

BOARD MEETING DATE: July 11, 2014

AGENDA NO. 5

PROPOSAL: Recognize Revenue, Amend Air Filtration Contract and Execute New Contract to Upgrade and Demonstrate Zero-Emission Heavy-Duty Vehicles 

SYNOPSIS: The SCAQMD applied for and expects to receive a \$500,000 award from U.S. EPA under Section 105 of the Clean Air Act to sponsor Clean Air Technology Initiative projects. Staff proposes to utilize these funds to cosponsor school bus air filtration and zero-emission yard tractor projects. This action is to recognize the \$500,000 award from U.S. EPA into the Advanced Technology, Outreach and Education Fund (17). Secondly, this action is to amend a contract with IQAir to add \$170,000 from the Advanced Technology, Outreach and Education Fund (17) to install and test air filtration systems in school buses. Lastly, this action is to execute a new contract with TransPower to upgrade and demonstrate two electric yard tractors at a cost not to exceed \$405,000, comprised of \$330,000 from the Advanced Technology, Outreach and Education Fund (17) and \$75,000 from the Clean Fuels Fund (31).

COMMITTEE: Technology, June 20, 2014; Recommended for Approval

RECOMMENDED ACTIONS:

1. Recognize \$500,000, upon receipt, from the U.S. EPA into the Advanced Technology, Outreach and Education Fund (17) to cosponsor school bus air filtration and zero-emission yard tractor projects; and
2. Authorize the Chairman to:
 - a. Amend a contract with IQAir adding \$170,000 from the Advanced Technology, Outreach and Education Fund (17) to install and test air filtration systems in school buses; and

- b. Execute a new contract with TransPower to upgrade and demonstrate two electric yard tractors at a cost not to exceed \$405,000, comprised of \$330,000 from the Advanced Technology, Outreach and Education Fund (17) and \$75,000 from the Clean Fuels Fund (31).

Barry R. Wallerstein, D.Env.
Executive Officer

MMM:HH:RP:AAO:RC

Background

SCAQMD staff applied for an award from the U.S. EPA under Section 105 of the Clean Air Act (CAA) for Clean Air Technology Initiative (CATI) projects and expects to receive a \$500,000 award. CATI was established by the U.S. EPA, CARB, San Joaquin Valley Air Pollution Control District and SCAQMD to identify and implement projects that would significantly reduce emissions in communities such as San Bernardino where residents are disproportionately affected by emissions from diesel traffic along the Los Angeles and Inland Empire goods movement corridors and from diesel activities at the Ports, warehouses and railyards. Staff proposes using these funds to cosponsor school bus air filtration and zero-emission electric yard tractor technology projects in communities highly impacted by heavy diesel activities.

School Bus Air Filtration Project

On March 4, 2011, the Board authorized execution of a \$200,000 contract with IQAir to install air filtration systems at schools in Boyle Heights and San Bernardino. Air filtration systems at two schools in Boyle Heights and San Bernardino were installed successfully by September 2013. Staff proposes to capitalize on results from a recent CARB proof-of-concept study which demonstrated that air filtration systems inside passenger vehicles and school buses achieve significant reductions in ultrafine PM levels from outdoor road levels.

Electric Yard Tractor Project

In 2012 and 2013, TransPower developed and placed into regular revenue service two prototype electric yard tractors hauling heavy containers at a San Antonio retailer facility under demanding duty cycles similar to those at port terminals, warehouse distribution centers and railyards. The tractors accumulated nearly 1,000 miles of actual service and demonstrated they could operate under the duty cycle for as long as 13 hours between battery charges.

In light of these results, staff worked further with TransPower to identify additional improvements needed to accelerate early commercialization of the electric tractors and believes deploying the yard tractors at various facilities such as warehouse distribution

centers will help to gain additional information on the performance of zero-emission yard tractors under various operations.

Proposal

This action is to recognize, upon receipt, CATI funds from the U.S. EPA into the Advanced Technology, Outreach and Education Fund (17) and to amend a contract with IQAir and execute a new contract with TransPower using these funds as follows:

School Bus Air Filtration Project

This project with IQAir would install and test stand-alone air filtration and ventilation systems on school buses and conduct in-use testing to verify the removal of ultrafine PM, black carbon and PM_{2.5} emissions inside school buses with and without operation of the air filtration systems and under open and closed window conditions. LAUSD proposes to loan school buses of three different sizes (small, medium and large) to temporarily install air filtration and monitoring equipment to measure reductions in ultrafine PM, black carbon and PM_{2.5} during morning and evening commuting hours. Data will be collected under realistic driving conditions with students on-board the buses. This work will follow up on CARB's proof of concept study which installed air filtration systems in passenger vehicles and school buses. In-cabin and on-road ultrafine PM concentrations showed between 90-93% reductions from outdoor road levels in passenger vehicles. Stand-alone air filtration systems were installed on six school buses and preliminary data analysis showed an 80-90% reduction of in-cabin ultrafine PM from outdoor road levels with operation of the air filtration systems.

