

The State of California's Draft Priority Climate Action Plan

Created under the U.S. Environmental Protection Agency's Climate Pollution Reduction Grants Program



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State Agencies contributing to this PCAP include:

- California Environmental Protection Agency
- California Natural Resources Agency
- California Labor and Workforce Development Agency
- California State Transportation Agency
- California Business, Consumer Services, and Housing Agency
- California Government Operations Agency
- Governor's Office of Business and Economic Development
- California Volunteers - Office of the Governor
- Governor's Office of Planning and Research
- California Public Utilities Commission
- California Energy Commission
- California Department of Conservation
- California Department of Transportation
- Department of Resources Recycling and Recovery
- California Air Resources Board
- California Department of Food and Agriculture
- California Infrastructure and Economic Development Bank
- California Department of General Services
- California Department of Public Health

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List of Acronyms

AB	Assembly Bill
ACF	Advanced Clean Fleets
ACCII	Advanced Clean Cars II Regulation
ACT	Advanced Clean Trucks
AQIP	Air Quality Improvement Program
CALFIRE	California Department of Forestry and Fire Protection
CARB	California Air and Resources Board
CCI	California Climate Investment
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CDTFA	California Department of Tax and Fee Administration
CEC	California Energy Commission
CERF	Community Economic Resilience Fund
CMEA	Clean Mobility Equity Alliance
CMIS	Clean Mobility in Schools
CMO	Clean Mobility Options Program
CO ₂ E	carbon dioxide
CORE	Clean Off-Road Equipment
CPRG	Climate Pollution Reduction Grant
CPUC	California Public Utilities Commission
DACAG	Disadvantaged Communities Advisory Group
DDRDP	Dairy Digester Research and Development Program
ECAA	Energy Conservation Assistance Act
EVSE	Electric Vehicle Supply Equipment
FCEV	Fuel Cell Electric Vehicles
FRIP	F-Gas Incentive Program
GGRF	Greenhouse Gas Reduction Fund
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbons
HVIP	Clean Truck and Bus Incentive Program
INDIGO	Industrial Decarbonization and Improvement to Grid Operations
IRA	Inflation Reduction Grant
ISEF	Innovative Small E-fleet
MHD	Medium and-heavy duty
MMT CO ₂ E	million metric tons of carbon dioxide equivalent
MRR	Mandatory Reporting of GHG Emissions
MSW	Municipal solid waste

NO _x	nitrogen oxides
NWL	Natural and Working Lands
ODS	ozone depleting substances
PCAP	Priority Climate Action Plan
PFAS	polyfluoroalkyl substances
PFIP	Port and Freight Infrastructure Program
PHEV	Plug-In Hybrid Electric Vehicles
SB	Senate Bill
SDFR	Socially Disadvantaged Farmers and Ranchers
SF ₆	Sulfur hexafluoride
SGIP	Self Generation Incentive Program
SLCP	Short-Lived Climate Pollutant
STEP	Sustainable Transportation Equity Project
SO ₂ F ₂	sulfuryl fluoride
U.S. EPA	United States Environmental Protection Agency
VMT	Vehicles Miles Traveled
ZE	Zero emission
ZEV	Zero-emission vehicle

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1. Introduction

California has a statutory goal of reducing anthropogenic emissions by at least 85% below 1990 levels and achieving carbon neutrality by 2045. We are currently building on 15 years of experience of climate action with an economy-wide multi-sector approach to cutting greenhouse gases—while providing maximum benefits to communities that have historically borne the public health burdens of exposure to pollution from fossil fuel combustion mobile sources and industries. The CPRG program will definitively support accelerated efforts and help us achieve both goals.

California appreciates the unprecedented lift by the Biden Administration to tackle climate change, as evidenced by the passing of the Inflation Reduction Act (IRA) and the creation of the Climate Pollution Reduction Grants program (CPRG), among other accomplishments. Through the CPRG program, the United States Environmental Protection Agency (U.S. EPA) seeks to support the development and expansion of state, territory, Tribal and local climate action plans, that aggressively reduce greenhouse gases (GHGs), provide equitable access and solutions to new technologies, and support a resilient equitable economy that benefits all Americans. California values its long-standing relationship with the U.S. EPA and has developed this Priority Climate Action Plan (PCAP) not only to showcase the State’s current climate priorities, but as a foundation to help deliver the steep GHG reductions needed to contribute to the United States (U.S.) commitment under the Paris Agreement, and ensure that it meets its Justice 40 Initiative policy goals.

This PCAP builds on over a decade of California’s climate leadership. Most recently, California passed Assembly Bill (AB)1279 (Muratsuchi, Chapter 337, Statutes of 2022) which sets goals to achieve carbon neutrality by 2045 and to ensure that by 2045 statewide anthropogenic GHG emissions are reduced at least 85 percent below 1990 levels. California’s 2022 Scoping Plan Update¹ lays out the sector-by-sector roadmap for California to achieve the mandates in AB 1279, outlining a technologically feasible, and cost-effective path to achieve the State’s climate target. The 2022 Scoping Plan Update also highlights how increased climate ambition can address persistent air pollution and opportunity gaps faced by low-income communities and communities of color.

In this PCAP, California has leveraged the substantial work of the 2022 Scoping Plan Update, and the directives and sector-specific plans and reports it incorporates.² Further, this PCAP covers the geographic extent of California, nearly every economic sector, and in our inventory below, accounts for all greenhouse gas (GHG) sources across the State.³ This PCAP uplifts a strong set of impactful near-term actions. Because California has long been a leader in climate policy and practice, this PCAP elevates many existing programs that stand ready to catalyze

¹ <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>

CPRG funding into the action and help California and the U.S. achieve a historic rate of clean technology production, deployment, and rapid consumer adoption, while ensuring affordability and maximizing myriad co-benefits.

2. Approach to Developing the PCAP

Given the substantial body of climate planning across State and local governments at the start of CPRG, California's work to develop the PCAP began with an extensive review of existing climate plans, policies and programs, as well as lessons learned from them to date. These were captured through document review,² as well as through in-depth discussions with relevant State agency staff, and the collection of input from across State agencies and other stakeholders via surveys and detailed questionnaires.

Consistent with Governor Gavin Newsom's whole-of government approach to tackling climate change, this PCAP formally brought together multiple agencies across the Administration, via the California State Agency CPRG Task Force, whose membership is listed in the Acknowledgement section above. This PCAP has also been a direct result of further extensive outreach and coordination, including:

- A kick-off public webinar in August, 2023
- Three regional public webinars on January 31 and February 1
- Monthly meetings of the State Agency CPRG Task Force
- Direct solicitation from State agencies on their top climate priorities for CPRG
- The development and continued contact with MSAs leading their own planning grants
- Regular dialogue with air districts across the State
- Outreach and solicitation from local governments without CPRG planning grants
- Sector-specific coordination meetings across State and local agencies on goods movement, ZEV infrastructure, waste, bioenergy, agriculture, and natural and working lands
- Outreach and consultation with Tribal Nations

In addition, this draft PCAP includes layers of analysis and assessment. The statewide GHG inventory included here leverages the State's GHG emissions inventory. Using it and other robust and vetted data sources, this PCAP will also include the GHG abatement potential of

² This includes but is not limited to: The 2022 Scoping Plan Update, The 2022 State Strategy for the State Implementation Plan, The Community Air Protection Blueprint, the SB 100 Joint Agency Report, the Climate Action Plan for Transportation Infrastructure, the Short-Lived Climate Pollution Strategy, the Climate Smart Lands Strategy, California Climate Insurance Report: Protecting Communities, Preserving Nature, and Building Resiliency, the SB1000 Electric Vehicle Infrastructure Deployment Assessment, 2021 Integrated Energy Policy Report: Vol 1: Building Decarbonization, Fourth Cap and Trade Auction Proceeds Investment Plan, Achieving Carbon Neutrality Report, and California Transportation Plan 2050.

each draft measure included in this PCAP. **At the time of this writing, the analysis of the GHG reduction for each measure is not yet complete, these figures have not fully been finalized and final estimates are not included here.** In addition, mapping analysis was used to identify low income and disadvantaged communities under each the EPA's recommended definition for CPRG, and against the State's existing definition. Both were used to assess the merit of each draft PCAP measure to uplift equity and ensure benefits to low-income and disadvantaged communities. Across each draft measure, a review of the legal framework and authority to implement each measure was also carried out. Where possible, workforce considerations and job creation potential were assessed.

3. PCAP elements

Section three includes several PCAP elements, beginning with a statewide GHG emissions inventory, followed by the State's overarching GHG targets, an overview of the State's approach to low-income and disadvantaged community benefits analysis, and workforce considerations, and finally, the measures that make up the bulk of this plan.

3.1 Greenhouse Gas (GHG) Inventory

This Plan leverages California's AB 32 GHG Inventory³ which was initiated after the passage of the State's landmark climate bill, the Global Warming Solutions Act, (AB 32), (Nunez, Chapter 488, Statutes of 2006).⁴ The AB 32 inventory includes emissions from the following types of sources: fossil fuel combustion, including combustion for imported electricity consumed in state, by-products of chemical reactions in industrial processes, use of GHG-containing consumer products and human-made chemicals, agricultural operations, and recycling and waste sector operations. The exchange of ecosystem carbon between the atmosphere and plants and soils (including through wildfires) is separately quantified in the [Natural and Working Lands Ecosystem Carbon Inventory](#).⁵ The methods used to quantify emissions included in the AB 32 GHG Inventory are consistent with international and national practices⁶ and meet the requirements of AB 32.

The 2023 edition of the AB 32 GHG Inventory includes the emissions of the seven GHGs identified in California's landmark climate policy, AB 32, for the years 2000 to 2021. There are additional climate pollutants that are not included in AB 32 that are tracked separately

³ https://ww2.arb.ca.gov/sites/default/files/2023-12/2000_2021_ghg_inventory_trends.pdf

⁴ <https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006>

⁵ California Air Resources Board, "An Inventory of Ecosystem Carbon in California's Natural & Working Lands," 2018. [Online]. Available: https://ww3.arb.ca.gov/cc/inventory/pubs/nwl_inventory.pdf

⁶ Intergovernmental Panel on Climate Change, "IPCC Guidelines for National Greenhouse Gas Inventories, Volume 1 - General Guidance and Reporting," [Online]. Available: <https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol1.html>

from the AB 32 GHG Inventory. These include black carbon and sulfur dioxide (SO₂), which are discussed in the Short-Lived Climate Pollutant (SLCP) Strategy⁷, and ozone depleting substances (ODS), which are being phased out under a 1987 international treaty^{8,9}.

Statewide GHG emissions are calculated using several data sources. The primary data source is from reports submitted to CARB through the Regulation for the Mandatory Reporting of GHG Emissions¹⁰ (MRR). MRR requires facilities and entities with more than 10,000 metric tons CO₂e per year of combustion and process emissions, all facilities belonging to certain industries, and all electricity importers to submit an annual GHG emissions data report directly to CARB. Reports from facilities and entities that emit more than 25,000 metric tons of CO₂e per year are verified by a CARB-accredited third-party verification body. For additional information see: [emissions data reported to MRR](#).

CARB also relies on data from other California State and federal agencies to develop the AB 32 GHG Inventory. These agencies include, but are not limited to the California Energy Commission, California Department of Tax and Fee Administration, California Department of Conservation, California Department of Food and Agriculture, California Department of Resources Recycling and Recovery, U.S. Energy Information Administration, and U.S. Environmental Protection Agency (U.S. EPA). The timing for when these data sources are available drives the publication date for the AB 32 GHG Inventory each year. All data sources used to develop the AB 32 GHG Inventory are listed in supporting documentation on the following webpage: [California AB 32 GHG Emission Inventory Data](#). Figure 1 below shows the breakdown of the most recent AB 32 inventory, and Figure 2 below shows how the State's overall levels of AB 32 sources have trended downward, in line with the State's climate targets and efforts, over the past twenty years. Lastly, Figure 3 shows the percentage of different gases that make up the State's total GHGs.

⁷ California Air Resources Board, "Short-Lived Climate Pollutant (SLCP) Strategy," 2017. [Online]. Available: <https://www.arb.ca.gov/cc/shortlived/shortlived.htm>

⁸ Many ODS substitutes are GHGs whose emissions are included in the AB 32 GHG Inventory, consistent with IPCC Guidelines.

