

INVEST CLEAN Workplan

Section 1: Overall Project Summary and Approach

Introduction

The South Coast Air Quality Management District (South Coast AQMD) is leading **Infrastructure, Vehicles, and Equipment Strategy** for **Climate, Equity, Air Quality, and National Competitiveness** (INVEST CLEAN or Project) to implement zero-emission (ZE) transportation measures related to goods movement from the Priority Climate Action Plans (PCAPs) for the Los Angeles – Long Beach – Anaheim and Riverside – San Bernardino – Ontario Metropolitan Statistical Areas (MSA), and the state of California. The PCAPs prioritize goods movement due to the substantial greenhouse gas (GHG) reductions, co-benefits for criteria and hazardous air pollutants, impacts on low-income disadvantaged communities (LIDAC), and the opportunity to drive economic growth including job creation.

The two MSAs represent nearly 18 million residents who are impacted by drought, extreme heat, year-round wildfires, and floods and are home to over two-thirds of California's LIDAC communities who are disproportionately impacted by environmental and social inequalities. The Fifth National Climate Assessment highlights the fact that climate change exacerbates existing environmental, air quality, social, and economic inequities in LIDACs.⁴ Further, the majority of the MSAs' population are living in areas classified under the Clean Air Act as extreme non-attainment for ozone and serious non-attainment for PM2.5.⁵ Climate impacts and air pollution significantly degrade the quality of life for our residents, increasing risks of mortality, acute and chronic illnesses, lost wages and school days, and other long-term environmental and economic consequences. Additionally, unemployment in the two MSAs is at 5.5 percent, ranking the highest in the nation.⁶

On-road transportation and non-road equipment comprise over 50 percent of GHG emissions for both MSAs, with goods movement as a subset, including ports, airports, cargo-handling facilities, warehouses, railyards, and others. The State PCAP developed by the California Air Resources Board (CARB) indicates that the transportation sector is the largest source of GHG emissions when including fossil fuels processing. Goods movement-related mobile sources in the transportation sector accounted for 38 percent of the entire state's GHG emissions in 2021.⁷ Mobile sources related to goods movement also contribute to more than 80 percent of the NOx and 30 percent of particulate matter in the South Coast Air Basin where the majority of the MSAs population are located.⁸

South Coast AQMD's primary regulatory authority is over stationary sources of air pollution with limited jurisdiction over mobile sources.⁹ The Clean Air Act requires local air agencies, such as South Coast AQMD, to implement all feasible measures to reduce criteria pollution which includes conducting research, development, demonstration, and incentivizing the adoption of cleaner technologies which often has co-benefits for GHGs. During the last ten years, South Coast AQMD provided over \$1.3 billion dollars and upgraded over 9,000 pieces of heavy duty on-road, non-road equipment, and locomotives through

⁴ Fifth National Climate Assessment, <https://nca2014.globalchange.gov/report>

⁵ U.S. Environmental Protection Agency, Green Book, <https://www3.epa.gov/airquality/greenbook/ancil3.html>

⁶ U.S. Bureau of Labor Statistics, Unemployment Rates for Large Metropolitan Areas, Not Seasonally Adjusted, <https://www.bls.gov/web/metro/laurgm.htm>

⁷ CARB - California Greenhouse Gas Emissions from 2000 to 2021: Trends of Emissions and Other Indicators. [California Greenhouse Gas Emissions from 2000 to 2021: Trends of Emissions and Other Indicators](https://www.carb.ca.gov/Climate-Action/Pages/Greenhouse-Gas-Emissions-2000-2021.aspx)

⁸ 2022 Air Quality Management Plan, South Coast Air Quality Management District, <https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16>

⁹ California Health and Safety Code Sections 40400 et seq, <https://law.justia.com/codes/california/2022/code-hsc/division-26/part-3/chapter-5-5/article-1/section-40400/>

incentive programs.¹⁰ South Coast AQMD has the capability, ability, experience, and systems to rapidly implement the proposed Project. South Coast AQMD has also worked closely with various original equipment manufacturers (OEMs) to develop ZE vehicles and equipment, and deployed numerous cutting-edge projects such as Volvo Low Impact Green Heavy-Transport Solutions (LIGHTS) and Joint Electric Truck Scaling Initiative (JETSII) projects which involved the first of its kind deployment of 150 battery electric ZE vehicles with requisite infrastructure.^{11, 12} South Coast AQMD is also partnering with two major U.S. locomotive OEMs to develop ZE locomotive technologies.^{13, 14} In addition, South Coast AQMD works with logistic real estate companies and charging network developers to establish ZE infrastructure. Overall, INVEST CLEAN's proposed investment in ZE infrastructure, vehicles, and equipment will create an estimated 470 high-road jobs in California while supporting and creating approximately 4,700 high-road jobs nationwide due to OEM manufacturing and the involvement of related suppliers. Figure 1 illustrates the extent of job creation throughout the nation. As the infrastructure is fully utilized over time, an estimated 43,500 additional high-quality jobs will be created and sustained through manufacturing, electrical installations, and maintenance. Coupled with the Project's proposed workforce training partnership with the National Electrical Contractors Association (NECA) and International Brotherhood of Electrical Workers (IBEW), there will be significant potential for job creation and development of the workforce needed to implement, maintain, and sustain the ZE transformation of the Southern California Goods Movement Corridor. The workforce training element will prepare workers to support the Southern California Goods Movement Corridor and also prepare the national workforce for the transition to ZE good movement.

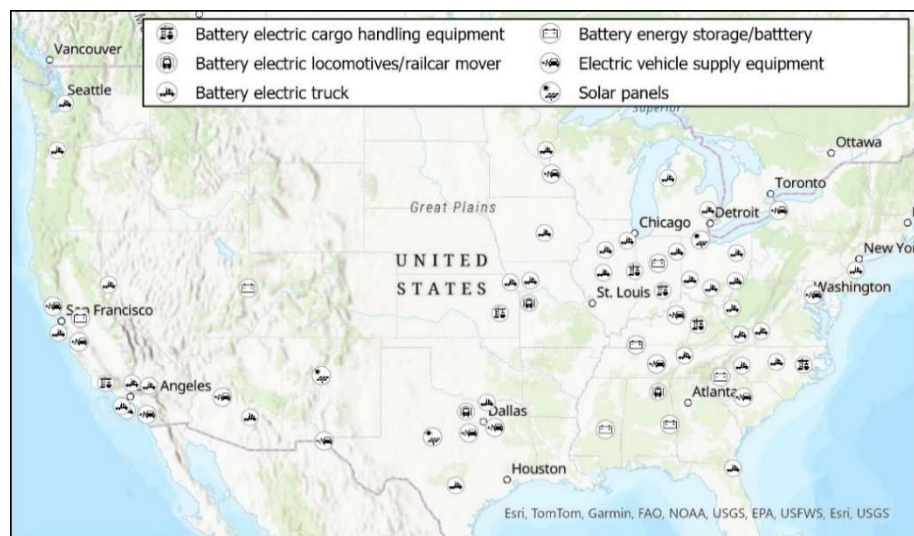


Figure 1: Manufacturing Locations for BE Trucks, CHE, Locomotives, and Charger

INVEST CLEAN is a transformational initiative aimed at overcoming barriers to transitioning the Southern California goods movement corridor to ZE technologies to reduce GHG emissions, criteria and hazardous air pollutants. Eliminating emissions from the goods movement sector requires the dedication of all levels of government and the commitment of industry to establish a comprehensive, long-term strategic plan for achieving carbon neutrality. INVEST CLEAN will accelerate the adoption of heavy-duty ZE technologies due to the concentration and scale of freight movement in combination with the cooperation of our local, State, and other government representation, as well as industry, labor, academia, community-based organizations, and others. (See files: Letters of Commitment and Support).

¹⁰ South Coast AQMD Incentives & Programs, <https://www.aqmd.gov/home/programs>

¹¹ Volvo LIGHTS: Low Impact Green Heavy Transport Solution, <https://www.lightsproject.com/>

¹² JETSII: The Joint Electric Truck Scaling Initiative, <https://www.jetsiiprject.com/>

¹³ South Coast AQMD Governing Board Letter, December 3, 2021, <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2021/2021-dec3-004.pdf?sfvrsn=4>

¹⁴ South Coast AQMD Governing Board Letter, December 1, 2023, <https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2023/2023-dec1-006.pdf?sfvrsn=2>

INVEST CLEAN will increase community benefits through a robust workforce training program in partnership with labor and educational institutions. Further, INVEST CLEAN will integrate community inputs and benefits into the proposed measures and create an innovative program to help mitigate the impacts of goods movement on our most vulnerable residents while significantly reducing GHG emissions.

1a. Description of GHG Reduction Measures

INVEST CLEAN implements and builds on the PCAP transportation measures to strategically address issues that are limiting factors for the successful ZE transformation of the Southern California goods movement corridor. These measures also have been developed to maximize GHG emission reductions as well as reductions in criteria and hazardous air pollutants. These co-benefits will further progress for Southern California to meet National Ambient Air Quality Standards and reduce public health impacts. The Project supports and reinforces the ZE transformation through a workforce development and training program that supports the proposed GHG reduction measures and is described below in “Section 5. Job Quality.” Outreach is integrated into the Project by creating a Community Benefits Plan with community-based organizations to educate residents, focusing on LIDACs. Additional jobs will be created as a result of battery storage and solar panels installed to support charging infrastructure projects.

South Coast AQMD developed INVEST CLEAN by drawing from more than 25 years of experience in implementing incentive programs and managing technology development and demonstration projects, coupled with a comprehensive understanding of public-private partnerships and of challenges and urgent need to deploy ZE technologies to reduce GHGs and air pollutions. Over the past few decades, South Coast AQMD has successfully implemented truck, locomotive, and equipment upgrade incentive programs such as Proposition 1B-Goods Movement Emission Reductions, Carl Moyer, and Volkswagen (VW) Settlement Programs, as well as other incentive programs funded by State GHG reduction funds. These programs have resulted in the reduction of 61,040 tons of NO_x and 1,230 tons of PM, as well as substantial amount of GHG emissions in the past 10 years. Notably, many of these commercially available clean technologies, including battery electric heavy-duty trucks and CHE, are the outcomes of the pilot and demonstration projects led by South Coast AQMD’s Technology Advancement Office.

Below is a list of INVEST CLEAN’s four (4) GHG reduction measures, outlining key features:

Measure 1 - Charging Infrastructure Deployment Incentive Program

Incentives to install electrical charging equipment to support the Southern California goods movement corridor for battery electric vehicles. Electrical infrastructure is the limiting factor for the successful deployment of battery electric heavy-duty vehicles to support efficient and secure freight movement in the two MSAs. A scoring system will be developed to prioritize disadvantaged communities, community considerations, small fleets, shovel-ready sites, and public charging or shared charging projects.

Measure 2 - Battery Electric Freight Vehicle Deployment Incentive Program

Incentives to decarbonize freight operations by replacing or converting heavy-duty long haul diesel trucks (Class 8) and last-mile delivery vehicles (primarily Classes 4 and 5) with a CARB-certified battery electric technology. South Coast AQMD will partner with the Southern California Association of Governments (SCAG) and build on their existing Last Mile Freight Program.¹⁵ The implementation of this measure will align with the State’s Advanced Clean Fleet, Advanced Clean Trucks regulations and EPA’s Green House Gas Standard for Heavy-Duty Vehicles-Phase 3, facilitating the gradual adoption of ZE vehicles and mandating exclusive ZE manufacturing starting in 2036.^{16, 17, 18} Charging infrastructure from Measure 1 supports this effort.

