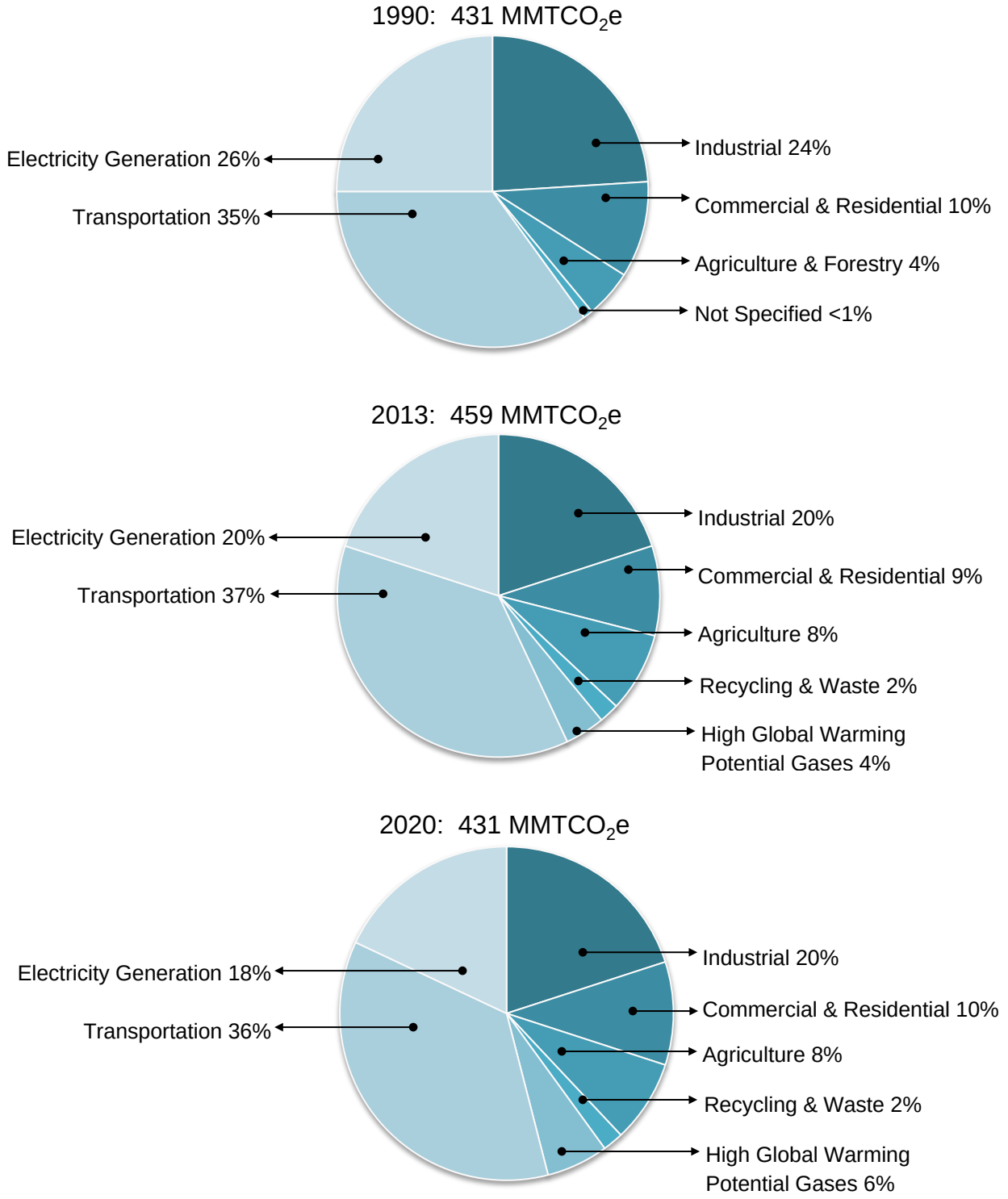
Figure 3. California Greenhouse Gas Emissions and Reduction Goals*



**$MMTCO_2e$ means "million metric ton of carbon dioxide equivalent" emissions.*

Figure 4 presents GHG emissions by sector for 1990 and 2013 inventories, and the 2020 forecast with adopted measures. The seven major sectors—electricity generation, transportation, industrial, commercial and residential, agriculture and forestry, recycling and waste, and high global warming potential gases—match the broad groups of emission sources identified in the 2014 Scoping Plan Update. Emissions forecasts show that California is on track to meet the 2020 target of returning GHG emissions to 1990 levels when factoring in the emissions benefits of adopted measures and programs.

Figure 4. California Greenhouse Gas Emissions by Sector – 1990 and 2013 Inventories and 2020 Forecast*



**MMTCO$_2$e means "million metric ton of carbon dioxide-equivalent" emissions. Percentages have been rounded to the nearest whole number. Recent emissions inventory updates excluded forest sector emissions and sequestration.*

III. CLIMATE POLLUTANT EMISSION REDUCTION STRATEGIES

Since the late 1960s, California has implemented a series of policies that steadily clean the air, diversify energy and fuels, and spur innovation in advanced technologies. These policies work in tandem to reduce California's contributions to GHG emissions. While the State is well on its way to meeting the 2020 GHG emission reduction target, now is the time to establish the State's next set of policies for 2030 and beyond.

The following sections outline the State's current strategies for meeting the 2020 GHG emission reduction target, and the planning efforts underway to identify the next set of policies needed to achieve a 40 percent reduction in GHG emissions from 1990 levels by 2030. The results of these planning efforts will yield valuable information to inform the Legislature during budget deliberations for this three-year investment planning cycle as well as future investment cycles. The projects that result from these investment cycles must help California implement the State's plans and meet GHG emission reduction targets. Appendix B provides more detail on GGRF appropriations to-date.

A. Strategies to Achieve the 2020 Greenhouse Gas Emission Reduction Target

AB 32 requires ARB to prepare and periodically update the Scoping Plan identifying California's strategy for meeting the State's climate goals. Strategies to achieve the 2020 GHG emission reduction target are documented in the Scoping Plans, including measures now being implemented by many State agencies. These measures are summarized in Figure 5.

Figure 5. Existing State Strategies to Meet the 2020 Greenhouse Gas Emission Reduction Target

Transportation	• Vehicle GHG Emission Standards and Advanced Clean Cars, Low Carbon Fuel Standard, Biofuels, Alternative Fuel Grants, Sustainable Communities, Truck/Trailer Efficiency, Heavy Duty Vehicle Hybridization, Mobile Air Conditioning, Shorepower for Ships, Transit and Active Transportation Programs
Energy	• *Electricity Generation:* Renewables Portfolio Standard, California Solar Initiative and New Solar Homes Partnership, Distributed Generation, Combined Heat and Power, Bioenergy • *Energy Efficiency:* Standards for Appliances and New Buildings, Efficiency for Existing Residential, Commercial, and Industrial Buildings
Natural Resources, Waste Diversion, and Short-Lived Climate Pollutants	• *High Global Warming Potential Gases:* Consumer Products, Refrigerant Management, Semiconductors, Sulfur Hexafluoride-Insulated Switchgear • *Other Measures:* Natural Resource Conservation and Management, Landfill Methane, Commercial Recycling
For all of the above categories	• Cap-and-Trade Program

Primary regulations and programs expected to deliver GHG emission reductions to meet the 2020 mandate established by AB 32 include the Low Carbon Fuel Standard, Advanced Clean Cars, Sustainable Communities, Renewables Portfolio Standard, Energy Efficiency, Short-Lived Climate Pollutant Reduction Strategy,[14] and High Global Warming Potential Gases, among others. The Cap-and-Trade Program applies to transportation, energy, and industrial sources and helps California achieve the 2020 statewide emission reduction target. The State Agency Greenhouse Gas Reduction

[14] California Air Resources Board. Draft Short-Lived Climate Pollutant Reduction Strategy. September 2015. http://www.arb.ca.gov/cc/shortlived/2015draft.pdf

Report Card,[15] published by the California Environmental Protection Agency (CalEPA), includes estimates of GHG emissions reduced as a result of measure implementation and a list/timetable for the adoption of measures.

In recent years, additional planning and implementation efforts have been established to complement the strategies identified in the 2008 Scoping Plan and the 2014 Scoping Plan Update, and support both the State's near- and mid-term GHG emission reduction targets. These include:

- Bioenergy Interagency Working Group Bioenergy Action Plan:[16] The purpose of the Bioenergy Action Plan is to accelerate clean energy development, divert waste to energy, job creation, and protection of public health and safety. The Plan contains more than 50 recommended actions to increase the sustainable use of organic waste, expand research and development of bioenergy facilities, reduce permitting and regulatory challenges, and address economic barriers to bioenergy development. The Plan will help facilitate the creation of more than 4,000 jobs and help California meet its clean energy, waste reduction, and climate change goals.

- California Department of Transportation (Caltrans) California State Rail Plan:[17] The California State Rail Plan establishes a vision, sets priorities, and presents implementation strategies to enhance passenger and freight rail service in the public interest. The Plan is the first document that fully integrates the planned California High-Speed Rail system with existing and proposed conventional rail systems. It is a critical document for the successful development and implementation of the California High-Speed Rail Authority's "blended system" which combines high-speed rail and improved conventional rail. The Plan serves as a basis for federal and State investments for high-speed and intercity passenger rail in California. The vision, priorities, and strategies support the State's goal of an integrated multimodal transportation system.

- Caltrans Strategic Management Plan, 2015-2020:[18] The purpose of the Strategic Management Plan is to be a roadmap of Caltrans' role, expectations, and operations as the Department meets statewide challenges. The tools outlined in the Plan are performance management, transparency, accountability, sustainability, and innovation. The Plan serves a number of functions, including: providing clear direction for meeting statewide objectives; creating and

[15] California Environmental Protection Agency. State Agency Greenhouse Gas Reduction Report Card. 2015. http://www.climatechange.ca.gov/climate_action_team/reports/2015_CalEPA_Report_Card.pdf
[16] Bioenergy Interagency Working Group. 2012 Bioenergy Action Plan. August 2012. http://www.resources.ca.gov/docs/energy_and_climate_change/2012_Bioenergy_Action_Plan.pdf
[17] California Department of Transportation. California State Rail Plan. May 2013. http://californiastaterailplan.dot.ca.gov/docs/Final_Copy_2013_CSRP.pdf
[18] California Department of Transportation. Strategic Management Plan, 2015-2020. March 2015. http://dot.ca.gov/perf/library/pdf/Caltrans_Strategic_Mgmt_Plan_033015.pdf

deepening strategic partnerships; and providing performance measures that monitor success.

- California Energy Commission (CEC) Existing Buildings Energy Efficiency Action Plan:[19] The Existing Buildings Energy Efficiency Action Plan provides a 10-year roadmap to activate market forces and transform California's existing residential, commercial, and public building stock into high performing and energy-efficient buildings. The results of this effort will be accelerated growth of energy efficiency markets, more effective targeting and delivery of building upgrade services, improved quality of occupant and investor decisions, and vastly improved building performance. Equally important, this effort will deliver substantial energy savings and GHG emission reductions, contributing to the collective goal of reducing the impacts of climate change while improving the resilience of the State's built environment and economy. The Plan provides a comprehensive framework centered on five goals, each with an objective and a series of strategies to achieve them.

- California Public Utilities Commission (CPUC) Energy Efficiency Strategic Plan:[20] The Long Term Energy Efficiency Strategic Plan presents a single roadmap to achieve maximum energy savings across all major groups and sectors in California through the year 2020 and beyond. The Plan is the State's first integrated framework of goals and strategies for saving energy throughout the government, utility, and private sectors, holding energy efficiency as the highest priority resource in meeting California's energy needs.

B. Strategies to Achieve Post-2020 Greenhouse Gas Emission Reduction Goals

Many of the existing State strategies shown in Figure 5 will continue to deliver increasing benefits after 2020 (e.g., the Advanced Clean Cars regulations). Other actions identified in the State's Scoping Plan focus on post-2020 GHG emission reductions, such as the statewide rail modernization program, which is integrating existing passenger rail and transit service with the future high-speed rail system, can act as additional catalysts for long-term GHG emission reductions.

However, these existing strategies will not be sufficient to achieve the necessary long-term GHG emission reductions needed to help avoid the worst impacts of climate change, and meet California's air quality goals.

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[19] California Energy Commission. California Existing Buildings Energy Efficiency Action Plan. September 2015. http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-05/TN205919_20150828T153953_Existing_Buildings_Energy_Efficiency_Action_Plan.pdf

[20] California Public Utilities Commission. California Energy Efficiency Strategic Plan. January 2011 Update. http://www.cpuc.ca.gov/NR/rdonlyres/A54B59C2-D571-440D-9477-3363726F573A/0/CAEnergyEfficiencyStrategicPlan_Jan2011.pdf

In recognition of the need to continue reducing GHG emissions, the Governor identified five key climate change strategy pillars in his January 2015 Inaugural Address. The pillars (described previously and illustrated in Figure 1) recognize several major areas of the California economy that will need to reduce emissions in order to meet the mid-term target, while simultaneously protecting the State against the impacts of climate change. Many impacts—increased fires, floods, severe storms and heat waves—are occurring already and will only become more frequent and more dangerous. To help plan for the impacts of climate change, the Governor also directed State agencies to take climate change into account in their planning and investment decisions, and employ full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives.

1. 2016 Scoping Plan Update

In response to the Governor's Executive Order B-30-15 and the direction provided in his January 2015 Inaugural Address, all State agencies with jurisdiction over sources of GHG emissions began work on developing the 2016 Scoping Plan Update and guiding principles for implementing the mid-term target. During the October 2015 workshop,[21] the State agencies presented the following mid-term strategies:

- Reduce GHG emissions to 40 percent below 1990 levels by 2030.
- Create jobs and support a robust workforce.
- Save water.
- Support disadvantaged communities.
- Make California more resilient.
- Transform to a clean energy economy.
- Give consumers clean energy sources.
- Identify and pursue GHG emission reducing synergies within and among pillars/sectors.

A vision was provided for 2030 and a series of recommendations for short-lived climate pollutants, energy efficiency, natural and working lands, electricity, and transportation and land use. These recommendations include:

- Reducing short-lived climate pollutants, such as methane, fluorinated gases, and black carbon (discussed in detail later in this section).
- Building upon zero net energy and green building programs, as well as establishing goals and a path toward zero carbon buildings.
- Protecting natural, agricultural, and forest land at risk of development to more carbon-intensive uses; managing natural and working lands to sustainably store carbon; and capturing organic biomass waste diversion for energy and fuel production; urban greening; and conservation-oriented land use planning to promote infill development.

[21] California Air Resources Board. 2030 Target Scoping Plan. Workshop. October 1, 2015. http://www.arb.ca.gov/cc/scopingplan/meetings/10_1_15slides/2015slides.pdf

- Further developing vehicle technologies, changing and expanding fuel supplies and distribution systems, and continuing to support planning and implementation of land use strategies that reduce vehicle activity.
- Utilizing market-based mechanisms (e.g., Cap-and-Trade), planning initiatives, and further research and development to continue reductions.

Once completed, the 2016 Scoping Plan Update will provide a blueprint for achieving long-term GHG emission reductions and will also highlight the need for new strategies and recommendations for a path forward (e.g., policies, research, infrastructure) to meet long-term targets. The climate priorities and next steps in the 2016 Scoping Plan Update to meet the post-2020 goals will inform the recommendations for 2017-18 auction proceeds expenditures.

2. Complementary Post-2020 Strategies

In addition, several agencies have projects underway that will include strategies resulting in post-2020 GHG emission reductions:

- Governor's Office of Planning and Research Environmental Goals and Policy Report[22] (to be finalized): This report outlines the State's sustainability efforts in response to climate change, including reducing GHG emissions and safeguarding California from inevitable changes. The report also identifies a series of metrics and indicators that can be used to help inform decision-making throughout the State.