⁹ United Nations Environmental Programme, "About Montreal Protocol," 2023. [Online]. Available: <https://www.unep.org/ozonaction/who-we-are/about-montreal-protocol>

¹⁰ <https://ww2.arb.ca.gov/mrr-regulation>

Figure 1: California's AB 32 GHG Emissions Inventory

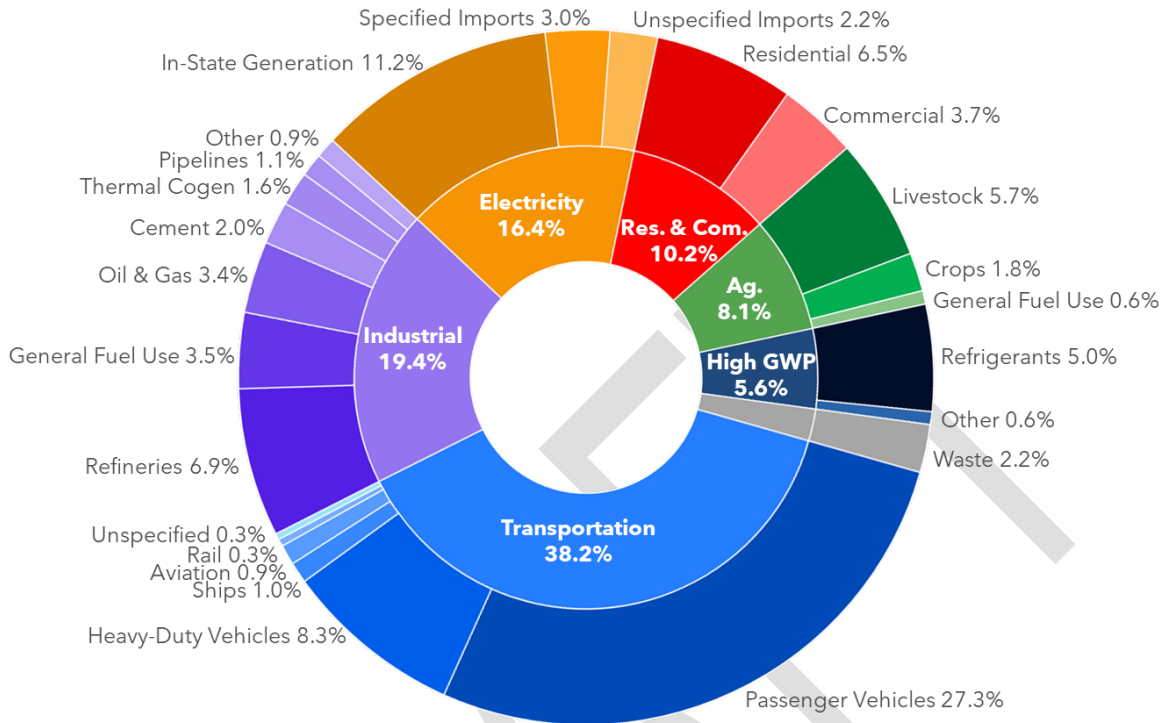


Figure 1 shows 2021 GHG emissions by Scoping Plan category. The inner ring shows the Scoping Plan sectors, while the outer shows the sub-sectors. Values do not reflect some rounding.

Figure 2: California’s Annual Greenhouse Gas Emissions (2000 to 2022)

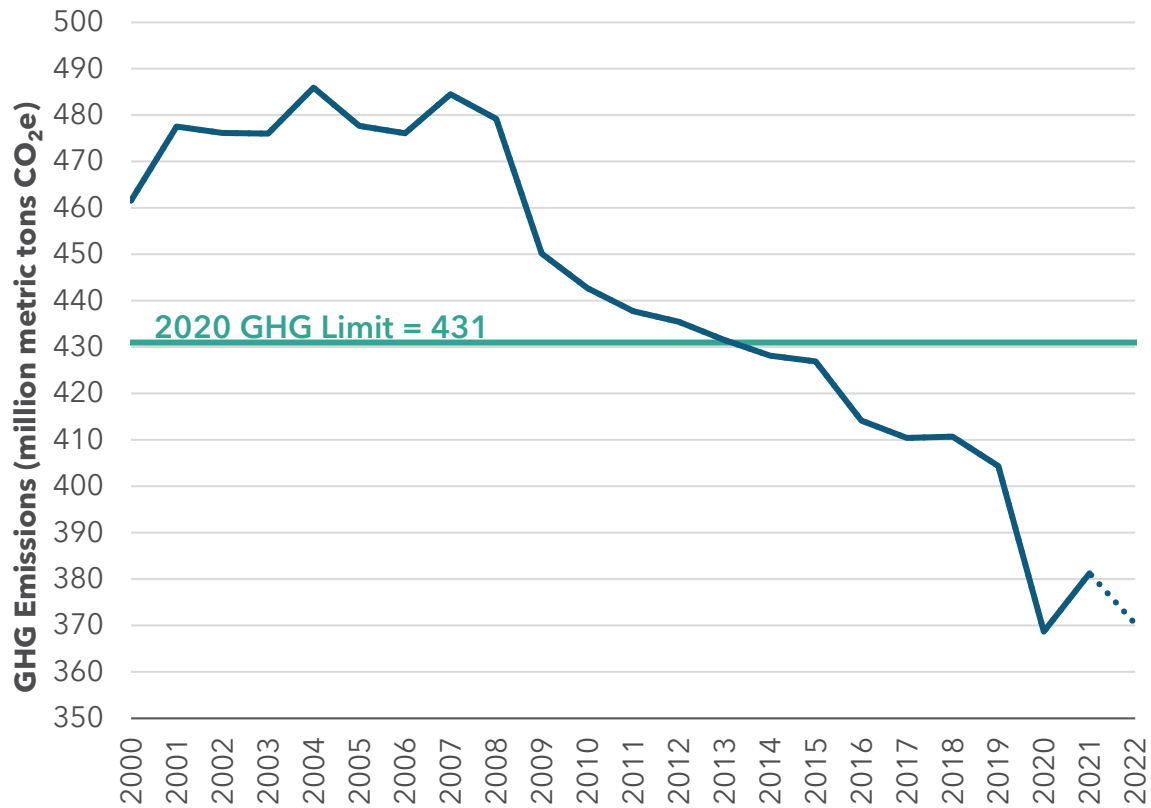


Figure 2 above shows California’s annual GHG emissions from 2000 to 2021 in relation to the 2020 GHG Limit established by AB 32 [1]. The dotted blue line shows an estimate of AB 32 GHG Inventory emissions for 2022 based solely on data reported and third-party verified to CARB pursuant to the Regulation for the Mandatory Reporting of GHG Emissions (MRR). The 2022 estimate is provided for informational purposes only and should not be used for any policy making decisions or regulatory compliance. The 2022 estimate of AB 32 GHG Inventory emissions is calculated as 2022 MRR non-biogenic emissions, divided by the ratio of 2019-2021 MRR non-biogenic emissions to 2019-2021 AB 32 GHG Inventory emissions. California’s GHG emissions dropped below the 2020 GHG Limit in 2014 (428.2 MMTCO₂e) and have remained below this level since that time.

Figure 3: California's 2021 Greenhouse Gas Emissions by Gas

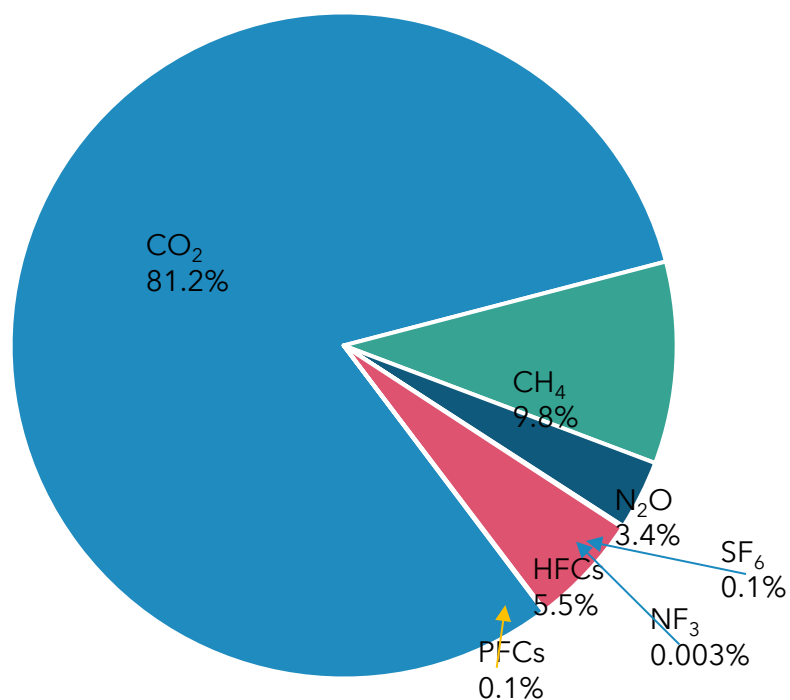


Figure 3 shows the 2021 GHG Emissions by gas. The above does not include Biogenic CO₂ and sources "Excluded" from the Inventory (e.g., international flights, military, international shipping).

3.2 GHG Reduction Targets

With the passage of AB 32 in 2006, California established its first statewide climate target - to return to 1990 GHG levels (431 MMT CO₂e) by 2020, which the State subsequently met several years ahead of schedule. In 2016, with the passage of SB 32 (Pavley, Chapter 249, Statutes of 2016)¹¹, California solidified the target to reduce statewide anthropogenic emissions 40% below 1990 levels by 2030. In 2022, the State codified its most ambitious target to date with the passage of AB 1279 (Muratsuchi, Chapter 337, Statutes of 2022)¹², which sets California on a path to reduce anthropogenic emissions 85% below 1990 levels by 2045 and to also achieve carbon neutrality by 2045. This Priority Climate Action Plan and California's participation in U.S. EPA's CPRG Program are well aligned with the State's climate targets and the all-hands-on-deck approach to meeting them.

¹¹ http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb_0001-0050/sb_32_bill_20160908_chaptered.htm

¹² https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB1279

3.3 Prioritizing Benefits to Low-Income and Disadvantaged Communities

Addressing climate change and advancing our equity and economic opportunity goals cannot be decoupled. In line with Governor Newsom's Executive Order 13 to take additional actions to embed equity analysis and considerations, this plan works to center equity by addressing some of the disparities for historically underserved and marginalized communities. California strives to ensure that our climate and air research, regulations, investments, and plans include provisions that specifically address and advance equity. This includes engaging with representatives of these communities, reducing and eliminating air pollution disparities, removing barriers that can prevent frontline communities from accessing benefits, lowering costs for low-income Californians, and promoting high-quality jobs. We can simultaneously confront the climate crisis and build a more resilient, just, and equitable future for all communities. Importantly, we know that due to persisting health and opportunity gaps, not all communities are equally resilient in the face of climate impacts. The 2022 Scoping Plan Update began the work to better understand how to capture incremental additional economic impact faced by overly burdened communities since a global metric such as the Social Cost of Carbon cannot adequately capture that detail.¹⁴

In addition, for the purposes of this PCAP, and per U.S. EPA guidance, California is considering low-income and disadvantaged communities as identified through both the Climate and Economic Justice Screening Tool (CEJST) as well as the supplemental data from EPA's Environmental Justice Screening and Mapping Tool (EJScreen).¹⁵ The footprint of the federal definition is visualized alongside a comparison of the State's definition for disadvantaged communities, as defined by California Senate Bill 535 (De León, Chapter 830, Statutes of 2012) which directs minimum funding levels from the State's Cap-and-Trade auction proceeds to be spent within and to benefit California's disadvantaged communities.¹⁶

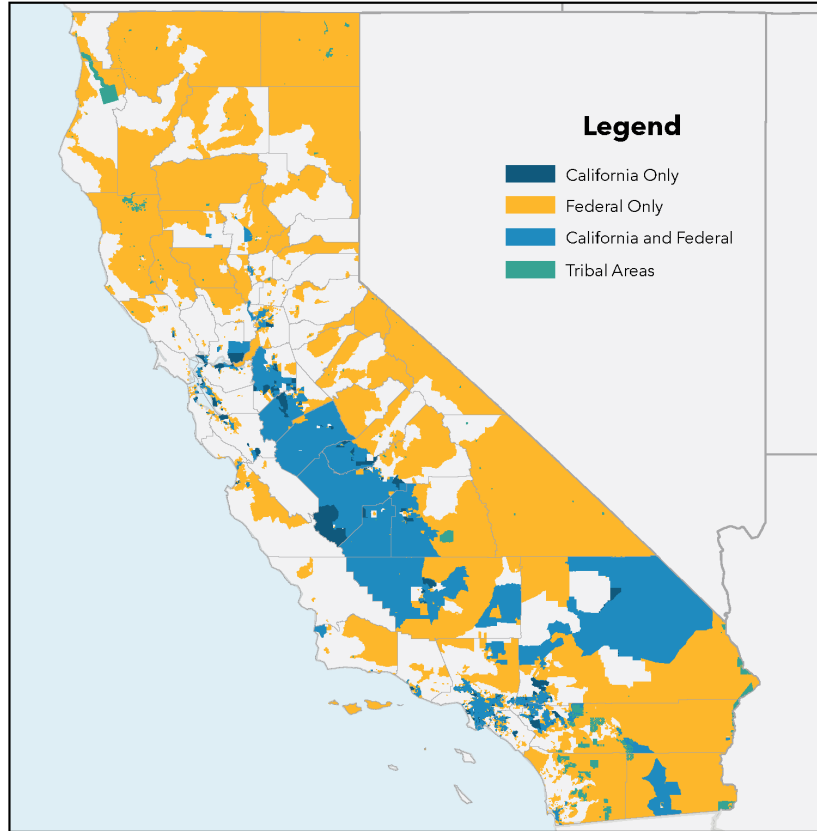
¹³ Executive Department. State of California. 2022. Executive Order N-16-22. [GSS 9320 2- 20220912152941 \(ca.gov\)](https://www2.arb.ca.gov/sites/default/files/2022-11/2022-sp-appendix-k-climate-vulnerability-metric_0.pdf).

¹⁴ https://www2.arb.ca.gov/sites/default/files/2022-11/2022-sp-appendix-k-climate-vulnerability-metric_0.pdf

¹⁵ Data and EPA guidance can be found here: <https://www.epa.gov/inflation-reduction-act/cprg-tools-and-technical-assistance-low-income-and-disadvantaged>

¹⁶ A summary of California's definitions for disadvantaged communities can be found here: <https://oehha.ca.gov/calenviroscreen/sb535>

Figure 4: Low Income and Disadvantaged Communities under CPRG



Federal disadvantaged status based on EPA IRA map (Jan 2024).
California status based on SB 535 designation (May 2022).
Tribal areas are generally considered disadvantaged for both;
map is based on SB 535 tribal areas.