¹⁵ Southern California Association of Governments, Last Mile Freight Program, <https://scag.ca.gov/last-mile-freight-program>

¹⁶ CARB, Advanced Clean Fleets, <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets>

¹⁷ CARB, Advanced Clean Trucks, <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks>

¹⁸ U.S. EPA, Final Rule: Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3, <https://www.epa.gov/regulations-emissions-vehicles-and-engines/proposed-rule-greenhouse-gas-emissions-standards-heavy>

Measure 3 - Battery Electric Cargo Handling Equipment (CHE) Deployment Incentive Program

Incentivizes deployment of battery electric CHE to introduce advanced technologies to the market and drive adoption. This measure will help reduce emissions associated with goods movement by replacing or converting diesel-powered CHE used at facilities such as warehouses, intermodal railyards, airports, ports, or freight facility centers. CHE encompasses a wide variety of equipment including, but not limited to, rubber-tired gantry (RTG) cranes, yard trucks, forklifts, side handlers, top picks and reach stackers. Retiring existing CHE is pivotal to a strong emission reduction strategy because existing equipment is predominantly diesel and highly polluting. This measure is critical to help support the commercialization of more types of CHE to meet operational needs, especially duty cycles. Infrastructure will be paired with equipment to support successful deployment.

Measure 4 - Battery Electric Locomotive Pilot Program

Replace diesel switcher locomotives domiciled in the MSAs region with battery electric technology. Upgrading locomotives to ZE technology requires significant capital investment. Incentive funding will encourage the development and deployment of ZE switcher locomotive technologies and improve market penetration. Under normal conditions, locomotives have long service lives, so encouraging the transition of diesel locomotives to ZE technologies will provide substantial long-term reductions in GHG emissions. Additionally, thousands of gallons of diesel fuel can be saved annually when battery electric switcher locomotives are deployed. Infrastructure will be paired with equipment to support successful deployment.

The funding allocation for the four measures, including the incentive funding and associated cost for workforce training, community engagement, and data collection, and anticipated emission reductions for GHG and co-pollutants is summarized in Table 1 below.

Table 1: Overview of Proposed Measures Costs and Climate Benefits

CPRG Measures	Incentives		Budget**	Emission Reductions				
				GHG (MT CO2e)		NOx (ton/yr)	PM2.5 (ton/yr)	DPM (ton/yr)
				2025-2030	2025-2050	2030		
M1: Charging Infrastructure Deployment	700	\$/kW	\$189,412,885	3,427,178	11,153,463	1,289	18	19
M2: BE Freight Vehicle Deployment	400,000	\$/truck(class8)	\$85,396,000	67,391	172,369	16.7	0.2	0.2
	67,000	\$/truck(class4/5)*						
M3: BE CHE Deployment	300,000	\$/yard tractor*	\$25,528,435	61,230	143,567	24.1	1.2	1.1
	400,000	\$/top handler*						
M4: BE Locomotive Pilot	10,600,000	\$/locomotive*	\$199,660,095	42,476	300,146	285	9	10
Total			\$499,997,415	3,598,274	11,769,545	1,615	28	30

BE: battery electric

* Incentive includes both vehicles/equipment and chargers.

** Budget includes incentive funding and associated cost for workforce training, community engagement, and data collection. Details are provided in the Budget Narrative.

Tasks, Milestones, and Risks

South Coast AQMD has many decades of experience implementing incentive programs similar to the proposed Project. South Coast AQMD has a division dedicated to technology advancement, focusing on technology incentive and demonstration projects. The division includes highly skilled teams with extensive experience in handling high volumes of applications and projects and meeting grant deadlines, while achieving emission reduction goals.

If the proposed Project is awarded, a solicitation will be developed and brought through South Coast AQMD's standard procurement process to allow for public review and input which includes a policy

committee and full Governing Board consideration. The solicitation will be developed to attract the most cost-effective, ready to deploy, and/or shovel-ready projects.

After public comment is addressed and the Governing Board approves the solicitation, it will be released in multiple languages for a specified amount of time to allow interested applicants to respond. During this time, South Coast AQMD will work with our local government partners, industry, Chambers of Commerce, community-based organizations, and others to conduct outreach on the open solicitation. Received projects will be evaluated based on a scoring criterion established for each measure. On a per equipment basis, the measures will prioritize projects with the largest GHG reduction potential. The measures were also designed to support equity, workforce training, and the transition to ZE with authentic community engagement and benefits.

The solicitation process will be managed through South Coast AQMD's state-of-the-art Grant Management System (GMS) for efficient application submittal, evaluation, and project approval, and a procedure established to implement projects of types and scale. South Coast AQMD also has an OnBase system to handle contracting and invoicing which provides several layers of review for accuracy and oversight, and communication, and ensures project information is securely stored with redundant backups in place. Additionally, South Coast AQMD closely monitors each project progression and takes necessary steps to ensure the project implementation meets the program requirements, including emission reductions.

Milestones will be used to assess the progress of the overall INVEST CLEAN project as well as the individual projects awarded under each GHG reduction measure. Based on our experience, South Coast AQMD will implement the program using a phased approach. The National Renewable Energy Laboratory (NREL) has committed to partner with the South Coast AQMD to assess and provide third party oversight to validate the program's emission reduction performance. A standardized process will be created to collect data to evaluate the program's efficiency. Through NREL's scientific and consistent assessment of projects, we plan to improve and enhance the guidelines to expedite project solicitation. Additionally, we plan to modify the program as necessary to encourage participation, prioritize geographic diversity especially within disadvantaged communities, and mitigate any delays in achieving emission reductions. These program adjustments are also expected to lessen the possibility of projects dropping out of the program. Any funds becoming available due to a project falling through will quickly be awarded to projects in subsequent solicitations or from previous solicitation backup lists.

More details and the implementation timeline are further explained in Section 3c. Authorities, Implementation Timeline, and Milestones.

During the evaluation process of the GHG reduction measure projects, there will be criteria to demonstrate an applicant's ability to successfully implement a grant with strong results. If a grantee were to withdraw for any reason, South Coast AQMD will draw from a back-up list of eligible projects. South Coast AQMD incentive programs are often oversubscribed, and backup lists of eligible projects are maintained to allow for flexibility to reallocate funds to other projects which mitigates any delays and maintains the level of committed emission reductions. Further, South Coast AQMD's close partnership with major OEMs for infrastructure equipment, vehicles, CHE, and locomotives enables South Coast AQMD to keep up with the market forecast and lead time to assist with project deployments. South Coast AQMD also meets with utility companies regularly to discuss current and upcoming projects to prevent delays.

South Coast AQMD has observed that the OEM manufacturers can deliver battery electric trucks and equipment with minimal delay and anticipates that this trend will continue over the next few years. In fact, many OEM manufacturers have expressed readiness and capability to produce more ZE vehicles though the vehicles currently remain parked due to insufficient charging infrastructure. The lack of charging infrastructure to support medium- and heavy-duty vehicles and equipment has become the most important limiting factor that is delaying and preventing the deployment of these technologies. INVEST CLEAN was designed to address the limiting factors for ZE vehicle and equipment deployment at scale from issues such as lack of charging infrastructure, education on the new technologies, and developing the needed workforce.

For Class 8 heavy-duty trucks, program implementation efficiency will be evaluated on a regular basis and if the results show excessive delays on deployment, strategies will be explored to either address the impacting factors and/or funds could be shifted to last mile freight projects since there are a wide range of vehicles and more charging infrastructure to support these vehicle classes. Expediting the implementation of Measure 1 could mitigate the risk of lack of infrastructure.

ZE locomotive technology deployment is challenging due to the high-power demand, range, battery energy density, operation in the harsh environment, and cost. The production of battery electric locomotives will take 30-36 months; still a larger scale deployment could occur in late 2027 due to the pressing need for cleaner technologies. All levels of government are focused on advancing locomotive technology to achieve substantial emission reductions, health benefits, and public safety. Implementing Measure 4 for battery electric locomotives will enable the accumulation of significant experience in reliable operation, facilitating the resolution of technical challenges, cost reduction, and ensuring a longer operational life for the locomotives. Major locomotive manufacturers and operators in the MSA region are committed to supporting this Measure and explore the charging standard for switcher locomotives.

In summary, South Coast AQMD has the tools, partnerships, staff, ability, and experience needed to overcome any challenges we may encounter.

EPA Strategic Plan Alignment

All measures align with the EPA's FY 2022-2026 EPA strategic plan objective 1.1 by incentivizing the heavy-duty vehicles and equipment involved in the goods movement activities to transition to ZE technology to reduce GHG emissions. [1] These measures also support EPA Strategic Plan objectives 2.1, 2.2, and 4.1 by implementing programs through meaning feedback and comment that will provide capacity building resources to LIDACs and reducing disparities in environmental and public health conditions, responding to environmental justice concerns, working in ways that are community driven, coordinated and collaborative, supporting equitable and resilient community development, and addressing disproportionate impacts, as well as improving air quality and reducing fine particle pollution in counties not meeting the current National Ambient Air Quality Standards. Further, for 2.2 South Coast AQMD provides region-specific language assistance and disability access.

PCAP alignment

INVEST CLEAN implements GHG reduction measures from three PCAPs including the Los Angeles – Long Beach – Anaheim and Riverside – San Bernardino – Ontario MSAs, as well as the state of California. Table 2 shows the relevant GHG reduction measures from the PCAPs.

Table 2: Relevant GHG Reduction Measures from the PCAPs

MSA PCAP	INVEST CLEAN Measures	Measures
State of California	MI, M2, M3, M4	(1) Create a Holistic, Heavy-Duty ZE Vehicle Buydown Program (2) Install Truck Charging to Support ZE Goods Movement at California Ports and Warehouse Districts (3) Advance the Deployment of Clean Non-Road Equipment (4) Bolster Investments in the State's Sustainable Port and Freight Infrastructure (6) Allow for Local Deployment of ZEV Infrastructure and Low-Income ZEV Support.
Los Angeles-Long Beach-Anaheim	MI, M2, M3, M4	(T1) Decarbonize goods movement (T3) Transition Medium- and Heavy-Duty vehicles to ZEVs
Riverside-San Bernardino-Ontario	MI, M2, M3, M4	Goods Movement Decarbonization

Measure 1 will equip the region with charging infrastructure in alignment with the local and State PCAPs to support widespread adoption of ZE heavy-duty vehicles. Measures 2, 3, and 4 implement local and State PCAPs relating to creation of a buydown program, bolstering sustainable port and freight infrastructure, and decarbonizing goods movement. Specifically, Measure 2 will support long haul trucks

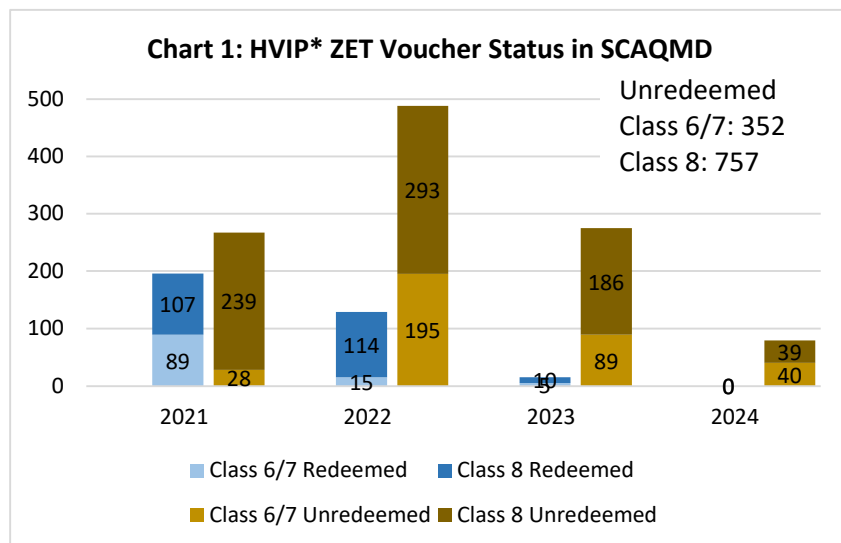
and last-mile freight vehicles and strategies. Measure 3 will decarbonize CHE operated at the major goods movement hubs at the ports, railway yards, airports, and distribution warehouses which are often directly adjacent to or integrated in LIDACs. Measure 4 will help reduce emissions from rail by driving the adoption of ZE switcher locomotives which are difficult to abate due to long life cycles and cost.