- Short-Lived Climate Pollutant Reduction Strategy (to be finalized): This strategy provides current information and trends on California's emissions from short-lived climate pollutants and outlines recommendations for California to achieve deep reductions in short-lived climate pollutant emissions through 2030.

- ARB State Implementation Plan Update[23] (to be finalized): This update will document the new State strategies needed to achieve federal ambient air quality standards in each region. While this document will focus on criteria pollutant reductions, there will be substantial co-benefits for GHG emission reductions.

- California Sustainable Freight Action Plan[24] (to be finalized): This effort will outline the needs and steps to transform California's freight transport system to one that is more efficient and sustainable, including use of zero and near-zero

[22] Governor's Office of Planning and Research. Governor's Environmental Goals and Policy Report – Draft for Discussion. September 2013. http://opr.ca.gov/docs/EGPR_ReviewDraft.pdf

[23] California Air Resources Board. California State Implementation Plans. September 2015. http://www.arb.ca.gov/planning/sip/sip.htm

[24] California Air Resources Board. Sustainable Freight Discussion Document. April 2015. http://www.arb.ca.gov/gmp/sfti/sustainable-freight-pathways-to-zero-and-near-zero-emissions-discussion-document.pdf

emission technologies, over the next several decades. This project will be a collaborative effort with key partners in the fields of air quality, transportation, and energy.

- California Department of Food and Agriculture Healthy Soils Initiative:[25] The Healthy Soils Initiative is being developed in response to the Governor's 2015-16 Budget and introduces several new initiatives to increase carbon in soil and establish long-term goals for carbon levels in all of California's agricultural soils.

- Caltrans California Transportation Plan 2040[26] (to be finalized): This is a statewide, long-range transportation plan developed to meet the State's future travel needs while reducing GHG emissions. The plan calls for sustainable transportation that improves mobility for all, strengthens California's communities, and enhances quality of life. Included in the plan are a set of goals, policies, strategies and performance measures.

- Caltrans Complete Streets Implementation Action Plan 2.0:[27] The intent of the Complete Streets Implementation Action Plan 2.0 is to describe the Caltrans complete streets policy framework and an overview of the agency's continued complete streets efforts. The Plan lays out the structure for monitoring, reporting, and overcoming barriers to further integrate complete streets into all Caltrans functions and processes.

- CEC Integrated Energy Policy Report[28] (scheduled to be finalized January 2016): This report makes energy policy recommendations based on CEC's energy assessments and forecasts with the intent of conserving resources, protecting the environment, providing reliable energy, enhancing the state's economy, and protecting public health and safety. The scope of this report focuses on energy efficiency, renewable energy, electricity, natural gas, transportation, climate change, nuclear power plants, and changing trends in California's sources of crude oil.

- Forest Climate Action Team Forest Carbon Plan[29] (scheduled to be finalized by the end of 2016): This plan will provide carbon targets for forest land and an array of strategies to promote healthy forests that protect and enhance forest

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[25] California Department of Food and Agriculture. Healthy Soils Initiative. 2015. https://www.cdfa.ca.gov/EnvironmentalStewardship/HealthySoils.html

[26] California Department of Transportation. California Transportation Plan 2040. March 2015. http://www.dot.ca.gov/hq/tpp/californiatransportationplan2040/Documents/index_docs/CTP_ReportPublicDraft_03022015.pdf

[27] California Department of Transportation. Complete Streets Implementation Action Plan 2.0. Meeting the safety and mobility needs of all users for all modes. 2014. http://www.dot.ca.gov/hq/tpp/offices/ocp/docs/CSIAP2_rpt.pdf

[28] California Energy Commission. 2014 Integrated Energy Policy Report Update. http://www.energy.ca.gov/2014publications/CEC-100-2014-001/CEC-100-2014-001-CMF.pdf

[29] Forest Climate Action Team. Forest Carbon Plan Vision. February 2015. http://www.fire.ca.gov/fcat

carbon storage and the broader range of environmental services for all forests in California. The plan will provide a roadmap for the forest sector to achieve the more general goals outlined in this Investment Plan.

C. Short-Lived Climate Pollutants

An important step in achieving the Governor's climate goals includes addressing short-lived climate pollutants. SB 605[30] requires ARB to develop a comprehensive strategy to reduce emissions of short-lived climate pollutants by January 1, 2016.

In September 2015, ARB, in coordination with other State agencies and local air districts, released the Draft Short-Lived Climate Pollutant Reduction Strategy. The draft strategy provides an inventory of California's emissions of short-lived climate pollutants. The draft strategy also provides projections for California's emissions of short-lived climate pollutants in 2030 and outlines recommendations for California to achieve deep reductions in short-lived climate pollutant emissions through 2030.

Short-lived climate pollutants are powerful global warming forcers, and reducing these emissions can have an immediate beneficial impact on climate change. California is already reducing short-lived climate pollutants through a number of existing emission reduction programs, but additional strategies are needed. The Short-Lived Climate Pollutant Reduction Strategy outlines a number of further actions needed, some of the key strategies include:

- For methane, avoiding or capturing emissions from manure at dairies, reducing emissions from enteric fermentation, eliminating organics in landfills and directing them to composting, in-vessel digestion, and other useful purposes, and reducing fugitive emissions from all sources.
- For fluorinated gases, accelerating the transition of refrigeration and air-conditioning equipment to lower global warming potential refrigerants, including the development of incentives that encourage the use of such refrigerants.
- For black carbon, introducing cleaner freight and off-road equipment and reducing residential woodsmoke from woodstoves, fireplaces, and burning of green waste through use of cleaner alternatives for heating and disposal; for forest-related black carbon, improving the health and resiliency of forests and reducing wildfire risk and severity through active management and linking forest management activities to disposal through alternative use, including biomass power and fuel production.

[30] Lara, Ricardo. Senate Bill No. 605, Chapter 523. Short-Lived Climate Pollutants. September 21, 2014. http://leginfo.ca.gov/pub/13-14/bill/sen/sb_0601-0650/sb_605_bill_20140921_chaptered.htm

IV. INVESTMENT OF AUCTION PROCEEDS TO MEET CLIMATE AND DISADVANTAGED COMMUNITY GOALS

A. Cap-and-Trade: Source of Auction Proceeds

The Cap-and-Trade Program is a key element of California's GHG emission reduction strategy. The Cap-and-Trade Program will provide about 20 percent of the GHG emission reductions needed to achieve the 2020 limit under AB 32. The Program creates a limit on the emissions from sources responsible for 85 percent of California's GHG emissions, establishes the price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy, and provides covered entities the flexibility to implement the lowest-cost options to reduce emissions. In addition to reducing GHG emissions, the Program also complements and supports California's existing efforts to reduce criteria and toxic air pollutants.

In the Cap-and-Trade Program, ARB places a limit, or cap, on GHG emissions by issuing a limited number of tradable permits (allowances) equal to the cap. A portion of the allowances are distributed for free, a portion placed in a cost-containment reserve, and the remainder auctioned. ARB conducts quarterly auctions where California State- and Québec-provincial-owned allowances, as well as allowances consigned by electrical distribution utilities, can be purchased. The funds raised by the sale of California State-owned allowances are deposited into the GGRF and are available for appropriation.

Each year, the cap is lowered and the number of allowances declines in proportion to achieve the intended emission reductions. The cap is enforced by requiring each source that operates under the cap to turn in one allowance or offset credit for every metric ton of carbon dioxide equivalent ($MTCO_2e$) emissions that it produces. Businesses that aggressively reduce their emissions can trade or sell their surplus allowances to firms that find it more expensive to reduce their emissions.

Beginning in 2013, the cap included GHG emissions from electricity and large industrial sources. Transportation fuels and residential and commercial use of natural gas and propane were included in the cap starting in 2015. The first Cap-and-Trade auction was held on November 14, 2012, and subsequent auctions have been conducted quarterly. The latest auction was held on November 17, 2015, and the next auction is scheduled for February 17, 2016.

To prevent leakage and provide transition assistance, industrial facilities and electrical distribution utilities (on behalf of their rate payers) receive allowance allocations, from ARB pursuant to provisions of the Cap-and-Trade Regulation.[31] Appendix C provides a

[31] California Air Resources Board. Final Regulation Order. California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms to allow for the Use of Compliance Instruments Issues by Linked Jurisdictions. January 2015. http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf

more detailed description of electrical distribution utilities and the use of allowance allocations, including the California Climate Credit.

B. Process for Allocation of Auction Proceeds

As described previously, the implementing legislation (i.e., AB 1532, SB 535, and SB 1018) establishes the GGRF, the process for allocating auction proceeds, the eligible uses for those proceeds, and the minimum level of investments in or benefiting disadvantaged communities. The implementing legislation establishes a two-step process for allocating funding to State agencies:

- Three-Year Investment Plan: The Administration (Finance, in consultation with ARB and other State agencies) must develop and submit to the Legislature a three-year Investment Plan to identify priority programmatic investments of auction proceeds. The Investment Plan must identify near- and long-term GHG emission reduction goals and targets, analyze gaps in current State strategies for meeting GHG emission reduction goals, and identify priority investments that facilitate GHG emission reductions.

  The first such plan was provided to the Legislature in May 2013 for Fiscal Years 2013-14 through 2015-16. Subsequently, updates to the Investment Plan must be developed every three years and submitted to the Legislature with the release of the Governor's January budget proposal.

- Budget Appropriations: Funding will be appropriated to State agencies by the Legislature, consistent with the three-year Investment Plan.

Prior to the submittal of an Investment Plan (or updates) to the Legislature, ARB must hold at least two public workshops and a public hearing in coordination with Finance and the Climate Action Team. ARB must also consult with the CPUC to ensure the plan does not conflict with or unduly overlap with activities that are under the oversight or administration of the CPUC.

C. State Government Roles and Responsibilities

Figure 6 illustrates the roles and responsibilities of the various entities that are involved in developing the Second Investment Plan, as well as allocation and implementation of the auction proceeds.

Figure 6. Roles and Responsibilities

GOVERNOR

- Prepare budget proposals reflecting his policies and priorities.
- Provides direction to Finance and other State agencies.

LEGISLATURE

- Provides direction via legislation.
- Appropriates funds to State agencies and GGRF programs via the budget process.

DEPARTMENT OF FINANCE

- Prepares the Governor's budget.
- Submits an Annual Report to the Legislature.
- Submits the three-year Investment Plan to the Legislature.

CalEPA

- Identifies disadvantaged communities, per SB 535, in coordination with the Office of Environmental Health Hazard Assessment.
- Consults on the three-year Investment Plan and ARB's Funding Guidelines.
- Coordinates with the Climate Action Team.

AIR RESOURCES BOARD

- Administers the Cap-and-Trade Program, which generates auction proceeds.
- Acts as the GGRF Administrator (accountant).
- Develops Funding Guidelines, reporting and tracking procedures, and quantification methodologies for administering agencies.
- Provides consultation with other agencies on GGRF programs, per statute.
- Develops the three-year Investment Plan with Finance and CalEPA, in consultation with other relevant State agencies.
- Hosts workshops and a public hearing for the three-year Investment Plan.

ADMINISTERING STATE AGENCIES

- Design and implement GGRF programs in accordance with statutory requirements and ARB Funding Guidelines.
- Submit Expenditure Records for each appropriation to document how expenditures will further the purposes of AB 32 and obtain ARB concurrence prior to issuing final guidelines or final solicitation materials.
- Determine program structure and criteria for selecting projects for funding.
- Use money to fund projects that help achieve GHG emission reduction goals and further the other purposes of AB 32.
- Ensure that a portion of the GGRF projects are located in and/or provide benefits to disadvantaged communities.
- Provide oversight of project applicants receiving funding to track project completion and report on benefits.

D. Investment Categories

The implementing legislation specifies the general categories that are authorized to receive budget appropriations from the GGRF, as summarized in Figure 7. Per statute, Cap-and-Trade auction proceeds must be used to further the purposes of AB 32.

Figure 7. Eligible Investments Identified in Statute

Eligible investments include, but are not limited to, those that do the following:

Low Carbon Transportation and Infrastructure	• Reduce GHG emissions through the development of state-of-the-art systems to move goods and freight, advanced technology vehicles and vehicle infrastructure, advanced biofuels, and low-carbon and efficient public transportation.
Strategic Planning for Sustainable Infrastructure	• Reduce GHG emissions through strategic planning and development of sustainable infrastructure projects—including, but not limited to, transportation and housing.
Energy Efficiency and Clean Energy	• Reduce GHG emissions through energy efficiency, clean and renewable energy generation, distributed renewable energy generation, transmission and storage, and other related actions—including, but not limited to, at public universities, State and local public buildings, and industrial and manufacturing facilities.
Natural Resources and Solid Waste Diversion	• Reduce GHG emissions associated with water use and supply, land and natural resource conservation and management, forestry, and agriculture. • Reduce GHG emissions through increased in-State diversion of municipal solid waste from disposal through waste reduction, recycling, composting, and reuse.
For all of the above categories	• Programs implemented by State, local and regional agencies, local and regional collaboratives, and nonprofit organizations coordinating with local governments. • Research, development, and deployment of innovative technologies, measures, and practices related to programs and projects funded by Cap-and-Trade auction proceeds.

Specifically, the statute establishes the following goals for the use of the auction proceeds:

- Maximize economic, environmental, and public health benefits to the State;
- Foster job creation by promoting in-State GHG emission reduction projects carried out by California workers and businesses;
- Complement efforts to improve air quality;
- Direct investment toward the most disadvantaged communities and households in the State;
- Provide opportunities for businesses, public agencies, nonprofits, and other community institutions to participate in and benefit from statewide efforts to reduce GHG emissions; and
- Lessen the impacts and effects of climate change on the State's communities, economy, and environment.

E. Disadvantaged Communities

The availability of auction proceeds provides a unique opportunity to make investments that both further the purposes of AB 32 and yield significant benefits for disadvantaged communities. SB 535 provides strong direction for how auction proceeds must be invested to benefit disadvantaged communities, requiring that at least 25 percent of the annual GGRF proceeds be allocated to projects that benefit disadvantaged communities and at least 10 percent be allocated to projects located within disadvantaged communities. The intent of SB 535 is to direct resources to the State's most impacted and disadvantaged communities to provide economic and health benefits.

1. Identification of Disadvantaged Communities

CalEPA is responsible for identifying disadvantaged communities prior to submittal of the Investment Plan to the Legislature. Based on statute, the identification criteria may include, but are not limited to:

- Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation; or
- Areas with concentrations of people that are of low-income, high unemployment, low levels of homeownership, high rent burden, sensitive populations, or low levels of educational attainment.

CalEPA used a tool called CalEnviroScreen to identify disadvantaged communities for investment. The Office of Environmental Health Hazard Assessment developed this tool under CalEPA's guidance to assess areas that are disproportionately affected by multiple types of pollution and areas with vulnerable populations. The Secretary for Environmental Protection identified the top 25 percent of CalEnviroScreen 2.0 census

tracts as disadvantaged communities for the purposes of implementing SB 535. Additional information on the identification of disadvantaged communities, including an interactive mapping tool that shows census tract locations and the associated rankings for each indicator, is available at: http://www.calepa.ca.gov/EnvJustice/GHGInvest.

2. Guidance for Investments to Benefit Disadvantaged Communities

ARB's Funding Guidelines provide guidance for administering agencies to maximize benefits to disadvantaged communities that are direct, meaningful, assured, and meet a community need. The Funding Guidelines outline a specific process for determining whether projects funded by the GGRF meet the criteria for being located within or benefiting disadvantaged communities. Some projects physically located outside the boundaries of a disadvantaged community census tract, but in close proximity and offering meaningful benefits to one or more disadvantaged communities, may satisfy the criteria.

