

South Coast On-Road Heavy-Duty Vehicle Incentive Measure 2022 Progress Report

***Covering Projects Completed Through
12/31/2022***

March 30, 2023



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Introduction

The California Air Resources Board (CARB or Board) 2016 State Strategy for the State Implementation Plan (2016 State SIP Strategy) contains the State's emission reduction commitment for the South Coast Air Basin (Basin). For the federal 80 parts per billion 8-hour ozone standard (80 ppb standard), the 2016 State SIP Strategy included a commitment for 2023 to adopt an on-road heavy-duty truck incentive measure. On March 22, 2018, CARB adopted the South Coast On-Road Heavy-Duty Vehicle Incentive Measure (South Coast Incentive Measure) to fulfill the commitment for Board consideration and demonstrate how an increment of emissions reductions from incentive programs will be quantified towards the State's aggregate commitment in the California State Implementation Plan (SIP). CARB submitted the South Coast Incentive Measure to U.S. Environmental Protection Agency (U.S. EPA) to be included in the California SIP. U.S. EPA approved the South Coast Incentive Measure on January 15, 2021.

According to U.S. EPA guidelines, emissions reductions achieved from the implementation of an incentive program can be credited towards the State's aggregate commitment if they meet the following integrity elements: enforceable, quantifiable, surplus, and permanent.¹ The reductions achieved in the Basin from turning over trucks during 2019-2022 meet these integrity elements.

As part of the South Coast Incentive Measure enforceable commitment, CARB must submit annual reports, including this report, which includes the required elements list below:

- *Identify the portion of the 1,300 projects funded through the previous year by project identification number, project life, and implementation date, description of both baseline and new equipment, applicable incentive program guidelines, and quantified emission reductions;*
- *Describe any changes to the 2017 Carl Moyer Memorial Air Quality Standards Attainment Program (Moyer Program) Guidelines and related impacts on program integrity;*
- *Document CARB and South Coast Air Quality Management District (District) actions to monitor selected projects for compliance with contract requirements; and*

¹ See "Guidance on Incorporating Voluntary Mobile Source Emission Reduction Programs in State Implementation Plans (SIPs)," October 24, 1997, at page 6-7; "Improving Air Quality with Economic Incentive Programs," January 2001 at Section 4.1; "Incorporating Emerging and Voluntary Measures in a State Implementation Plan (SIP)," September 2004 at pages 3-4' and "Diesel Retrofits: Quantifying and Using Their Emission Benefits in SIPs and Conformity," February 2014 at pages 27-29.

- *Determine whether the identified projects are projected to achieve the full one ton per day of NOx emissions reductions in the Basin in 2023.*

CARB staff collaborated with District staff to identify categories of trucks captive in the Basin that will be replaced using 2019 through 2022 funding and achieve the first ton of emissions reductions from this effort. The reductions will be credited against CARB's 2023 aggregate emission reduction commitment for the 80 ppb standard in the Basin.

This fourth annual report on the South Coast Incentive Measure shows the progress made towards incentivizing the turnover of older diesel trucks to vehicles and engines meeting the 0.02 g/bhp-hr emissions standard. As part of the South Coast Incentive Measure, CARB committed to reducing 1.0 ton per day (tpd) of oxides of nitrogen (NOx) emissions by funding 1,300 on-road, heavy-duty compression ignition truck repower and replacement projects in accordance with the Moyer Program Guidelines. Further, by July 1, 2021, if U.S. EPA determined that information submitted by CARB is insufficient to demonstrate that emission reductions required will occur on schedule, CARB will adopt and submit to U.S. EPA, no later than September 1, 2022, substitute measures and/or rules that will achieve emission reductions addressing the shortfall as expeditiously as practicable and no later than January 1, 2023.

Projects Funded and Completed Through 2022

Funding Update

The State Legislature has directed millions of dollars towards incentive programs. These incentive programs focus on accelerating the turnover of older and dirtier vehicles to newer and cleaner ones. Since the Board adopted the South Coast Incentive Measure, the State Legislature adopted and the Governor signed Assembly Bill (AB) 617, which established the Community Air Protection Program (CAPP). CAPP provides a new funding source, initially implemented through the Moyer Program and Proposition 1B Goods Movement Emission Reduction Program (Prop 1B).

Other incentive funding, such as the Air Quality Improvement Program and Greenhouse Gas Reduction Fund, is channeled into the California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP). These incentive funding sources have funded heavy-duty truck projects with significant amounts of emissions reductions from vehicles and engines meeting the 0.02 g/bhp-hr emission standard operating in the Basin since 2016.