California State Parks, Esri, TomTom, Garmin, FAO,
NOAA, USGS, EPA, USFWS

3.4 Workforce Considerations

California is working aggressively to transition away from fossil fuels, reach its climate goals, and ensure that its climate policies generate high-quality, local jobs.

The State acknowledges the burden associated with transitioning to carbon neutrality, especially for workers in fossil fuel industries, and has developed job training and job placement programs to assist in this workforce transition. Programs such as the Community Economic Resilience Fund Program (CERF), and the Regional Investment Initiative within the Governor’s California Jobs First portfolio, support this transition, specifically aiding communities and regional groups in producing regional roadmaps for economic recovery and resilience that prioritize the creation of accessible, high-quality jobs in sustainable

industries.¹⁷ Additionally, programs like the California Conservation Corps' Training and Workforce Development Program provides funding for job training and workforce development in the building energy efficiency and forestry sectors.¹⁸

California Climate Investments -- the State's fund through which its Cap-and-Trade auction proceeds flow -- has funded 569,477 projects and subsidies totaling \$9.8 billion as of May 2023, which are expected to reduce an estimated 98.0 MMTCO₂e.¹⁹ Cumulatively, \$7.2 billion in implemented funds are benefiting disadvantaged communities, low-income communities, and low-income households in California. CARB estimates that for roughly \$7.5 billion of awarded California Climate Investments funds, 85,000 direct, indirect, and induced jobs are being supported.²⁰

Furthering its efforts to facilitate the workforce transition, in 2021, the California State Legislature passed Assembly Bill 680 (AB 680) (Burke, Chapter 746, Statutes of 2021), requiring CARB to work with the California Labor and Workforce Development Agency to update the Funding Guidelines for Agencies that Administer California Climate Investments (Funding Guidelines) to include new workforce standards. Specifically, updating the Funding Guidelines to require administering agencies to prioritize investments in projects that directly support jobs or job training and placement programs. Although these standards are only required for a subset of California Climate Investments programs, all California Climate Investments programs are encouraged to incorporate recommended workforce development strategies and workforce standards to support a robust workforce in the new, low-carbon economy and improve access to high-quality jobs.

In addition, the California High-Speed Rail Project, which receives substantial funding from California Climate Investments, as well as \$3.1 billion in Federal dollars, has been a job creator. The project has directly supported 92,000 job-years of employment and generated \$18.0 billion in total economic activity. In addition, the Authority's expenditures through completion of the Phase 1 system from San Francisco to Los Angeles/Anaheim are expected to support 945,000 job-years, nearly \$79.0 billion in labor income, and \$203.6 billion in total economic output. with a focus on construction employment and training opportunities that also benefit economically disadvantaged areas.

CPRG funding alongside the State's climate investments will further accelerate the growth in high-paying jobs critical to achieving State and federal climate goals and also help clean the state's air -- especially in California communities that have historically borne the public health burden of exposure to fossil fuel combustion.

¹⁷ Office of Planning and Research. Community Economic Resilience Fund. <https://opr.ca.gov/economic-development/cerf/>

¹⁸ *California Conservation Corps Supporting San Bernardino Mountains Restoration – California Climate Investments*

¹⁹ *Board Meeting January 18, 2024 --The Economic Impact of California High-Speed Rail*

²⁰ *California Climate Investments 2023 Annual Report, Cap-and-Trade Auction Proceeds*

3.5 GHG Reduction Measures

The draft list of measures presented below outline necessary and no-regrets actions that will help ensure the State and the U.S. stay on course to avoid the worse effects of climate change. The draft measures are grouped by several sectors: transportation, industrial, energy, high global warming potential, agriculture, natural and working lands, and waste. **These measures are not yet finalized and are subject to change.**

Calculations are provided to assess how each measure would reduce GHGs, and where possible, affect air pollution levels. In addition, a qualitative analysis of its benefits to low-income and disadvantaged communities along with other benefits is included. In addition, agencies and programs that could implement the measure and a review of their authority to implement them are enumerated, and where possible, the interaction of the measure with other funding sources is outlined.

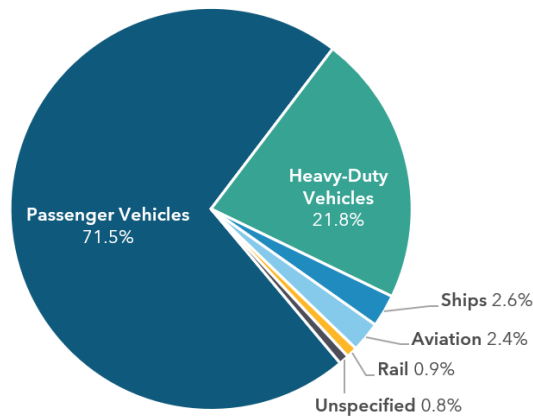
Transportation

The transportation sector has long relied on liquid petroleum fuels as the primary energy source for internal combustion engine vehicles, including cars, trucks, locomotives, aircraft, and marine, construction, agriculture and other off-road equipment. Combustion of fossil fuels in vehicles emits significant amounts of GHGs, criteria pollutants, and toxic air contaminants. In 2021, the transportation sector, when including processing of fossil fuels, accounted for approximately 50 percent of statewide GHG emissions.²¹ As seen in Figure 5 below, the largest source of GHGs from this sector is passenger vehicles.

²¹ <https://ww2.arb.ca.gov/ghg-inventory-data>

Figure 5: Transportation Sector Emissions in 2021

Total Emissions = 145.6 MMTCO₂e



In addition, the transportation sector accounted for over 80 percent of statewide NO_x emissions and 30% of fine particulate matter emissions, including toxic diesel particulate matter.²²

In California, communities adjacent to congested roadways, including ports and distribution centers, are often low-income or communities of color. These communities are exposed to the highest concentration of criteria and toxic air pollution from vehicles and equipment consuming fossil fuels, leading to a number of demonstrated health impacts such as respiratory illnesses, higher likelihood of cancer development, and premature death.²³ While CARB's programs, along with local action, have made substantial progress in reducing harmful local air pollution over the past few decades,²⁴ it is clear that California must transition away from fossil fuels to zero-emission technologies in order to meet our GHG and air quality targets.

California is a leader in designing and implementing transportation decarbonization policies. Delivering on Governor Newsom's Executive Order N-79-20²⁵ to transition away from internal combustion vehicles, CARB's Advanced Clean Cars II Regulation (ACCI²⁶) requires manufacturers to sell an increasing number of zero-emissions cars, SUVs, and light-duty trucks --- reaching 100% by 2035. California hit its goal of having 1.5 million light-duty ZEVs on the road in April 2023, two years ahead of schedule. CARB's Advanced Clean

²² <https://ww2.arb.ca.gov/our-work/programs/ghg-inventory-program>

²³ <https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health>

²⁴ https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf

²⁵ <https://ww2.arb.ca.gov/resources/fact-sheets/governor-newsoms-zero-emission-2035-executive-order-n-79-20>

²⁶ <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii>

Trucks Regulation (ACT)²⁷ similarly requires truck manufacturers to sell zero-emissions trucks (100% by 2045 where possible). The Advanced Clean Fleets Rule (ACF)²⁸, adopted in 2023, requires truck fleets to buy zero-emissions trucks as soon as 2024.

In addition, the State's Low Carbon Fuel Standard²⁹ is the primary mechanism to transform the transportation fuel pool with low-carbon energy alternatives, and is in the process of being updated to further support growth in renewable and clean transportation fuels.³⁰ Lastly, the State has supported several policies and programs, many developed by and with local representatives of California's low-income and disadvantaged communities, that provide alternatives to driving, such as transit, walking and biking, to reduce overall vehicle miles travelled.

Funds from CPRG would leverage California's pioneering and proven transportation policies and help deliver GHG and co-benefits faster, especially for low-income and disadvantaged communities. In addition, California's proposed measures under transportation further support the U.S. EPA's Clean Ports Initiative³¹ and proposed vehicle standards³², as well as President Biden's 2030 GHG targets.³³ The measures below outline critical transportation measures across goods movement, community-focused transportation options, and light-duty zero-emissions infrastructure.

Transportation Measure 1: Create a Holistic, Heavy-Duty Zero-Emission Vehicle Buydown Program

The newly created Heavy-Duty Zero-Emission Vehicle Buydown Program would expand and leverage three existing programs to accelerate the deployment of zero-emissions (ZE) medium- and heavy-duty (MHD) vehicles, particularly for small fleets that face the greatest barriers to their adoption. It would build off the Clean Truck and Bus Incentive Program (HVIP)³⁴ that provides vouchers for heavy-duty vehicle purchases; the Innovative Small E-fleet (ISEF)³⁵ that helps small fleets access ZE trucks; and a new ZEV loan pilot program under development.³⁶ CARB would lead this measure with key roles for the State Treasurer's Office and the California Energy Commission. This measure builds off CARB's successful incentive and loan programs that have been in place for over 10 years, have appropriated \$3.7 billion in funding, leveraged millions of dollars in private funding, and

²⁷ <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks>

²⁸ <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets>

²⁹ <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard>

³⁰ *Low Carbon Fuel Standard | California Air Resources Board*

³¹ <https://www.epa.gov/ports-initiative>

³² <https://www.epa.gov/newsreleases/biden-harris-administration-proposes-strongest-ever-pollution-standards-cars-and>

³³ <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>

³⁴ <https://ww2.arb.ca.gov/resources/fact-sheets/clean-truck-and-bus-vouchers-hvip>

³⁵ <https://ww2.arb.ca.gov/resources/fact-sheets/innovative-small-e-fleet-pilot-program>

³⁶ <https://ww2.arb.ca.gov/resources/fact-sheets/truck-loan-assistance>

have helped deploy thousands of cleaner trucks. Existing loan programs have a low default rate of four percent.

The combined, new program under this measure would simultaneously help overcome two barriers faced by small fleets: 1) the high upfront cost of ZE trucks, and 2) the difficulty by small fleets in qualifying for affordable loans, which are not yet offered by private lenders. The program could also potentially create a used vehicle voucher incentive, which our current incentive programs do not cover, to prove the residual value of ZE MHD trucks and further develop the ZE MHD market. This innovative program could be replicated by other states and influence national initiatives for cleaner transportation.

Investing in ZE goods movement will provide GHG reductions and much needed air quality improvements, particularly for low-income and disadvantaged communities living long overburdened by proximity to and pollution from goods movement operations. California's MHD vehicles contribute disproportionately to mobile source emissions. They comprise roughly 3 percent of California's 30 million vehicles but are responsible for one-third of mobile source NO_x emissions and one-fourth of mobile source GHG emissions.³⁷ Diesel exhaust emissions are classified as carcinogenic toxic air contaminants and account for 70 percent of the known cancer risk from toxic air contaminants in California.³⁸ To achieve equitable public health outcomes across the State, California must continue to pursue all available avenues to invest in ZE MHD vehicles, and this measure can play a pivotal role in achieving those goals. In addition, consistent with Justice40 targets, this measure would leverage CARB's existing outreach and engagement practices to ensure that ZE MHD investments benefit our most disadvantaged communities.

Many laws authorize and govern existing programs and would similarly apply to the new Heavy-Duty Zero-Emission Vehicle Buydown Program. Senate Bill 372 requires that CARB provide financial and non-financial assistance to applicants for ZEVs. AB 1496 (Chapter 1164, Statutes of 1993) established the California Capital Access Program, approving CARB as an "Independent Contributor," which is an entity that contributes funds to a loan support program, in this case, one that assists fleets procure loans at lower interest rates. In addition, CARB has offered cleaner vehicle incentives since 1998 when the Carl Moyer Program -- supporting the transition away from the state's dirtiest diesel trucks to the latest, cleaner technologies-- was first enacted by State law. In 2012, three bills were approved - AB 1532 (Pérez, Chapter 807), Senate Bill (SB) 535 (de León, Chapter 830), and SB 1018 (Budget and Fiscal Review Committee, Chapter 39) - that established the Greenhouse Gas Reduction Fund (GGRF) to receive Cap-and-Trade auction proceeds and provide a framework for

³⁷ California Air Resources Board. "*Proposed Advanced Clean Fleets Regulation Staff Report: Initial Statement of Reasons*," August 30, 2022.

³⁸ *Ibid.*

investing auction proceeds to further the purposes of California’s groundbreaking climate law, AB 32 (Nunez, Chapter 488, Statutes of 2006).

Transportation Measure 2: Install Truck Charging to Support Zero Emissions Goods Movement at California Ports and Warehouse Districts

This measure would accelerate the development of truck charging infrastructure by leveraging and adding federal funds to an existing block grant program run by the California Energy Commission (CEC) and administered by CALSTART, a nonprofit organization working nationally and internationally with businesses and governments to develop clean, efficient transportation solutions. That program, known as Energy Infrastructure Incentives for Zero Emission Commercial Vehicles, or EnergiIZE,³⁹ is the nation’s first large-scale commercial fleet zero-emission infrastructure incentive project. CEC would manage the federal funds, conduct oversight, and provide general direction while CALSTART⁴⁰ would administer the program in conjunction with Tetra Tech.⁴¹ CPRG awards via EnergiIZE will prioritize urgently needed, shovel ready projects, with strong operations plans and community-level benefits.

Past rounds of EnergiIZE funding were oversubscribed *within minutes*, definitive proof that the need for Zero Emission medium duty truck charging infrastructure in California is pressing. And that need will only grow, a result of the State’s existing climate goals and regulations that are compelling the transition to ZE MHD vehicles. Accordingly, the scale of statewide truck charging needed is immense; there are about 1 million MHD trucks in California currently, and the most recent CEC Report⁴² estimates that 109,000 depot and 5,500 public electric vehicle chargers will be needed to support 155,000 MHD EVs in 2030. By 2035, California will need about 256,000 depot and 8,500 public electric vehicle chargers to support 377,000 MHD EVs. Electrification infrastructure for the trucking industry will require continued and significant funding and will likely prove more complex than light duty vehicle charging due to the need for higher-powered chargers, higher site-level power levels, and larger site footprints. Recent data shows that MHD vehicles and infrastructure technology have matured, and this measure could utilize additional funding quickly.