Figure 8 shows a statewide map of the census tracts currently identified as "disadvantaged communities" for the purposes of GGRF investments under the First Investment Plan. Detailed maps for all regions of California and an interactive mapping tool are available at: http://www.arb.ca.gov/auctionproceeds. The mapping tool allows users to zoom in on a specific location to see disadvantaged community information, including the following:

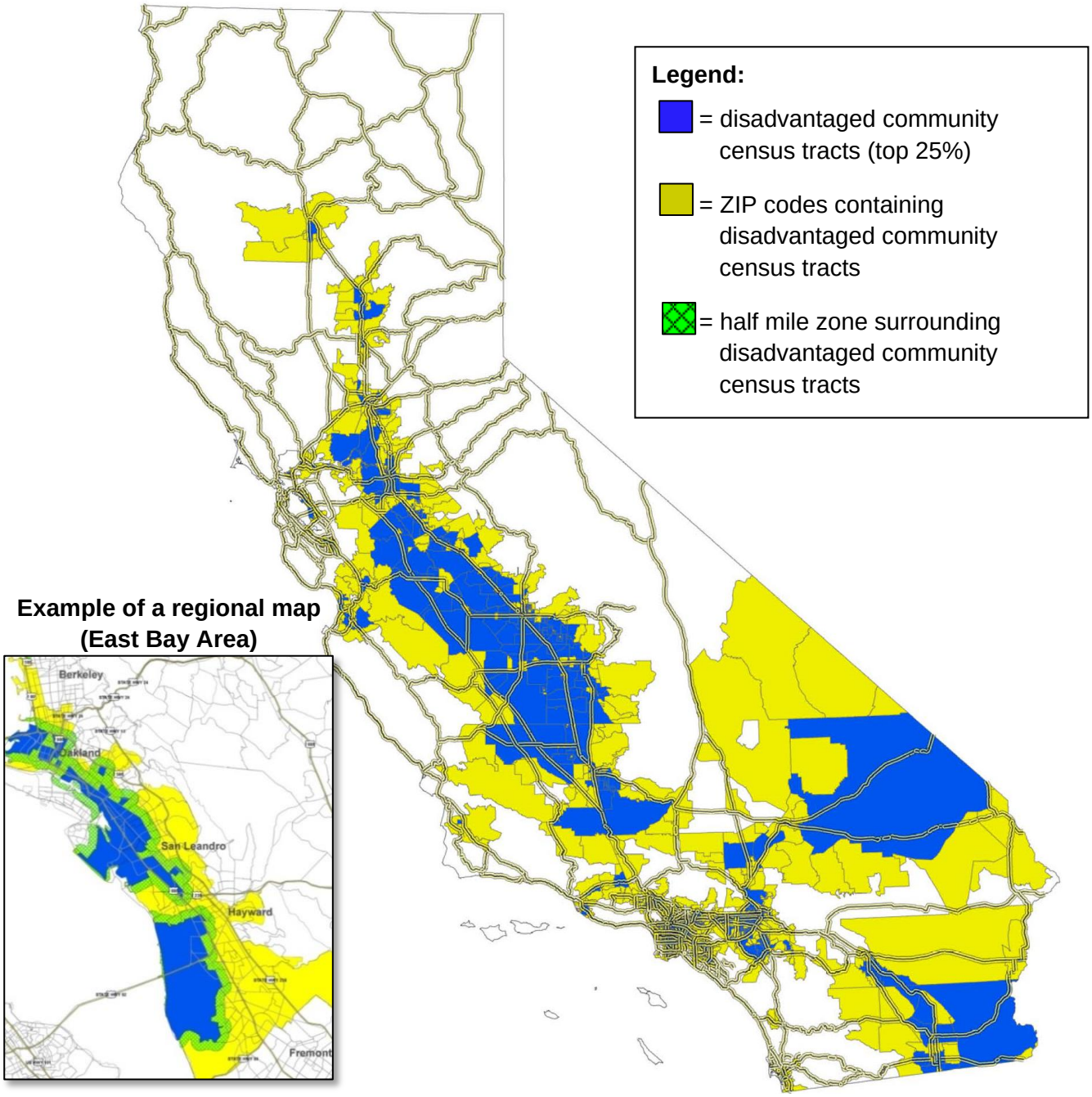
- Census tracts that have been identified as disadvantaged communities;
- Half-mile zones around disadvantaged community census tracts; and
- ZIP codes containing disadvantaged community census tracts.

3. Updates to CalEnviroScreen

As CalEnviroScreen evolves and community characteristics change over time, the Office of Environmental Health Hazard Assessment will periodically review and update the tool and CalEPA may consider changes to the identification of disadvantaged communities. For this investment cycle, the Office of Environmental Health Hazard Assessment plans to update the data inputs to CalEnviroScreen in 2016, based on the latest available information, which may result in minor changes to the census tracts defined by CalEPA as disadvantaged communities. For each newly added census tract defined as a disadvantaged community, a different census tract will be removed. If there are any changes to the disadvantaged communities, the new list will be used for investments made with 2016-17 through 2018-19 funding.

Figure 8. Statewide Map of Disadvantaged Communities
(overlaid on highway system)

CalEnviroScreen Version 2.0 (October 31, 2014)
Top 25% Highest Scoring Census Tracts



For more detailed regional maps identifying disadvantaged communities, refer to: http://www.calepa.ca.gov/EnvJustice/GHGInvest.

V. PROCESS FOR IDENTIFYING PRIORITY INVESTMENTS

To develop a list of recommended investments, a large number of programs and projects have been identified that could potentially be funded. The criteria for identifying investments were based on legislative direction, public comments, and efforts to avoid duplication with other funding sources.

A. Consultation with Climate Action Team and State Agencies

The Climate Action Team is chaired by the California Secretary for Environmental Protection. The Secretary sought input on the Second Investment Plan and discussed stakeholder comments from the public workshops with executive-level representatives from the following State agencies, boards, and departments:

- Air Resources Board (ARB)
- California Business, Consumer Services, and Housing Agency (BCSH)
- California Department of Fish and Wildlife (CDFW)
- California Department of Food and Agriculture (CDFA)
- California Department of Housing and Community Development (HCD)
- California Department of Public Health (CDPH)
- California Department of Transportation (Caltrans)
- California Department of Water Resources (DWR)
- California Energy Commission (CEC)
- California Government Operations Agency (CalGovOps)
- California Health and Human Services Agency (CHHS)
- California Natural Resources Agency (CNRA)
- California Public Utilities Commission (CPUC)
- California State Transportation Agency (CalSTA)
- Department of Forestry and Fire Protection (CAL FIRE)
- Department of Resources, Recycling, and Recovery (CalRecycle)
- Governor's Office of Business and Economic Development (GoBiz)
- Governor's Office of Planning and Research (OPR)
- State Water Resources Control Board (State Water Board)
- Strategic Growth Council (SGC)

The CPUC has an important role in Climate Action Team discussions, providing input on the scope of the Second Investment Plan and the recommendations for priority investments.

The recommended investment priorities provide opportunities for workforce education and training programs that connect individuals in disadvantaged communities to good jobs to build or operate projects that reduce GHG emissions. The Labor and Workforce Development Agency and the Green Collar Jobs Council will continue to work with the Climate Action Team, local agencies, and community stakeholders to identify effective

workforce models and develop common principles to guide workforce education and training investments.

B. Public Process and Input

The Final Second Investment Plan is due to the Legislature in January 2016. Figure 9 provides a timeline for the public process on the Second Investment Plan. For more information, please visit: http://www.arb.ca.gov/investmentplan.

Figure 9. Public Process Milestones for the Second Investment Plan

July 28, 2015	• Release Second Investment Plan Draft Concepts for Public Discussion
August 3-13, 2015	• Hold public workshops on Draft Concept Paper for Second Investment Plan
October 27, 2015	• Release Draft Second Investment Plan
November 3-5, 2015	• Hold public workshops on Draft Second Investment Plan
December 2, 2015	• Release Revised Draft Second Investment Plan
December 17, 2015	• Hold ARB Board hearing on Revised Draft Second Investment Plan
January 2016	• Submit Final Second Investment Plan to the Legislature

In July 2015, a Draft Concept Paper was released on the investment of auction proceeds for public comment. Appointees from members of State agencies and departments, including several representatives of the Climate Action Team, then participated in seven workshops in Sacramento, Fresno, Oroville, Oakland, Fontana, Los Angeles, and San Diego to obtain public input on the Draft Concept Paper for the Second Investment Plan and the Draft Funding Guidelines. Written comments submitted for consideration following the workshops can be viewed at: http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=investplan2015-ws.

In October 2015, the Draft Second Investment Plan was released. Appointees from State agencies and departments, including several representatives of the Climate Action Team, then participated in three additional workshops during November 2015 in Sacramento, Fresno, and Los Angeles to obtain additional public input in response to the Draft Second Investment Plan. Written comments for consideration following the

workshops can be viewed at:
http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=investplan2-ws.

Commenters from the August and November 2015 workshops represented a broad array of interests advocating for investment in a wide range of project areas including clean transportation, sustainable communities, energy efficiency, clean energy, natural resource management and preservation, agriculture, waste management and diversion, and disadvantaged community-focused projects.

Appendix D summarizes public input and comments received on the Draft Concept Paper and the Draft Second Investment Plan from the August 2015 and November 2015 public workshops, as well as comment letters received electronically between July 2015 and November 2015. These comments were made regarding potential investment concepts to include in this Second Investment Plan.

ARB held a public hearing on December 17, 2015, in Sacramento to obtain public input on the Revised Draft Second Investment Plan. Written comments submitted for the hearing are posted at:
http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=investplan2-ws.

VI. CURRENT STRATEGY GAPS AND INVESTMENT CONCEPTS

Reaching the State's long-term goals will require new strategies for how communities are planned, how people and freight are moved, how the State is powered, how industries produce their products, how successful the State is in treating waste as a resource (e.g., source of energy, fuel, etc.) and how well California's lands and natural resources that sequester carbon are preserved and managed.

Implementing legislation (i.e., AB 1532) requires the Investment Plan to include a gap analysis. This analysis includes reviews of existing plans, programs, and other State strategies that are designed to help achieve GHG emission reductions in various sectors. As illustrated by Figure 3, full implementation of existing State strategies will achieve the 2020 GHG emission reduction target. Several of these actions depend on complementary incentives to achieve the full reductions anticipated.

Investment recommendations that are presented later in this document, and summarized in Appendix A, are a reflection of the conclusions from this gap analysis. Some project types are recommended for investment to support the current strategies for the 2020 GHG emissions limit, while other investments are vital to propel the changes needed to meet post-2020 goals. For example, in the transportation sector, making investments now in zero emission vehicles (ZEVs) and equipment, improved infrastructure, and low carbon fuels are essential to long-term GHG benefits and the post-2020 transformation to an integrated, efficient transportation system.

Figure 10 summarizes the types of projects being considered for recommendation as investments in the three-year cycle beginning in Fiscal Year 2016-17, with a new emphasis on efforts to reduce short-lived climate pollutants. Then we describe two cross-cutting concepts for investment to inform public discussion. The remainder of this Second Investment Plan will assess the existing situation and current funding resources, then identify the need for additional investments.

Figure 10. Summary of Investment Concepts (2016-17 to 2018-19)

Transportation & Sustainable Communities	Clean Energy & Energy Efficiency	Natural Resources & Waste Diversion
• Public transit (e.g., rail, bus, ferry), affordable housing, active transportation, and sustainable communities (this includes investments funded by the existing 60% continuous appropriation). • Zero emission vehicles and equipment, plus charging and fueling infrastructure. • Innovative efficiency strategies for freight and passenger transportation (e.g., connected vehicles, information technology solutions for logistics, reduction of non-productive moves, etc.). • Ultra-low carbon fuels.	• Energy efficiency and clean energy projects, including energy-water conservation. • Renewable energy generation. • Low Global Warming Potential refrigerant systems. • Residential woodsmoke reduction (through woodstove replacement and utilization of biomass waste). • Carbon capture and sequestration.	• Conservation and improved management strategies for achieving net climate benefits and long-term carbon sequestration on natural and working lands. • Planting trees in urban areas and greening the built environment to sequester carbon. • Waste and residue utilization (e.g., energy from dairy, farm, forest, or organics residues).

A. Potential Cross-Cutting Approaches

1. Local Climate Action in Disadvantaged Communities

To help support local transformation through climate action in disadvantaged communities, a portion of the total GGRF proceeds could be identified for “integrated projects”—projects that support energy and transportation solutions, smart growth, urban forestry, and more—in a community. For example, a community could propose an integrated project that includes: affordable housing near transit; a new or improved transit line and service to connect the affordable housing to areas of employment; zero emission buses, additional bus drivers, and training for its transit system; bicycle and walking paths; and tree planting and subsequent tree maintenance in public areas such

as local schools. To provide job training benefits, the community could utilize its conservation corps[32] to implement some of these project components.

This approach could be particularly advantageous in the 2,000 census tracts identified as disadvantaged communities where significant capital and jobs are needed to improve areas that have traditionally lacked investment. Residents of disadvantaged communities have expressed an interest in making the decisions about which projects and project types are the highest priority locally for funding to meet the SB 535 investment requirements.

Community residents or local governments with jurisdiction in these disadvantaged communities may be well positioned to identify projects that reduce GHG emissions to meet local needs and support community-wide transformation. These local governments could serve as conveners for the community to choose project types from a menu of potential projects, provide technical assistance within the community, and offer feedback to the State agency(ies) administering the funding for the projects selected by the community.

2. Efficient Financing Mechanisms to Maximize Investment

Diversifying financing mechanisms for GHG emission reduction projects could extend the utility of GGRF proceeds, strengthen the State's investment portfolio, expand the types and number of projects that can be supported, and ultimately deliver greater climate benefits statewide. Expanding beyond simple grant and rebate financing to offer loans, credit enhancements, and other innovative mechanisms could provide expanded options to induce climate action. Many programs and project types may be appropriate for innovative financing.

One option for a cost-effective approach could include using a portion of the auction proceeds to support GHG emission reduction financing through a revolving loan fund, loan guarantee program, reverse auction, or other financing mechanism established by the California Infrastructure and Economic Development Bank (I-Bank), with program design and project selection responsibilities remaining with State agencies with relevant expertise. Another example could include the I-Bank utilizing GGRF funds to expand its existing program to provide direct loans, targeted at GHG emission reduction projects for clean energy and energy efficiency for municipalities, universities, schools, and hospitals, as well as small businesses.[33] These approaches could expand financing options and leverage additional private capital for all GGRF programs.

Three states—Connecticut, New York, and Hawaii—have each developed state green banks to engage private capital, while meeting each state's unique challenges and

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[32] California Association of Local Conservation Corps. http://calocalcorps.org/local-conservation-corps

[33] California Lending for Energy and Environmental Needs Center. http://www.ibank.ca.gov/clean_energy.htm

needs. California can look to these states and other state and federal programs to learn best practices for strategic investment in innovation.

B. Transportation and Sustainable Communities

California's transportation sector represents 37 percent of GHG emissions in California, making it one of the highest priorities for investment in the State. While significant progress has been made improving air quality in California through cleaner engines and fuels, further investments in innovative technologies and pioneering strategies can lay the foundation for aggressively decarbonizing the State's transportation system. Increasing access to alternative mobility options and active transportation must occur concurrently with investments in vehicle emissions systems.

1. Existing Situation

The State is pursuing four general approaches to reducing criteria pollutants, toxics, and GHG emissions from both the passenger and freight transportation sectors:

- Improving vehicle efficiency, including deployment of ZEVs and equipment;
- Reducing the carbon intensity of transportation fuels;
- Increasing sustainable mobility options through integrated transportation, public transit, active transportation, land use, and housing decisions; and
- Improving the efficiency and throughput of existing transportation systems.

To accelerate these approaches, the State has established several targets and goals, including Governor Brown's Executive Order B-16-2012[34] for ZEVs, a draft 2015 ZEV Action Plan,[35] and regional targets for reducing GHG emissions associated with regional travel demand.

To propel similar progress with vehicles and equipment that transport cargo, Governor Brown released Executive Order B-32-15,[36] which directs State agencies to develop an integrated strategy to improve freight efficiency, transition to zero emission technologies, and increase the competitiveness of California's freight system. The Sustainable Freight Pathways to Zero and Near-Zero Emissions discussion document[37] describes ARB's vision and levers to achieve a more efficient, cleaner freight system.

