

BOARD MEETING DATE: February 3, 2017

AGENDA NO. 4

PROPOSAL: Recognize Revenue and Execute Contract for Development of Ultra-Low Emission Diesel Engine for On-Road Heavy-Duty Vehicles

SYNOPSIS: On July 7, 2016, the Board released a Request for Information to obtain technical information on ultra-low NOx emission technologies for heavy-duty diesel engines. Two responses were received, one of which was from the Southwest Research Institute (SwRI). CARB had previously awarded a contract to SwRI to investigate and demonstrate emission control strategies for 13-liter diesel engines to achieve 90% emission reductions compared to the current NOx standard. As a follow-on to this successful demonstration project, CARB and the Port of Los Angeles (POLA) have expressed interest in cofunding the advancement of current larger displacement diesel engines to achieve ultra-low NOx emissions. Staff proposes to cost-share the project. CARB will contract directly with SwRI while the POLA cofunding will pass through the SCAQMD. These actions are to recognize up to \$287,500 from POLA and execute a contract with SwRI for development of an ultra-low emission heavy-duty diesel engine in an amount not to exceed \$575,000 from the Clean Fuels Fund (31).

COMMITTEE: Technology, January 20, 2017; Recommended for Approval

RECOMMENDED ACTIONS:

1. Recognize, upon receipt, up to \$287,500 from the Port of Los Angeles into the Clean Fuels Fund (31) for the development of an ultra-low emission diesel engine for on-road heavy-duty vehicles; and
2. Authorize the Chairman to execute a contract with SwRI for the development of an ultra-low emission diesel engine for on-road heavy-duty vehicles in an amount not to exceed \$575,000 from the Clean Fuels Fund (31).

Wayne Nastri
Executive Officer

Background

On-road heavy-duty vehicles are currently one of the largest sources of NO_x emissions in the South Coast Air Basin. Reductions of on-road heavy-duty vehicle NO_x emissions beyond the 2010 NO_x emission standard will be required to meet national ambient air quality standards. Consequently, the Board recently cofunded the development of on-road heavy-duty natural gas engines that are at least 90% cleaner than the current on-road heavy-duty engine NO_x emission standard. As a result, a new generation of heavy-duty natural gas engines are now certified by CARB and U.S. EPA to meet a 0.02 grams per brake horsepower hour (g/bhp-hr) NO_x emission level. Now that the Cummins Westport ISL G 8.9-liter engine is in production, similar efforts are being devoted by CARB and others to develop larger displacement heavy-duty diesel engines.

On July 7, 2016, the Board released a Request for Information (RFI) to obtain technical information on ultra-low NO_x emission technologies for heavy-duty diesel engines. Two responses were received, one of which was from Southwest Research Institute (SwRI) describing a previously funded CARB project to investigate and demonstrate technological pathways for development of a 13-liter heavy-duty diesel engine that can achieve 0.02 g/bhp-hr NO_x emission level. Since a few of the technology strategies, all of which included a combination of advanced aftertreatment technology devices, were successfully demonstrated, CARB and the Port of Los Angeles (POLA) have expressed interest in cofunding the advancement of current larger displacement (larger than 13-liter) diesel engines to achieve ultra-low NO_x emission reductions. CARB proposes to contract directly with SwRI while the POLA cofunding of \$287,500 will be passed through the SCAQMD. The other proposal, also from SwRI, did not focus on large displacement engine development and thus was not within the focus of the RFI.

Proposal

This action is to recognize revenue up to \$287,500 from POLA into the Clean Fuels Fund (31). This action is to also execute a contract with SwRI for development of ultra-low emission heavy-duty diesel engines in an amount not to exceed \$575,000, of which SCAQMD's share is not to exceed \$287,500.

The objective of the proposed project is to use lessons learned from the successful 13-liter heavy-duty diesel engine demonstration project to advance engine and aftertreatment technologies in current heavy-duty diesel engines to achieve NO_x emission levels that are at least 90% lower than 2010 heavy-duty NO_x emission standards. SwRI will be required to: (1) identify specific diesel engines, test cycles and aftertreatment technologies, (2) characterize the baseline emission performance of the engine, (3) determine engine characteristics for cold starts, hot starts, normal operation and low-load, low-temperature operation, and (4) define possible engine control strategies. Based on the engine performance and engine control strategies, SwRI will be required to select technology pathways for screening and final engine system

development. Once developed, the engine will be tested using both the Federal Test Procedure for emission certification and non-certification test cycles representative of real-world use in different vocations that are prevalent in the air basin. The use of vocational specific test cycles will provide additional insights towards the engine's real-life emission reduction potential.

Sole Source Justification

Section VIII.B.2 of the Procurement Policy and Procedure identifies four major provisions under which a sole source award may be justified. This request for sole source award is made under provision B.2.d.: Other circumstances exist which in the determination of the Executive Officer require such waiver in the best interest of the SCAQMD. Specifically, these circumstances are B.2.d.(1): Project involving cost-sharing by multiple sponsors. The proposed project will be cost-shared by CARB and POLA. Details of the cost-share to be provided by CARB and POLA are shown under the Resource Impacts.

Benefits to SCAQMD

Projects to support implementation of various clean fuel vehicle programs are included in the *Technology Advancement Office Clean Fuels Program 2016 Plan Update* within the category "Engine Systems" under "Develop and Demonstrate Advanced Alternative Fuel Medium- and Heavy-Duty Engines and Vehicles". This project is to develop an ultra-low NOx emission diesel engine for on-road heavy-duty vehicles. This engine also can be fueled with renewable diesel fuels. Successful development will help to support the larger engines necessary for long haul trucking operations and contribute towards technology to support the petition for a national standard for near-zero heavy-duty engines. Longer term, it will help to accelerate wide-scale deployment of heavy-duty engines in the South Coast Air Basin with contributions toward the attainment of clean air standards for the region by significantly reducing criteria pollutant emissions from diesel-fueled trucks. Statewide, the project addresses the reduction of GHG emissions and the mandated goal of near zero NOx levels by 2021.

Resource Impacts

The proposed project budget is \$1,325,000 with pass-through funding of \$287,500 anticipated from POLA to be recognized, upon receipt, into the Clean Fuels Fund (31). SCAQMD's total cost-share will not exceed \$287,500 from the Clean Fuels Fund (31). CARB will contract directly with SwRI for a significant cost-share of \$750,000. The SCAQMD's contract with SwRI will not exceed \$575,000. Proposed project costs are broken down as follows:

Proposed Project Costs

Funding Source	Funding Amount	Percent
CARB	\$750,000	56%
POLA	\$287,500	22%
SCAQMD (<i>requested</i>)	\$287,500	22%
Total	\$1,325,000	100%

Sufficient funds are available from the Clean Fuels Fund, established as a special revenue fund resulting from the state-mandated Clean Fuels Program. The Clean Fuels Program, under Health and Safety Code Sections 40448.5 and 40512 and Vehicle Code Section 9250.11, establishes mechanisms to collect revenues from mobile sources to support projects to increase the utilization of clean fuels, including the development of the necessary advanced enabling technologies. Funds collected from motor vehicles are restricted, by statute, to be used for projects and program activities related to mobile sources that support the objectives of the Clean Fuels Program.