The local and State PCAPs prioritize goods movement because the combined MSA region represents the busiest goods movement corridor in the nation with the San Pedro Bay Ports processing approximately 30 percent of U.S. containerized freight which is transported and processed by the Inland Empire Logistics corridor through a network of highways, railways, intermodal facilities, warehouses, and other facilities. The National Zero-Emission Freight Strategy prioritizes a significant portion of the hubs and corridors within the MSAs region for Phase 1 and 2. Further, the National Highway Freight Network includes several priority routes such as the I5, I10, I15, I110, I-215, I605, I710, Rt. 47, and SR 60.²⁰ According to the Vehicle Inventory and Use Survey (VIUS) data tables from 2021, medium- and heavy-trucks based in California account for roughly 10 percent of the national total, which is the highest percentage of trucks in the nation.²¹ While no data readily available for the two MSA region, the 2021 Emission FACTor (EMFAC) database indicates that medium- and heavy- trucks based in the South Coast Air Basin account for roughly 38 percent of the total trucks in California.²² The State of California PCAP identified that medium- and heavy-duty trucks contribute disproportionately to GHG emissions. Though medium- and heavy-duty trucks account for roughly 3 percent of all vehicles, they contribute to one fourth of mobile source GHG emissions.²³

1b. Demonstration of Funding Need

ZE Infrastructure Readiness

California will need 109,000 lower-speed and 5,500 higher-speed chargers to support 155,000 medium- and heavy-duty plug-in electric vehicles by 2030.²⁴ Additionally, within the next five years, a minimum of 16,000 DC fast chargers supporting medium- and heavy duty will need to be installed. Currently, a few projects that have received Hybrid and ZE Truck and Bus Voucher Incentive Program (HVIP) vouchers will result in the deployment of approximately 3,000 chargers across all of California. The majority of these chargers only serve private fleets and are not accessible to the public. A charging facility located in Long Beach is the only known publicly accessible battery electric truck charger, allowing up to 26 trucks being charged simultaneously. Given the number of chargers needed by 2030 in the



*HVIP: Hybrid and ZE Truck and Bus Voucher Incentive Project

²⁰ National Highway Freight Network, National Highway Network Map and Tables for California, https://ops.fhwa.dot.gov/Freight/infrastructure/ismt/state_maps/states/california.htm

²¹ United States Census Bureau. Vehicle Inventory and Use Survey (VIUS) Data Tables. <https://www.census.gov/programs-surveys/vius/data/tables.html>

²² CARB, EMFAC 2021. <https://ww2.arb.ca.gov/our-work/programs/msei/on-road-emfac>

²³ CARB, Truck Loan Assistance. <https://ww2.arb.ca.gov/resources/fact-sheets/truck-loan-assistance>

²⁴ CEC, California AB 2127 Report, <https://www.energy.ca.gov/data-reports/reports/electric-vehicle-charging-infrastructure-assessment-ab-2127>

MSAs region, at least 23,000 chargers will need to be installed annually to meet the needed transition to battery electric technologies.

As of March 2024, over 1,100 incentive vouchers (specifically, 352 medium-duty and 757 heavy-duty) for battery electric trucks in the South Coast AQMD area alone were not redeemed, mainly due to the lack of charging infrastructure (see Chart 1).²⁵

The availability of heavy-duty vehicle charging infrastructure in the two MSA region is not sufficient to serve the vehicles and equipment anticipated to be delivered in the near future. To address this need, South Coast AQMD initiated an infrastructure-only solicitation in December 2023.²⁶ The solicitation received applications for 80 projects. Furthermore, after the solicitation's closure, additional infrastructure projects were proposed to South Coast AQMD creating a substantial funding gap of approximately \$300 million. These potential projects are shown on Figure 2 below, as also provided in the attached file (Attachment: Potential projects_SCAQMD).

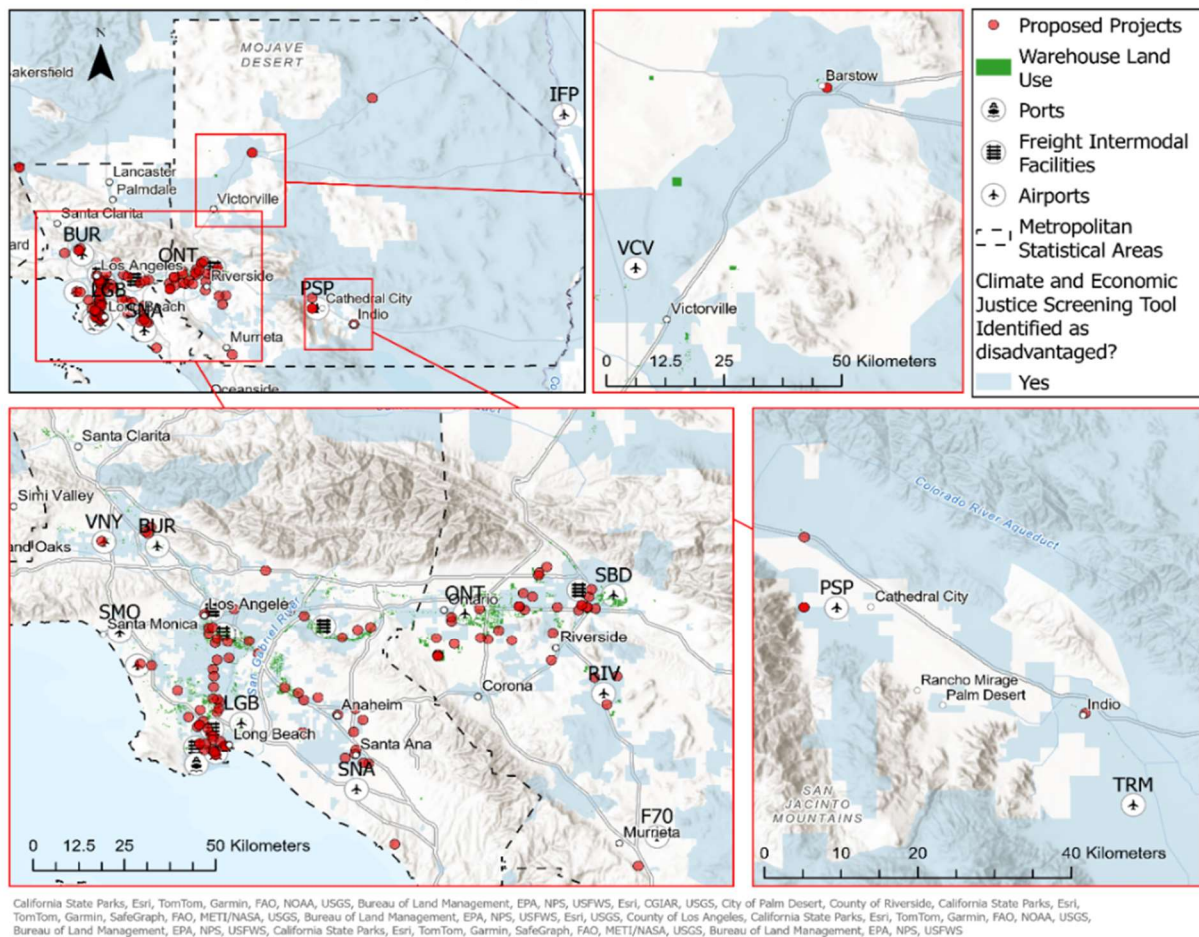


Figure 2: Illustration of Potential Projects in the Two MSA Region

Existing Incentive Program Limitations

Over the past decade, South Coast AQMD has successfully implemented several incentive programs representing hundreds of projects and pieces of equipment, including Proposition 1B, Carl Moyer, Voucher Incentive, and Volkswagen Environmental Mitigation Trust Programs. The equipment types include heavy-duty trucks, CHE, locomotives, and supporting infrastructure. Of these, Carl Moyer offers

²⁵ California Clean Truck & Bus Vouchers (HVIP), <https://californiahvip.org/impact/>

²⁶ South Coast AQMD Zero-Emission Infrastructure Program Announcement.

<https://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2023/2023-dec1-005.pdf>

the highest awards. Table 3 below illustrates, on average, a fleet owner's out of pocket cost is more than \$250,000 to purchase the ZE equipment, which is higher than the full purchase cost for an equivalent diesel truck (\$150,000-180,000). For a small fleet, that amount is unaffordable and unless additional funds are available to leverage the purchase, many grant awardees cannot move forward with the replacement if the remaining balance cannot be secured.

There is a dire need for supporting infrastructure. Numerous equipment manufacturers expressed the ability to produce ZE equipment, but inadequate infrastructure prevents the deployment of the equipment.

Table 3: Examples of 2024 Battery Electric Class 8 Truck Cost

Vehicle Make	Vehicle Model	Technology	Vehicle Cost*	Carl Moyer Award	Grantee Cost
Peterbilt	579EV	Electric	\$511,000	\$222,280	\$288,720
VOLVO	VNRE300	Electric	\$545,076	\$353,672	\$191,404
Freightliner	PE116DC	Electric	\$519,308	\$210,207	\$309,101
Volvo	VNRE62T300	Electric	\$541,316	\$204,194	\$337,122
Nikola Motor	TRE BEV	Electric	\$548,030	\$247,402	\$300,628
Freightliner	eCascadia	Electric	\$615,538	\$234,938	\$380,600
Average			\$546,711		\$335,481

*: vehicle total cost, including FET and sales tax. There is a \$40k federal tax credit for ZE trucks.

