

BOARD MEETING DATE: June 5, 2015

AGENDA NO. 3

PROPOSAL: Execute Contracts to Develop and Demonstrate Class 8 Plug-In Hybrid Electric Drayage Trucks and Amend Contract to Integrate On-Board Chargers 

SYNOPSIS: On October 5, 2012, the Board approved \$958,120 for Vision Industries and \$925,000 for Balqon to develop and demonstrate zero emission drayage trucks as part of a DOE-funded zero emission cargo transport demonstration project. Since then, Vision Industries has filed for bankruptcy and ceased operation and Balqon has notified the SCAQMD of their decision to withdraw from the project leaving \$1,883,120 of the DOE funds available for reallocation. This action is to execute contracts, pending approval by the DOE, with Transportation Power Inc. and US Hybrid to develop and demonstrate Class 8 plug-in hybrid electric drayage trucks. This action is to also amend a contract with US Hybrid to add on-board chargers in their battery electric drayage trucks. The total amount of awards shall not exceed \$2,176,342, comprised of \$1,883,120 from the DOE funds recognized in the Advanced Technology Goods Movement Fund (61) and \$293,222 from the Clean Fuels Fund (31).

COMMITTEE: Technology, May 15, 2015; Recommended for Approval

RECOMMENDED ACTIONS:

1. Authorize the Chairman to execute contracts, contingent upon DOE approval, with the following entities:
 - A. Transportation Power Inc. to develop and demonstrate two Class 8 CNG plug-in hybrid electric drayage trucks in an amount not to exceed \$1,153,446, comprised of \$958,120 from the Advanced Technology Goods Movement Fund (61) and \$195,326 from the Clean Fuels Fund (31); and
 - B. US Hybrid to develop and demonstrate three Class 8 LNG plug-in hybrid electric drayage trucks in an amount not to exceed \$947,896, comprised of \$925,000 from the Advanced Technology Goods Movement Fund (61) and \$22,896 from the Clean Fuels Fund (31).

2. Authorize the Chairman to amend a contract with US Hybrid to integrate on-board chargers into two battery electric drayage trucks in an amount not to exceed \$75,000 from the Clean Fuels Fund (31).

Barry R. Wallerstein, D.Env.
Executive Officer

MMM:FM:BC

Background

Heavy-duty diesel trucks in the South Coast Air Basin remain a large source of emissions with adverse health effects, especially in the surrounding communities along the goods movement corridors near the Ports of Los Angeles and Long Beach and next to major freeways. In order to mitigate the impact and attain stringent federal ozone standards, SCAQMD has been strongly promoting and supporting the development and deployment of advanced zero emission cargo transport technologies.

Replacement Projects

On October 5, 2012, the Board recognized a \$4,169,000 grant from DOE into the Advanced Technology Goods Movement Fund (61) for the development and demonstration of zero emission drayage truck technologies. Concurrently, the Board also approved contracts with four electric vehicle manufacturers to develop these truck technologies, including a \$958,120 contract with Vision Industries for four fuel cell drayage trucks and a \$925,000 contract with Balqon for three battery electric drayage trucks. On September 24, 2014, Vision Industries filed for Chapter 11 bankruptcy protection, with an intention to continue with the project once they re-emerged from the reorganization process. However, in December 2014, the case was subsequently converted to a Chapter 7 liquidation bankruptcy and Vision Industries ceased operation. Furthermore, due to limited resources, Balqon has notified the SCAQMD of their decision to withdraw from their vehicle demonstration project. With both Vision and Balqon no longer able to proceed with their projects, staff has proposed alternative electric drayage truck technologies as replacement projects.

On-Board Chargers

US Hybrid is one of four manufacturers awarded contracts by the Board to develop zero emission drayage trucks. US Hybrid has been developing two battery electric trucks in this project with a plan to use off-board chargers to support the trucks during demonstration. However, based on feedback from fleet operators and available EV charging infrastructure for heavy-duty trucks at the demonstrator sites, US Hybrid has

opted to upgrade their electric trucks with an on-board charger to offer simpler charging logistics and cost savings for fleet operators.

Proposal

This action is to execute contracts, contingent upon approval by DOE, with Transportation Power Inc. (TransPower) to develop and demonstrate two Class 8 CNG plug-in hybrid electric drayage trucks and with US Hybrid to develop and demonstrate three Class 8 LNG plug-in hybrid electric drayage trucks. This action is also to amend a contract with US Hybrid to integrate on-board chargers in their battery electric trucks.

Replacement Projects

TransPower will manufacture two Class 8 CNG plug-in hybrid electric drayage trucks with a targeted operating range of 150-200 miles, including 30-40 all-electric miles. The hybrid technology is based on the advanced electric drive system TransPower has developed for their battery electric trucks, which are currently in demonstration with fleet partners at the Ports of Los Angeles and Long Beach. The proposed CNG hybrid electric trucks also share many components and subsystems with the catenary truck that TransPower is developing for the Siemens overhead catenary system demonstration. In addition, by utilizing commercially available and widely used CNG engines and components, these trucks are expected to be more cost-competitive and well-positioned for commercialization.