COVID-19 Impacts

The COVID-19 pandemic and the resulting health and economic crisis have had drastic and wide-ranging impacts on the lives, livelihoods, and behaviors of people around the world. As it relates to the South Coast Incentive Measure, the COVID-19 health and economic crisis has

disrupted the supply chain for manufacturing of vehicles and placed financial strain on many contracted applicants. The supply chain disruption has delayed the delivery of vehicles to awarded contracts. Inflation and low truck inventory have driven up the cost of new combustion trucks meeting the 0.02 g/bhp-hr emission standard. Also, this financial and affordability strain has forced some applicants including small fleets to withdraw from their awarded contracts that had not yet been paid from the Moyer Program. Fortunately, the funding for these withdrawn projects is being redirected to new applicants and thereby, still achieving emissions reductions.

Fourth and Final Year: 2019, 2020, 2021, and 2022 Projects

This year represents the fourth and final year of reporting on the progress towards achieving the South Coast Incentive Measure emissions reduction commitment. As of December 31, 2022, 70 drayage and refuse truck replacement projects were funded through the Moyer Program in the Basin. Project information specific to these 70 trucks is provided in Appendix A. Additional Moyer Program projects are under contract and awaiting delivery from the manufacturer. Specifically, these are 179 Moyer Program replacement projects waiting for delivery.

Table 1: Project Status by Incentive Program

Project Types	Number of Projects	NOx Emissions Reductions (tpd) ²
Completed Moyer Guideline Projects	70	0.06
Contracted Moyer Guideline Projects	179	0.10
Total	249	0.16

The Moyer Program in the Basin is administered by the District. The District has noted several barriers in administering the Moyer Program including significant delivery delays and compliance deadlines. The global supply chain disruptions have caused significant delays in truck deliveries. In 2022, most major original equipment manufacturers stopped taking orders for trucks certified to the 0.02 g/bhp-hr standard and zero -emission trucks, and deliveries aren't expected until 2023. With the Truck and Bus Regulation deadline of January 1, 2023, applicants need a compliant truck to operate beyond the Truck and Bus Regulation and this caused applicant withdraws from the Moyer Program to pursue other options. These events among others have slowed the District's ability to complete the Moyer Program projects.

In addition to the Moyer Program, other incentive programs are successfully accelerating the turnover of older diesel engines to cleaner engines. Through Prop 1B, 383 truck replacement

² Numbers may not add due to rounding.

projects were completed between 2019 and 2022, with an additional 272 projects under contract and awaiting delivery. HVIP has turned over 2,119 trucks to those with engines meeting the 0.02 g/bhp-hr emission standard in the Basin. Together, the Moyer Program, Prop 1B, and HVIP have paid or are awaiting delivery for the replacement of over 3,000 trucks in the Basin. These significant investments have and will continue to improve the air quality and health for the communities in the Basin.

Substitute Measures

As part of the South Coast Incentive Measure, CARB committed to reducing 1.0 tpd of NO_x emissions by funding 1,300 on-road, heavy-duty compression ignition truck repower and replacement projects in accordance with the Moyer Program Guidelines. The South Coast Incentive Measure committed to turnover through a specific group of Moyer Program projects and, as described above in Table 1, this specific group is short of meeting the originally estimated commitment. On June 30, 2021, U.S. EPA sent CARB a letter with an insufficiency finding determining that “the information provided to date is insufficient to demonstrate that the 1.0 tpd NO_x tonnage commitment will be achieved through the Moyer Program on-road heavy-duty replacement and repower projects by December 31, 2022.”

Therefore, to fulfill the South Coast Incentive Measure enforceable commitment, on February 24, 2023, CARB submitted to U.S. EPA the Control Measure for Ocean-Going Vessels At Berth (At Berth Regulation) as a substitute measure and/or rule that will achieve the emission reductions shortfall from the South Coast Incentive Measure. Although the 2016 State SIP Strategy included the At Berth Regulation as a measure commitment, emission reductions of only 0.3 tpd NO_x in the Basin in 2023 were estimated at that time. Due to changes included in the At Berth Regulation as adopted in 2020, emissions reductions are higher than estimated in the 2016 State SIP Strategy. CARB staff quantified an additional 0.8 tpd NO_x emissions reductions from this rulemaking in the Basin in 2023 beyond the 2016 State SIP Strategy estimate that serve to substitute for the reductions shortfall from the South Coast Incentive Measure.

Changes to Guidelines

The South Coast Incentive Measure requires CARB to report any changes to the Moyer Program Guidelines and related impacts on program integrity. The Board adopted limited changes to the Moyer Program to support the State Legislature’s allocation of \$45 million to fund on-road trucks through the Moyer Program, as well as broader changes to cost-effectiveness thresholds to ensure the Moyer Program continues to focus on developing the most advanced zero-emission and low emission technologies, consistent with encouraging further emissions reductions. Currently, on-road projects that fund engines meeting the 0.02 g/bhp-hr NO_x standard have demonstrated higher incremental costs above that of engines meeting the 0.02 g/bhp-hr NO_x standard as demonstrated by studies found by the

Heavy-Duty Engine and Vehicle Omnibus Regulation ([Heavy-Duty Omnibus Regulation | California Air Resources Board](#)). These changes are limited and have no integrity element impacts to the Moyer Program as it relates to South Coast Incentive Measure.