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[34] Executive Order No. B-16-12. Implementation Plan. September 2012. https://www.gov.ca.gov/news.php?id=17472

[35] Governor's Interagency Working Group on Zero Emission Vehicles. 2015 ZEV Action Plan, An updated Roadmap toward 1.5 Million Zero Emission Vehicles on California Roadways by 2025. April 2015. http://gov.ca.gov/docs/DRAFT_2015_ZEV_Action_Plan_042415.pdf

[36] Executive Order No. S-32-15. Sustainable Freight Pathways. July 2015. https://www.gov.ca.gov/news.php?id=19046

[37] California Air Resources Board. Sustainable Freight Pathways to Zero and Near-Zero Emissions, Discussion Document. April 2015. http://www.arb.ca.gov/gmp/sfti/sustainable-freight-pathways-to-zero-and-near-zero-emissions-discussion-document.pdf

The California Freight Mobility Plan[38] identifies priority freight routes and transportation facilities that are critical to California's economy and necessary to meet freight efficiency goals.

In addition, California is investing in a sustainable transportation future by expanding its public transit systems and modernizing passenger rail throughout the State. The California High Speed Rail will serve as the backbone of an inter-regional transportation system that is augmented by regional and local connector systems to provide access to sustainable mobility options.

Lastly, Metropolitan Planning Organizations throughout California continue to develop and implement Sustainable Communities Strategies as part of their Regional Transportation Plans. These strategies demonstrate how they will reach the State's regional GHG emission reduction targets through such activities as planning compact and transit-oriented communities, supporting and developing land use policies that accommodate the Regional Housing Needs Assessment, transportation demand management strategies, and transportation networks. Transportation and land use programs funded by the GGRF are supporting implementation of these strategies. Figure 11 shows the State's major transportation goals and targets related to reducing GHG emissions.

Figure 11. California's Major Transportation Goals and Targets

Sustainable Communities	• 2020: Metropolitan areas meet first GHG emission reduction targets • 2035: Metropolitan areas meet second GHG emission reduction targets
Zero Emission Vehicles (ZEVs)	• 2015: Metropolitan areas will have infrastructure plans for ZEVs • 2020: California infrastructure will support 1 million ZEVs • 2023: 1 million zero & near-zero emission vehicles on the road • 2025: 15% of new car sales are ZEVs • 2025: 1.5 million ZEVs on the road (cars and trucks)
Transportation	• 2030: Reduce petroleum use from cars and trucks by up to 50% • 2050: Reduce transportation GHG emissions to 80% below 1990 levels

[38] California Department of Transportation. California Freight Mobility Plan. December 2014. http://www.dot.ca.gov/hq/tpp/offices/ogm/california_freight_mobility_plan.html

2. Current Funding

Within this category, the largest sources of existing funding are directed to transportation infrastructure for all modes and support for public transit. When the Legislature and the Governor enacted SB 862[39] in 2014, they established continuous appropriations of 60 percent of the available GGRF proceeds for transportation and sustainable communities programs, including High Speed Rail, local and regional public transit, active transportation, affordable housing, and agricultural land preservation projects. All of these projects help cut petroleum use from passenger transportation, create a more robust and accessible public transit system, and integrate land use, transportation, active transportation, and housing strategies to build transportation-efficient communities.

For the vehicle side, most established funding sources focus on advancing cleaner passenger vehicles and freight equipment. Existing programs provide rebates for light duty clean cars, vouchers for cleaner heavy duty trucks, grants for current technology trucks, locomotives, and harbor craft, as well as funds for demonstrating and deploying new heavy duty technologies with zero or near-zero emissions in all applications. The GGRF Low Carbon Transportation Program supports pilot projects, demonstrations, and deployment of zero and near-zero emission transportation technologies, including those powered by renewable fuels, to provide climate and air quality benefits.

While these dedicated investments are benefiting the State, they are not sufficient to successfully decarbonize California's transportation sector—the largest source of GHG emissions.

3. Gaps and Needs Assessment

California must make substantial public investments in modern transportation strategies to develop a transportation system that better meets the State's 2030 and 2050 climate goals. This transformation is also necessary to help meet health-based air quality standards in the Los Angeles region and the San Joaquin Valley.

Because rebate programs for zero emission and plug-in hybrid vehicles are consistently oversubscribed, these programs may need additional financial support and consideration of structural changes to target incentives where they are most necessary to meet the State's ZEV targets and to provide long-term sustainability. Programs need to be expanded to promote adoption of ZEV technology among a broader range of consumers (disadvantaged, low-income, and moderate-income) and to assist small businesses in adopting new ZEV fleets. Furthermore, continued financial support is critical to transition to a zero emission freight system. This approach includes

[39] Budget and Fiscal Review Committee. Senate Bill No. 862, Chapter 36. Greenhouse Gases: Emissions Reduction. June 20, 2014. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB862

significant investment in pre-commercial development and demonstrations of innovative freight technologies, followed by greater funding to support widespread deployment.

Funding is also needed for the alternative renewable fuels and fueling infrastructure to support these advanced technologies. Investments in low carbon intensive fuels here in California can reduce GHG emissions, provide in-State economic opportunities, and help grow the State's clean fuels market. In addition, as the State moves beyond 2020, creating a more efficient and competitive freight system in California will require more than advanced vehicle and equipment technologies—it will necessitate an integrated approach to overall system efficiency to move more cargo with less climate impact.

California must also improve mobility options to allow all residents to drive less and reduce household costs while reducing GHG emissions and realizing better air quality. This change necessitates expanded public transit service to increase ridership; more transit-oriented development that includes affordable housing and other trip reduction strategies; expanded networks, facilities and programs that promote safe additional access via transit and active transportation to jobs, schools, colleges, shopping and other destinations; expanded vanpool, car share, and carpool programs; incentives that reduce vehicle travel; and protection of agricultural lands that are at risk of conversion to more carbon-intensive uses. The 60 percent continuous GGRF appropriation to these project types supports implementation of sustainable community strategies and a more sustainable passenger transportation system.

Figure 12 shows the investment concepts for transportation and sustainable communities.

Figure 12. Investment Concepts for Transportation and Sustainable Communities

Advanced Vehicle Technology

- Support accelerated adoption and deployment of clean passenger vehicles and transit buses.
- Support demonstrations, pilot projects, and deployment of zero and near-zero emission heavy duty trucks, freight and non-freight equipment (e.g., forklifts, agricultural equipment, yard trucks, locomotives, ships, and other harbor craft), and airport equipment.

Potential Recipients: Individuals, public and private fleet owners (including small businesses and schools), terminal operators, seaports and airports, railroads, distribution centers, and air districts.

Alternative Fuels and Infrastructure

- Support electric vehicle and equipment charging, hydrogen and renewable fuels and infrastructure, and electric vehicle charging and smart grid integration, including in multi-unit dwellings, small businesses, schools, retail locations, ports, truck stops, and distribution centers.
- Provide incentives for in-State production of ultra-low carbon intensity fuels.

Potential Recipients: Local governments, private fuel producers and vendors, public and private fleet owners (including small businesses and schools), seaports, airports, railroads, distribution centers, truck stops, and air districts.

System Efficiencies

- Support demonstration and implementation of passenger and freight efficiency measures to reduce the carbon footprint while increasing capacity and competitiveness (e.g., connected vehicles, information technology, collaborative logistics, etc.).

Potential Recipients: Fleet owners (including small businesses), ports, railroads, terminal operators, airports, distribution centers, and air districts.

Sustainable Communities and Transportation Infrastructure

- Support sustainable communities strategies, including expansion of public transit and active transportation infrastructure, bicycle utilization, infill development and agricultural land conservation, and transit-oriented affordable housing.
- Support passenger rail expansion powered by renewable energy.

Potential Recipients: Cities and communities, counties, schools and universities, local and regional transportation and transit authorities, the High Speed Rail Authority, specified special districts, housing authorities, joint powers authorities, developers, and affiliated nonprofit organizations.

Includes investments supported by continuous appropriations of 60% of the GGRF

4. Disadvantaged Communities

GHG emission reduction strategies for transportation that uniquely address the needs of disadvantaged communities across the State include efforts to provide more affordable, expanded transportation mobility options. This includes investments to increase public transit service, reliability, and affordability; expand farmworker vanpools; enhance safety and access to active transportation options; encourage location-efficient development accessible to transit; and provide financial support to help low-income residents of these communities as well as small businesses to access and benefit from ZEVs. In addition, GHG emission reduction strategies that address serious local air pollution issues in disadvantaged communities, including the modernization of port and freight activities, can directly improve the health of disadvantaged communities. Fully half of the Low Carbon Transportation and the Affordable Housing and Sustainable Communities investments are targeted to benefit disadvantaged communities.

5. Co-Benefits

While California already has efforts in place that will significantly cut diesel particulate matter, other air toxics, and black carbon emissions, these investments will support further reductions in criteria pollutants, air toxics, and short-lived climate pollutants from the transportation sector. These reductions will deliver additional health and economic benefits for communities along busy roadways, and near ports, rail yards, and distribution centers where concentrations of diesel particulate matter and other vehicle exhaust toxics are high. In addition to providing public health benefits, zero and near-zero emission vehicle technologies, coupled with vehicle-to-grid technology, can help better integrate renewable resources into the grid and enhance grid reliability, efficiency, and affordability. Investing in cleaner, advanced vehicle technologies can also generate jobs and job training for specialized manufacturing and servicing positions.

Sustainable community projects provide more transportation mobility options and opportunities to realize the health advantages of active transportation, but additional efforts will be needed to prevent potential displacement pressures so all Californians can benefit from this kind of development.

C. <u>Clean Energy and Energy Efficiency</u>

California's energy sector—including use of electricity and natural gas—accounts for about half of the State's near-term GHG emissions. Reducing energy-sector emissions to near-zero by 2050 will require wholesale changes to the State's current electricity and natural gas systems. It will require better integrating renewables, including distributed generation renewables, aligning demand with supply, expanding storage capacity, and increasing energy efficiency.

Transforming the energy sector will also require reducing the carbon footprint of one of the largest electricity users in the State—the water system. Targeted investments to power water systems with more renewable energy sources, improve energy efficiencies,

and strategically reduce demand for carbon-intensive water can contribute to the systemic transformation of California's water system that is already underway. Providing a foundation for more sustainable water management in California, the Governor's California Water Action Plan,[40] the State Water Plan,[41] and the 2014 Scoping Plan Update, provide high-level recommendations and priorities to address both climate change and the drought, and can inform priority investments.

1. Existing Situation

Figure 13 highlights key goals California has set to direct how the State generates and uses energy.

Figure 13. California's Renewable Energy and Energy Efficiency Goals and Targets

Renewable Electricity	• 2013: 20% of electricity from renewable sources • 2013: 250 MW of energy to be generated from urban waste, dairy and agricultural waste, and by-products of forest management • 2020: 33% of electricity from renewable sources • 2020: 12,000 megawatts of distributed generation • 2030: 50% of electricity from renewable sources
Zero Net Energy	• 2020: All new residential construction will be Zero Net Energy • 2030: All new commercial construction will be Zero Net Energy
Energy Efficiency	• 2030: Double energy efficiency savings achieved at existing buildings
Water	• 2020: Urban water usage will be 20% lower than 2005
Green State Buildings	• 2018: State agency energy purchases will be 20% lower than 2003 • 2020: State agency GHG emissions will be 20% lower than 2010 levels • 2025: 50% of State buildings will be Zero Net Energy

[40] Governor Brown. California Water Action Plan. January 2015. http://resources.ca.gov/docs/california_water_action_plan/Final_California_Water_Action_Plan.pdf

[41] California Department of Water Resources. California Water Plan. http://www.waterplan.water.ca.gov

2. Current Funding

To assist with achieving these ambitious goals, California has made important investments to help secure the State's energy future. The State continues to provide incentives for energy efficiency and clean energy projects, including grants, tax breaks, and loans. In addition to State incentives, the publicly owned and investor-owned utilities also have programs to support clean energy and energy efficiency. For example, recent legislation[42] directs investor-owned utilities to use the lesser of $100 million or 10 percent of their auction proceeds on multifamily solar installation for low-income residents in disadvantaged communities.

Some local municipalities also offer help in a variety of forms, including rebates, building permit fee waivers, and Property Assessed Clean Energy financing. Incentives focused on increasing energy-water efficiency include funding from the GGRF for appliances that are more energy efficient and use less water, as well as agricultural practices and equipment to cut both energy and water use.

3. Gaps and Needs Assessment

Clean energy and energy efficiency have traditionally received substantial public support. While there are many programs directed at providing renewable generation capabilities and improved energy efficiency to residential, commercial, industrial, and public entities, there are still a few important areas that require additional investment.

Providing financial assistance for water agencies to pursue renewable energy fills an important niche that can help decarbonize the State's water supply. While there are many renewable energy incentives in California, bio-energy systems lag and need additional financial support to advance the market. This, as well as co-generation opportunities, are covered in the discussion on methane emission reductions as part of the Natural Resources and Waste Diversion investment section.

There is an opportunity to improve the energy efficiency of California's businesses, especially small businesses. For example, as the 2020 deadline for the Montreal protocol-driven phase out of ozone depleting substance approaches, commercial and institutional refrigeration systems throughout California are increasingly being transitioned to systems that use high global warming potential refrigerants, a major source of short-lived climate pollution. While low global warming potential refrigerant systems are available, financial barriers inhibit widespread adoption. Currently, there are no incentives to support low global warming potential refrigerants. Offering support to California businesses and/or institutions to install or upgrade to a low global warming potential refrigerant system can provide significant reductions of fluorinated gas emissions at a very low cost. These systems may be more efficient than older systems that use high global warming potential refrigerants, also reducing energy use and

[42] Eggman. Senate Bill No. 693, Chapter 582. Multifamily Affordable Housing Solar Roofs Program. October 8, 2015. http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160AB693

electricity bills. Other opportunities may be supported to improve the energy efficiency of California's schools and businesses more broadly, including industrial and manufacturing businesses, but these funding opportunities need to be targeted to minimize overlap with existing State and utility-based energy efficiency financing and funding.

Furthermore, expanding the current State and utility weatherization and renewable energy programs to include small businesses could help reduce energy bills while also providing significant GHG emission reductions through improved energy efficiency.

Reducing residential woodsmoke from home heating and home green waste burning is another target for new investment. In California's rural communities, where residents rely on wood as a primary heating source, there are climate and air quality benefits to be gained by aiding the replacement of inefficient fireplaces and woodstoves with natural gas heating (if available) or the most efficient, lowest polluting woodstoves. In some of these communities, residents also dispose of their green waste through open burning when there are lower carbon, but more expensive, options. Providing support to expand existing local programs to reduce residential woodsmoke should be considered.

Carbon capture and sequestration is a potential means to reduce GHG emissions and mitigate climate change, whereby large amounts of carbon dioxide are captured, transported, injected, and stored underground in geological formations such as depleted oil and gas reservoirs and saline formations. Carbon capture and sequestration may be able to divert millions of metric tons of carbon dioxide from emission into the atmosphere and store them underground. Support for carbon capture and sequestration could be used to fund a demonstration project in California to capture a partial stream of carbon dioxide from an industrial facility, like a power plant, and inject the stream into an underground geologic formation.

Utilizing woody biomass, a by-product of forest management in biomass conversion technologies offers sustainable production of biofuels and bioenergy products. Mechanical thinning of forests produces woody biomass that must be disposed of in some manner. These forest wastes are historically underutilized and wasted due to high costs associated with the collection and transportation as well as low market values. Unfortunately, the traditional practice of open biomass burning is a major source of GHG and criteria air pollutant emissions, including black carbon.