Ultimately, the resulting GHG reductions from this measure will be influenced by several factors, including the size of an overall award under CPRG, the portion of each project covered by federal funding, the amount of match required (CEC traditionally uses a 50% match requirement for charger incentive funding), and whether it was a public station or private depot station.

³⁹ <https://energiize.org/resources>

⁴⁰ <https://calstart.org/about/>

⁴¹ <https://www.tetrattech.com/>

⁴² <https://www.energy.ca.gov/data-reports/reports/electric-vehicle-charging-infrastructure-assessment-ab-2127>

In addition, as described in Transportation Measure 1 above, investments in ZE goods movement will greatly improve public health, particularly for low-income and disadvantaged communities often traversed and intersected by MHD vehicles. This is especially true of the concentrations of distribution centers and the many related delivery trucks that, in California, are most often found in or adjacent to low-income and disadvantaged communities. Addressing this disparity equitably will be helped by leveraging CEC's Disadvantaged Communities Advisory Group (DACAG),⁴³ a legislatively created body that advises the CEC on energy issues in California. In addition, federal funding could be folded under CEC's annual process to draft and solicit feedback on investment plans through a robust public process and in consultation with an advisory group that includes members of disadvantaged communities. Similar to Justice40, CEC's funding programs have long required that 50% of benefits accrue to low-income and disadvantaged communities.

The authority to implement this measure is well established by Warren Alquist Act which created the CEC and its purview;⁴⁴ AB 118 (Núñez, Chapter 750, Statutes of 2007) that created CEC's Clean Transportation Program, and AB 8 (Perea, Chapter 401, Statutes of 2013) and AB 126 (Reyes/Gonzalez) which extended the program. AB 2127 (Ting, Chapter 365, Statutes of 2018) further requires CEC to publish a biennial report on the charging infrastructure needed to meet California's zero-emission vehicle targets and SB 1000 (Lara, Chapter 368, Statutes of 2018) requires CEC, in consultation with CARB, to assess equity in funded transportation projects.

Transportation Measure 3: Advance the Deployment of Clean Off-Road Equipment

This measure would expand programs and efforts that help lower the up-front cost and deploy ZE heavy-duty off-road equipment, including ZE agricultural equipment, airport ground support equipment, cargo handling equipment, commercial harbor craft, construction equipment, heavier lift forklifts, mobile power units, railcar movers and freight locomotives, terminal tractors (yard trucks), transport refrigeration units, and Electric Vehicle Supply Equipment (EVSE) and other supporting infrastructure. This measure is largely informed from CARB's experience implementing the Clean Off-Road Equipment Voucher Incentive Project (CORE).⁴⁵ CARB could similarly lead this measure, with CALSTART administering the program as a third-party contractor. Alternatively, air districts⁴⁶ and local governments, and port authorities each with eligibility to receive CPRG implementation

⁴³ The DACAG was established by Senate Bill 350 (de León, Chapter 547, Statutes of 2015), the Clean Energy and Pollution Reduction Act of 2015.

⁴⁴ <https://www.energy.ca.gov/about>

⁴⁵ <https://ww2.arb.ca.gov/our-work/programs/clean-off-road-equipment-voucher-incentive-project>

⁴⁶ Examples include the San Joaquin Valley Air Pollution Control District's Electrified Dairy Feed Mixing Program, Zero-Emission Ag UTV Program, Tractor Replacement Program, Ag Pump Replacement Program, Zero-Emission Forklift Program, and Clean Vehicle Infrastructure Program.

funds, could also implement this measure. CARB's experience with CORE illustrates the need for this measure as well as its potential outcomes and benefits.

The outstanding need for this measure can be illustrated in part by CORE's success to date. Demand for CORE funding has been high, and the project has been oversubscribed each funding cycle since its inception in 2020. For example, in 2022, \$125 million in CORE funding was oversubscribed by more than \$100 million, and 3 of the 10 eligible equipment categories sold out within 90 minutes. In 2023, \$185 million was available, and within 60 minutes, 3 of the 11 categories were oversubscribed. In the last round, a \$10 million small business set aside was exhausted within 22 minutes. CARB staff expect demand to remain high, while funding for the program and its proven success are, at this time, uncertain.

In addition, as with the above goods movement measures, a transition to ZE off-road equipment carries measurable air quality and other co-benefits that would lessen pollution and public health burdens most often shouldered by low-income and disadvantaged communities. CORE also currently aims for at least 50 percent of funding to support equipment domiciled in disadvantaged communities, and to date, has achieved a rate higher than 75 percent. The CORE team would continue these practices under this measure, as well as continue to conduct outreach and partnership with CBOs, along with efforts to convene community members and equipment manufacturers to foster communication and ZE equipment awareness.

This measure would help encourage additional manufacturers to bring ZE products to market, support technology transfer to new equipment types and market segments, and grow the overall ZE off-road market. The benefits of this measure, and related lessons learned and technologies developed, would apply not only to California, but across the U.S.

CARB's authority to implement this measure is well established. AB 1532 (Pérez, Chapter 807, Statutes of 2012), Senate Bill (SB) 535 (De León, Chapter 830, Statutes of 2012), and SB 1018 (Budget and Fiscal Review Committee, Chapter 39) established that the Greenhouse Gas Reduction Fund (GGRF) receive auction proceeds from California's Cap-And-Trade Program and provide the framework for how the auction proceeds will be administered to further the purposes of AB 32 (Nunez, Chapter 488, Statutes of 2006). AB 118 (Nunez, Chapter 750, Statutes of 2007) created the Air Quality Improvement Program (AQIP), a voluntary incentive program implemented by CARB, to fund clean vehicle and equipment projects, air quality research, and workforce training. Several bills have appropriated funding from the GGRF or through AQIP to fund ZE technology, including ZE equipment through CORE. Governor Newsom's Executive Order N-79-20 also calls for 100 percent of off-road vehicles and equipment operations to be zero-emission by 2035 where feasible.

Transportation Measure 4: Bolster the State’s Sustainable Port and Freight Infrastructure Program

This measure would augment the Sustainable Port and Freight Infrastructure Program (PFIP),⁴⁷ which advances clean, efficient, sustainable, and resilient port and freight infrastructure. At its core, PFIP and this measure would champion projects that deploy electric equipment and vehicles, renewable energy, and other emissions-reducing technologies. While PFIP projects vary according to context-specific needs, they include strategically integrating electrical infrastructure into port projects to reduce emissions during vessel berthing; optimizing truck access to vital freight hubs; installation of all-electric heavy lift cargo cranes; and much more. Increased funding under CPRG would empower PFIP to unlock GHG emissions reductions, improve air quality, and bolster logistics and economic efficiency of goods movement across the State and beyond.

The California Transportation Agency and the California Department of Transportation would lead this measure and project partners could include local governments, ports, air quality management districts, and rail operators. The State’s ambitious \$1.2 billion initial allocation provided an effective kickstart to PFIP and showed that additional funding would be needed to fully meet the critical needs it identified. In its pipeline of emissions reducing projects, PFIP has showed that there are at least \$430 million worth of shovel-ready projects that fit within PFIP’s objectives of reducing environmental impacts. Under this measure, the State would bring together funding sources and seek roughly \$238 million through CPRG.

As described in the above goods movement transportation measures, PFIP projects would cut air pollution across the State’s most burdened populations, many of which are adjacent to some of the nation’s largest port operations. Quarterly reports would also include public-facing activities to help ensure meaningful engagement with communities affected by each project, and the California Department of Transportation Office of State Planning, Equity, & Engagement framework would be followed.

In addition, different projects under PFIP have the potential to generate local, high-quality jobs. Standards to ensure the inclusion of job quality that are embedded in PFIP include community workforce agreements, diversity and inclusion initiatives, career advancement opportunities, local hiring preferences, regular workforce feedback mechanisms, collaboration with workforce development agencies, and inclusive hiring practices for underserved groups. This measure would also help modernize goods movement systems to improve economic efficiency and help strengthen State and U.S. goods movement operations.

In addition to a proven track record to implement such projects, several laws and directives ensure the State’s authority to implement this measure. For example, SB 198 (Chapter 71,

⁴⁷ <https://calsta.ca.gov/subject-areas/freight-rail-border>

Statutes of 2022) established the PFIP Program.⁴⁸ Other bills and directives also further underpin the State’s authority to implement this measure.⁴⁹

Transportation Measure 5: Support Mobility Projects Uplifted by Communities

This measure would expand existing grant programs to fund projects identified by communities, including any that local governments would like to pursue under CPRG. This measure would also cover clean mobility projects identified through CARB’s Clean Mobility in Schools (CMIS), the Sustainable Transportation Equity Project (STEP), or the Clean Mobility Options Program (CMO), which each aim to directly improve transportation equity in disadvantaged and low-income communities by addressing community-identified transportation needs, increasing access to key destinations and services, reducing vehicle miles travelled (VMT), and reducing GHGs. This measure aims to elevate unique transportation concerns and to address different barriers faced by various communities.

This measure would cover a diverse collection of projects, including active transportation infrastructure; new and expanded zero-emission public transit and school bus services; and shared mobility services such as zero-emission micro transit and e-bike lending libraries. The projects could also include a variety of necessary supporting elements such as workforce training in the clean transportation sector; diverse community engagement, outreach, and education activities; displacement avoidance considerations; and clean transportation subsidies.

Under implementation by CARB, qualified but unfunded projects from the CMIS, STEP, or CMO programs would be prioritized. The combined total need of such unfunded projects is substantial, and funding from CPRG for these community-driven transportation solutions could be matched with local sources and any available State funding.

Many of the projects identified through CARB’s programs have been chosen because they benefit low-income and disadvantaged communities. In addition, projects were chosen because they were informed and developed through a concerted process of community engagement that was inclusive and representative of the diversity of the community being served. All proposed projects also identified ways in which, through the proposed project, community-led decision-making would continue, including through direct community decision making, focus groups, and surveys.

⁴⁸ SB 198 also established the Transportation Infrastructure Climate Adaptation Strategy Grant Program and the Local Transportation Infrastructure Climate Adaptation Project Program, both designed to tackle climate-related challenges in transportation systems.

https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=2021202205B198

⁴⁹ These include, but are not limited to, SB 375 which aims to reduce greenhouse gas emissions by integrating land use, transportation, and housing planning, Executive Order B-16-12 which outlines directives to improve the efficiency of freight transportation in California,

This measure could be implemented by or alongside various local authorities and community-based organizations. CARB would also leverage a network of local implementers working on community-based clean mobility projects through an effort known as the Clean Mobility Equity Alliance (CMEA). The partnerships developed through CMEA and between local governments and community-based organizations would help build the social infrastructure needed to pursue future funding opportunities, helping to spur transformational change at the community scale.

The State has the authority to implement this measure as established by several State bills and directives, including, but not limited to, SB 1275 (de León, Chapter 530, Statutes of 2014)⁵⁰, which established a broad suite of statewide transportation equity programs under the Charge Ahead Initiative, including CMIS and STEP. Further, SB 350 (de León, Chapter 547, Statutes of 2015)⁵¹, directed CARB to undertake a study to identify the barriers to accessing clean transportation and mobility investments for low-income Californians, work that underpins this measure.⁵² In addition, local governments may have their own authority to implement this measure.

Transportation Measure 6: Allow for Local Deployment of ZEV Infrastructure and ZEV support for Low-Income Residents

California's light-duty ZEV market is one of the largest and most dynamic in the world. Over 1.7 million light duty ZEVs have been sold through Q3, 2023 (including Fuel Cell Electric Vehicles (FCEVs) and Plug-In Hybrid Electric Vehicles (PHEVs). ZEVs now account for over 25% of new vehicle sales.⁵³ However, many communities lack reliable ZEV infrastructure or the access to affordable ZEV options.

This measure elevates the fact that many local governments serving low-income and disadvantaged communities, and Tribal Nations without their own CPRG planning grants, are seeking every available opportunity to fund light-duty ZEV infrastructure projects in their regions and communities, and in some cases, to fund ZEV incentive programs similar to CARB's Clean Cars 4 All,⁵⁴ which targets incentives to low-income residents. Not only have such needs been prioritized at the local level under CPRG, the urgency for such action is also outlined in the State's 2022 Scoping Plan Update and CEC's Electric Vehicle Charging Infrastructure Assessment, mandated biennially under AB 2127 (Ting, Chapter 365, Statutes of 2018), among other reports.⁵⁵

⁵⁰ http://leginfo.ca.gov/pub/13-14/bill/sen/sb_1251-1300/sb_1275_bill_20140921_chaptered.pdf

⁵¹ http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb_0301-0350/sb_350_bill_20151007_chaptered.htm

⁵² In addition, the bills that establish the State's Greenhouse Gas Reduction Fund and the Air Quality Improvement Program also apply here, as do SB 375, SB 150, AB 118 (Chapter 750, Statutes of 2007), and AB 398 (Eduardo Garcia, Chapter 135, Statutes of 2017).

⁵³ <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics>

⁵⁴ <https://ww2.arb.ca.gov/sites/default/files/movingca/vehiclescrap.html>

⁵⁵ <https://www.energy.ca.gov/data-reports/reports/electric-vehicle-charging-infrastructure-assessment-ab-2127>

Local governments and Tribal Nations typically have the necessary authority to plan, permit, site, and build ZEV infrastructure in their jurisdictions, as well as to run vehicle incentive programs.