Electric Yard Tractor Project

This project with TransPower would upgrade and demonstrate two electric yard tractors at warehouse distribution centers in the South Coast Air Basin. The upgrade of the two heavy-duty electric yard tractors will incorporate all of the lessons learned during the demonstration of the tractors in San Antonio, Texas, including, at a minimum:

- Adaptation of a heavier duty transmission and shifting mechanism;
- Improvement of automated shifting software, monitoring and protection of batteries when vehicles are unattended, integration of battery monitoring and overall tractor control software, the battery management system sensor design and an electrically driven accessory inverter;
- Modification of battery cell packaging to improve accessibility for servicing; and
- Demonstration of the electric yard tractors at various goods movement facilities in the SCAQMD as part of a loaner program.

Benefits to SCAQMD

The proposed school bus air filtration and electric yard tractor projects support the implementation of CATI plans and SCAQMD's Clean Communities Plan which identifies Boyle Heights and San Bernardino as two areas to begin development of a

Community Exposure Reduction Plan to identify strategies to reduce criteria and toxic pollutants. In addition, the electric yard tractor project promotes the development of zero-emission goods movement equipment, specifically involving ports, warehouses, distribution centers, and railyards in the South Coast Air Basin. Zero-emission transportation and goods movement technologies are also included within SCAG's Regional Transportation Plan, the joint CARB, SCAQMD and San Joaquin Valley APCD *Vision for Clean Air* document, and SCAQMD's FY 2013-14 Goals and Objectives.

Installation of air filtration systems in school buses will reduce children's exposure to the negative health impacts of ultrafine particulate matter. It will also demonstrate how existing school buses can easily be retrofitted to incorporate air filtration technologies and help foster acceptance and commercialization of these air filtration technologies for school buses.

Furthermore, successful demonstration of battery electric yard tractors will move the technology closer to commercialization for wide-scale market deployment and the region closer to attainment of clean air standards by eliminating diesel particulate matter and NO_x emissions. Additionally, since yard tractors are used to move goods in and around warehouse distribution centers, marine port terminals, and railyards, the application of zero-emission technologies will improve the air quality in these disproportionately impacted communities.

These activities are included in the *Technology Advancement Office Clean Fuels Program 2014 Plan Update* under "Electric/Hybrid Technologies & Infrastructure."

Sole Source Justification

Section VIII.B.3 of the Procurement Policy and Procedure identifies four provisions under which a sole source award may be justified for contracts funded in whole or in part with federal funds. This request for sole source awards to IQAir and TransPower are made under provision B.3a: The item is available from a single source.

School Bus Air Filtration Project

In 2010, SCAQMD released a Program Announcement (PON2010-02) to solicit and test the effectiveness of qualified air filtration devices in reducing the exposure of children to outdoor-infiltrated and indoor-generated ultrafine particles and black carbon emissions by at least 85% while maintaining a noise level below 45 decibels. In addition, staff contacted over 150 manufacturers, and nine companies provided a total of 15 different air filtration systems in the testing opportunity. Based on test results, IQAir's stand-alone air filtration device was the only technology that satisfied both performance requirements. As such, IQAir air filtration technology is selected for a follow-on evaluation on school buses.

Electric Yard Tractor Project

TransPower’s prototype electric yard tractors were placed into regular service hauling heavy containers weighing as much as 80,000 pounds and achieved operating speed of up to 43 miles per hour. The tractors also showed they could operate under demanding duty cycle for as long as 13 hours between battery charges. As such, TransPower’s electric tractor is selected for a follow-on demonstration study because staff is unaware of any other electric vehicle technology that has achieved similar performance metrics in an actual service environment.

Resource Impacts

The total SCAQMD cost for both the amended and new contracts shall not exceed \$575,000, comprised of \$500,000 to be recognized from U.S. EPA into the Advanced Technology, Outreach and Education Fund (17) and \$75,000 from the Clean Fuels Fund (31). Projects costs are summarized in the tables below.

Proposed Project	Funding Partners	Funding Amount
Installation of Air Filtration Systems in School Buses	U.S. EPA	\$170,000
	Total	\$170,000

Proposed Project	Funding Partners	Funding Amount
Electric Yard Tractor Project	U.S. EPA	\$330,000
	SCAQMD (requested)	\$75,000
	Total	\$405,000