The development and commercialization of new, clean biomass facilities offers an opportunity to utilize biomass that would otherwise go to waste. Similarly, establishing a robust biomass use market with diverse wood product manufacturing and distributed bioenergy production is essential to provide value to biomass and thereby make it cost-effective to transport from the forest to end users. Reforestation and management to improve forest health should continue to be promoted as a mechanism to foster sustainable forests for long-term carbon storage. Existing regulations and approved land management practices continue to be enforced to minimize adverse effects to soil,

water, and biodiversity. While near-term GHG emissions may increase due to collection and transportation processes, holistic forest management can reduce catastrophic wildfire, open biomass burning, and black carbon emissions. Additionally, collection and transportation processes may provide increased opportunities for rural communities and economic stimulus.

Putting woody biomass to its most beneficial use requires lifecycle and economic analyses of the many waste diversion options to fully quantify the benefits and identify possible unintended consequences of each biomass use option by region. All pathways should be explored to provide a diverse set of options to maximize use of woody waste biomass and achieve GHG and criteria air pollutant emission reductions. However, given the current imbalance of biomass supply to viable outlets, utilizing existing infrastructure (i.e., bioenergy) and exploring near-term additional waste utilization techniques can help avoid open pile burning.

Figure 14 shows the investment concepts for clean energy and energy efficiency.

Figure 14. Investment Concepts for Clean Energy and Energy Efficiency

Energy Efficiency and Renewable Energy

- Support energy efficiency and renewable energy projects for residential, commercial, industrial, and public buildings.
- Support technology demonstration, pilot projects, and deployment projects for energy storage (e.g., renewable energy storage, power-to-gas, batteries, etc.).
- Support new, clean biomass facilities and biomass conversion technologies for renewable energy generation.

Potential Recipients: Home owners, businesses (including small businesses), State agencies, local governments, universities, and agricultural operations.

Low Carbon Water System

- Support renewable energy generation by water agencies and water suppliers, including at waste water treatment facilities.
- Support improved energy efficiencies, including pumps, turbines, and existing desalination plants.
- Support reduced demand for carbon-intensive water.
- Support on-farm energy and water efficiency practices.

Potential Recipients: Water utilities, irrigation districts, local governments, State water managers, nonprofit organizations, schools and universities, and agricultural, industrial, and commercial operations.

Low Global Warming Potential Alternatives

- Provide incentives to assist California businesses, particularly small businesses, with installing low global warming potential refrigeration equipment and other strategies to reduce fluorinated gases, among other high global warming potential gases.

Potential Recipients: California businesses, particularly small businesses.

Residential Woodsmoke Reduction

- Support reductions in indoor and outdoor residential woodsmoke, including incentives for woodstove/fireplace replacements and utilization of home green waste.

Potential Recipients: Air districts, woodstove retailers, nonprofit organizations, and local governments.

Carbon Capture and Sequestration

- Provide funding to capture carbon dioxide from an industrial source and inject into an underground geologic formation.

Potential Recipients: Air districts and industrial operations.

4. Disadvantaged Communities

For clean energy and energy efficiency, specifically addressing the socioeconomic vulnerability of disadvantaged communities requires strategies that reduce household and small business energy costs. Clean energy generation (like solar payer and efficient woodstoves), as well as building improvements (like weatherization) that reduce energy use, not only save residents and businesses on their energy bills, but also result in healthier, more comfortable indoor living and working environments in addition to cleaner outdoor air.

Disadvantaged communities are also in a position to benefit from microgrids and "community scale" renewable projects that have been demonstrated across the State. These projects enable high penetration of renewables and distributed generation, including electric vehicles, to be deployed at community scale in a manner that optimizes their economic and GHG emission reduction benefits. Equally important, it enables maintaining power to critical services and facilities during power grid outages without high-polluting generators.

5. Co-Benefits

Investing in clean energy and energy efficiency in California can save consumers and businesses money on their utility bills, create healthier homes and workplaces, and generate clean energy manufacturing and service jobs, and job training opportunities. Reduced utility bills are particularly beneficial for disadvantaged community residents who can use the savings for other quality-of-life expenditures. Many of the strategies that reduce the carbon footprint of the State's water system also help with drought resiliency for both farmers and urban water consumers. Replacing woodstoves and fireplaces with the most efficient wood-burning technologies or alternatives can cut climate pollutants, improve indoor air quality for households reliant on wood for home heating, and improve outdoor air quality in valley and foothill areas where the topography traps the smoke.

An incentive program to upgrade refrigerant systems would benefit small businesses, such as neighborhood grocery stores, as they face the high cost of replacing older refrigeration equipment using ozone depleting refrigerants with new systems using refrigerants that are non-ozone depleting and have lower global warming potential. New systems typically offer the added benefits of improving energy efficiency, reducing operation and maintenance costs, and improving reliability, thus reducing downtime and the risk of product loss.

D. <u>Natural Resources and Waste Diversion</u>

California's natural resources are key assets to address climate change. Natural and working lands, and in particular forests, which constitute over one-third of the land base in California and supply clean water to nearly two-thirds of the State's residents, are critical for meeting California's climate goals. Natural and working lands provide important opportunities for climate mitigation that help reduce GHG emissions from wildfire, land conversion, and other sources, and store carbon in biomass and soils.

Furthermore, protecting these lands from conversion to more carbon-intensive uses, such as residential and commercial development, also serves to promote infill development that reduces vehicle miles traveled, infrastructure expansion, and the associated GHG emissions. These projects can also help protect against the impacts of future climate change.

Given the time frame required to realize the full benefits from GHG emission mitigation activities undertaken in most natural systems, achieving the State's mid- and long-term climate goals will not be possible without investing now in California's natural resources. This includes requiring an integrated, landscape-level approach to protect and manage lands across ownerships in California including State, federal, tribal, and private lands. Protecting and managing these lands—including forests, wetlands, agricultural, and rangelands, among other land types—can enable and enhance their ability to contribute to renewable energy and fuel production, provide essential ecosystem benefits, and increase the capacity of these landscapes to store carbon in a manner that can be sustained well into the future.

In addition, transforming how the State manages organic waste and woody biomass, including the high volume of dead and dying trees that are in forests today, is an effective means of reducing methane and black carbon emissions. Cross-sector consideration and treatment of organic waste and woody biomass also provides opportunities to improve soil health; generate renewable energy and fuels; and grow markets for non-commercial forest products and forest management waste, including soil amendments, mulch, and animal bedding.

1. Existing Situation

GHGs, including short-lived climate pollutants, are released from California's landscapes primarily through land conversion and the associated loss of carbon from tree and other vegetation removal and soil disturbance and wildfire, particularly forest fires. These activities and events release stored carbon and, in some cases, limit the capacity of these lands to store carbon in the future. Ongoing land development and infrastructure expansion, and the increased frequency and severity of wildfires due to past fire suppression, drought and related impacts, pose challenges to effectively protect and manage California's natural and working lands.

CNRA, CalEPA, CAL FIRE, ARB, federal and local agencies, and other partners are collaborating on a Forest Carbon Plan to describe and implement climate goals for forests. Through the Forest Carbon Plan, the State expects to set targets for forest carbon storage, identify implementation plans to achieve these targets, and develop funding recommendations to support long-term carbon storage in forests.

The Forest Carbon Plan will complement the strong history of sustainable management and land conservation in California. These ongoing efforts protect natural ecosystems and wildlife, preserve agricultural viability and working forests, improve water supply and quality, and provide parks and open spaces for residents and visitors from around the world.

State-federal and public-private partnerships are critical to effective management of natural and working lands in California, particularly forests, rangelands and other grasslands, and wetlands and riparian ecosystems. GGRF investments can be leveraged with funding from non-State entities and focused on GHG emission reduction activities across ownership types. State and federal investments in natural and working lands protection and management are providing climate benefits as well as agricultural production, ecosystem integrity and species conservation, and watershed protection.

CalRecycle implements waste diversion strategies to cut GHG emissions (especially methane) and criteria and toxic air pollutants, by reducing the amount of municipal solid waste that is disposed of in landfills and repurposing that waste as new, value-added products. Increasing waste diversion alternatives, expanding their markets, and building the necessary infrastructure will be needed to reach the State's waste diversion goals. Similar strategies can be applied to support reduced-emission disposal of forest waste produced through management activities and disposal aimed at decreasing wildfire risk. Expanding biomass markets in rural areas provides local economic opportunities, as well as a revenue source to invest in increasing amounts of forest management to reduce wildfire and open biomass burning emissions.

Figure 15 summarizes key State goals for natural resources and waste diversion.

Figure 15. California's Natural Resources and Waste Diversion Targets and Goals

Natural and Working Lands	• Protect, restore, and manage natural and working lands so they provide stable carbon stores and net GHG benefits • Increase urban tree canopy and expand green infrastructure to sequester carbon and increase energy efficiency of the built environment • Significantly reduce GHG and black carbon emissions from wildfire and open biomass burning
Waste Diversion and Utilization	• 2020: 75% recycling, composting, or source reduction of solid waste • 2025: Effectively eliminate organic disposal from landfills • 2030: Methane emissions will be 40% less than 2005 levels • Significantly cut methane emissions from dairies • Utilize organic waste to help meet the State's renewable electricity and bioenergy targets (see Figure 2)

2. Current Funding

State funding to support conservation and restoration of natural and working lands includes several programs housed at CDFA and departments, boards, and

conservancies under CNRA, such as CAL FIRE, CDFW, and the Department of Conservation (DOC). Local and federal funds exist for conservation and restoration projects—leveraging these funds with the GGRF can broaden the opportunities for additional projects to achieve the State's mid- and long-term goals. State funding to CalRecycle to support waste diversion in California has largely focused on expanding California's recycling and composting/anaerobic digestion capacity.

3. Gaps and Needs Assessment

Natural and Working Lands. Investment in resilient carbon storage across all land types is of particular importance to consider for this Second Investment Plan. These investments should be aimed at putting natural and working lands on a long-term trajectory towards climate-resilient carbon storage. In forests, in particular, investments in thinning and other management practices that may result in short-term reductions of carbon stored may lead to increased, more resilient long-term storage. To guide investments to increase carbon storage and achieve a net climate benefit in the near- and long-term, investments should be considered within the following areas:

- Protect existing natural and working lands threatened by conversion to more carbon-intensive land uses; and
- Strategically manage and restore lands to increase their capacity to sustainably store carbon and reduce GHG emissions, including short lived climate pollutants.

There is a strong history of land conservation in California to protect natural ecosystems and wildlife, preserve agricultural viability and working forests, and improve water supply and quality, and provide parks and open spaces for residents and visitors from around the world. Production agriculture and working forests are necessary elements of the landscape, not only because they provide food and fiber to the world and are a significant component of California's economy, but also because good management of these lands provides public benefits, carbon sequestration among them. California's natural and working lands should be protected from conversion and managed wisely to reduce GHG emissions, reverse carbon loss, and to preserve and grow carbon stocks.

These investments will have an impact on both private and public lands, as the State enlists all landowners (both public and private) in stewarding landscapes. This includes:

- Managing natural and working lands to achieve sustainable net carbon sequestration and GHG emission reductions;
- Targeting investments toward private landowners for conservation of forest and agricultural lands that are at risk of conversion; and
- Cost-share programs to promote restoration of forested lands, meadows, wetlands, and other natural areas.

The benefits of urban forests and the greening of built environments that can result in climate benefits are also important. These benefits, including carbon sequestration, air filtration, community cooling, improved active transportation and recreation conditions,

improved storm-water runoff, and water retention, can each provide incremental climate benefits.

Waste as a Resource. Managing the State's waste plays an important role in reducing methane, a potent short-lived climate pollutant. Organic waste—including organic matter sent to landfills, agricultural and forest biomass, and livestock manure—is responsible for more than half of the State's methane emissions. Addressing this need will require utilizing organic matter on-site, or redirecting organic matter sent to municipal waste facilities, including landfills and wastewater treatment plants, to composting and anaerobic digestion—to create renewable energy and other useful products, including amendments that improve agricultural soil health. The generation of this on-site renewable energy can fuel local transportation needs, including powering landfill and dairy trucks, or can be injected into gas pipelines for use in other locations.

Traditional methods of managing livestock manure should be transitioned to scrape manure management systems and dairy digesters should be utilized for turning waste into energy, where feasible and appropriate. Intermediate technologies, such as solid separation, may have a role in contributing to emission reductions. All systems should take into account agronomic and other benefits of various manure management pathways.

Waste-related funding in California has largely focused on expanding recycling capacity. While this investment is a start, transforming how the State handles organic matter—essential to reversing growth in methane emissions—will require a significantly larger investment in infrastructure to support resource recovery from organic waste, including production of various forms of energy, compost, and other soil amendments.

There are also additional opportunities for achieving GHG emission reductions from utilizing the resources from the organic waste, whether it is generated from natural and working lands, or diverted from landfills or wastewater treatment. For example, the use of compost as a soil amendment can result in GHG benefits due to increased carbon storage on the land, soil stabilization (which reduces erosion), and water conservation. Additional actions could take advantage of the synergies between these two waste sources.

Healthy Soils. A combination of innovative farm and land management practices contribute to building adequate soil organic matter that can increase carbon sequestration and reduce overall GHG emissions while supporting California agriculture. California leads the nation in agricultural production in both value and crop diversity—and soils are fundamental for those crops to grow and food production to remain secure. With limited arable land and the effects of ongoing drought, it is critical, now more than ever, that California soils are "healthy" and productive long into the future, resilient to drought and climate change impacts, and continue to produce crop yields that will sustain a growing local and global population.

Figure 16 shows the investment concepts for natural resources and waste diversion.

Figure 16. Investment Concepts for Natural Resources and Waste Diversion

Protect and Grow Carbon Stocks on Natural and Working Lands

- Increase management and restoration activities on public and private natural and working lands to improve carbon sequestion.
- Reduce emissions from wildfire by building forest resiliency.
- Support conservation of natural and working lands that are at risk of conversion to more carbon intensive uses.
- Increase urban tree canopy (including subsequent tree maintenance) and expand green infrastructure to sequester carbon and increase energy efficiency of the built environment.
- Support projects that combine conservation easements with carbon sequestration efforts.
- Support net GHG emission reductions and carbon sequestration on agricultural and rangelands, including healthy soils practices.

Potential Recipients: Land owners, public natural resource management agencies, local governments, agricultural operations, tribes, schools, and nonprofit organizations.

Reduce Emissions from Organic Waste

Forests

- Support new, clean biomass energy and fuel production facilities located near feedstock or modernization of existing ones to be more efficient and reduce GHG emissions.
- Utilize dead and dying trees, and biomass from forest health treatments, as an energy source or for wood products.

Livestock Manure

- Support dairy digesters.
- Support manure management systems, like flush-to-scrape, where applicable.

Organic Waste

- Support infrastructure needed for additional compost/anaerobic digestion capacity utilizing the most effective emission control technologies.
- Support incentives to create compost from organic byproducts of anaerobic digestion.

Waste-to-Fuel

- Support equipment and infrastructure to create transportation fuel from biomass, dairy, and other organic waste digestate to fuel on-site heavy duty trucks and equipment (e.g., dairy digesters).

Potential Recipients: Dairy operators, agricultural operations, governments, sanitation agencies, waste agencies, joint power authorities, businesses, schools, tribes, and nonprofit organizations.

4. Disadvantaged Communities

Strategies in this category that address the needs of disadvantaged communities are those that ultimately result in healthier places to live, work, and play. Restoring and improving how the State manages the forests, wetlands, and other natural lands located in disadvantaged communities helps direct the benefits of these ecosystem services to these communities. For instance, wetland restoration in the Delta provides flood resiliency to nearby disadvantaged communities. Urban forestry helps mitigate some of the environmental health burdens in disadvantaged communities. Trees in urban and rural areas as well as the California's 33 million acres of forests can provide air and water filtration, resiliency against heat and heat-related illness, recreational opportunities for residents, and create more vibrant streetscapes and landscapes.