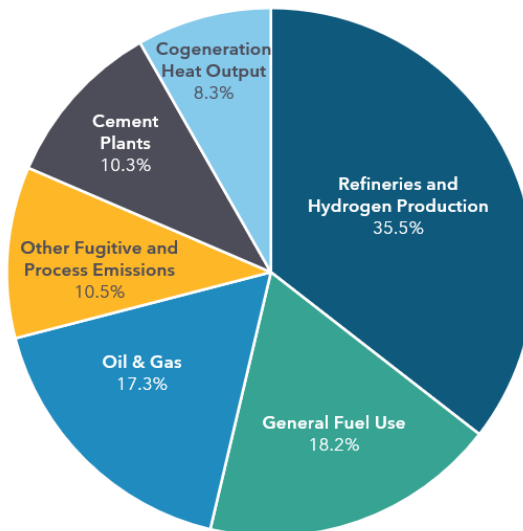
Additional benefits from the further deployment of ZEVs for low-income residents and installation of light-duty ZEV infrastructure are reduced vehicle operating costs, reduced air pollution, and in many cases, the first opportunity for community members to access ZEV technology or to charge a ZEV reliably.

Industrial

California's industrial sector, which includes upstream oil and gas extraction and refining operations for transportation fuels, contributes roughly 19 percent of California's total emissions,⁵⁶ and can be further broken down as shown in Figure 6 below.

Figure 6: Industrial Sector Emissions in 2021

Total Emissions = 73.9 MMTCO₂e



This sector is the economic engine that drives that State's economy and includes a diverse range of sources, including cement plants, refineries, glass manufacturers, oil and gas producers, paper manufacturers, mining operations, metal processors, and food processors. Combustion of fossil gas, other gaseous fossil fuels, and solid fossil fuels provide energy to meet three broad industry needs: electricity, steam, and process heat. There are also fugitive emissions from processing (such as clinker production in cement plants) and other chemical transformations inherent to some manufacturing processes.

⁵⁶ <https://ww2.arb.ca.gov/ghg-inventory-data>

Decarbonizing industrial facilities will benefit low-income and disadvantaged communities where many of the industrial facilities are located. Achieving this goal will primarily depend upon replacing or reducing existing fossil fuel use with a mix of electrification, solar thermal heat, biomethane, low- or zero-carbon hydrogen, and other low-carbon energy to provide energy for heat and reduce combustion emissions. Emissions also can be reduced by implementing energy efficiency measures and using substitute raw materials that can reduce energy demand and some process emissions. Some remaining combustion emissions and some non-combustion CO₂ emissions can be captured and sequestered.

Transforming this sector will require the demonstration and deployment of advanced decarbonization technologies targeted to the unique needs and requirements of the many industrial sub-sectors. That is to say, there is no 'one-size fits all' solution for industry to contribute and support the state's transition to a net-zero economy by 2045. The measure included in this PCAP directly addresses the complexity of this sector, and supports solutions that can provide examples of innovative, cost-effective and practical solutions that decarbonize specific industrial and sub-sector needs. Those solutions, focused on the State's hardest hit communities, can be transferred to other states as their effectiveness is demonstrated here. The end result of this effort will be the consistent decline overall in the use of fossil energy usage and lower process emissions in the industrial sector, resulting in improved air quality, especially in low income and disadvantaged neighborhoods where many of these facilities are located.

In addition, the measure below is consistent with federal efforts to reduce industrial emissions, including the U.S. Department of Energy's Industrial Decarbonization Roadmap⁵⁷ and similar programs.⁵⁸

Industrial Measure 1: Accelerate Industrial Decarbonization

This measure would leverage CEC's existing Industrial Decarbonization and Improvement to Grid Operations Program (INDIGO) to quickly and seamlessly fund industrial decarbonization projects across California's manufacturing sector, including chemicals, metals, food and beverages, and nonmetallic minerals, such as cement, glass, electronics, pharmaceuticals, and related support facilities. CEC would lead this measure with input from CARB and the California Department of Food and Agriculture (CDFA). Industrial stakeholders and utilities would implement the projects.

With bolstered CPRG funding, new INDIGO projects would accelerate the decarbonization of California's industry; ensure substantial and lasting GHG reductions; provide reliability benefits to local electricity grid operations; reduce air pollution, particularly for low-income

⁵⁷ <https://www.energy.gov/industrial-technologies/doe-industrial-decarbonization-roadmap>

⁵⁸ This includes the Advanced Energy manufacturing and Recycling Grant Program (BIL 40209), and the Industrial Demonstrations Program. See more here: https://www.epa.gov/system/files/documents/2023-08/6.Industrial_Waste_508-combined.pdf

and disadvantaged communities; provide replicable examples that could stretch beyond the State; and provide workforce opportunities.

While the decarbonization technologies and practices supported by this measure would vary, they could include process heat electrification (such as industrial heat pumps), alternative processes (such as thermal energy storage, use of evaporators replaced with membranes, and use of feedstocks that reduce use of fossil fuels), renewable energy generation, energy efficiency, and load flexibility.

This measure would decrease air pollution, and consistent with CEC's current practices, 60 percent of installations would be located in or to directly benefit low-income and disadvantaged communities. Project developers would also develop community benefits plans. It is expected that this measure will require a skilled workforce to manufacture, design, install, and operate the GHG reduction technologies, leading to job creation. These projects also have the potential to generate real-world technical and economic data on installed decarbonization equipment in use, initiate service and maintenance infrastructure in California, and ultimately, spur similar private-sector investment in decarbonization technologies across different industries.

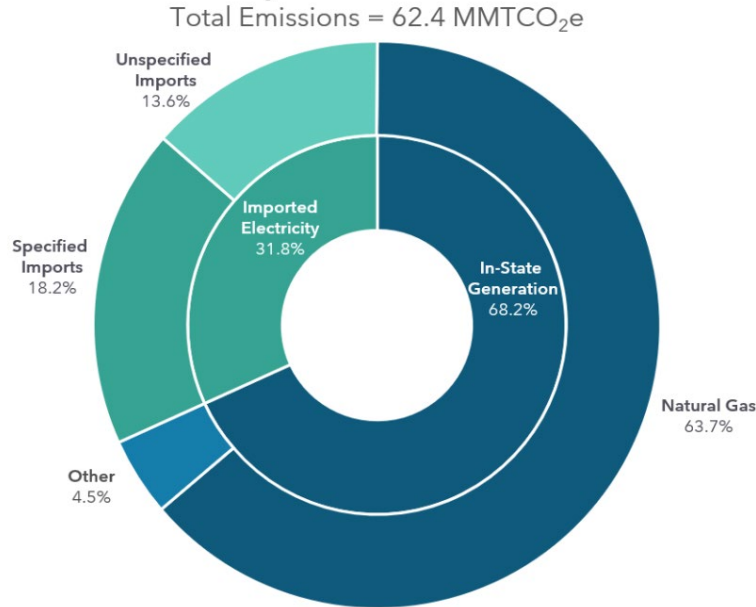
Recognizing the need for decarbonization of the industrial sector, AB 209 (Committee on Budget, Chapter 251, Statutes of 2022) created the CEC's INDIGO program, and among other bills and directives, demonstrates the State's authority to implement this measure.

Energy

Electricity currently comprises 16 percent of the State's GHGs, according to the latest inventory⁵⁹ constituting the third largest sector in terms of carbon pollution. Further, the majority of emissions from generation serving California comes from natural gas as shown in Figure 7 below.

⁵⁹ <https://ww2.arb.ca.gov/ghg-inventory-data>

Figure 7: Electricity Sector Emissions in 2021



Emissions from electricity - both imported and local generation - have dropped dramatically over time. Much of the state's success in reducing GHGs is due to focused decarbonization requirements, programs, and investments in the electricity sector. This includes pioneering efforts such as the Renewable Portfolio Standard, SB 350 Clean Energy and Pollution Reduction Act, SB 100 implementation (requirement to achieve 100 percent electric retail sales to end-use customers by 2045), and the Cap-and-Trade Program (which has been in effect since 2012). These initiatives have delivered significant reductions from this sector, notably related to electricity imports. (This has also resulted in incentivizing lower-carbon electric generation in adjoining states that deliver electricity to California.) It is also worth noting that California's policies have provided strong investment signals for renewable electricity that have benefited other jurisdictions that can now deploy these technologies at lower costs and at scale.

As the State begins to implement broad-scale additional efforts to reach carbon neutrality by 2045 as set forth in the 2022 Scoping Plan Update, a clean, affordable, and reliable electricity grid will serve as the backbone to support deep decarbonization across California's economy. Programs to ensure the full implementation of this goal will build on California's past success and continue to develop and deploy affordable renewable and zero-carbon electricity, upgrades to grid capacity, increased energy storage, the deployment of zero-emissions appliances, efficiency upgrades for homes and commercial buildings, bolstering long-term energy planning, and more. We are at a pivotal time where the actions we take today have significant impacts on our goals years into the future. For example, the 2022 Scoping Plan Update estimates that a five-year delay in renewable capacity would increase emissions by 8 percent in 2030 (25 MMTCO₂e), compared to an

approach at current levels. The measures below align with the federal goal to achieve 100 percent clean electricity by 2035,⁶⁰ and can also help provide jobs and economic opportunity, energy security and resiliency, and air quality and health benefits particularly for low-income and disadvantaged residents. The measures below were chosen in line with these critical actions and the important benefits they offer.

Energy Measure 1: Expand Decarbonization through the Energy Conservation Assistance Act

The proposed expansion of the Energy Conservation Assistance Act (ECAA) would scale zero- and one-percent interest loans to educational agencies, municipalities, and Tribal Nations for clean energy generation, energy storage, ZEV infrastructure, and energy efficiency upgrades. The measure aims to ensure that loan repayments do not exceed the utility bill savings generated by these energy-efficient measures, thereby maintaining budget neutrality for the applicants. CEC would have primary responsibility for this measure.

This measure could unlock funding for 20 eligible projects without otherwise identified funding, which includes \$44 million in wait list applications from low-income and disadvantaged communities. In fact, with the recent expansion of ECCA program to include Tribal applicants and expanded opportunities to fund energy storage and ZEV infrastructure, this program has greater capacity than ever to expand clean energy measure opportunities for often hard to reach populations.

In addition, projects under ECCA would deliver improved air quality, clean energy generation, grid resilience, and decarbonization of buildings, contributing to healthier living environments.

The ECAA program operates under the authority granted by the Energy Conservation Assistance Act of 1979 (Public Resources Code §§ 25410-25422), most recently amended in 2021. The CEC's established track record in managing a vast portfolio of energy projects, along with its low default rate, underscores its capability and authority to successfully implement this expanded initiative. Recent legislation (AB 33, Ting, Chapter 226, Statutes of 2021) expanded the ECAA program to California Native American Tribes and expanded allowable measures to include energy storage and ZEV infrastructure.

Energy Measure 2: Create a Funding Program to Upgrade the Capacity of Distribution Systems

This measure would create a new Distribution System Capacity Upgrades Funding Program to enhance the electric distribution system in California. Its primary goal would be to increase capacity to support climate initiatives, particularly transportation and building

⁶⁰ <https://www.energy.gov/sites/default/files/2023-05/DOE%20-%20100%25%20Clean%20Electricity%20-%20Final.pdf>

electrification, which are crucial for reducing the State's reliance on fossil fuels, to meeting several sector-specific climate goals, and the State's overarching 2045 carbon neutrality target. The program aims to address the challenges posed by the increased electrical demand from electric vehicles (EVs), heat pumps, and other electrification technologies, which the current distribution system is not fully equipped to handle. It also aims to help mitigate rising electricity costs which currently acts as a disincentive for consumers to switch from fossil fuels in vehicles and buildings. The California Public Utilities Commission (CPUC), in consultation with CEC and CARB, would implement the program.

The cost of overall distribution system upgrades is immense and would traditionally be funded by ratepayers. CPRG funding would kick-start this program, help alleviate the financial burden on consumers, and accelerate grid upgrades that will otherwise become a bottleneck to ZE technologies across the State.

The program is also expected to deliver considerable benefits to disadvantaged communities, especially those affected by high levels of trucking emissions, such as near ports and along major transportation corridors. To facilitate the transition to electric vehicles and reduce these emissions in such communities, urgent upgrades to the distribution systems in these highway corridors and port areas are essential. In addition, the CPUC has an open proceeding on distribution system planning and in which numerous representatives from low-income and disadvantaged communities participate. The CPUC could leverage this proceeding for further meaningful engagement with community groups.

The CPUC, vested with broad authority over investor-owned utilities, will spearhead this program. CPUC's jurisdiction covers approximately 75 percent of California's customers, providing CPUC with substantial leverage and capacity to implement such a large-scale program effectively.

Energy Measure 3: Expand the Success of California's Self Generation Incentive Program for Behind the Meter Energy Storage

The proposed expansion of the Self Generation Incentive Program (SGIP) would enhance behind-the-meter energy storage and resilience during power outages, particularly for low-income residential customers. Energy storage systems would be charged when electricity rates are low and renewable generation is high, and discharge energy during peak hours when electricity rates and GHGs from fossil generation are highest. These practices enhance resilience, reduce emissions, and support affordability. This initiative would be led by the CPUC using existing proceedings and program implementers to expand SGIP and scale its transformative impact.

The majority of the avoided emissions from this measure would likely come from natural gas Peaker plants, and reducing their use across the State would deliver air quality benefits, especially where those Peaker plants are located in or adjacent to low-income and disadvantaged neighborhoods. In addition, increasing the number of energy storage

systems and integrating them into demand response programs can further bolster grid reliability, potentially transforming them into virtual power plants.