Population of Goods Movement Equipment

The funding need for the two MSA regions was assessed by examining the population of existing Class 8 heavy-duty goods movement trucks using the available data for the South Coast AQMD. Only diesel-fueled trucks from Model Year (MY) 2011 to 2018, were included in the tally. This model year range was selected because these trucks, being 5 years or older, are compliant but are considered to have deteriorating emissions and limited useful remaining life.²⁷ Table 4 illustrates the scale of incentive funding needed based on 75 percent of the vehicle cost for 10 percent of the truck population:

Table 4: Funding Need Example for Battery Electric Goods Movement Trucks

Class 8 Diesel Freight Trucks (MY 2011-18) in South Coast AQMD	10 % of Population	Average Cost of Battery Electric Truck	Funding Need
29,245	2,924	\$547,000	\$1.19 billion

ZE Goods Movement Locomotives

Locomotive replacement projects offer the greatest GHG and criteria pollutant emission reduction benefits due to the amount of diesel fuel they consume and the abundance of high-emitting locomotives currently operating in the two MSA regions. ZE freight locomotives have only recently become available for switchers and rail car movers that do not travel long distances. Incentive programs for locomotive projects often require project life spans exceeding 10 years to make them eligible for appealing incentives, which has presented a challenge for operators in terms of commitment. It has been a concern for the first-generation products, and it could become obsolete or significantly decrease in value within a short period of time. In order to accelerate the technology advancement in the locomotive category, an estimate of \$200 million in funding is recommended to encourage the production and deployment of 20 battery electric switchers in the MSAs. These switchers, averaging \$10 million each, are 4 to 6 axle ZE models capable of serving as yard switchers and traveling between railyards on a single charge. Increasing the deployment of ZE switcher locomotives may provide even greater benefits, particularly if the technology can be scaled for line-haul locomotives or used as helper locomotives to reduce reliance on the larger, higher polluting line-haul locomotives.

²⁷ Data was based on CARB's EMFAC database along with Port of Los Angeles and Port of Long Beach's registration databases.

Funding Sources

Over the last several years, the State and federal government have created large grant programs to address challenges related to climate change and goods movement, the need far exceeds the available resources. South Coast AQMD's Air Quality Management Plan identified that the South Coast Air Basin alone will require \$1 billion annually to address air pollution to meet the National Ambient Air Quality Standards.²⁸ The MSAs funding needs would exceed what is estimated for the South Coast region alone. South Coast AQMD has applied for numerous grants, including:

- South Coast AQMD partnered with the local port terminal, Long Beach Container Terminal, to apply for the 2023 Port Infrastructure Development Program funded through Inflation Reduction Act (IRA) to complete the improvements for the terminal's charging infrastructure with a funding request of \$68 million. The proposed project was expected to have an annual GHG emission reduction of approximately 3.6 thousand MT tons CO₂e.
- The Charging and Fueling Infrastructure program was created by the Bipartisan Infrastructure law in the amount of \$2.5 billion. A portion of these funds are formula allocated to the States through the National EV Infrastructure program and the competitive portion is insufficient to meet national needs. South Coast AQMD was a partner in the California – Oregon – Washington's proposal and submitted on behalf of TESLA for corridor heavy-duty charging stations with a funding request of \$97 million. An annual GHG emission reduction of 33 thousand MT tons CO₂e were expected in California alone.
- On the state level, primarily funded by Greenhouse Gas Reduction Fund, California Air Resource Board's California Advanced Technologies Demonstration and Pilot Projects grant was another opportunity that South Coast AQMD applied for. One proposal was to further expand the deployment of battery electric heavy-duty trucks with a funding request of \$44m for an annual GHG emission reduction potential of 8.3 thousand MT tons CO₂e, and another was to deploy vehicles and equipment to facilitate the introduction of battery electric technologies to municipality operation with a funding request of \$34M for an annual GHG emission reduction potential of 2.7 thousand MT tons CO₂e.

South Coast AQMD continues to seek for other funding opportunities, including:

- Clean Ports is a new funding opportunity created by the IRA. South Coast AQMD is partnering with the Ports of Los Angeles and Long Beach to strategically seek grants that do not overlap and/or focus on areas where need exceeds available funding sources to maximize coverage of the goods movement network. Therefore, South Coast AQMD is submitting this CPRG application which will provide at a minimum \$200 million for the Riverside – San Bernardino – Ontario MSA and \$300 million for the Los Angeles – Long Beach – Anaheim MSA. The Ports will submit applications under Clean Ports for the marine terminals.
- Clean Heavy-Duty Vehicles is another program created by IRA. Congress legislated this program to fund Class 6 and 7 vehicles. INVEST CLEAN does not include Class 8 and the Notice of Funding Opportunity is not yet available to know program details.
- Consolidated Rail Infrastructure and Safety Improvements (CRISI) does not include Class 1 railroads.
- Congressional Directed Spending Requests are limited to specific federal agency accounts and award sizes. In FY 2023, South Coast AQMD received a \$500,000 award for a hydrogen fuel cell locomotive project, and in FY 2024, South Coast AQMD obtained another \$500,000 award for a hybrid tugboat equipped with onboard ZE charging.
- Diesel Emissions Reduction Act (DERA) is a limited opportunity. For FY 2022 – 2023, U.S. EPA Region 9 was allocated \$22,200,000 with a maximum request per application of \$4.5 million. South Coast AQMD received \$4.5 million for 20 Class 8 heavy-duty trucks. DERA provides limited funding and is

²⁸ South Coast Air Quality Management District, 2016 Air Quality Management Plan, <https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15>

nowhere near the scale needed to transition the Southern California Goods Movement Corridor to ZE technologies.

- Targeted Airshed Grants (TAG) funds projects for the five areas in the nation with the worst ozone and particulate matter 2.5 pollution. For the last grant cycle, FY2022, South Coast AQMD applied for four projects totaling \$30 million and was awarded approximately \$16 million. The Notice of Funding Opportunity for the next grant cycle is not yet available. The funding is not sufficient to address climate and air pollution issues in the region.

1c. Transformative Impact

INVEST CLEAN will catalyze transformative change for the Southern California Goods Movement Corridor by addressing the most significant limitations and challenges to deploying ZE vehicles and equipment. This targeted strategy will result in more successful ZE technology deployments which will reduce GHGs, criteria and hazardous air pollutants to protect public health, especially in LIDACs. The Project will also support economic development and job creation locally, statewide, and across the nation.

This region is the western gateway to the U.S. supply chain and international commerce, hosting the two busiest ports in the nation. It is supported by a network of highways, railways, airports, and intermodal facilities with corresponding warehouse and distribution facilities that are located in and adjacent to environmental justice communities. The Project aligns with the Joint Office of Energy & Transportation in the “National Zero-Emission Freight Corridor Strategy” with 11 percent of Phase 1 and 2 Hubs located in this region.

This measure addresses the obstacles of limited availability of ZE vehicle/equipment charging infrastructure and affordability of new clean vehicle technologies by providing financial incentives. South Coast AQMD worked with the NREL to create an incentive structure that maximizes the building out of infrastructure and turnover of diesel-fueled medium- and heavy-duty trucks and CHE. NREL will collect data and analyze the incentive structure on an annual basis to optimize the efficacy of the program and document best practices that can be utilized broadly. Further, implementing these measures will create market demand for commercially available battery electric ZE equipment and supporting infrastructure thus setting the pathway for the acceleration of ZE technology implementation. In addition, INVEST CLEAN will foster growth in sectors like renewable energy and batteries, and will facilitate ZE technology transfer to other sectors of the economy. The benefits of this measure and technology developed will apply to the MSAs and across the nation, setting a course for less reliance on fossil fuels. It also will spur economic growth through purchases of equipment, vehicles, and supplies across the nation and support job creation. The unemployment rate in the MSAs region is 5.5 percent, which is significantly higher than the national average of 3.9 percent.^{29,30} (see File: Techappx_SCAQMD)

The ZE battery-electric locomotive deployment will be a pioneering step toward decarbonizing freight rail transportation which is one of the largest concerns by LIDAC communities in the MSAs region. This Project will overcome challenges to transitioning freight rail to ZE technologies by addressing the high capital investment for battery electric locomotives and by deploying 18 engines to generate the operational data required before wide-scale adoption can occur. By incentivizing the development and the deployment of the ZE locomotives and implementing a large-scale demonstration, the transition to clean technologies could be sped up significantly.

INVEST CLEAN will set a new standard for engaging in and implementing a Community Benefits Plan developed by and to be led by community-based organizations. The Project will also implement a comprehensive workforce training program in partnership with the NECA and IBEW and supported by more than three (3) universities, seven (7) colleges, one (1) community college, and seven (7) educational-related institutions. Details on the Community Benefits Plan are in Section 4. Low Income and Disadvantaged Communities and the Workforce Training Program is described in Section 5. Job Quality.

²⁹ U.S. Bureau of Labor Statistics, Unemployment Rates for Large Metropolitan Areas, Not Seasonally Adjusted, <https://www.bls.gov/web/metro/laurgma.htm>

³⁰ U.S. Department of Labor, Bureau of Labor Statistics, <https://www.bls.gov/news.release/pdf/empsit.pdf>

The Project will put the Southern California Goods Movement Corridor on a transformational ZE pathway to reduce GHGs providing with co-benefits for from the reduction of criteria and hazardous air pollutants, and thereby protecting public health, especially in LIDACs. INVEST CLEAN will also support economic growth and create high-road jobs by supporting the goods movement sector which is vital to the U.S. supply chain and international commerce. Additionally, the Project will build resiliency in the freight sector by modernizing vehicles and equipment and developing a skilled workforce to be better prepared for future events like the COVID-19 pandemic, foreign conflicts and geopolitical issues, inflation, or other impacts. The Project will also leverage community support to promote awareness about climate pollution and prevention.

Section 2: Impact of GHG Reduction Measures

INVEST CLEAN will strategically implement measures in the goods movement sector to achieve immediate, cost-effective GHG emission reductions with co-benefits from reductions of criteria and hazardous air pollutants, while building a foundation for a ZE future. The GHG reduction measures in the proposed Project will reduce fossil fuel usage by thousands of gallons in the goods movement sector by incentivizing ZE vehicles and equipment. Measure 1 is the highest priority due to the critical need to build charging infrastructure for ZE technologies. Providing ubiquitous and strategically placed charging stations to meet the operational needs of the goods movement industry along our freight corridors is the key to successful deployment and adoption of ZE battery electric trucks. Measures 2-4 will implement targeted incentive programs for ZE vehicles and last-mile freight, CHE, and switcher locomotives to support broad deployment in the MSAs region, while capturing experience and data to drive development and commercialization across the nation.

2a. Magnitude of GHG Reductions from 2025 through 2030

For the proposed Project, the emission reduction estimates are based on the vehicles or equipment miles traveled, hours of operation, fuel usage, and electricity consumption. Following the methodology in the AFLEET CFI Emissions tool³¹, an emission calculator recommended by the Federal Highway Administration for Charging and Fueling Infrastructure Discretionary Grant Program, GHG emission reductions from the proposed Project was calculated in metric tons of CO₂ equivalent (CO₂e). Considered GHG pollutants are CO₂, CH₄ and N₂O. For battery electric trucks, truck chargers, and battery electric CHE, the project life is assumed to be 10 years. For battery electric switcher locomotives, a 20-year project life is assumed. The vehicles and equipment are assumed to be phased deployments starting in 2026 for trucks and chargers, and 2028 for locomotives. The emission reductions for Measures M1-4 from 2025 through 2030 are shown in Table 5. A total of 3.6 million MT tons of CO₂e is expected to be avoided in that period from the upgrade of high-pollution vehicles and equipment with battery electric technologies funded under the Project. While the transition involves strong financial investment, comprehensive collaborations, and support from various sectors and agencies, the battery electric technologies are being well received by the fleets and other end users, as observed in the recent projects under South Coast AQMD's administration. It is expected that the vehicles and equipment will be utilized much longer after the end of this grant period, resulting in long-lasting emission reductions. The calculation for the emission reductions associated with Measure 1, deployment of charging infrastructure, conservatively assumed a 20 percent utilization rate for the first year of operation and 60 percent for the maximum, while as previously discussed, there is already a great demand for charging facilities. The mileage data and operation duration used in the estimation for Measures 2-4 are based on the real-world data that South Coast AQMD has collected through annual usage data from the equipment owners required by most of the incentive programs South Coast AQMD administers. Therefore, it is expected that the emission reductions will be permanent. The assumptions and calculation methods are explained in the attached technical appendix (Attachment: Techappx_SCAQMD).