Studies suggest that creating a robust recycling, composting, and digestion system in California has the potential for substantial local job creation.[43] However, efforts to expand composting, anaerobic digestion, and recycling should be pursued strategically to avoid creation of environmental health issues for nearby communities. For example, anaerobic digestion facilities should be sited appropriately to minimize truck traffic, thereby reducing vehicle miles travelled, as well as the associated criteria and toxic air pollutants. In addition, digester and composting facilities located near residents are already installing emission control techniques to minimize volatile organic compounds (VOCs) and other air pollutants. State and local agencies are working together to encourage growth of these types of operations, while establishing these facilities in a way that addresses disadvantaged community concerns, helps meet the unique needs of these communities, and protects the environment and public health through existing statutory mechanisms, such as the California Environmental Quality Act and environmental permitting programs

5. Co-Benefits

The State's forests, soil, grasslands and waterways are, as Governor Brown stated in his January 2015 Inaugural Address, "…the very systems of nature on which human beings and other life forms depend." Natural and working lands are essential assets in ensuring California remains one of the most ecologically, economically, and culturally rich places in the nation. California's natural and working lands provide ecosystem services on which we all depend, including water capture supply and filtration, including groundwater recharge, improved air quality, and provision of food, fiber, and wildlife habitat.

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[43] Natural Resources Defense Council. From Waste to Jobs: What Achieving 75 Percent Recycling Means for California. March 2014. http://www.nrdc.org/recycling/files/green-jobs-ca-recycling-report.pdf;
Natural Resources Defense Council. Smarter Business: Green Business Guides - More Jobs, Less Pollution - Growing the Recycling Economy in the U.S. November 2011. http://www.nrdc.org/business/guides/recyclingreport.asp; and
Institute for Local Self-Reliance. Composting Makes ene: Jobs through Composting & Compost Use. May 2013. http://ilsr.org/composting-sense-tables

Sustainably managed natural and working lands can also buffer both humans and nature from the expected impacts of climate change—by improving water quality, providing flood control, promoting groundwater recharge, providing shade and shelter, providing food and fiber production, reducing incidence of pests, disease and wildfires, and protecting against soil erosion. These co-benefits should be sought at every opportunity and pursued through innovative integration of natural resources into other GGRF investment priorities, such as energy and sustainable communities. The public benefits of investing in natural resources now are numerous and are felt through time.

Working to make the State's forest carbon stocks more permanent and resilient to withstand disturbances is not only an effective mitigation strategy, but also brings myriad other benefits, including improved wildlife habitat and healthier watersheds. Wetlands in California not only sequester carbon, they are the first line of defense against sea-level rise and storm surge, particularly in the fragile Delta region. Investments in these wetlands and mountain meadows can improve water quality for downstream communities as well as providing recreational opportunities associated with habitat restoration such as hunting, fishing, hiking, and birdwatching. Urban forests cool communities, reduce energy used to cool homes, and create comfortable conditions that encourage active transportation. The recreational co-benefits of natural lands can not only improve health but provide direct economic benefit to the local community. Working natural lands can provide the revenue needed for families to maintain large, unfragmented tracts of land intact, and enable them to afford restoration and other activities necessary to maintain healthy natural ecosystems.

Improving the health of agricultural soils with compost, other amendments, and improved farming practices increases the carbon storage capacity of soils, while reducing water and synthetic fertilizer use. The diversion of manure to digesters can reduce air and water impacts related to open manure lagoons and help better manage nitrogen associated with animal wastes. A more robust, healthier agricultural sector has economic benefits for many of the State's rural communities.

Waste diversion projects have the potential to yield economic, environmental, and public health co-benefits. Operating the next generation of composting and anaerobic digestion plants will require new skills, and where applicable, job training for community residents. Reducing the amount of municipal solid waste landfilled will improve air quality by reducing criteria and toxic air pollutants directly from landfills. In addition, waste diversion projects can reduce the distance waste is hauled to landfills, thereby reducing vehicle miles travelled, as well as the associated criteria and toxic air pollutants. Compost and anaerobic digestion projects produce valuable soil amendments which have a number of environmental co-benefits such as reducing soil erosion, displacing synthetic fertilizers, and increasing soil water holding capacity.

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APPENDIX A

Investment Goals and Concepts

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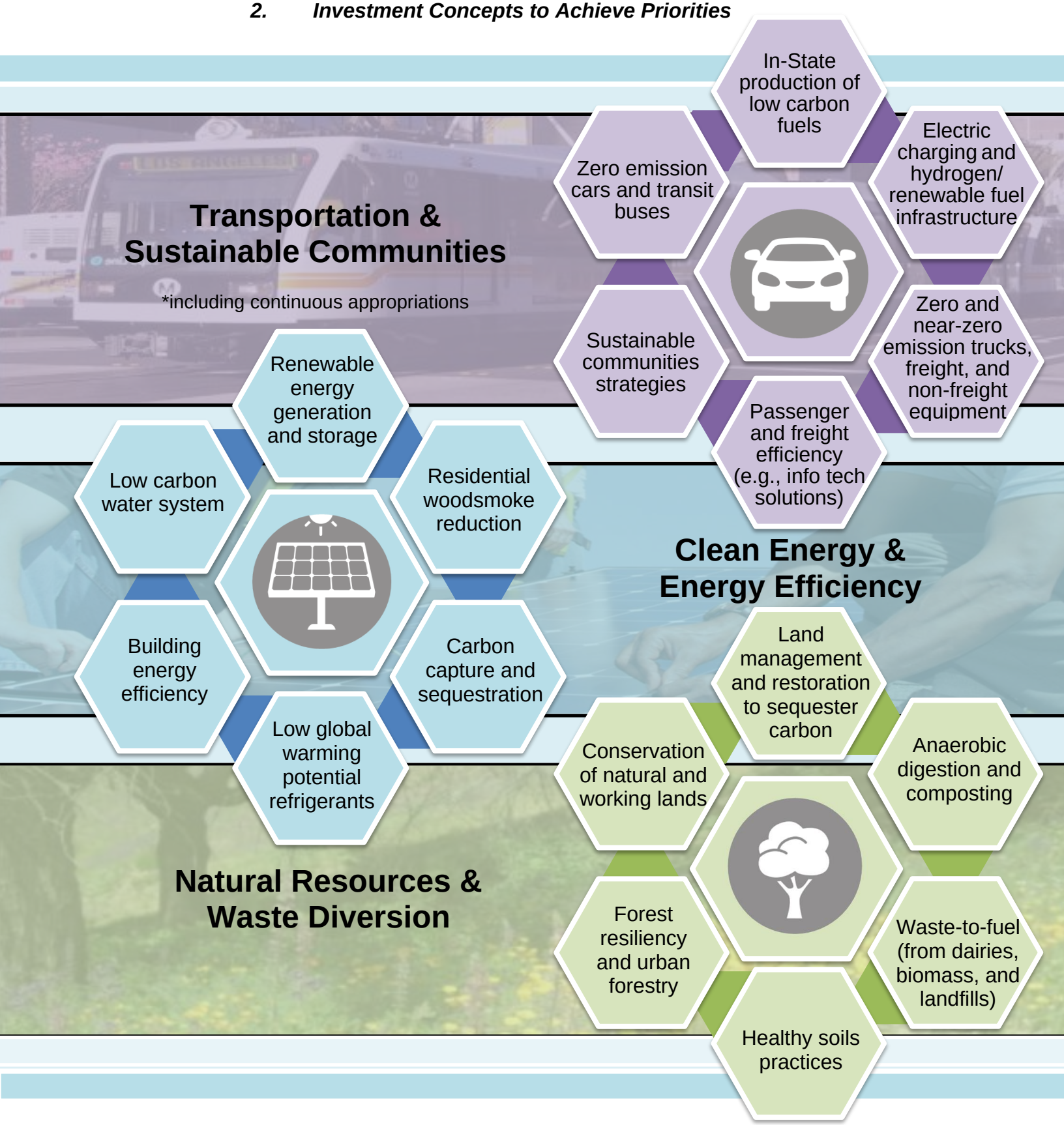
Investment Goals and Concepts

This section summarizes the goals and concepts recommended for funding in the Second Investment Plan. The investment goals (outlined below) and concepts to achieve priorities (presented in Figure A-1) are derived from a public handout provided during the November 2015 workshops in Sacramento, Fresno, and Los Angeles.

1. Goals for California Climate Investments

- Reducing greenhouse gas emissions
- Benefiting California's most disadvantaged communities
- Increasing rural community participation
- Maximizing co-benefits to health, environment, and economy

2. Investment Concepts to Achieve Priorities



APPENDIX B

Greenhouse Gas Reduction Fund Appropriations

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Greenhouse Gas Reduction Fund Appropriations

In May 2015, over $2.2 billion in California Climate Investments were proposed (as shown in Table B-1). As part of the budget process, the Legislature and Governor appropriated $1.4 billion for Fiscal Year 2015-16. The current California Climate Investment budget appropriations are displayed in Table B-2.

Table B-1. 2015-16 Cap-and-Trade Expenditure Plan - May 2015-16 Budget Revision (Dollars in Millions)

Investment Category	*Department*	*Program*	*Jan 10/ Accelerated Drought*	*May Revision*	*Total*
Sustainable Communities and Clean Transportation	High-Speed Rail Authority	High-Speed Rail Project	$250	$250	$500
	State Transit Assistance	Low Carbon Transit Operations Program	$50	$50	$100
	California State Transportation Agency	Transit and Intercity Rail Capital Program	$100	$165	$265
	Strategic Growth Council	Affordable Housing and Sustain-able Communities Program	$200	$200	$400
	Air Resources Board	Low Carbon Transportation	$200	$150	$350
Energy Efficiency and Clean Energy	Department of Community Services and Development	Energy Efficiency Upgrades/Weatherization	$75	$65	$140
	Department of General Services[44]	Energy Efficiency for Public Buildings	$20	$20	$40
	University of California/ California State University	Renewable Energy and Energy Efficiency Projects	$0	$60	$60
	Department of Water Resources/Department of Food and Agriculture	Water and Energy Efficiency	($30)	$60	$60
	California Energy Commission/Department of Water Resources	Drought Executive Order - Rebates for Appliances	$0	$30	$30
		Drought Executive Order - Water and Energy Technology Program	$0	$30	$30
	Department of Food and Agriculture	Agricultural Energy and Operational Efficiency	$5	$20	$25
Natural Resources and Waste Diversion	Department of Fish and Wildlife	Wetlands and Watershed Restoration	$25	$40	$65
	Department of Forestry and Fire Protection	Forest Health	$42	$50	$92
	Department of Food and Agriculture	Healthy Soils	$0	$20	$20
	Department of Resources Recycling and Recovery	Waste Diversion	$25	$35	$60
Total			**$992**	**$1,245**	**$2,237**

[44] Shifts administration of Green Buildings and $20 million from the current year from CEC to DGS.

Table B-2. Greenhouse Gas Reduction Fund Appropriations for Investment

Agency	Program	Appropriations[1]			Project Categories	Type of Award Process
		2013-14 ($M)[2]	2014-15 ($M)[2]	2015-16 ($M)[2]		
High Speed Rail Authority	High Speed Rail Construction of the initial operating segment in the Central Valley and further environmental and design work on the statewide system.	$0	$59	$500[3,4]	Planning/design	State Implemented
			$191		Right-of-way acquisition and construction of Initial Operating Segment	
California State Transportation Agency	Transit and Intercity Rail Capital Program Competitive grant program for rail and bus transit operators for capital improvements to integrate State and local rail and other transit systems, and provide connectivity to the high-speed rail system.	$0	$25	$200[3]	Connectivity to existing/future rail and transit systems; increased service and reliability of rail and transit, and integration of transit and rail systems	Competitive
Department of Transportation	Low Carbon Transit Operations Program Support new or expanded bus and rail services to increase transit ridership and decrease greenhouse gas emissions.	$0	$25	$100[3]	New/expanded bus or rail services or expanded intermodal transit facilities; service or facility improvements	Distribution to local transit agencies based on statutory formula
Strategic Growth Council	Affordable Housing and Sustainable Communities Program Implementation of SB 375 sustainable communities strategies and similar strategies in other areas with greenhouse gas reduction policies. Projects will reduce greenhouse gas emissions by increasing transit ridership, active transportation (walking/biking), affordable housing near transit stations, preservation of agricultural lands, and local planning that promotes infill development.	$0	$125	$400[3]	Transit-orientated development and integrated connectivity projects	Competitive
			$5		Agricultural land preservation	

Table B-2. Greenhouse Gas Reduction Fund Appropriations for Investment (*Continued*)

Agency	Program	Appropriations[1]			Project Categories	Type of Award Process
		2013-14 ($M)[2]	2014-15 ($M)[2]	2015-16 ($M)[2]		
Air Resources Board	Low Carbon Transportation Accelerate the transition to low carbon freight and passenger transportation. Support the Administration's goal to deploy 1.5 million zero emission vehicles in California by 2025. Respond to increasing demand for rebates for zero emission cars and vouchers for hybrid and zero emission trucks and buses, as well as provide incentives for the pre-commercial demonstration of advanced freight technology to move cargo in California.	$20	$111	$95[5]	Clean vehicle rebates	First-Come First-Served
		$10	$5		Heavy duty hybrid/ZEV trucks and buses	
		$0	$50		Freight demonstration projects	Competitive
			$9		Truck and bus pilot projects in disadvantaged communities	
			$25		Light duty pilot projects in disadvantaged communities	
Department of Community Services and Development	Low-Income Weatherization Program/Renewable Energy Installation of energy efficiency and renewable energy projects in single and multifamily low-income housing units within disadvantaged communities. Weatherization measures typically include weather-stripping, insulation, caulking, water heater blankets, windows, refrigerators, energy efficient light bulbs, electric water heaters and heating and cooling systems. Renewable energy measures include installation of solar water heater systems and photovoltaic systems.	$0	$75	$79[5]	Single-family weatherization	Existing Service Providers
					Multi-family weatherization	Existing Service Providers / Competitive
					Solar photovoltaic and water heating	Competitive

Table B-2. Greenhouse Gas Reduction Fund Appropriations for Investment (*Continued*)

Agency	Program	Appropriations[1]			Project Categories	Type of Award Process
		2013-14 ($M)[2]	2014-15 ($M)[2]	2015-16 ($M)[2]		
California Energy Commission	Energy Efficiency in Public Buildings Energy efficiency and energy generation projects in public buildings owned and operated by a State agency or entity, including, without limitation, the University of California and California State University. Examples of fundable projects include, but not limited to, lighting systems, heating, ventilation and air conditioning equipment, interior and exterior lights, energy management systems and equipment controls, pumps and motors, building insulation, renewable energy (e.g., PV) and combined heat and power projects using renewable fuel, and load shifting projects, such as thermal energy storage.	$0	$20		Building retrofits for energy efficiency	First-Come First-Served
					Energy generation	
Department of Food and Agriculture	Climate Smart Agriculture Projects that reduce greenhouse gas emissions from the agriculture sector by capturing greenhouse gases, harnessing greenhouse gases as a renewable bioenergy source, improving agricultural practices and promoting low carbon fuels, agricultural energy, and operational efficiency.	$10	$10	$40[5]	Energy and water use efficiency	Competitive
			$15		Dairy digesters	
					Alternative and renewable fuels	State Implemented
Department of Water Resources	Water Action Plan - Water-Energy Efficiency Grants to implement residential, commercial, or institutional water efficiency programs or projects. Support State Water Project facilities.	$10	$10		Hydro energy turbine efficiency	State Implemented
		$20	$10	$20[5]	Water conservation and energy efficiency	Competitive

Table B-2. Greenhouse Gas Reduction Fund Appropriations for Investment (*Continued*)

Agency	Program	Appropriations[1]			Project Categories	Type of Award Process
		2013-14 ($M)[2]	2014-15 ($M)[2]	2015-16 ($M)[2]		
Department of Fish and Wildlife	Water Action Plan - Wetlands and Watershed Restoration Implement projects that provide carbon sequestration benefits, through restoration of wetlands (including those in the Delta), coastal watersheds and mountain meadows.	$0	$25	$2[5]	Delta and coastal wetlands	Competitive
					Mountain meadows habitat	
					Water efficiency on Department of Fish and Wildlife lands	
Department of Forestry and Fire Protection	Healthy Forests Urban forests in disadvantaged communities and forest health restoration and reforestation projects that increase carbon sequestration and reduce wildfire risk. Projects to enhance forest health and reduce fuel loads in light of climate change increasing wildfire intensity and damage.	$0	$24		Forest health restoration, forest legacy, and land conservation	Competitive
			$18		Urban forestry	Competitive
Department of Resources Recycling and Recovery	Waste Diversion Financial incentives for capital investments in composting/anaerobic digestion infrastructure and recycling manufacturing facilities to divert waste from landfills.	$0	$15		Organics composting / anaerobic digestion	Competitive
			$5		Increased recycled manufacturing	
			$5	$6[6]	Organics and recycling project loans	
Total Appropriations for Programs[1]		$70	$862	$1,442		

Table B-2. Greenhouse Gas Reduction Fund Appropriations for Investment (*Continued*)

[1] Appropriation is for State agencies to administer programs and fund projects.
[2] State agency allocations by project type.
[3] For State agencies with continuous appropriations, the Fiscal Year 2015-16 values are based on their assigned percentages applied to a total proceeds amount of $2.237 billion, as estimated in the May 2015 Revised Budget Summary (http://www.ebudget.ca.gov/2015-16/pdf/Revised/BudgetSummary/FullBudgetSummary.pdf).
[4] In addition to the $500 million shown above, SB 862 states that $400 million shall be available to the High Speed Rail Authority beginning in FY 2015-16, as repayment of a loan to the General Fund. This money shall be repaid as necessary, based on the financial needs of the High-Speed Rail project.
[5] For State agencies without continuous appropriations, the Fiscal Year 2015-16 values are based on three 2015 statutes: SB 101[45] and AB 93.[46]
[6] For the Department of Resources Recycling and Recovery, the Fiscal Year 2015-16 amount includes $5 million appropriated under SB 862.