The SGIP, established in 2001, has been supported by legislative actions including AB 209, which amends Public Utilities Code Section 379.6 and adds Section 379.10 and gives CPUC authority to use SGIP to offer California residents solar and storage incentives. This authority, and a track record in financing over 1.23 GW of capacity through SGIP across numerous projects, demonstrate CPUC's capability to successfully implement this measure.

Energy Measure 4: Bolster Healthy Landscapes and Resilient Communities through Expanding the Biomass to Carbon Negative Biofuels Program

This measure seeks to expand the existing Biomass to Carbon Negative Biofuels Program at the California Department of Conservation,⁶¹ and ultimately play a unique role in addressing climate change by producing low-carbon and carbon-negative fuels from forest and agricultural biomass while addressing critical issues such as forest health, wildfire risk, and air quality concerns. The Department of Conservation would lead this measure, in partnership with various State and federal agencies, local governments, and Tribes. These entities would collectively contribute to the measure's development, solicitation crafting, and application review processes.

This measure could contribute to substantial GHG reductions over time. For example, smaller, pilot-sized facilities are expected to support sequestration and avoidance of between 18,000-30,000 MT CO₂e per year, while larger facilities aim for over 0.39 MMTCO₂e annually. The financial scope of the program is significant, with implementation costs ranging from \$60 million to \$500 million per facility, where grants are designed to cover at least 10% of the total costs. CPRG funding would be leveraged and matched with private and public funding, including local funding from jurisdictions -- many of which are rural -- that would benefit from these facilities with enhanced forest resilience, improved air quality, and jobs.

Additionally, by avoiding wildfire risks and reducing air pollution from the burning of agricultural waste, this measure promises substantial public health and safety benefits, for rural low-income and disadvantaged communities as well as Tribal Nations, many of which live in California's San Joaquin Valley, and face persistent air quality challenges.⁶² The program also aims to create hundreds of construction jobs and numerous long-term operational roles, with a focus on local hiring to boost employment for priority populations.

The transformative potential of this program is significant. It is expected to lead to notable advancements in sustainable forestry and biofuel technology, thereby setting a national model for combining rural economic opportunities with environmental stewardship and

⁶¹ <https://www.conservation.ca.gov/cgs/fbp>

⁶² https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf

improvements in air quality. Additionally, the program can contribute substantially to renewable energy, potentially supplying renewable electricity to the grid and replacing fossil fuels.

The Department of Conservation derives its authority from Chapter 2 of Division 1 of the California Public Resources Code (Pub. Resources Code, §§ 600 et seq.), which provides the Department with powers and responsibilities over several natural resource areas, including forestry, agriculture, and energy, which are directly relevant to the existing Biofuels Program and this measure. Furthermore, the Department's general statutory authorization to award grants and accept federal grants for relevant purposes is outlined in Public Resources Code, section 604, and section 608, respectively. Section 608 is particularly crucial as it allows the Department to expend federal funds under conditions set by the federal government, which aligns with the objectives of the Biofuels Program. Additional specific authorizations for various grant programs related to natural resource management are found in separate statutes, such as Public Resources Code, §§ 10200 et seq. (California Farmland Conservancy Program) and §§ 4208 et seq. (Regional Forest and Fire Capacity Program).

The Department's mission to balance contemporary needs with future challenges, particularly in the realms of carbon management, sustainable economic development, watershed management, and hazards management, further reinforces its capacity to implement such a comprehensive program. Senate Bill (SB) 155, passed in 2021, is a critical legislative piece that directly supports the Biofuels Program. It includes an appropriation in the 2022-23 Fiscal Year for pilot projects in the Sierra Nevada to create carbon-negative fuels from materials resulting from forest vegetation management, explicitly stating that eligible projects should focus on California-based hydrogen or liquid fuel use (Section 50).

Energy Measure 5: Implement Bioenergy Projects

This measure includes emerging opportunities elevated by local jurisdictions to create renewable energy, including renewable hydrogen from various organic waste sources such as landfill methane;⁶³ woody biomass, yard and agricultural waste; and biosolids. This measure could apply to projects that capitalize on any one of these practices, or that are able to combine them to more cost effectively reduce emissions and achieve greater co-benefits. These actions could have a significant impact on reducing methane emissions--a powerful short-lived climate pollutant.

In particular, this measure could include, but would not be limited to, the following:

- Anaerobic digestors to process organic waste and collect renewable gas
- Systems to process organic waste and create renewable energy

⁶³ *This measure is meant to address methane emissions from organic decomposition in landfills, consistent with SB 1383 (Lara, Chapter 395, Statutes of 2016).*

- Equipment that processes organic waste to feedstock for the above technologies (e.g., dewatering presses)
- Equipment and processes to upgrade landfill gases for energy uses
- Upgrades to help fulfill SB 1383 requirements for landfill operators, such as waste sorting technologies
- On-site renewables energy and storage for increased energy processing needs
- Other onsite construction as needed to combine the above operations

This measure would prioritize technologies or practices that do not expand fossil gas or hydrogen combustion.

This measure would be led directly through local governments with authority to implement it and eligibility to pursue CPRG implementation grants.

In addition, this measure could help lead to a variety of benefits. Any projects that support destruction of polyfluoroalkyl substances (PFAS), a known carcinogen associated with water, wastewater, and landfills, could help lower public health risks.⁶⁴ These projects could also help create jobs, and help test and scale emerging renewable energy technologies, practices, and markets. All projects could bring these benefits to low-income and disadvantaged communities, depending on their location and operational contexts. Outcomes, benefits, and public engagement efforts from each project could be tracked and documented to help ensure these benefits, share lessons learned, and scale success.

Energy Measure 6: Enable Renewable Microgrids for Rural Communities and Tribes

This measure elevates interest from local State governments and Tribal Nation in rural parts of California to pursue renewable microgrid projects that can contribute to lower emissions and manage local energy resiliency. This measure would be led directly through local governments or Tribes with authority to implement it and eligibility to pursue CPRG implementation grants. Microgrids would need to be created in accordance with any relevant CPUC and utility directives concerning microgrids.

All such projects could bring jobs and other benefits - such as energy reliability and resilience, energy sovereignty, economic development, improved air quality and health, and GHG reductions - to low-income and disadvantaged communities, depending on their location and operational contexts. Outcomes, benefits, and public engagement efforts from each project could be tracked and documented to help ensure these benefits, share lessons learned, and scale success.

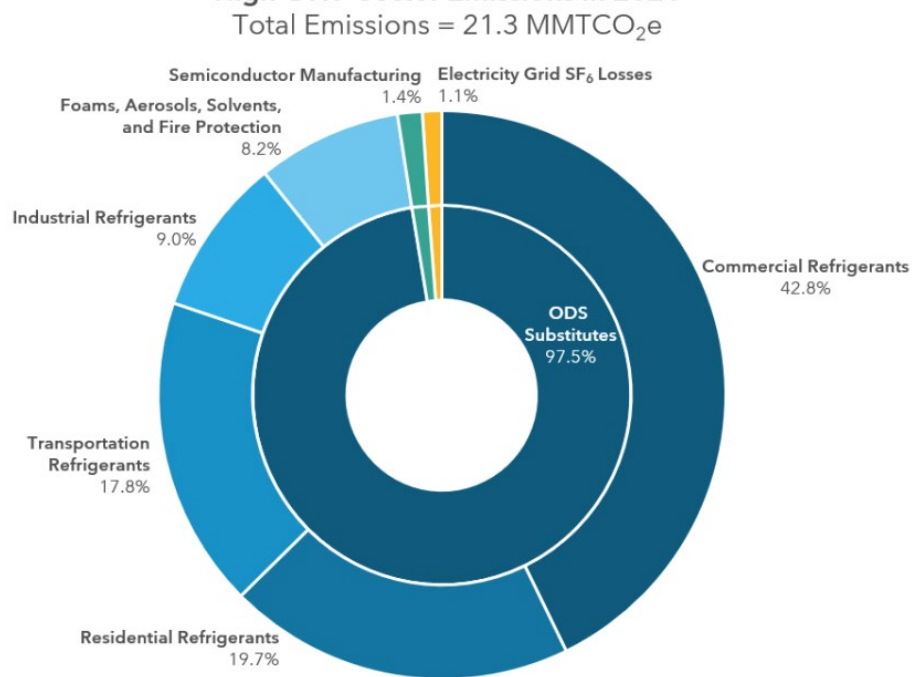
⁶⁴ - https://www.epa.gov/sites/default/files/2021-01/documents/pitt_research_brief_pyrolysis_final_jan_25_2021_508.pdf#:~:text=New%20options%20for%20the%20treatment%20of%20PFAS-impacted%20WWTP,destroying%20the%20beneficial%20use%20potential%20of%20the%20material.

High Global Warming Potential

The High Global Warming Potential sector includes emissions from releases of ozone depleting substance (ODS) substitutes, sulfur hexafluoride (SF₆) emissions from the electricity transmission and distribution system, and gases that are emitted in the semiconductor and other manufacturing process. ODS substitutes, which are primarily HFCs, are used in refrigeration and air conditioning equipment, solvent cleaning, foam production, fire retardants, and aerosols.

As of the latest California GHG Inventory high-GWP gases comprise 5.6% of California's emissions. Emissions of ODS substitutes account for 97.5% of emissions from this sector and consist primarily of hydrofluorocarbons (HFC). In 2021, refrigeration and air conditioning equipment contributed 91.6% of ODS substitutes emissions (see Figure 8 below).

Figure 8: High-Global Warming Potential Sector Emissions in 2021



California began regulating high-GWP emissions at the start of its action on climate in the 2010s and established a program to manage and reduce emissions from refrigeration systems - the major source of high-GWP emissions in the State. This effort began with the largest systems, including all facilities with refrigeration systems containing more than 50 pounds of high-GWP refrigerant. Early actions required such facilities to conduct and report periodic leak inspections, promptly repair leaks, and keep service records on site. This brought thousands of groceries and convenience stores under regulation, many of which are in low-income and disadvantaged neighborhoods.

To support the refrigeration sector and other sectors reliant on high-GWP refrigerants, SB 1013 (Lara, Chapter 375, Statutes of 2018)⁶⁵ established a new program (the F-Gas Incentive Program (FRIP)) to promote the voluntary adoption of climate-friendly low global warming potential (low-GWP) refrigerant technologies and alleviate barriers that prevent the adoption of these technologies. The current proposed action in this sector proposed will, in part, help to address those barriers - especially in low-income and disadvantaged neighborhoods - with funding to assist facilities to transition to the less climate polluting refrigeration alternatives while also generating local jobs. Our proposed measure also complements the federal High GWP Gases Voluntary Programs (or Fluorinated Gas Partnership Programs).⁶⁶

High Global Warming Potential Measure 1: Expand F-gas Reduction Incentive Program

This measure would expand CARB's existing F-gas Reduction Incentive Program (FRIP) and propel its success in reducing hydrofluorocarbons (HFCs) and hydrochlorofluorocarbons (HCFCs), or F-gases, which have outsized near-term climate impacts and global warming potential (GWP) thousands of times that of CO₂. HFCs are also the fastest growing source of GHG emissions in California, the U.S., and the world.⁶⁷ This measure focuses on reducing such emissions from industrial and commercial refrigeration and would continue to be led by CARB with industry partners as appropriate.

Despite the urgency to reduce F-gases from industrial and commercial refrigeration and the effectiveness of this climate action, funding for upgrades from high-GWP refrigerants (GWP 2000 - 4000) to low-GWP (GWP less than 10) is limited. While California regulations prohibit HFCs in new technology, without additional funding, thousands of existing units are likely to undergo needed upgrades to mid-range GWP systems (GWP~1400) due to the higher cost of low or ultra-low GWP alternatives and the refrigeration system conversions they require, which could include upgrades to display cases, piping, compressors, and/or condensers.⁶⁸ Upgrades to mid-GWP refrigerants lock in higher emissions for 20 to 30 years. This measure would prioritize stores in disadvantaged communities and food deserts, and additional consideration would be given to small businesses.

We expect this measure would yield substantial GHG reductions. As an example, the FRIP 2019 allocation of \$1 million reduced emissions by ~38,000 MTCO₂e with a cost-effectiveness of ~\$27/MTCO₂e across 15 supermarket projects.

⁶⁵ https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1013

⁶⁶ See: https://19january2017snapshot.epa.gov/climatechange/voluntary-energy-and-climate-programs_.html and https://19january2017snapshot.epa.gov/f-gas-partnership-programs_.html

⁶⁷ https://ww2.arb.ca.gov/sites/default/files/2020-07/final_SLCP_strategy.pdf

⁶⁸ Viable high-GWP alternatives exist and include carbon dioxide (GWP = 1), Ammonia (GWP = 0), and hydrocarbons (GWP < 5).

Funding to spur greater adoption of low-GWP refrigerants and associated equipment will help scale these markets and bring down costs over time, which could be transformative for this sector beyond California. Installation of newer systems will lower such businesses operating costs under a national HFC phasedown and could lower electricity-related criteria pollution from increased energy efficiency. In addition, this measure would follow FRIP's requirement to conduct outreach to small and independent businesses in low-income and disadvantaged communities.⁶⁹ In addition, this measure would leverage FRIP's mandate to help build a workforce skilled in low-GWP technologies by continuing to require applicants to provide hands-on and virtual trainings by industry, engineering design firms, and public utilities, among others, to contractors and technicians.

California's authority to implement this measure is created, by among other bills and directives, SB 1383 (Chapter 395, Statutes of 2016), which mandated the reduction of HFCs or fluorinated gases by 40% below 2013 levels by 2030, and by SB 1013 (Chapter 375, Statutes of 2018), which created FRIP.