³¹ Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) for Charging and Fueling Infrastructure (CFI) Emissions, <https://afleet.es.anl.gov/infrastructure-emissions/>

Table 5: Cumulative GHG Emission Reduction for Measures 1-4 between 2025 and 2030

	2025-2030 Cumulative Emission Reductions (MT CO ₂ e)
M1: Charging Infrastructure Deployment	3,427,178
M2: BE Freight Vehicle Deployment	67,391
M3: BE CHE Deployment	61,230
M4: BE Locomotive Pilot	42,476
Total	3,598,274

2b. Magnitude of GHG Reductions from 2025 through 2050

The equipment funded under the proposed measures will have a minimum project life of 10 years for heavy-duty trucks, chargers, and CHE and 20 years for the locomotives. The emission calculations are based on this minimum life span for a conservation estimation. It is expected that funded vehicles and equipment will be utilized at least for their minimum lifetime and beyond. It is estimated that a total \$12 million MT tons of CO₂e will be eliminated between 2025 and 2050 from this Project. Furthermore, the funded infrastructure can continue providing charging service for battery electric trucks, CHE, and locomotive switchers throughout 2050 as the electricity power cable and other power components have much longer lifetime than the assumed 10 years for the chargers. A GHG emission reduction of 24 million MT CO₂e is expected for Measure 1 for the scenario that the funded chargers last through 2050. The assumptions and calculation methods are explained in attached technical appendix (Attachment: Techappx_SCAQMD).

With the efforts of this Project, a large-scale truck charging network will be gradually established in the region, workforce training will ensure enough drivers and technicians will operate and maintain the battery electric equipment and chargers. Communities will receive education to obtain necessary knowledge and certifications to speed up the spread of battery electric technologies. The anticipated emission reductions are expected to be enduring.

For the longer term GHG reductions, the electricity generation emission factors estimate for 2030 and on reflect the implementation of California's Renewable Portfolio Standard (RPS) Program which requires 60 percent renewables by 2030 and 100 percent carbon free by 2045. The 2030 GHG emission factors represent the weighted average of emission factors for utilities in Los Angeles and Orange counties and were used for the calculation in years 2030 to 2044. The 2045 (and later) GHG emission factors were set to zero because of RPS Program requirements. The EPA's GHG emission factors for the Western California subregion were used for the year 2025 to 2050. The cumulative emission reductions for each measure are listed in Table 6 below.

Table 6: Cumulative GHG reduction for Measures 1-4 between 2025 and 2050

	2025-2050 Cumulative Emission Reductions (MT CO ₂ e)
M1: Charging Infrastructure Deployment	11,153,463
M2: BE Freight Vehicle Deployment	172,369
M3: BE CHE Deployment	143,567
M4: BE Locomotive Pilot	300,146
Total	11,769,545

2c. Cost Effectiveness of GHG Reductions

The short-term (2025-2030) GHG cost-effectiveness is estimated to be \$139/MT CO₂e, based on the projected GHG emissions in Table 5 and the proposed project budget. This ratio is substantially lower than EPA's estimate of \$230/MT CO₂e for the 2030 GHG social cost.³²

The proposed Project implementation uses battery electric commercial technologies and chargers. Additionally, regionally and nationally, there is lack of skilled technicians and operators as well as a lack

³²Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances, https://www.epa.gov/system/files/documents/2022-11/epa_scghg_report_draft_0.pdf

of public knowledge and acceptance of battery electric technologies. The proposed Project will invest in workforce training and community engagement. The immediate emission reductions from these efforts can't be conveniently qualified and reflected in the cost effectiveness rate. Furthermore, data from the operation of the deployed equipment and vehicles will be analyzed to optimize the performance and improve the energy consumption. Extra emission reductions can be achieved through this effort. It is also expected that there will be installation of solar panels and supporting stationary battery storage located with the charging infrastructure.

Being located in California, the proposed Project is also affected by relatively higher prevailing costs compared to other states. Among all the states, California has the highest Regional Price Parity, resulting in higher labor and material cost for deploying the equipment and vehicles proposed for the Project compared with equivalent projects in other states, indicating high levels of labor cost and purchase cost.³³ Some of the cities in the MSAs also have the highest sales tax in the nation, further impacting the cost of implementing the Project.³⁴

2d. Documentation of GHG Reduction Assumptions

See Technical Appendix (Attachment: Techappx_SCAQMD).

Section 3: Environmental Results – Outputs, Outcomes, and Performance Measures

3a. Expected Outputs and Outcomes

The Project is expected to result in significant environmental benefits through the widespread large-scale transition to battery electric technologies and will eliminate a total of at least MT CO₂e by 2030, which is sizable in comparison with the regional emissions. The PCAP for Los Angeles, Long Beach, and Anaheim indicates that under the business-as-usual scenario, GHG emissions in the MSA are projected to reach 83,457,200 MT CO₂e in 2030, with the transportation sector emitting 38,519,494 MT CO₂e. The PCAP for Riverside, San Bernardino, and Ontario indicates that under the business-as-usual scenario, GHG emissions in the MSA are projected to reach 4,474,988 MT CO₂e in 2030, with the transportation sector emitting 2,223,617 MT CO₂e. As previously mentioned, the two higher-dollar measures - M1 aimed at funding the charging infrastructure and M4 aimed at funding the battery electric switcher locomotives - have relatively long operation lifetimes. The emission reduction benefits are expected to last more than 20 years, with GHG emission reductions per year peaking in 2030 and continuing to accrue GHG reductions through 2050.

The Project will also result in significant co-benefits by reducing the emissions of criteria air and hazardous air pollutants. It is estimated that the project will eliminate an annual total of 1,615 tons of NO_x and 28 tons of PM_{2.5}. SCAB, the main portion of the two MSAs, is designated as being in extreme nonattainment for ozone and serious nonattainment for PM_{2.5}. As shown in the 2022 South Coast Air Quality Management Plan, South Coast AQMD estimated 166 tons/day, or 69,719 tons/year are needed to reach attainment for ozone.³⁵ The Project will play a role in achieving that emission reduction goal. Since the emission sources to be eliminated by the Project are primarily diesel engines, it is estimated that there will be an annual emission reduction of 30 tons for diesel particulate matter (DPM) from the Project. DPM is the largest contributor to cancer risk in the SCAB, accounting for approximately 50 percent of the cancer risk.³⁶ Communities near freeways, ports, and intermodal facilities, most of which are in the LIDAC, will benefit from the Project and will be prioritized for investment under this Project.

³³ Regional Price Parities by State and Metro Area | U.S. Bureau of Economic Analysis (BEA):

<https://www.bea.gov/data/prices-inflation/regional-price-parities-state-and-metro-area>

³⁴ California City & County Sales & Use Tax Rates: <https://www.cdtfa.ca.gov/taxes-and-fees/rates.aspx>

³⁵ South Coast AQMD Air Quality Management Plan, <https://www.aqmd.gov/home/air-quality/air-quality-management-plans/air-quality-mgt-plan>

³⁶ South Coast AQMD Multiple Air Toxics Exposure Study V: <https://www.aqmd.gov/docs/default-source/planning/mates-v/mates-v-final-report-9-24-21.pdf>

3b. Performance Measures and Plan

South Coast AQMD will establish contracts with incentive fund awardees to determine the deployment timeline and reporting requirements. South Coast AQMD plans to reimburse the purchase of the vehicles and equipment after ZE equipment verifications. Inspection will be conducted to confirm the installation of the charging stations or purchase of vehicles prior to issuing the payment to the awarded entities. South Coast AQMD will closely track the deployment of charging stations, vehicles, and equipment. The deployment timeline of the charging stations will ensure that the vehicles and equipment can begin operations on schedule. Deployment status will be monitored and compared with the proposed timeline in the application. The updates will be included in the semi-annual and annual reports.

Incentive fund awardees will also be required to electronically collect and submit or make accessible the performance data of the charging stations and vehicles to the South Coast AQMD or a designated third party. For the charging stations, the designated third party will track the utilization of the individual chargers, including the charging sessions, charging time, electricity usage, vehicle types, etc. Such data will be used for the analysis of GHG emission reductions. For the battery electric trucks, CHEs, and locomotives, telemetry data will be collected for the mileages, operation hours, charging behaviors, vehicle types, etc. Individual awarded units under each measure will be tracked for their usage separately and then aggregated per measure on a quarterly basis. South Coast AQMD will establish emission reduction targets for each quarter based on the proposed timeline in the application. The following approaches will be taken to calculate the GHG and CAP/HAP emission reductions from the deployed equipment and track the progress. The data will be included in the semi-annual and annual reports, as well as the final report.

The qualification for GHG emissions from the operation of the funded charging stations will follow the qualification method outlined in the application, primarily based on energy consumption. It will consist of two components: (1) upstream GHG emission reductions, representing the difference in GHG emissions between diesel fuel production and electricity production; and (2) avoided GHG emissions from diesel truck operation as funded chargers create the charging availability for battery electric trucks. The qualification for CAP and HAP emission reductions will focus on the operations.

The qualification for GHG emissions from the operation of funded battery electric trucks, CHEs, and locomotives will also follow the qualification method in this application using the mileages or operation hours. As the Project will fund both the equipment and chargers, the GHG emissions will be comprised of two portions as well: (1) upstream GHG emission reductions, representing the difference in GHG emissions between diesel fuel production and electricity production and (2) avoided GHG emissions from diesel equipment operation. The qualification for CAP and HAP emission reductions will focus on the operations.

The locomotives will be connected to the manufacturers' Optimization Program which continuously monitors the locomotives around the clock, ensuring the data collection and analytics to drive advancements in locomotive technology. The locomotive monitoring program will provide real-time operational metrics throughout the entire lease period or project lifespan, which will be used by the manufacturers for product improvement and scale up plan. Both manufacturers and rail operators will utilize this data to further improve the performance of such locomotives.

3c. Authorities, Implementation Timeline, and Milestones

As shown in Table 7 and Figure 3, the implementation of these measures will begin with administrative duties, which include the release of program announcements, formulation of application evaluation guidelines, organization of workshops and outreach activities, application evaluation and scoring, and the selection of the most cost-effective projects that can be implemented in the near term. The project selection will prioritize projects located in overburdened communities. An increase in incentives will be reserved for small fleet operators to offset the risk of investing in advanced technology and provide funding to cover the incremental costs of diesel equipment. After the replacement vehicles or equipment is deployed, the vehicles and equipment will be scrapped or permanently removed from the service to ensure emission reductions are achieved. The project proposals for the infrastructure projects will be

evaluated and selected using the criteria established under the Carl Moyer Program Guidelines by the California Air Resources Board. The installation of charging infrastructures will be conducted concurrently with the deployment of ZE vehicles and equipment. The equipment and vehicle solicitation and deployment timeline will occur as early as late 2025 or within 6-8 months of the award as shown in Figure 3.