[45] Senate Bill No. 101, Chapter 321. Budget Act of 2015: Committee on Budget and Fiscal Review. September 22, 2015. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB101
[46] Assembly Bill No. 93, Chapter 10. Budget Act of 2015: Weber. June 24, 2015. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB93

APPENDIX C

Electrical Distribution Utility Investments of Auction Proceeds

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Electrical Distribution Utility Investments of Auction Proceeds

Electrical distribution utilities receive allowance allocations from ARB pursuant to provisions of the Cap-and-Trade Regulation (Regulation).[47] Per the Regulation, these allowances are to be used for the benefit of ratepayers, consistent with the goals of AB 32.

The Regulation specifies two types of electrical distribution utilities to be allocated allowances—investor-owned utilities and other utilities. Investor-owned utilities are electric utilities owned by investors and include the largest electric utilities in the State. The Regulation requires investor-owned utilities to consign all of their allocated allowances at the auctions held by ARB. SB 1018 and the California Public Utilities Commission (CPUC) together require investor-owned utilities to return nearly all of the resulting proceeds to their industrial, small business, and residential customers.

The other electrical distribution utilities receiving allowance allocations are publicly owned utilities and electrical co-operatives. Publicly owned utilities and electrical co-operatives are owned and operated by local governments such as cities, local utility districts, and irrigation districts, while electrical co-operatives are owned by their members. The governing boards of publicly owned utilities and electrical co-operatives determine how to use their allocated allowances.

Each year, electrical distribution utilities are required to report to ARB by June 30, describing how each utilized the allocated allowances it received for the prior year (see section 95892(e) of the Regulation). For example, for vintage 2013 allowances allocated to electrical distribution utilities, the report from each was due to ARB by June 30, 2014. Utilities must describe how the allocated allowance value was used, describe how that use was consistent with the requirements of the Regulation, and identify unspent allocated allowance value.

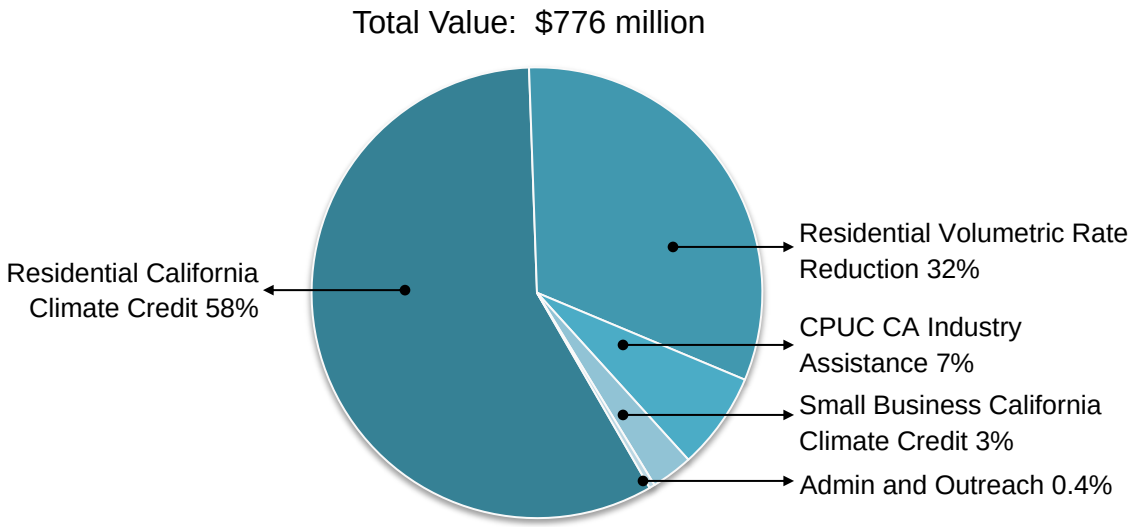
The following sections summarize data the electrical distribution utilities submitted in June 2014 on their usage of 2013 allowance value. Utilities recently submitted information on their use of 2014 allowance value and ARB is in the process of compiling this information. Once completed, ARB will post updated information on the use of 2014 allowance value on the ARB website: http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/allowanceallocation.htm.

[47] California Air Resources Board. Final Regulation Order. California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms to allow for the Use of Compliance Instruments Issues by Linked Jurisdictions. January 2015. http://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_c&t_012015.pdf

3. Investor-Owned Utility Investments

As detailed in the Summary of Vintage 2013 Electrical Distribution Utility Allocated Allowance Value Reports,[48] the total value of vintage 2013 allowances allocated to investor-owned utilities was $776 million. The expected use of the vintage 2013 allocated allowance value benefits a range of recipients, including residential customers and small businesses. The funds support outreach and administrative costs, as well as the first round of semi-annual California Climate Credit[49] to some residential customers. The CPUC has directed the investor-owned utilities to return half of the vintage 2013 allocated allowance value to customers during 2014 and half during 2015. Figure C-1 provides a breakdown of the IOUs expected use of vintage 2013 allocated allowances, based on utilities' public forecasts as approved by CPUC.

Figure C-1. Investor-Owned Utilities Expected Use of Vintage 2013 Allocated Allowance Value



[48] California Air Resources Board. Cap-and-Trade Program, Summary of Vintage 2013 Electrical Distribution Utility, Allocated Allowance Value Reports. August 13, 2013. http://www.arb.ca.gov/cc/capandtrade/allowanceallocation/edu-v2013-allowance-value-report.pdf

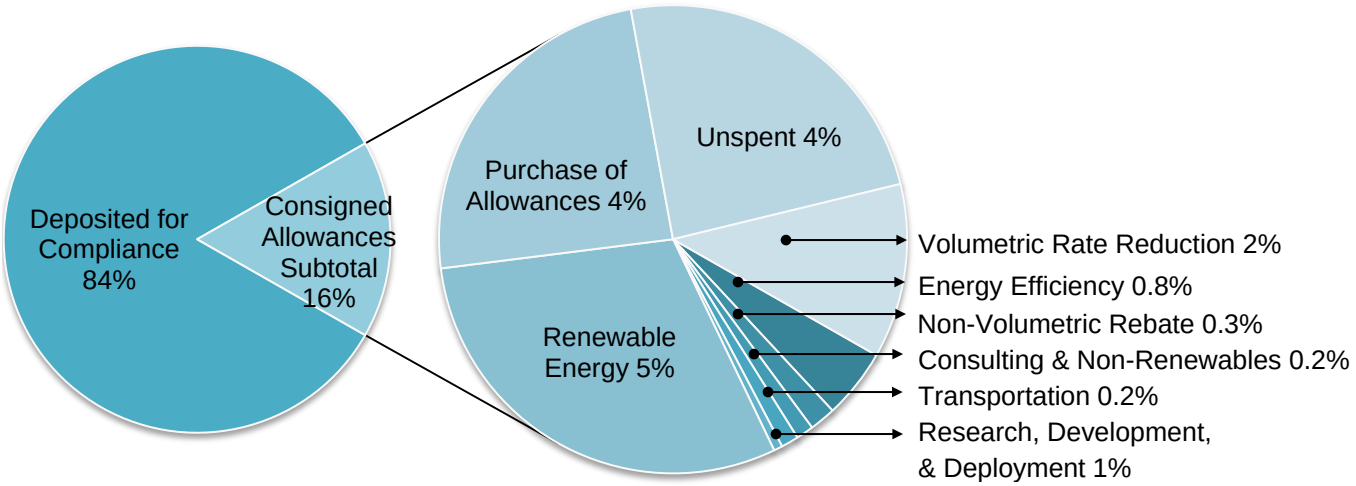
[49] California Public Utilities Commission and California Energy Commission. Energy Upgrade California. www.energyupgradeca.org/climatecredit

4. Publicly Owned Utility and Electrical Co-Operative Investments

The total value of vintage 2013 allowances allocated to publicly owned utilities and electrical co-operatives was $373 million. Publicly owned utilities and electrical co-operatives are not subject to CPUC jurisdiction and, therefore, make their own decisions on the use of their allocated allowances, subject to Regulation requirements to benefit ratepayers and maintain consistency with AB 32. Each allowance can be either deposited for compliance with the Regulation or consigned and sold at auction. For example, in the CPUC Decision[50] to adopt Cap-and Trade allowance revenue allocation methodologies for the investor-owned utilities, the CPUC directed the utilities to distribute the auction proceeds to specified ratepayers as bill credits so that ratepayers can benefit. This includes allowances deposited for compliance and allowance value used to purchase allowances, provide customer rebates, purchase renewable energy, and invest in energy efficiency. Figure C-2 provides a breakdown of the publicly owned utilities and electrical co-operatives use of vintage 2013 allocated allowance value. A detailed use of allocated allowances reported by publicly owned utilities or electrical co-operatives can be found in the Summary of Vintage 2013 Electrical Distribution Utility Allocated Allowance Value Reports.

Figure C-2. Publicly Owned Utilities and Electrical Co-Operatives Use of Vintage 2013 Allocated Allowance Value*

Total Value: $373 million



**Amounts are totals across all reporting publicly owned utilities and electrical co-operatives, assuming a deposited allowance is worth $12.28, the average of the prices at the five auctions held through November 2013, and all other dollar amounts are those reported to ARB in 2013 Use of Allowance Value Reports.*

[50] California Public Utilities Commission. Decision D. 12-12-033. Decision Adopting Cap-and-Trade Greenhouse Gas Allowance Revenue Allocation Methodology for the Investor-Owned Electric Utilities. April 2013. http://www.libertyutilities.com/west/documents/advice_letters/130417_CalPeco_AL-27E.pdf

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APPENDIX D

Public Input on Investment of Cap-and-Trade Auction Proceeds
(July 2015 - November 2015)

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D-1. Funding Recommendations from Speakers at the August 2015 Public Workshops

This section summarizes the major comments and suggestions for funding by commenters who spoke in August 2015 during the seven public workshops regarding the Draft Concept Paper. Most speakers also submitted written comments. To view all of the written comments, please see the program website at: http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=investplan2015-ws.

SACRAMENTO PUBLIC WORKSHOP – August 3, 2015

Transportation and Sustainable Communities

- Integrate projects across agencies and communities to employ creative strategies.
- Implement projects at the scale needed (i.e., community engagement and local customization).
- Include bicycles as eligible projects.
- Invest in electric vehicle infrastructure.
- Increase concepts pertaining to active transportation (include streetscape improvement, etc.).
- Heavily favor development and deployment of freight solutions.

Clean Energy and Energy Efficiency

- Invest in opportunities to convert diesel to electric pumps.
- Include priority for in-State fuel production at existing bio-refineries.
- Highlight the importance of the residential woodstove replacement program.

Natural Resources and Waste Diversion

- Include concepts on managing livestock manure (i.e., scrape management).
- Highlight the benefit of organics processing and management.
- Stress the importance of conservation of shrub lands, deserts, etc.
- Highlight forest health, management and restorations.
- Highlight reductions offset by forest mega-fires.
- Include concepts on recycling programs.
- Support the inclusion of wetlands and watersheds.

Other Topics

- Emphasize projects that are locally designed and created.
- Invest in opportunities for small businesses (i.e., incentives to update their vehicle fleets).
- Emphasize job creation and training.
- Increase focus on efficient financing mechanisms (leveraging funds, revolving loan funds, etc.).
- Support the inclusion of wastewater projects.
- Include K-12 schools in the investment concepts.
- Support better coordination across agencies.

Frequent comment: Consider investments holistically, support multi-benefit green-infrastructure in cities (integrating projects with urban greening, active transportation options, and first- and last-mile opportunities). Also, focus investment concepts on the importance of natural and working lands.

FRESNO PUBLIC WORKSHOP – August 4, 2015

Transportation and Sustainable Communities

- Promote expansion on ZEVs and related infrastructure.

Clean Energy and Energy Efficiency

- Implement solar for renewable energy programs for communities that rely on propane and wood.

Natural Resources and Waste Diversion

- Encourage support and additional resources to agricultural and rangeland conservation and management, urban forestry, and wetlands preservation.
- Use caution when changing dairy management (i.e., switching to scrape); consider the impacts on water quality, air quality, etc.
- Promote good land use.

Other Topics

- Expand eligible uses of the GGRF for planning and research activities.
- Include a small business category and highlight the importance of small business participation, particularly within disadvantaged community census tracts.
- Identify direct community needs and priorities with community residents.
- Focus on rural communities and small business.
- Work collaboratively for more programs, expand funding for existing programs, and create jobs.
- Need to integrate projects with local coordination to achieve goals.
- Increase capacity for local governments to integrate programs within communities.
- Include language on a green bank and other efficient financing mechanisms.

Frequent comment: Use strong language to focus investments on natural resources and waste diversion and natural and working lands. All projects should address specific community needs and be locally coordinated and integrated, where applicable. Also, enhance language to incorporate concepts regarding small businesses and rural and disadvantaged communities.

OROVILLE PUBLIC WORKSHOP – August 6, 2015

Transportation and Sustainable Communities

- Promote rapid expansion (build-out and deployment) of ZEVs.
- Focus on aspects such as transit-oriented housing, car sharing, etc.
- Focus on a sustainable freight system (ZEVs and improved efficiency).
- Focus more investments on electric car deployment and related infrastructure.

Clean Energy and Energy Efficiency

- Ensure investments work to break California's dependence on fossil fuels.
- Add language on woodstove replacement to include a reclaim-type program to dispose of old woodstoves.

Natural Resources and Waste Diversion

- Expand funding for the maintenance of trees planted under existing urban forestry programs.
- Influence greenbelt development for corridors (linked with urban forestry).
- Stress the importance of preserving the forests.
- Highlight the importance of biomass facilities.

Other Topics

- Focus investment in vulnerable and disadvantaged communities as well as rural communities.

Frequent comment: Place more emphasis on transportation and sustainable communities, specifically for investments in electric vehicles and related infrastructure. Enhance language on both forest health and urban forestry to ensure benefits.