Agriculture

California is responsible for more than half of all U.S. domestic fruit and vegetable production and nearly three-quarters of its fruits and nuts. Our croplands are some of the most productive agricultural lands in the world, with 16 million acres of grazing land and 27 million acres of cropland and a farmgate value of over \$55 billion, covering 9 percent of the state and making California global leader in agriculture. These lands are becoming increasingly vulnerable to the impacts of climate change. Between 2020-2022, an estimated 750,000 acres of farmland were fallowed due to drought and caused more than \$1.2 billion in direct impacts; impacts to food processing and related industries amounted to an additional \$845 million in losses, and over 19,420 jobs were lost.⁷⁰ California is taking aggressive measures to ensure the agriculture sector is more resilient to the effects of climate change. Climate smart agricultural practices have the potential to transform this sector to increase soil carbon storage, reduce GHG emissions, and reduce pesticide exposure and health impacts. They also support California's pathway to carbon neutrality while simultaneously improving the lives of those who live and work in the agricultural community.

We have established several ambitious targets to help guide our efforts. Some key targets are to accelerate the pace and scale of healthy soils practices to 80,000 acres annually by 2025, conserve at least 8,000 acres of crops annually through conservation easements or fee acquisitions and increase organic agriculture to 20 percent of all cultivated acres by

⁶⁹ https://ww2.arb.ca.gov/sites/default/files/2023-06/FRIP_2023_3PA_Solicitation.pdf

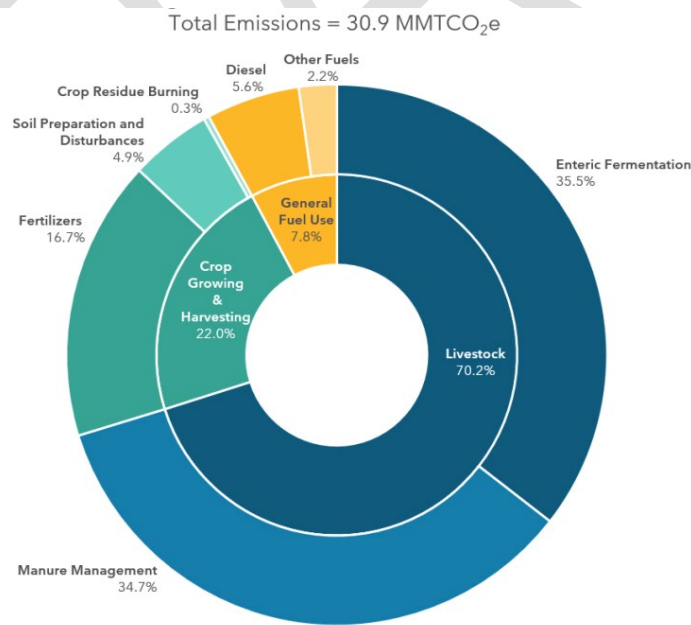
⁷⁰ <https://news.ucmerced.edu/news/2022/continued-drought-conditions-add-billions-california-agriculture-losses%2%A0uc-merced-report>

2045. We have also established a target to electrify 25 percent of agricultural energy demand by 2030 and 75 percent by 2045.

To support these targets, California has made significant investments in climate smart agriculture. The 2022-23 budget includes \$280 million to support agricultural water conservation practices, provide on-farm technical assistance, and provide direct drought relief to small farm operators.⁷¹ These investments also support other strategies identified in the 2022 Scoping Plan Update, including accelerating deployment of healthy soils practices, organic farming, sustainable pest management practices, and more.

Although we have made large investments in this space, there is still significant work to be done to increase practice adoption across California’s 43 million acres of agricultural land and to reduce agriculture GHGs, as broken out in Figure 9 below. Since its establishment in 2014, CDFA’s Healthy Soils Program has been able to incentivize 130,000 acres of healthy soils practices.⁷² CPRG funding would play a vital role in supporting the sustained funding of our proposed programs, specifically the Healthy Soils Program and the Dairy Digester Research and Development program. The State chose to include these programs in our PCAP because they have already proven successful, and they would result in near-term GHG emissions reductions and benefit from additional funding. Furthermore, they prioritize rural, low-income, and disadvantaged communities. Details on these programs are discussed below.

Figure 9: Agriculture Sector Emissions in 2021



⁷¹ <https://ebudget.ca.gov/2022-23/pdf/Enacted/BudgetSummary/ClimateChange.pdf>

⁷² https://www.cdfa.ca.gov/oefi/healthysoils/docs/HSP_Flyer-English.pdf

Agricultural Measure 1: Expand California's Healthy Soils Practices

This measure would expand support for various conservation practices such as compost application, nutrient management, conservation tillage, and cover cropping across California's diverse agricultural landscape, including through outreach and technical assistance to the farmers who need it most. These practices are designed not only to enhance the carbon storage capability of the soil but also to improve agricultural productivity, soil water holding capacity, and environmental health factors such as air quality. CDFA, in close coordination with farmers, ranchers, and agricultural entities across California, with a focus on Socially Disadvantaged Farmers and Ranchers (SDFRs), could lead this measure under its Healthy Soils Program. Alternatively, local governments with the appropriate authority and eligibility to pursue CPRG funding could implement this measure.

As of 2023, the Healthy Soils Program has led to an estimated reduction of 1.1 MMTCO_{2e} from 1,500 projects. The cost-effectiveness of these measures is calculated at approximately \$87 per MTCO_{2e}. This measure could be expected to yield similar results.

Following the example of CDFA's Healthy Soils Program, this measure could be designed to be inclusive, with a strong emphasis on aiding SDFRs and low-income communities. For example, as of May 31, 2023, 40% of the funds implemented through CDFA's program have benefited priority populations. By enhancing soil health, this measure would also indirectly contribute to food security, local job creation, and overall rural economic resilience, benefiting these communities significantly. In addition, improved soil health leads to better crop yields, reduced need for synthetic fertilizers and pesticides, and enhanced biodiversity. In the 2022 Healthy Soils Program funding round, projects resulted in 1.2 million pounds of NO_x reduction.

Legislative support for the Healthy Soils Program is anchored in SB 859 (2016), which established the program under CDFA's jurisdiction. The Environmental Farming Act Science Advisory Panel, as designated by this legislation, provides guidance. This legal framework empowers CDFA to effectively manage and expand the program, integrating soil health into the broader context of California's climate action and agricultural policy. Many local governments have their own authority to implement this measure as well.

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Agriculture Measure 2: Reduce Methane Emissions by Expanding California's existing Dairy Digester Research and Development Program (DDRDP)

This measure would expand the Dairy Digester Research and Development Program (DDRDP) carried out by CDFA. This measure aims to increase small farm dairy digesters and fund research and demonstration projects for hydrogen production from dairy digesters. It would also leverage DDRDP's demonstrated success in helping small farms afford and install livestock manure anaerobic digesters and would further help implement linear generators and fuel cell technology for converting dairy biogas into renewable electricity and hydrogen. Such investments are critical to meeting State and federal clean energy and climate goals.

This measure would multiply DDRDP's significant methane emissions reductions, and draw down emissions cost-effectively. The program has historically reduced about 2.45 MMTCO_{2e} annually.

Most DDRDP projects are in California's San Joaquin Valley, home to many low-income and disadvantaged communities. In these areas, this measure would promote rural economic growth, create local jobs, improve local environmental conditions, and support California's interagency efforts to grow California's emerging hydrogen market.

Operated under SB 1383's authority, DDRDP sets targets for methane emission reduction. The CDFA's Office of Environmental Farming and Innovation, experienced in administering similar programs, would manage the DDRDP expansion.

Natural and Working Lands

As climate change increases the likelihood of extreme wildfires, drought, heat, and other impacts, carbon stocks in California's Natural and Working Lands (NWL) will face increased risks and impacts. NWL cover approximately 90 percent of the state's 105 million acres and include California Native American Tribes' ancestral and cultural lands, parks and green spaces in our cities and communities, and the waters and iconic landscapes the nation knows and loves. The diverse landscapes and biodiversity found throughout California's NWL provide a multitude of benefits to the people of California, including clean water, clean air, biodiversity, food, economic prosperity, recreational opportunities, continuation of traditional Tribal ways of life, mental health benefits, and many others.

California's approach to climate action in the NWL sector is not solely focused on maximizing carbon stocks. The State prefers to support carbon management that holistically fosters ecosystem health, resilience, provision of overall climate function, public health, and reduction of short-lived climate pollutants - providing an array of related benefits. CPRG would uniquely support our climate strategy in the NWL sector by allowing us to accelerate and expand successful, existing programs that would benefit from additional funding and can be quickly implemented. By helping to scale nature-based climate solutions across the State, California can further prioritize equity by helping residents and communities hit first and worst by climate change impacts.

Governor Newsom's Executive Order N-82-20 established a target to conserve 30 percent of California's lands and coastal water by 2030 - also known as 30x30. This target directly supports President Biden's Executive Order committing the United States to 30x30 through its America the Beautiful initiative.⁷³ There are a number of other key targets,⁷⁴ legislation,⁷⁵ and plans⁷⁶ that guide and uplift our NWL strategies.

⁷³ <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>

⁷⁴ Target: Treat 2.3 million acres statewide annually in forests, shrublands/chaparral, and grasslands through strategies like prescribed fire, thinning, and harvesting.

Target: Implement climate smart practices for annual and perennial crops on ~80,000 acres annually.

* See *2022 Scoping Plan* for full list of NWL targets.

⁷⁵ *Senate Bill 27* requires CNRA to create a Carbon Sequestration and Climate Resiliency Project Registry to facilitate funding of nature-based and direct air capture projects.

Assembly Bill 1757 requires CARB and CNRA to establish targets for carbon sequestration and nature-based climate solutions.

Senate Bill 1386 declares NWL are an important strategy in meeting GHG reduction goals.

⁷⁶ *Natural and Working Lands Climate Smart Strategy*, the *California Climate Adaptation Strategy*, and the *2022 Scoping Plan for Achieving Carbon Neutrality*

The 2022 Scoping Plan models that the emissions from the NWL sector will decrease by 2 MMTCO_{2e} annually compared to the business-as-usual scenario. By continuing to invest in the health of our lands, NWL will, in due course, be able to function as a carbon sink instead of a carbon source.

The programs we have chosen to include in our PCAP were selected because they are all shovel-ready projects that can be implemented in a five-year time frame and will significantly reduce emissions by 2030. They also prioritize equity, community voice, job benefits, and complement other federal funding. Taking these criteria into consideration, we are proposing the measures below.

Natural and Working Lands Measure 1: Bolster California's Forest Health Program

This measure would bolster the Forest Health Program, an initiative of the California Department of Forestry and Fire Protection (CALFIRE). The measure would expand funding for a critical range of activities, including fuel reduction, controlled burns, pest management, reforestation projects, and biomass utilization. Its primary aim would be to continue to enhance forest resilience against wildfires, pests, and diseases, while promoting carbon sequestration in forest ecosystems. CALFIRE, being the lead State agency for the Forest Health Program, would continue to administer this measure alongside the involvement of local, State, and federal agencies, universities, special districts, Native American tribes, private landowners, and non-profits like fire safe councils and land trusts.

This measure would leverage the Forest Health Program's past success. For example, from 2017 to 2023, the program funded 108 projects expected to result in a reduction of 16.2 million MTCO_{2e} over their 60-year lifetimes. The program's efficiency is further highlighted by its cost-effectiveness, with an average cost of \$24 per MTCO_{2e} reduced. Despite the success of this program, funding is still desperately needed to shore up forest health, prevent further wildfire and emissions from forests, and help these ecosystems and communities store carbon into the future.

This measure would deliver substantial benefits to low-income and disadvantaged communities, aligning with Justice40 and ensuring that at least 40 percent of CPRG funding would benefit such populations. This strategic focus addresses the heightened risks these communities face due to climate change and their limited resources to adapt or recover from such impacts. In addition, the measure would help protect public health by reducing wildfire smoke, a significant source of air pollution. The program also supports rural economies through the development of sustainable wood products markets and improves biodiversity and water quality. Its multifaceted approach provides a model for comprehensive nature-based climate solutions.

The authority for the Forest Health Program is firmly established under California Public Resources Code §4799.05. The program aligns with California's broader climate and environmental strategies, including the Wildfire and Forest Resilience Action Plan and the Natural and Working Lands Climate Smart Strategy. The continued commitment to this

program is also supported by legislative actions, such as SB 901 passed in 2018, ensuring its alignment with state-wide climate goals and policy directives.

Natural and Working Lands Measure 2: Expand Urban and Community Forest Projects

This measure would expand urban canopy while delivering energy conservation and storm-water runoff reduction; improving air, soil, and water quality; and enhancing public health and property values. This measure would expand and improve management of urban and community forests through planting and maintaining trees, developing green spaces, and implementing sustainable urban forestry practices. Utilizing its track record under its Urban and Community Forest Program, CALFIRE could be the lead agency for this measure, continuing to collaborate with cities, counties, air districts, and non-profit organizations to execute projects. Alternatively, local governments with the appropriate authority, and with eligibility to pursue CPRG funding, could implement this measure.

This measure could contribute substantial GHG reductions and other benefits, as evidenced by CALFIRE's Urban and Community Forest Program. As of May 31, 2023, the program, through its 115 projects, resulted in an estimated 0.48 MMTCO_{2e} of GHG reductions. The average cost of these reductions is calculated at \$156 per MTCO_{2e}, reflecting the program's investment in sustainable urban environmental management.