Table 7: Proposed Project Timeline for INVEST CLEAN

Task Name	Task Description	Responsible Party
Task 1: South Coast AQMD Board Action	Execute EPA Grant Agreement, kickoff meeting, execute subcontracts	South Coast AQMD
Task 2: Release Program Solicitation	Open program to solicit project applications for all measures	South Coast AQMD
Task 3: Community Engagement	Outreach and workshops to disadvantaged communities & other impacted communities	South Coast AQMD Clean Cities Coalition Sierra Club Ports of L.A. & Long Beach
Task 4: Workforce Training/ Development	Working with IBEW and colleges to establish training and educational programs	South Coast AQMD NECA – IBEW Local Universities
Task 5: Project Evaluation/Selection/Contract Execution	Review project proposals, establish eligible project list, execute contracts	South Coast AQMD
Task 6: Equipment Procurement/Deployment	Finalize project selection for each category and issue award letter	South Coast AQMD
Task 7: Inspection/Project Verification	Inspect infrastructure site, baseline & replacement vehicles/equipment, verify ZE specs	South Coast AQMD
Task 8: Data Collection, Planning	Set data collection protocols, define analysis plans and goals	South Coast AQMD NREL
Task 8.1: Data Collection on all Measures	Live/Near Live collection of charging and equipment data to determine if program & emission reduction goals are being met	South Coast AQMD
Task 9: Mid-term Program Review	Evaluate if program objectives of all measures are on course, adjust program parameters if needed	South Coast AQMD NREL
Task 10: Reissue Program Announcement if needed	Re-open program with new parameters for remaining funds if needed	South Coast AQMD
Task 11: Deployed Project Report Tracking	Collect annual usage/operational data reports from stations/vehicles/equipment	South Coast AQMD SCAG NREL
Task 12: Semi-Annual & Final Reporting	Submit semi-annual and final reports to EPA	South Coast AQMD

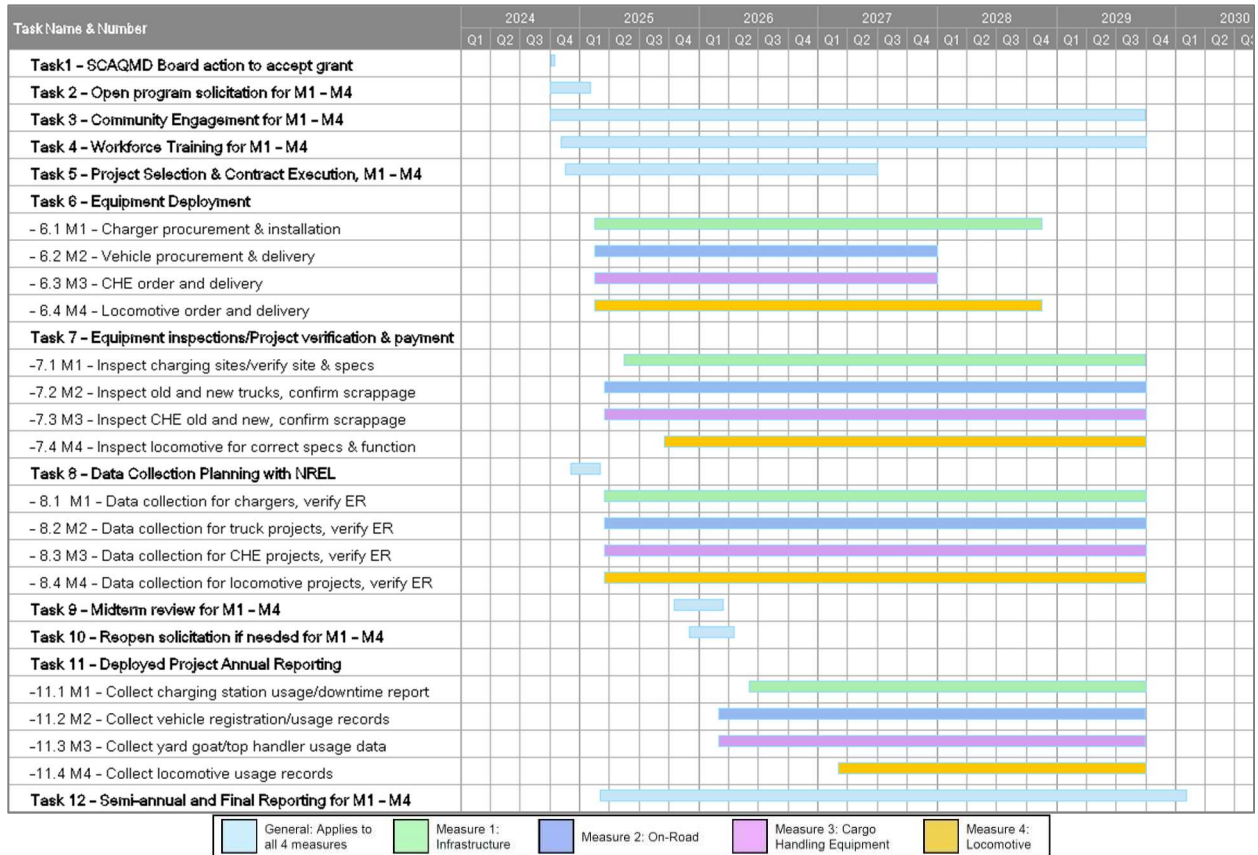


Figure 3: Illustration of Proposed Project Timeline

The South Coast AQMD has over 25 years of incentive implementation experience and has a robust system established to implement the project as soon as it is awarded. South Coast AQMD is also aware of supply chain and infrastructure challenges and is working closely with OEMs to ensure that the vehicles and equipment can be procured and deployed within the proposed timeline to ensure the earliest GHG reduction possible. South Coast AQMD has been engaged with community-based organizations for outreach, community education and project selections and input. The South Coast AQMD meets with local utility companies regularly to discuss existing and upcoming infrastructure site development. All ZE equipment will be purchased and enter service by Q4 2026. South Coast AQMD will monitor and collect operational and performance data from participating fleets for the project duration. South Coast AQMD received a large list of projects from the solicitations released last year and earlier this year, exceeding the \$300 million in funds we were able to secure. Further, this project list does not fulfill all the measures presented in this proposal; an additional \$200 million in locomotive projects can be anticipated from the upcoming solicitation that will be released on April 9, 2024.

If the grant is awarded, a solicitation will immediately be released, and application outreach workshops will be held. South Coast AQMD has a user-friendly Grant Management System (GMS), which is a web-based platform designed for applicants to conveniently submit online applications, upload documentation, communicate with staff via messaging features, and the applicant can access the application dashboard to check their application status. Additionally, the GMS system facilitates internal application review and approval processes.

Table 8: Potential Project Partner Roles and Responsibilities

Organization	Role	Key Personnel	Responsibilities
South Coast AQMD	Grantee, Project Administration	Aaron Katzenstein, Lisa Tanaka O'Malley, Mei Wang, Tom Lee, Fan Xu, Mary Leonard	Project administration and oversight, project planning, contract management, budget and payment tracking, data collection, reporting
National Renewable Energy Laboratory	3 rd party reviewer	Ken Kelly, Jason Lustbader	Data analysis, report review, 3 rd party validation,
Southern California Association of Governments	Subawardee	Annie Nam, SCAG	Implementation of Last-Mile Freight portion of Measure 2
Community Based Organization	Community support	Angelo Logan, Clarence Williams, Tecolote Perch Yassi Kavezade, MYK	Assist with implementation of Community Benefits Plan and Workforce Training
Los Angeles - Long Beach – Anaheim MSA Steering Committee	PCAP, CCAP, Reporting, Implementation Assistance	Ryan Wolfe, SCAG	Support with PCAP, CCAP, Reporting, and Implementation Assistance
Riverside – San Bernardino MSA Steering Committee	PCAP, CCAP, Reporting, Implementation Assistance	Josh Lee, SBCTA	Support with PCAP, CCAP, Reporting, and Implementation Assistance
Ports	Project implementation	Morgan Caswell, POLB Jacob Goldberg, POLA	Project cost-share and site selection collaboration
CALSTART	Implementation Assistance	Jasna Tomic	Project implementation
SCE	Utility	Bethmarie Quiambao, Chanel Parson, Mike Backstrom	Site power and permit
IBEW	Workforce training	Joe Sullivan, Ramsay Merritt Stevens, Tommy Faavae	Provide education and training
Workforce Organizations	Education	John Frala, Clean Fuel Education John Harriel, Murrow Meadows Corporation Venessa Ingalls, Tradeswomen Sisterhood Hillary Jenks, Inland Empire Labor Institute Khadeejah Soper, Women's Initiative for Readiness in Electrical Armando Loza, Miguel Contreras Foundation Michelle Yanez, MY Workforce Solutions	Provide training

Section 4: Low-Income and Disadvantaged Communities

4a. Community Benefits

The Southern California Goods Movement Corridor impacts the quality of life for the MSAs for nearly 18 million residents. According to CalEnviroScreen over two-thirds of California's environmental Justice or LIDACs are located within the MSAs region.³⁷ Due to the massive goods movement system in Southern California, many LIDACs are located near or adjacent to goods movement corridors, intermodal facilities

³⁷ California Office of Environmental Health Hazard Assessment, CalEnviroScreen, <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40>

and warehouses. The Climate and Economic Justice Screening Tool (CEJST) shows similar results for LIDACs and the census tracts are provided in a separate spreadsheet file (Attachment: Areas_SCAQMD).

LIDACs adjacent to the marine ports, intermodal facilities, highways, railways, warehouses, and related facilities are disproportionately impacted by degradations in the environment with far reaching social and economic impacts. These environmental impacts, including climate, criteria and hazardous pollution, noise, light, public safety, and overall quality of life are compounded by longstanding social and economic inequities. Community representatives have consistently expressed health concerns for exposure to emissions from sources associated with goods movement and have prioritized the need for emission reductions from intermodal facilities and warehouses.³⁸

INVEST CLEAN is centered on equity to deliver direct and indirect benefits through the ZE transformation of the Southern California Goods Movement Corridor. First and foremost, this Project will reduce harmful GHG emissions with co-benefits for criteria and hazardous air pollutants. It will also uplift communities, especially LIDACS, through a comprehensive workforce training program in partnership with NECA – IBEW, universities/colleges, community colleges, and educational CBOs and institutions. Moreover, INVEST CLEAN builds on South Coast AQMD’s long history of environmental justice initiatives to create an authentic Community Benefits program that encourages infrastructure incentive grant awardees to incorporate community priorities and establishes a Community Steering Committee to conduct outreach, maintain open engagement, and implement community benefit projects.

The Project’s GHG reduction measures focus on addressing the limitations and challenges to successfully transforming the Southern California Goods Movement Corridor to become a sustainable, ZE system while minimizing impacts on communities, in particular overburdened LIDACs.

INVEST CLEAN will deliver reductions of approximately 12 million MT CO₂e from 2025 to 2050 and over 1,615 tons per year of NO_x, approximately 28 tons per year of PM_{2.5}, and almost 30 tons per year of Diesel Particulate Matter to protect public health. The majority of the MSAs’ populations reside in the South Coast Air Basin which is in extreme nonattainment for ozone and serious nonattainment for PM_{2.5}. The project will result in reductions in criteria and toxic air pollution and will lay the groundwork to achieving ZE to assist the region meet National Ambient Air Quality Standards to protect public health and the associated costs. Table 9 below shows the Annual Benefits of Meeting National Ambient Air Quality Standards for NO_x and PM_{2.5}.