OAKLAND PUBLIC WORKSHOP – August 10, 2015

Transportation and Sustainable Communities

- Promote integrated, multi-benefit green infrastructure projects; ensure these projects connect (i.e., first- and last- mile).
- Invest in developing a meaningful active transportation infrastructure.
- Support healthy and equitable infill and brownfield development.
- Support advanced vehicle technologies.

Clean Energy and Energy Efficiency

- Incentivize energy and water upgrades.
- Emphasize the important of low global warming potential and natural refrigerants.

Natural Resources and Waste Diversion

- Emphasize conservation easements to prevent conversion and generate a verifiable outcome of dollars spent.
- Expand funding to ensure natural resources are properly managed.

Other Topics

- Enhance language and make significant investments in small- to medium-sized organizations, businesses, and communities.
- Acknowledge relationships of interrelated sectors for integrated projects; fund programs that optimized multiple benefits through an integrated approach.
- Expand language on finding more regional solutions.
- Include concepts to include rural communities.
- Mobilize and channel investments to K-12 schools.
- Require a closer, collaborative relationship between agencies and local governments; emphasize flexibility of funds.

Frequent comment: Focus on integrated approaches at the local level; highlight the importance of relationships between interrelated sectors and the role of local governments. Also, add and enhance language for the inclusion of rural communities and small businesses.

FONTANA PUBLIC WORKSHOP – August 12, 2015

Transportation and Sustainable Communities

- Fund carbon smart green infrastructure (i.e., trees, water capture and infiltration, etc.) with multiple GHG emission reductions and social benefits.
- Continue projects on transportation systems.

Clean Energy and Energy Efficiency

- Highlight the importance of low-income family weatherization, solar panel installations, and wood-burning fire replacements.

Natural Resources and Waste Diversion

- Include community engagement in urban forestry concepts.
- Highlight the importance of wetland and riparian projects.

Other Topics

- Create an integrated climate funding market; rethink the way local climate change measures are developed and measured to expedite administration, reduce redundancies, and achieve maximum benefits.
- Promote integrated projects for local climate action.
- Include recycling manufacturing concepts.
- Prioritize projects that promote community involvement.

Frequent comment: Focus on integrated, local projects that achieve multiple benefits and co-benefits and promote community involvement. Include and enhance concepts on natural resources and waste diversion as well as efficient financing mechanisms.

LOS ANGELES PUBLIC WORKSHOP – August 12, 2015

Transportation and Sustainable Communities

- Promote projects that sustain healthy and active lifestyles.
- Highlight the importance of transforming the freight sector.
- Connect more projects to rivers, bike paths, etc.

Clean Energy and Energy Efficiency

- Expand concepts on weatherization to include home retrofits.

Natural Resources and Waste Diversion

- Include more than just working lands in conservation easement concepts.
- Adopt a holistic and broad definition for green infrastructure; support multi-benefit urban green infrastructure projects and highlight strategies for achieving them.

Other Topics

- Need better coordination on active transportation, urban greening, energy efficiency, transparency in applications, etc.
- Promote strong community engagement in all programs.
- Put more focus on integrated projects.
- Expand language to include small businesses.

Frequent comment: Highlight integrated projects that include holistic and broad definitions for green infrastructure and interrelated projects. Also, promote active transportation options and strong community engagement.

SAN DIEGO PUBLIC WORKSHOP – August 13, 2015

Transportation and Sustainable Communities

- Improve concepts on active transportation, specifically for walkability (lighting, first- and last-mile connections, etc.).
- Investment for freight technologies for disadvantaged communities needed.

Clean Energy and Energy Efficiency

- Highlight the importance of biodiesel.
- Include language on water agency involvement.

Natural Resources and Waste Diversion

- Highlight the importance of urban forestry.
- Incorporate concepts on green infrastructure.
- Enhance language on land use to prevent urban sprawl.

Other Topics

- Support investment in small- to medium-sized businesses.

Frequent comment: Include co-benefits language, as it relates to disadvantaged communities, in all three investment concept areas (transportation and sustainable communities, clean energy and energy efficiency, and natural resources and waste diversion). Also, add language to include small- to medium-sized businesses.

D-2. Funding Recommendations from Written Comments Submitted July-September 2015

This section summarizes the major comments on the Draft Concept Paper and suggestions for funding from written comment letters submitted electronically after the Draft Concept Paper release (July 2015). To view all of the written comments, please see the program website at: http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=investplan2015-ws.

Transportation and Sustainable Communities

- Highlight the importance of active transportation options; incorporate connected and safe active transportation infrastructure.
- Better integrate active transportation into appropriate programs so that significant walking and biking improvements are provided as part of housing and transit projects.
- Direct funding to Metropolitan Planning Organizations for sustainable strategy planning and implementation.
- Use innovation funds to encourage pilot programs for autonomous vehicles to address the “first- and last-mile problem" in improving public transit systems.
- Include greater emphasis on the potential of ZEVs.
- Develop a more efficient and competitive freight system with an integrated approach to overall system efficiency.

Clean Energy and Energy Efficiency

- Coordinate energy efficiency programs around opportunities to spur private capital.
- Support financing measures for deployment of renewable generation, energy storage, and water efficiency projects.
- Support the inclusion of a woodstove change out concept; include a reclaim type program to dispose of old technologies.
- Expand Community Services and Development’s Low-Income Weatherization Program to promote a joint cool roofs and solar roofs program that would reduce GHG emissions, help people adapt to water temperatures, and bestow public health and economic benefits for disadvantaged communities.
- Include infill and brownfield development as part of the sustainable communities.
- Provide incentives for renewable power generation in the water and wastewater sector (i.e., floating solar photovoltaics).
- Incentivize in-State production of low carbon fuels.
- Include renewable energy generation projects that are community-based and not household-based.
- Encourage data collection and sharing amongst industry stakeholders.
- Increase emphasis on bioenergy projects and technologies.

Natural Resources and Waste Diversion

- Set aside substantial amounts of acreage for conservation easements and direct acquisitions.
- Support carbon-smart green infrastructure.
- Consider innovative technologies for forest health and management.
- Direct financial incentives to protect and maintain additional open space.
- Enhance language on programs regarding parks, recreation, and public open spaces.
- Add language on natural and working lands to include concepts on rangelands and desert lands.
- Utilize a broader approach for natural resources and waste diversion.
- Recognize the full variety of co-benefits from the conservation of natural and working lands.
- Enhance investment concepts on sustainable agriculture and farmland conservation.
- Include healthy soils practices in urban landscaping.
- Expand on urban forestry concepts to include urban greening.
- Enhance language regarding dairy management practices (i.e., flush-to-scrape).
- Add language on the importance of dairy manure digesters.
- Provide incentives to maintain the biomass power industry in the State.
- Prioritize conservation programs that must be started now to maximize long-term benefits.
- Encourage farm- and landscape-level approaches to planning.

Other Topics

- Add language and strengthen concepts on the inclusion of small- to medium-sized businesses.
- Strengthen the language regarding rural communities to maximize benefits and opportunities.
- Add language for the inclusion of K-12 schools and districts.
- Include concepts on climate dividends.
- Provide funding for planning, research, and demonstration.
- Add more language on potential efficient financing mechanisms; ensure financing mechanisms are leveraged wherever possible.
- Incorporate investment in an innovation fund to support new ideas and strategies that achieve broader community based impacts, particularly in disadvantaged communities.
- Expand concepts on recycling and related infrastructure.
- Provide funding and develop incentives to assist California businesses with installing low global warming potential and natural refrigerants.
- Support expansion of regional collaboration among local governments; highlight the importance of local governments with integrated projects.

- Support programs and enhance language regarding rural communities.
- Prioritize investments with public health co-benefits.
- Increase attention to short-lived climate pollutants.
- Support local climate action.
- Promote increased coordination among agencies in investment decisions.
- Prioritize investments that advance climate resilience and larger complementary policy goals, including co-benefits.
- Ensure investments are designed to secure enduring benefits.

D-3. Funding Recommendations from Speakers at the November 2015 Public Workshops

This section summarizes the major comments and suggestions for funding by commenters who spoke in November 2015 during the three public workshops regarding the Draft Second Investment Plan. Most speakers also submitted written comments. To view all of the written comments, please see the program website at: http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=investplan2-ws.

SACRAMENTO PUBLIC WORKSHOP – November 3, 2015

Transportation and Sustainable Communities

- Support opportunities to bridge conventional and emerging technologies.
- Include complete streets and active transportation projects.
- Include biogas as a transportation fuel.
- Support investments ranging from low carbon transit to clean freight systems.

Clean Energy and Energy Efficiency

- Include funding for geothermal energy to generate energy, create new jobs, and reduce vehicle emissions.
- Include biodiesel produced in State as a bridge fuel that can create jobs and reduce environmental impacts in disadvantaged communities.

Natural Resources and Waste Diversion

- Expand funding for and definition of natural and working lands to include the entire landscape (e.g., deserts, etc.).
- Increase investment in rural forests to align with the scale of the opportunity for carbon sequestration.
- Expand forestry to address deforestation and forest health impacts.
- Include urban agriculture to support carbon sequestration, economic development, and composting opportunities.
- Expand conservation mechanisms to include fee title acquisition.
- Support for reducing organics in landfills.
- Include significant funding for dairy digester projects.

Other Topics

- Primary and secondary schools present a significant opportunity for implementation of projects and practices that can result in energy and water savings, composting, and stormwater management.
- Small businesses need support to identify and implement practices that reduce GHGs, save water, and reduce waste.
- Support biomass energy production.
- Expand emphasis on disadvantaged community benefits through increased engagement and funding, and integrated projects.
- Avoid burdens, harms, or unintended consequences of project implementation.

Frequent comment: Consider programs that invest in small- and medium-sized businesses to support implementation of practices that reduce GHGs, water consumption, and waste. Targeting small business owners in a streamlined way can deliver scalable impacts that help achieve the objectives of AB 32. Additionally, there is a need for more investment in natural and working lands.

FRESNO PUBLIC WORKSHOP – November 4, 2015

Transportation and Sustainable Communities

- Support complete streets investments.
- Include green school buses.
- Include more investment in making transit accessible, including sidewalks and shade.
- Increase opportunities for bridge fuels for transportation.
- Put more emphasis on sustainable freight in the Valley.

Clean Energy and Energy Efficiency

- Expand biomass utilization rural foothill communities.

Natural Resources and Waste Diversion

- Expanded investment in natural and working lands is critical to meeting reduction goals.
- Support for forest management to sequester carbon and reduce black carbon from wildfire.

Other Topics

- Support for mechanisms that enable layered applications and remove barriers for resource-constrained applicants.
- Focus on streamlined outreach and engagement, especially in disadvantaged communities that face significant barriers to accessing programs.
- Provide technical support for applications and reporting.
- Avoid adverse or unintended consequences of program implementation.
- Support for rural set-aside.
- Expand outreach for public workshops.
- Support for small businesses can achieve GHG reductions, water savings, and reduce waste.

Frequent comment: Focus on controlling vehicle emissions in disadvantaged communities where many lack resources for maintenance and repairs, specifically through expansion of the Tune In – Tune Up Program to more areas of the State.

LOS ANGELES PUBLIC WORKSHOP – November 5, 2015

Transportation and Sustainable Communities

- Include green infrastructure as a standalone investment category.
- Expand support for clean vehicle programs and low carbon transit programs.
- Support for transportation solution to Sepulveda Pass congestion.
- Invest in training for transit workers to ensure that supply can meet growing demand and safety standards.
- Prioritize low carbon transportation for goods movement to benefit disadvantaged communities.

Clean Energy and Energy Efficiency

- Increase investment in solar to deliver benefits to disadvantaged communities.
- Support for neighborhood-scale investments in clean energy.

Natural Resources and Waste Diversion

- Expand urban forestry program and include a reimbursement mechanism to support community scale implementation.
- Include biochar as an investment opportunity.
- Expand the definition of natural and working lands to new land types (e.g., rangeland) and address the threat of conversion.
- Expand conservation mechanisms to include fee-title acquisition.

Other Topics

- Support for concentrating investment in disadvantaged communities through integrated projects.
- There is a need for capacity building and to streamline applications to multiple programs.
- Support for programs that provide training and quality jobs, particularly to disadvantaged community residents.
- Include additional guidance on evaluating and quantifying co-benefits.
- Support for small businesses to achieve GHG reductions, water savings, and reduce waste.

Frequent comment: Highlight integrated projects that deliver multiple benefits to disadvantaged communities. Promote low carbon solutions for freight and goods movement.

D-4. Funding Recommendations from Written Comments Submitted October-November 2015

This section summarizes the written comment letters submitted electronically after the Draft Second Investment Plan release (October 2015). To view all of the written comments, please see the program website at: http://www.arb.ca.gov/lispub/comm2/bccommlog.php?listname=investplan2-ws.

Transportation and Sustainable Communities

- Incentivize the adoption of zero and near-zero emission transit buses.
- Support zero emission vehicle equipment and infrastructure.
- Accelerate the adoption of near-zero emission strategies.
- Facilitate the development of electric vehicle and equipment charging and renewable fueling infrastructure, particularly in disadvantaged communities and multi-family units.
- Fund streetscape improvements to improve the ability to safely walk and bike; focus on connections (i.e., first- and last-mile).
- Increase funding for transit passes, green active transportation networks, and bike infrastructure.
- Expand investments in public transportation.
- Prioritize sustainable freight projects.

Clean Energy and Energy Efficiency

- Include energy storage as an investment concept, including pilot programs.
- Include concepts to improve manufacturing productivity, performance, and technology adoption for energy efficiency.
- Allocate funding for water infrastructure investments and quantify the greenhouse gas benefits of water efficiency projects.
- Develop or adopt a carbon accounting system for water and wastewater that includes greenhouse gas reductions from both cold water and hot water savings.
- Allow funds to be used for home improvements related to energy efficiency and weatherization.
- Include concepts on an integrated renewable energy approach.

Natural Resources and Waste Diversion

- Prioritize investments in carbon storage in all land types by protecting existing lands threatened by conversion.
- Strategically manage lands to increase their carbon storage capacity and reduce greenhouse gas emissions.
- Include fee title land acquisition as an additional tool eligible for funding.
- Consider both economic and regulatory initiatives to allow for reliable and affordable interconnection of rural distributed generation facilities to the grid, such as dairy digesters.

- Allow funds for continued operation of existing biomass power plants.
- Fund a habitat land conservation.
- Increase and prioritize funding for waste diversion projects (i.e., organics processing and recycling infrastructure projects).
- Allocate funding for the infrastructure expansion needed to redirect organic wastes.
- Expand concepts on urban forestry and urban greening.

Other Topics

- Include K-12 schools as an investment priority with a school specific program, or by expanding eligibility for existing programs to allow schools to participate.
- Make funds available to multimedia programs that focus on energy conservation, water-use efficiency, pollution prevention, and waste minimization.
- Direct auction proceeds back as a climate dividend.
- Include funding for research, demonstration, and pilot projects.
- Consider ways to effectively collaborate with the community and local governments.
- Foster local creativity and innovation, empowering local communities to take advantage of funding from multiple sources so that combined projects achieve greater greenhouse gas results and co-benefits.
- Increase funding for both rural and disadvantaged communities.
- Remove barriers to funding for rural and disadvantaged communities.
- Give local community development groups, key city agencies, and other key stakeholders the capacity, tools, and capital resources to reduce energy use, upgrade infrastructure, and deploy diverse renewable energy sources, while promoting equitable economic development strategies that strengthen communities and prevent displacement.
- Expand concepts on efficient financing mechanisms.
- Make co-benefit goals more explicit; describe an actual process by which co-benefits will be assessed, measured, and maximized.
- Implement safeguards to ensure that funds do not inadvertently reward contractors with unsafe employment practices or use funds irresponsibly.
- Include more focus on areas to leverage funds.
- Include language articulating the value of climate resiliency.
- Prioritize cross-sectoral projects that provide co-benefits and combine mitigation with adaptation activities.
- Recognize the need for improved outreach and technical assistance to both rural and disadvantaged communities.