US Hybrid will develop three Class 8 LNG plug-in hybrid electric drayage trucks for demonstration. US Hybrid is currently working to develop two LNG hybrid trucks using Autocar trucks with an 8.9L ISL G engine but the trucks are designed for refuse haulers with a heavy front axle. For the proposed project, US Hybrid will convert three LNG drayage trucks from Total Transportation Services, Inc. (TTSI) with the hybrid electric drive system they have developed for demonstration in revenue drayage service. The battery pack will be 80-100 kilowatt-hour (kWh) and will provide a target of 30-40 miles of all-electric range.

These natural gas hybrid trucks will be deployed in revenue drayage service for at least two years of demonstration. With the anticipated 30-40 miles of all electric range, these trucks will be designed to operate mostly with zero tailpipe emissions during idling and low-power operations in sensitive zones around the ports and railyards, which may account for up to 40% of the drayage duty cycles.

On-Board Chargers

US Hybrid will develop an on-board charger for the two battery electric drayage trucks they are building for demonstration as part of a DOE-funded zero emission cargo transport demonstration project. The on-board charger will have approximately 60 kW in charging capacity and will be compatible with the charger interface plugs, control

signals and feeders for the EV supply equipment to be used by fleet operators, including TTSI and SA Recycling, during demonstration. This upgrade will provide simpler charging logistics for the fleet demonstrators in lieu of bulky off-board chargers. Furthermore, this will negate any need for the fleet demonstrators to be concerned with additional electrical work to accommodate off-board chargers in this project.

Sole Source Justification

Section VIII.B.3. of the Procurement Policy and Procedure identifies provisions under which a sole source award may be justified when funded in whole or in part with federal funds. The request for a sole source award for this project is made under the provision B.3.c: The awarding federal agency authorizes noncompetitive proposals. Both plug-in hybrid electric truck projects will be funded by DOE under their Zero Emission Cargo Transport Demonstration Program. Additionally, TransPower has been awarded funds for the CNG hybrid electric trucks by CEC under PON-13-506 – Natural Gas Engine-Hybrid Electric Research and Development. US Hybrid is also leveraging a portion of a CEC grant they have received as a subcontractor to Gas Technology Institute under PON-10-603 – Advanced Medium- and Heavy-Duty Vehicle Technologies Pre-Commercial Demonstrations for the proposed project. Both TransPower and US Hybrid have extensive knowledge and experience in advanced electric vehicle technologies that are required to successfully complete this project in a timely manner. For the proposed on-board charger project, US Hybrid has also requested the San Pedro Bay Port’s Technology Advancement Program (TAP) to co-sponsor this upgrade for their battery electric trucks.

Benefits to SCAQMD

These projects are included in the *Technology Advancement Office Clean Fuels Program 2015 Plan Update* under “Electric/Hybrid Technologies & Infrastructure.” Successful development and demonstration of hybrid electric drayage trucks will move the technology closer to commercialization for wide-scale market deployment as well as move the region closer to attainment of clean air standards by eliminating diesel particulate matter and substantially reducing NO_x emissions. Additionally, since drayage trucks are used to move goods in and around the ports, the application of zero emission and near-zero emission technologies will improve the air quality in the surrounding communities that are disproportionately impacted by these operations.

Resource Impacts

The SCAQMD’s total cost-share for these three projects shall not exceed \$2,176,342, comprised of \$1,883,120 in DOE funds (originally allocated for Vision Industries and Balqon), which were recognized in the Advanced Technology Goods Movement Fund (61), and \$293,222 from the Clean Fuels Fund (31). Project costs and funding amounts from participating entities are summarized in the tables below:

Proposed Project	Funding Partners	Cost-Share	Percentage
CNG Plug-In Hybrid Electric Trucks	DOE	\$958,120	46%
	CEC	\$900,000	43%
	TransPower	\$50,000	2%
	SCAQMD (<i>requested</i>)	\$195,326	9%
	Total	\$2,103,446	100%

Proposed Project	Funding Partners	Cost-Share	Percentage
LNG Plug-In Hybrid Electric Trucks	DOE	\$925,000	44%
	CEC	\$450,000	21%
	TTSI	\$630,000	30%
	US Hybrid	\$90,000	4%
	SCAQMD (<i>requested</i>)	\$22,896	1%
	Total	\$2,117,896	100%

Proposed Project	Funding Partners	Cost-Share	Percentage
On-Board Chargers	Ports/TAP	\$75,000	50%
	SCAQMD (<i>requested</i>)	\$75,000	50%
	Total	\$150,000	100%

Sufficient funds are available in the Clean Fuels Fund (31) for this proposed project. The Clean Fuels Fund (31) is 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.