This measure would be structured to prioritize disadvantaged communities, and along with climate and air quality considerations planting and supporting trees and tree shade in these communities also provide definitive improvements in quality of life. For example, in its 2021/2022 solicitation, 96% of the funds implemented under CALFIRE's Urban and Community Forest Program benefited low-income and disadvantaged communities, well aligned with Justice40 goals, and helping meaningfully address the disproportionate impact of climate change and urban heat islands on these communities.

This measure would continue to help mitigate urban heat, enhance groundwater infiltration, and improve overall urban air and water quality. It would also provide health benefits by reducing stress levels and encouraging physical activity, as well as boost local economies by creating urban forestry jobs, reducing energy costs through strategic shading, and protecting properties from flood damage.

The Urban and Community Forest Program operates under the authority of the California Urban Forestry Act of 1978 (Public Resources Code 4799.06-4799.12). This legal framework, alongside State directives, aligns this measure with California's broader goals for urban environmental improvement and community resilience.

Natural and Working Lands Measure 3: Expand the State's Wetland Restoration Program

This measure would further the achievement of the existing Wetland Restoration Program, a joint initiative of the Sacramento-San Joaquin Delta Conservancy (Delta Conservancy) and the California Department of Fish and Wildlife (CDFW). This measure could support a variety of wetland restoration projects, including re-wetting peat soils to reduce carbon emissions, restoring mountain meadows for carbon sequestration, and enhancing wetland biodiversity. This measure would focus on the Delta region, which includes over 150,000 acres of highly organic peat soils that are significantly subsided to depths of 20 to 30 feet below sea level, resulting in over 1.5 million tons of carbon dioxide emissions annually. Re-wetting the peat soil stops subsidence and resulting GHGs. The Delta Conservancy and CDFW would oversee the measure, with implementation by non-profits, public agencies, and Tribal Nations, with an emphasis on projects that benefit disadvantaged communities and further environmental justice.

This measure would leverage proven program success. For example, operating since 2010, the Delta Conservancy has made over \$130 million available for over 145 locally supported ecosystem restoration, climate resilience, drought response and economic development projects, all while reducing GHGs. The re-wetting of peat soils in the Delta region alone could prevent emissions of over 1.5 million tons of CO₂ annually, at a cost of roughly \$39 per MTCO₂e, a cost-effective way to reduce GHGs and deliver on State and federal climate commitments. Despite this strong track record, and support from State funding sources, the benefits of this measure are limited without additional funding from flexible sources such as CPRG.

Consistent with existing practices, this measure would set aside funding for projects that benefit low-income and disadvantaged communities, particularly those facing floods and other disproportionate climate change-related risks. This measure would also meaningfully engage those that have been historically underrepresented, as well as those that have a cultural interest in the project site, such as Tribes with ties to ancestral lands.

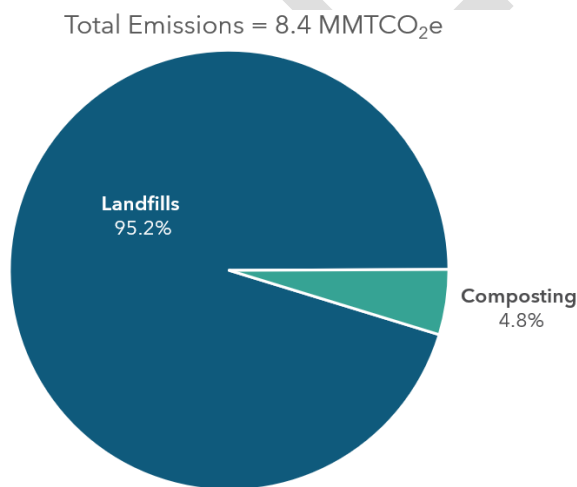
Restored wetlands also provide crucial habitats for wildlife, support local economies through sustainable recreation and tourism, and act as natural buffers against sea-level rise and flooding from extreme weather events. These ecosystems also play a key role in water purification and supply, contributing to the overall health and resilience of California's natural landscapes.

The program is underpinned by the Delta Reform Act of 2009 and subsequent legislation, which mandates the restoration and conservation of wetland ecosystems. The collaborative efforts of the Delta Conservancy and CDFW, guided by these legal frameworks, ensure the effective implementation of the program and this measure, and align with the State's broader environmental and climate resilience strategies.

Waste

Municipal solid waste (MSW) landfills are the second largest source of methane emissions in California, as seen in Figure 10 below. Because about a third of California's waste stream is made up of organic waste, it is critical that we focus on both diverting organic waste and improving landfill operations to tackle waste sector emissions from multiple angles. Due to the multidecadal time frame required to break down landfilled organic material, the emissions reductions from diverting organic material in one year are realized over the course of several decades. Combined with the fact that methane is a powerful GHG and short-lived climate pollutant, near-term action is crucial to avoid locking in future landfill methane emissions. CPRG would allow California to expand and accelerate near-term efforts that will significantly reduce emissions for decades to come while also providing immediate benefits to climate change and public health.

Figure 10: Waste Sector Emissions in 2021



Although approximately 95 percent of all the waste that has been disposed of in the state has been deposited in a landfill that is equipped with a gas collection and control system, as required by California's Landfill Methane Regulation,⁷⁷ a portion of the methane still escapes into the atmosphere. Technologies to utilize landfill gas efficiently can contribute further emission reductions in the energy sector.

To address organic waste diversion, our SLCP Reduction Strategy⁷⁸ lays out how California will achieve its SB 1383 targets to reduce organic waste disposal 75 percent from 2014 levels by 2025 and recover at least 20 percent of edible food for human consumption.⁷⁹ We will utilize strategies such as expanding markets for products made from organic waste,

⁷⁷ CARB. Landfill Methane Regulation. <https://ww2.arb.ca.gov/our-work/programs/landfill-methane-regulation>.

⁷⁸ <https://ww2.arb.ca.gov/resources/documents/slcp-strategy-final>

⁷⁹ SB 1383. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB1383.

recovering edible food to combat food insecurity, investing in organics recycling infrastructure, and more. Additional legislation and targets⁸⁰ passed over the last few years have reinforced California's commitment to protecting the climate by making critical advances the waste sector.

CPRG funding would have a substantial positive impact by allowing California to scale up successful programs such as our Organics Recycling Infrastructure Grants program and our Food Waste Prevention and Edible Food Recovery program. These programs were selected to include in our PCAP because they have immediate GHG reduction potential, provide jobs, protect the environment, and put organic waste back to work *growing food* and building healthy soil. Furthermore, these programs directly align with the federal strategies discussed in EPA's Strategies for Methane Mitigation,⁸¹ as well as EPA's Draft National Strategy for Reducing Food Loss and Waste and Recycling Organics.⁸² Additional detail on these programs is discussed below.

Waste Measure 1: Food Waste Prevention and Edible Food Recovery Program

This measure would leverage CalRecycle's existing grant programs,⁸³ and build a new program to holistically prevent food waste, reduce food waste in landfills, and recover edible food for human consumption. CalRecycle could administer this measure statewide, in collaboration with local governments and in partnership with hunger relief organizations. This measure could also be implemented directly by local governments with the appropriate authority and with eligibility to apply for CPRG funds.

The measure would operate in two primary areas. First, funds would support food waste tracking software, preservation equipment, and training, to reduce food loss throughout

⁸⁰ SB 1440. Implement biomethane procurement targets for investor-owned utilities to reduce GHG emissions in remaining pipeline gas and reduce methane emissions from organic waste.

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB1440

AB 1826. Requires businesses to recycle their organic waste, depending on the amount of waste they generate per week.

http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB1826&search_keywords

AB 1594. Eliminates incentives to use green materials as alternative daily cover by ensuring it counts as disposal.

http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB1594&search_keywords=

Target: The CPUC approved a decision in February 2022 implementing the biomethane procurement program, which will require investor-owned utilities by 2025 to procure 17.6 billion cubic feet (BCF) of biomethane produced from organic wastes to support the landfill disposal reduction and SLCP target and reduce fossil gas reliance for residential and commercial customers. Additionally, the organic waste stream includes more than one million tons of edible food that could be recovered before it enters the waste stream through food rescue programs that combat hunger in communities throughout California. <https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-sets-biomethane-targets-for-utilities#:~:text=The%20short%2Dterm%202025%20biomethane,waste%20diverted%20annually%20from%20landfills.>

⁸¹ https://www.epa.gov/system/files/documents/2022-01/organic_waste_management_january2022.pdf

⁸² <https://www.epa.gov/circulareconomy/draft-national-strategy-reducing-food-loss-and-waste-and-recycling-organics#feedback>

⁸³ The Food Waste Prevention and Rescue Grant Program: <https://calrecycle.ca.gov/climate/grantsloans/foodwaste/fy201920/> and the Edible Food Recovery Grant Program: <https://calrecycle.ca.gov/climate/grantsloans/foodwaste/fy202123/>

supply chains.⁸⁴ Second, this measure would aim to recover at least 20% of currently disposed edible food by 2025, using additional staffing for volunteer coordination and donor recruitment, transportation, refrigeration and food storage, and distribution systems to recover excess edible food. This measure aligns with California's Short Lived Climate Pollutant law (SB1383) and emphasizes reducing the environmental impact of food waste while addressing food insecurity, and alleviating burdens to organics processing facilities to manage additional food waste.

According to CalRecycle's 2021 Waste Characterization Study,⁸⁵ 4.3 million tons of food is sent to landfill annually in California, including 1.5 million tons of potentially donatable food. The more than 290 million pounds of edible food that has been recovered for human consumption as a result of CalRecycle funding is equivalent to a reduction of 0.27 MMTC02e.

In addition, this measure would directly benefit low-income and disadvantaged communities by providing nutritious food at little to no cost to food insecure populations statewide. More extensive food recovery networks would help ensure that food recovery resources are available to communities in need while also keeping excess edible food where it is generated, rather than being removed from local communities due to lack of food recovery or distribution infrastructure.

The authority to implement this program is established under California's SB1383 and other related statutes, which mandate the reduction of organic waste and support the recovery of edible food. CalRecycle, with its history of managing similar programs and expertise, is well-equipped to implement these actions, and local governments are also experienced deploying funds for these purposes.

Waste Measure 2: Bolster Organics Recycling Infrastructure

This measure would enhance organics recycling infrastructure to divert more green materials, food materials, or alternative daily cover from landfills, thereby reducing methane emissions and improving air and water quality. This measure would support composting, co-digestion, and anaerobic digestion projects, along with emerging, non-combustion biomass conversion technologies. This measure could be administered by CalRecycle or by local governments also eligible to apply for CPRG funds.

According to the SB 1383 Infrastructure and Market Analysis study, full implementation of SB 1383 and the Short-Lived Climate Pollutant Reduction Strategy requires diverting an additional 12 to 14 million tons of organic waste from landfills to avoid methane emissions.

⁸⁴ Notable initiatives like the Pacific Coast Food Waste Commitment, which features some of the nation's largest food businesses working collaboratively with local, state, and provincial governments to implement industry-wide actions that prevent wasted food along the West Coast, highlight powerful public-private partnerships targeting food waste reduction.

⁸⁵ <https://calrecycle.ca.gov/wcs/dbstudy/>

CalRecycle's analysis in 2020 anticipates an organic recycling capacity shortfall of about eight million tons by 2025, highlighting the urgency of investing in organics recycling infrastructure. And despite significant contributions from the State, this funding has been insufficient to meet the rising demand. For example, in the 2023 grant cycle, although CalRecycle awarded over \$130 million to 23 projects, ten eligible projects were waitlisted due to lack of funds. CPRG funding could bring these projects to fruition and could attract substantial matching private investments in the process.

The GHG impacts of this measure depend on total funding received. For example, the 2023 cycle of CalRecycle's Organics Grant Program is expected to divert 7.7 million tons of green and food material from landfills, which has the capacity to cut 2 million MTCO₂e in emissions over the next decade.

This measure could benefit low-income and disadvantaged communities by creating local jobs and targeting hiring in these communities. Projects will also offer green material diversion for communities, compost availability, and reductions in odor and air pollutants. In addition, this measure could provide renewable energy and fuel from organic waste, reducing dependence on fossil fuels. The use of produced compost could also support carbon sequestration across the State.

The authority for this measure stems from SB 1383 and AB 1826, which mandate organic waste diversion and recycling in California. CalRecycle's expertise and track record in managing similar programs since 2001 demonstrate its capability to successfully implement these actions. Public Resource Code 42999 authorizes CalRecycle to administer a grant program to provide financial assistance to promote in-state development of infrastructure to reduce organic waste or process organic and other recyclable materials into new, value-added products.

In addition, AB 1826 (Chesbro, Chapter 727, Statutes of 2014), requires businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses. Lastly, AB 939 (Sher, Chapter 1095, Statutes of 1989), requires every California city and county to divert 50 percent of its waste from landfills by the year 2000.

4. Conclusion and Next Steps

The State's Priority Climate Action Plan outlines urgently needed climate investments across the economy and to benefit our most vulnerable communities. By pinpointing near term climate implementation priorities and giving these the option to compete for federal implementation funding, this plan puts the State on stronger footing to achieve its science-based carbon neutrality target and will help the U.S. meet its commitments under the Paris Agreement. It will also help meet the nation's Justice40 initiative goals by providing a broad

range of benefits to California's low-income and disadvantaged communities that have historically had to shoulder the negative impacts of fossil fuel powered transportation and industry. Importantly, California's statutory, regulatory, and policy framework supports a broad authority to take decisive and quick action to utilize any federal funding received by the State.

California's next deliverable under the CPRG Program, the Comprehensive Climate Action Plan, will build off the processes and ideas that underpin the PCAP, expanding on its stakeholder engagement and the scope of climate actions included. This holistic approach will be the State's next step under CPRG to address the global climate crisis.

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