Table 9: Annual Benefits of Meeting National Ambient Air Quality Standards for NO_x and PM_{2.5}

Preventative Premature Deaths	Preventative Asthma Attacks	Preventative Work Loss Days	Potential Monetized Public Health Benefits ³⁹
1,600	27,000	96,000	\$16.5 Billion

South Coast AQMD’s Multiple Air Toxics Exposure Study (MATES) is a monitoring and evaluation study and characterizes health risk in the SCAB. The fifth MATES, as shown in Figure 4 below, illustrates areas with elevated air toxics cancer risks are predominantly located near ports and transportation corridors, amounting to approximately 88 percent of the carcinogenic risk attributed to mobile sources.⁴⁰ The Project will reduce DPM by 30 tons per year which will reduce air toxic cancer risk for the communities near freight hubs and corridors.

³⁸ South Coast AQMD, AB 617 Community Emission Reduction Plans, <https://www.aqmd.gov/nav/about/initiatives/environmental-justice/ab617-134>

³⁹ The Benefits of Meeting Federal Clean Air Standards in the South Coast and San Joaquin Valley Air Basins, <http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/socioeconomic-analysis>
http://publichealth.lacounty.gov/mch/AsthmaCoalition/docs/BenefitsofMeetingCleanAirStandards_11_06_08.pdf

⁴⁰ South Coast AQMD Fifth Multiple Air Toxics Exposure Study, <https://www.aqmd.gov/home/air-quality/air-quality-studies/health-studies/mates-v>

Additionally, ZE vehicles and equipment do not have internal combustion engines resulting in quieter operations without polluting communities with the strong smell of diesel. Odors affect quality of life and may cause headaches, irritation of the eyes, nose, and throat, cough, nausea, and other symptoms.⁴¹

INVEST CLEAN features a collaboration between South Coast AQMD and NECA-IBEW and its expansive network of CBOs to ensure high-road and equitable job creation across all the projects. Through this collaborative effort, we aim to solidify a foundation of high-road labor standards, ensuring that every project under the CPRG umbrella is synonymous with quality construction and tangible, community-wide benefits. Central to this commitment is our concerted effort to harness NECA-IBEW's comprehensive network to amplify the impact of our initiatives, particularly in providing equitable access to high-quality jobs and training opportunities. This alliance is crucial in extending our reach to LIDAC communities, ensuring they benefit directly from the unique opportunities presented by joint labor-management apprenticeship programs. Section 5. Job Quality provides greater details on the job and workforce training program.

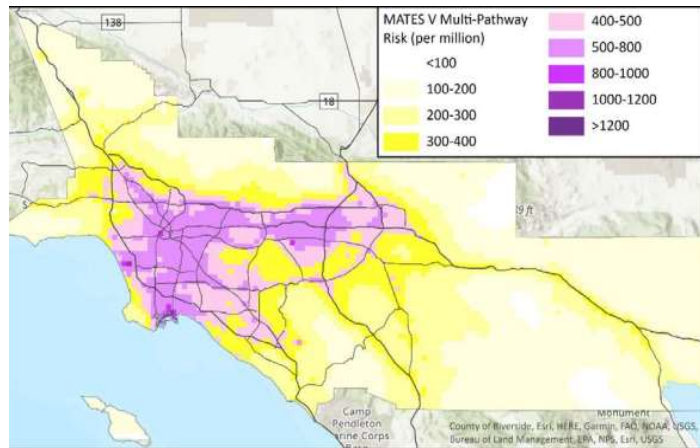


Figure 4: Air Pollution Health Impact in South Coast AQMD

Further enhancing the partnership with NECA-IBEW, INVEST CLEAN aims to mitigate adverse effects or disbenefits by encouraging infrastructure projects to integrate community benefits voluntarily. These may include initiatives such as engaging in outreach with educational resources to raise awareness about climate change and air pollution effect, programs to access resources for improved quality of life like building decarbonization and public transit, as well as creating open, green spaces, and vegetative barriers. This project approach will uplift community priorities in alignment with Justice40, CPRG, and informed by local environmental justice initiatives such as the Assembly Bill 617, Community Air Protection program.

INVEST CLEAN will set a new standard for authentic community engagement and deliver equitable access to ZE technologies by creating a Community Benefits Program led by a Steering Committee. The Steering Committee will include community-based organizations from geographically diverse areas throughout the MSAs and will be led by a third-party organization. The Steering Committee will serve an important role to provide South Coast AQMD with guidance and recommendations for the community engagement process and to conduct educational outreach on climate and air pollution including health impacts and zero-emission technologies. Engaging with the Community Steering Committee and the public will provide South Coast AQMD with the opportunity to assess, quantify and report community benefits accruing from INVEST CLEAN.

South Coast AQMD will provide funding through a combination of local, state, and other potential federal grants, and/or private sources to support community benefit projects. With administrative oversight by South Coast AQMD and under guidance by the third-party facilitator, the Steering Committee will select and work with appropriate organizations to implement selected community benefit projects. Prioritization of community benefit projects will be for freight-impacted areas and residential communities that are nearby a goods movement facility including warehouses, railyards/railways, seaports, airports, highway corridors, and Lithium extraction facilities. South Coast AQMD will also work with the Steering Committee to build capacity in seeking grants for emission reductions, climate, air pollution mitigation, and ZE projects.

⁴¹ Agency for Toxic Substances and Disease Registry, Environmental Odors, <https://www.atsdr.cdc.gov/odors/faqs.html>

Overall, INVEST CLEAN incorporates several pioneering Community Benefit components that have not traditionally been a part of an incentives type of Project. The Project will uplift community priorities to align with CPRG and Justice40 to ensure the most impacted LIDACs receive equitable environmental, social, and economic benefits to address longstanding issues from goods movement activity.

4b. Community Engagement

In early 2023, South Coast AQMD began meeting with the Southern California Association of Governments, Councils of Government throughout the MSA region, cities, counties, county transportation commissions, and other stakeholders to discuss and organize a regional effort for CPRG. Each MSA determined that they would form a Steering Committee including South Coast AQMD to participate in CPRG including the development of PCAPS, and the later CCAP and reports. The Los Angeles – Long Beach – Anaheim Steering met biweekly with a general and technical meeting and Riverside – San Bernardino – Ontario MSAs met on a weekly basis. Through the PCAP development process, South Coast AQMD actively participated in the development of the PCAP with meetings and briefings for Councils of Government, Chambers of Commerce, environmental justice organizations, cities, municipal agencies, and other stakeholders. Goods movement rose to the top as a priority GHG reduction measure for both MSAs. Both MSAs also met on a semi-regular basis with CARB to coordinate PCAP development and later on implementation grant proposals. South Coast AQMD volunteered to lead the Los Angeles – Long Beach – Anaheim MSA Working Group on goods movement which included members of the Steering Committee and expanded to include the Ports of Los Angeles and Long Beach and the Riverside – San Bernardino – Ontario MSA. South Coast AQMD elected to lead the regional CPRG goods movement proposal with the support of the Working Group and after extensive discussions with our sister agencies, industry, and community organizations. Throughout the development of the INVEST CLEAN proposal, South Coast AQMD held Working Group meetings as well as one-on-one meetings with all stakeholders to develop a collaborative workplan that effectively addressed ZE freight issues, balanced regional needs, and elevated community priorities.

CPRG also provided South Coast AQMD a unique opportunity to develop a Project with groundbreaking components to address the goods movement sectors longstanding impacts on the MSA communities, in particular LIDACs. In effect, South Coast AQMD contracted with two community-based consulting firms to conduct engagement to inform the development of INVEST CLEAN, specifically focusing on a community benefits plan and workforce training component. The engagement process included three phases: initial outreach and education on the Climate Pollution Reduction Grant program and INVEST CLEAN, general organizational engagement meetings; and summation of community feedback. This process was augmented by additional collaborative meetings to discuss specific aspects of community benefits and small group meetings to ensure a diverse group of voices were uplifted during outreach and engagement.

As a result, INVEST CLEAN includes a Community Steering Committee to continue meaningful engagement with LIDACs throughout the implementation of the GHG reduction measures. The Community Steering Committee and third-party facilitator will create a structure and conduit to facilitate open dialogue between South Coast AQMD and residents in LIDACs and to uplift authentic community priorities and shared values for the equitable distribution of benefits from ZE technologies including workforce training and jobs. The Community Steering Committee will provide guidance, oversight, and recommendations for the community engagement process, community benefit project selection, implementation of the community benefits, and education and outreach on climate and air pollution, and zero-emission technologies.

INVEST CLEAN is the direct result of an extensive community engagement process as witnessed by the seven (7) Letters of Commitment with 15 signatories and 73 letters of support with 101 signatories, including both MSA Steering Committees, CARB, NECA-IBEW, public electric utilities, Councils of Government, cities, counties, industry, academia and educational institutions, and community-based organizations for environmental justice. (See attached Letters of Commitment and Support). This level of engagement will increase during implementation of the Project to ensure GHG emission reductions with co-benefits for criteria and hazardous air pollutants are realized while supporting the ZE transformation

of the Southern California Goods Movement Corridor to realize environmental, social, economic benefits for the MSA region and the nation.

Section 5: Job Quality

South Coast AQMD is committed to advancing high-road and equitable economic development through INVEST CLEAN. In alignment with Executive Order 14082 and in support of the Energy and Infrastructure Provisions of the Inflation Reduction Act of 2022, this Project is dedicated to the creation and support of high-road, family, and community sustaining jobs that provide workers a meaningful union career.⁴² Recognizing the critical role that job quality plays in the success of our environmental initiatives, South Coast AQMD, in partnership with our organized labor and responsible contracting partners, will implement high-road labor standards that emphasize not only the quantity, but the quality of jobs created through federal investments.

Through INVEST CLEAN, South Coast AQMD and our partners are committed to supporting a world-class apprenticeship pipeline that opens pathways into high-quality union careers performing CPRG related work. This approach is centered around joint-labor-management apprenticeship programs, which are designed to foster a diverse, highly skilled, and sustainable workforce equipped to meet the challenges of today and tomorrow. Our strategy includes the following key components:

- **Commitment to Apprenticeship Utilization:** Pledge to use apprentices from joint labor-management registered apprenticeship programs with a graduation rate of at least 60 percent in alignment with California’s “Skilled and Trained” Public Contract Code for at least 15 percent of the total construction labor hours on all projects related to the implementation of GHG reduction measures.
- **Career Supporting Certifications:** Require the utilization of electricians certified by the Electric Vehicle Infrastructure Training Program (EVITP) in accordance with our existing procurement practices, as well as pertinent California legislation including LAB 841, California Public Utilities Commission Code 740.20, and the National Electric Vehicle Infrastructure (NEVI) Formula Program. EVITP certification ensures not only the responsible installation of our charging infrastructure but also positions the workforce for sustainable careers in the electrification industry.
- **Labor Rights:** Formalizing partnerships with labor organizations, we are ensuring that apprenticeship programs are aligned with industry standards and workers' rights. These partnerships also facilitate collective bargaining agreements, guaranteeing fair wages, family-sustaining benefits, and safe working conditions for all employees. This meets the Davis Bacon requirements under CPRG.
- **Supportive Services for Apprentices:** Provide and develop the necessary support services to address these critical workforce access gaps.
- **Benchmarks for Diversity and Inclusion:** Set clear benchmarks and goals to hire individuals from our disadvantaged and Justice40 communities. This approach not only enriches our workforce but also ensures that the benefits of our projects are shared widely across the communities we serve.