Confirmation of Project Compliance

CARB Program Oversight

CARB works with the District to administer programs that provide financial incentives that clean the air by advancing lower emitting engines and technologies, including through the Moyer Program. The District and CARB share a commitment to make these incentive programs work efficiently and effectively to clean the air.

California Health and Safety Code sections 39500, 39808, 44286, and 44291 give CARB the authority and direction to oversee the implementation of incentive programs. The Board works to ensure the programs are conducted in a manner consistent with applicable laws and guidelines and that expected emissions reductions are achieved. CARB oversight increases incentive program accountability by providing a mechanism to identify program deficiencies, make corrections, and ensure public funds are spent in a manner consistent with statutory intent. The objectives of this oversight include:

- identify strengths of district programs that can be shared with other districts; providing stronger outcomes for incentive programs statewide;
- identify training needs for air district staff;
- highlight areas in State guidance that require clarification;
- help CARB understand local challenges in program implementation; and
- strengthen the working relationship between State and local entities.

Guidelines for incentive program review are found in Chapter 3, Section R of the Moyer Program Guidelines, approved by the Board on April 27, 2017. The Policies and Procedures document provides districts and the public additional information on how reviews and audits are conducted for the Moyer Program and other incentive programs. The current version of these Policies and Procedures is available to the public on the CARB website. CARB may deviate from these Policies and Procedures with reasonable cause. If this occurs, the district under review will be notified and any significant variations in policy or procedure will be described in the program review report issued by CARB.

As part of this oversight responsibility, CARB conducted a review of the incentive programs implemented by the South Coast. In December 2019, CARB published "[Air Pollution Reduction Incentive Programs, PROGRAM REVIEW REPORT, South Coast Air Quality Management District, Fiscal Years 2008-09 through 2014-15](#)" that documents CARB's programmatic review, the projects selected for review and site inspection, and any findings, recommendations, and commendable efforts.

CARB's program review has concluded that the District's Moyer Program is efficiently and effectively achieving their emission reduction objectives. CARB staff identified no findings for the District's implementation of the Moyer Program, but offers one recommendation following review of project files. CARB recommends development of additional project file procedures that may ensure file completeness and agreement with reporting database(s). District staff has responded and acknowledge these recommendations, indicating the intent to review their documentation procedures, and grant award agreements with additional detail and clarification for consistency.

District Project Oversight

The District is responsible for implementing the Moyer Program in the Basin. The District performs the following to ensure the projects meet all requirements in the Moyer Program Guidelines.

- Perform a pre-inspection to verify that all the old truck's information on the application including Vehicle Identification Number (VIN), odometer, engine serial number, etc. are as specified in the original application;
- After the new truck arrives, perform a post inspection to ensure the new truck has the correct specifications;
- Perform a pre-dismantle inspection to verify that the replaced truck in the application is the same truck going to the dismantler and that the replaced truck has not been stripped; and
- Perform a post destruction inspection to verify that the correct truck was destroyed properly, including a hole in the engine block and frame cut in half to ensure the engine is inoperable.

Sample Project

Appendix B shows an example of the photos and documentation included in the District's inspection report. These photos are from an inspection report for one of the 70 Moyer Program Guideline projects listed in Appendix A. The photos show the replaced engine being destroyed. Photos are a typical form of documentation verifying destruction of the replaced engine. A picture of the VIN is provided to verify the engine is on the project life.

Emission Reduction Calculations

The South Coast Incentive Measure included a sample project emission reduction calculation in Appendix A of the South Coast Incentive Measure, using CARB's 2014 Emission Factors (EMFAC2014) for activity data to estimate drayage and refuse truck emissions reductions. The emissions reduction estimates are based on the formula and emission factors found in Appendix C and D of the Moyer Program Guidelines.

Table 2 summarizes the NOx emissions reductions per project as estimated in the South Coast Incentive Measure and the actual emissions reductions achieved by the 70 funded Moyer Program Guideline projects included in Appendix A. Table 2 shows actual emissions reductions are achieving the emissions reductions per project that are equivalent to the estimates in the South Coast Incentive Measure.

Table 2: NOx Emissions Reductions (tpd) per Drayage and Refuse Truck Project

Emission Reduction Source	Drayage Truck NOx Emissions Reductions (tpd)	Refuse Truck NOx Emissions Reductions (tpd)
South Coast Incentive Measure	0.0003	0.0017
Moyer Program Reported Project	0.0003 ³	0.0020

³ For the drayage truck calculation, the South Coast Incentive Measure Appendix A Example 1 accidentally used 58,853 miles per year for step (b) on page 24 instead of 53,853 miles per year. Therefore, the South Coast Incentive Measure should have drayage truck NOx emissions reductions at 0.0004 tpd (58,853 miles) instead of 0.0003 tpd (53,853 miles). This typographical error did not carry over in estimating the 1,300 trucks turned over and did not affect any other calculations.