In addition to the NECA – IBEW partnership, the GHG Reduction Measure for the ZE locomotive deployment will include onsite and classroom training. Each locomotive deployed will be supported by at least one dedicated expert from the manufacturer in locomotive and battery technology. This technician will be on the ground to support the safe and efficient operation of the locomotive and charging process, as well as provide “on the job” training to the operators and maintainers of the locomotive. This hands-

⁴² Presidential Executive Order 14082 and the Energy and Infrastructure Provisions of the Inflation Reduction Act of 2022, <https://www.federalregister.gov/documents/2022/09/16/2022-20210/implementation-of-the-energy-and-infrastructure-provisions-of-the-inflation-reduction-act-of-2022>

on “train the trainer” methodology will provide the rail operators with best practices for locomotive operations and maintenance practices to prepare the operator on transitioning to ZE equipment.

South Coast AQMD will also follow CPRG guidance to ensure projects will be subject to the Build America, Buy America (BABA) provisions of the Infrastructure Investment and Jobs Act (IIJA) and will require a skilled workforce to design, install, and service the equipment, leading to job creation in these communities. Most infrastructure sites selected under Measure 4 will be in alignment with Justice40.

By integrating high-road labor standards, establishing a robust apprenticeship pipeline and following CPRG guidance, INVEST CLEAN will not only contribute to the reduction of greenhouse gas emissions and criteria and hazardous air pollutants but will also paving the way for a sustainable and equitable future for all.

Section 6: Programmatic Capability and Past Performance

6a. Past Performance

The South Coast AQMD has successfully managed several emission reduction projects, including the ones funded by EPA Targeted AirShed Grants, Diesel Emission Reduction Act Grants, as well as grants from the Department of Energy, California Air Resources Board, and California State Transportation Agency. The projects span a wide range, from air monitoring programs to the deployment of battery-electric and hydrogen fuel cell ZEVs, transport refrigeration units, marine vessels, CHE, locomotives, transit buses, and school buses. South Coast AQMD also has a long history of successfully collaborating with stakeholders in the Air Basin and surrounding areas to reduce emissions from a variety of mobile sources and stationary sources. Since 1998, South Coast AQMD has effectively implemented several state incentive programs, including the Carl Moyer, Community Air Protection, Proposition 1B Goods Movement, VW Mitigation Trust, Funding Agriculture Replacement Measures for Emission Reductions (FARMER), Lower-Emission School Bus, the On-Road Heavy-Duty Voucher Incentive programs. South Coast AQMD has also been partnering with OEMs and stakeholders on technology demonstration projects such as Volvo LIGHTS and JETSI to accelerate the deployment of ZE technologies. Over the past decade, South Coast AQMD has managed approximately \$1.5 billion of incentive projects, executed more than 3,400 incentive contracts, and replaced over 8,800 high polluting engines and equipment with cleaner technologies, resulting in emission reductions of 61,040 tons of NO_x and 1,231 tons of PM. Additionally, South Coast AQMD has been actively soliciting and deploying infrastructure projects to support lower-emission and ZE equipment deployment since the late 1990s. With our extensive expertise, experience, resources, administrative support, and established business processes, South Coast AQMD is well-equipped to successfully implement the proposed Project and achieve the outlined emission reduction goals and milestones.

Since 1988, South Coast AQMD has collaborated in partnership with other governmental organizations, private industry, academia, and research institutes. South Coast AQMD has also continuously partnered with OEMs, marine engine designers, truck fleets, commercial harbor craft operators, and ocean-going vessel owners to develop engine emission control systems. South Coast AQMD has close partnership with ports, State, and federal agencies as well as regional collaboratives that work together in developing, demonstrating, and deploying near-zero and ZE technologies.

A list of recent federal funded projects administered by South Coast AQMD is shown below in Table 10.

Table 10: Recent Federal Funded Projects

Project Title	Federal Agency	CFDA#	Federal Agency Contact	Project Description	Grant Status
Switch-On: Deployment of Electric Freight Trucks & Charging Infrastructure	EPA	66.956	Vernese Gholson	Partnered with Volvo in the deployment of 70 Class 8 battery electric trucks (BETs) in the South Coast Air Basin	On-going, good standing with status reports and reporting

Project Title	Federal Agency	CFDA#	Federal Agency Contact	Project Description	Grant Status
Freight Air Quality Solutions (FAQS)	DOT & DOE	N/A	Samir Barot	Deployment of a Liquid Hydrogen Fuel Cell Locomotive in San Pedro Bay Ports and Installation of 376 Chargers and Fuel Dispensers in the South Coast Air Basin	On-going, good standing with status reports and reporting
Plug-in Hybrid-Tugboat	EPA	66.956	Andrea Bennett	Partnered with Crowley Maritime Corporation to deploy a plug-in hybrid tugboat capable of ZE operation and develop an innovative charging infrastructure powered by ZE on-site power generation	On-going, good standing with status reports and reporting
Long Range Fuel Cell Trucks and ZE School Buses Deployment	EPA	66.956	Vernese Gholson	Partnered with School District to deploy 38 school buses and Hyundai to develop 5 fuel cell Class 8 trucks	On-going, good standing with status reports and reporting
ZE Freight Line-Haul Locomotive Replacement	EPA	66.956	Vernese Gholson	Partner with Progress Rail and BNSF to replace a line-haul locomotive with a ZE locomotive	On-going, good standing with status reports and reporting

6b. Reporting Requirements

South Coast AQMD has demonstrated proficiency in overseeing state and federal grants to agencies including US EPA, DOE, DOT, CARB, and CEC, effectively managing substantial grant-funded projects. In addition, the organization's subject matter expertise and project management capabilities ensure that reporting is conducted on a complete and timely basis. As indicated in Table 10, the South Coast AQMD is in good standing on all past and ongoing projects and has submitted required reports for the awarded projects.

South Coast AQMD consistently submits satisfactory final technical reports for grant-funded projects and provides timely progress reports. When facing challenges, we promptly report obstacles with clear explanations. Overall, the performance in managing grant agreements reflects a commitment to meeting requirements and maintaining transparency.

6c. Staff Expertise

South Coast AQMD has the expertise and resources necessary to meet the goals of the proposed project. As stated previously, South Coast AQMD will administer project funds and provide comprehensive project management including managing EPA grants, preparing, and managing a contract with the fleets, and monitoring the progress of the proposed project. The proposed project will be implemented by a Planning & Rules Manager, a Program Supervisor, a Financial Analyst, an Air Quality Specialist, a Staff Assistant, and a Deputy District Counsel.

Overseeing the South Coast AQMD team is Dr. Aaron Katzenstein, Deputy Executive Officer for the Technology Advancement Office. Dr. Katzenstein's principal charge is to identify, evaluate and stimulate the development and commercialization of clean air technologies, develop and coordinate mobile source regulations, and implement incentive programs. Dr. Katzenstein received his doctorate in Atmospheric Chemistry and has over twenty years of experience at South Coast AQMD including multiple MATES studies, Air Quality Management Plans, policy development, research projects, air quality studies, and technology/infrastructure projects.

Ms. Mei Wang, Assistant Deputy Executive Officer for the Technology Advancement Office has over 20 years of experience in air pollution control technologies, emission source testing, advanced engine technologies, and incentive programs. She has overseen numerous incentive programs such as Carl Moyer, Proposition 1B, Enhanced Fleet Modernization, and various other state and federal grants. Additionally, she has managed technology demonstration projects ranging from retrofits for ocean-going vessels to the development of capture and control systems for oil tankers. Her responsibilities have also

extended to overseeing projects focused on the advancement of ZE locomotive technology, the development and retrofitting of ZE commercial harbor craft, the deployment of vehicle-to-grid school buses, electric yard tractor deployment, and infrastructure projects. She has a BS degree in Textile/Fiber and Composite Material Engineering and an MS degree in Environmental Science.

Ms. Lisa Tanaka O'Malley, Assistant Deputy Executive Officer for Legislative and Public Affairs has over 30 years of experience in legislative and government and community relations in the public and private sectors. She oversees legislative affairs focusing on federal issues, government and community relations, small business assistance, communications and public information center, environmental justice, and other issues. She represents South Coast AQMD on both MSA Steering Committees and the regional CPRG Working Group on Goods Movement.

Mr. Tom Lee is the Technology Implementation Manager of the Technology Advancement Office. He has over 35 years of air quality experience and manages incentive programs including Carl Moyer, Proposition 1B and Enhanced Fleet Modernization. He also manages the Capture and Control System for Oil Tankers Project demonstration and the development of Breathmobile mobile clinics. Mr. Lee received his Mechanical Engineering degree from the University of California, Irvine and is a California Board-certified Professional Engineer. Mr. Lee will monitor and manage the day-to-day activities of the proposed Project.

Dr. Fan Xu, Program Supervisor, will also manage the daily activities of the Project. She has 10 years of environmental consulting experience and project management. She has more than 3 years of incentive implementation experience with the Carl Moyer and Proposition 1B programs on HD vehicle and infrastructure projects. Dr. Xu has a BS degree in Environmental Science and doctorate in Health Science. Finance and Legal representatives will also participate in the project. A financial analyst will assist in providing financial administrative support for the proposed Project. The Contract Assistant will assist the Air Quality Specialist in managing contracts and will be selected from a team of Contract Assistants for RDD&D and incentive programs. The Deputy District Counsel will provide legal guidance throughout the planning and implementation of the Project.

Mr. Justin Joe, Air Quality Specialist, has over 5 years of experience managing heavy duty vehicle and infrastructure incentive programs and ZE technologies. In addition, he worked extensively on the Port of Los Angeles and Port of Long Beach Clean Truck program.

Section 7: Budget

South Coast AQMD estimates the total budget for the entire project will be \$499,997,415 over the five-year performance period. South Coast AQMD proposes to implement four measures under this Project as outlined in Section 1a. A total of \$467,900,000 (or 93.6 percent of the total project cost) is allocated for the charging infrastructure installation and vehicle and equipment deployment as shown below. Additionally, \$5,000,000 is allocated for workforce training, \$1,000,000 for community engagement, \$1,800,000 for data collection, and \$24,297,415 for project administration necessary to implement the measures. Details of the budget are provided in the Budget Narrative (Attachment: Budget_SCAQMD), which includes year by year budget for each measure, fund disbursement, and budget assumptions.

Table 11: Overview of the Proposed Project Budget

	Budget
Total Incentive Funding for the 4 Measures:	\$467,900,000
1- Charging Infrastructure Deployment Incentive Program	\$178,500,000
2- Battery Electric Freight Vehicle Deployment Incentive Program	\$78,000,000
3- Battery Electric Cargo Handling Equipment (CHE) Deployment Incentive Program	\$20,600,000
4- Battery Electric Locomotive Pilot Program	\$190,800,000
Workforce training for the 4 Measures	\$5,000,000
Community engagement and outreach for the 4 Measures	\$1,000,000
Data collection, analysis and future planning for the 4 Measures	\$1,800,000
Project administration for the 4 Measures	\$24,297,415
Total Proposed Project Budget	\$499,997,415