BOARD MEETING DATE: September 1, 2017 AGENDA NO. 3

PROPOSAL: Execute Contract to Cosponsor Versatile Plug-In Auxiliary Power Systems Demonstration

SYNOPSIS: In December 2015, the Board awarded a contract to the Electric Power Research Institute, Inc., (EPRI) to cosponsor development and demonstration of a Versatile Plug-In Auxiliary (VAP) System. EPRI is now requesting to use the previously approved cost-share for the second phase of the VAP System demonstration to evaluate the benefits and impacts of electric auxiliary power on emissions and fuel usage in various on-board and stationary applications. Up to three units will undergo baseline tests at Southern California Edison's EV Technical Center prior to field demonstration within SCAQMD. This action is to execute a contract with EPRI to demonstrate up to three VAP systems in various applications in an amount not to exceed $125,000 from the Clean Fuels Program Fund (31).

COMMITTEE: Technology, July 21, 2017; Recommended for Approval

RECOMMENDED ACTION:
Authorize the Chairman to execute a contract with the Electric Power Research Institute, Inc., to cosponsor demonstration of up to three Versatile Plug-In Auxiliary Power systems in an amount not to exceed $125,000 from the Clean Fuels Program Fund (31).

Wayne Nastri
Executive Officer

MMM:FM:NB:LHM

Background
In December 2015, the Board awarded a contract not to exceed $125,000 to the Electric Power Research Institute (EPRI) to develop and demonstrate Versatile Plug-In Auxiliary Power (VAP) systems to provide job site electric auxiliary power to evaluate the emissions and fuel usage benefits.

The VAP System provides a multifaceted approach to electrify both fleet vehicles and job sites. The core principle is to use battery energy storage with various types of export power systems to provide zero emission electric power in place of a traditional vehicle engine or portable internal combustion (IC) generator-supplied power. The concept can be applied to vehicle systems, such as cabin cooling through electric air conditioning and chassis electrical support for laptops, tool chargers and vehicle lights to perform varying degrees of job site electrification and idle-free work operation.

In Phase 1, SCE conducted bench tests on the VAP units provided by LG Chem as originally proposed, but they were not acceptable, so the unit was not installed for on-road testing. Phase 1 costs totaled $677,000 of in-kind support from project partners including SCE and EPRI. SCAQMD's cost-share was not expended because the on-road testing was not conducted. Based on the Phase I testing results, systems from alternative suppliers were evaluated and the scope of the project has expanded to include systems for portable power and portable DC fast charging.

Proposal

This action is to execute a contract with EPRI to cosponsor demonstration of up to three VAP systems within the SCAQMD. The objective is to evaluate the emissions and fuel usage benefits and impacts of electric auxiliary power used in various applications (e.g., truck or trailer mounted or independent mobile configuration for job sites). Baseline tests will be done by SCE on all VAP systems prior to field demonstrations.

Leveraging cost reductions in lithium-ion battery technology and specifications, testing procedures, and lessons learned in the first phase of this project, this second phase will procure, test and demonstrate multiple electrical platforms in the following subcategories:

- Small Energy VAP System Platform for job site and vehicle electrification
- Large Energy VAP System Platform for job site electrification
- Large Energy VAP System Platform for portable electric vehicle DC fast charger

All three systems will be available for demonstrations with end-users such as military, police, fire and other users identified by the project team.

The small energy VAP system to be procured from Envoltz or another provider is smaller than originally proposed and intended for installation on a work vehicle and will focus on cabin cooling, chassis electrical support and export power for light electric loads such as portable lights and cordless tool chargers. The small VAP system may be demonstrated with utility work crews at various sites and within various applications.

The two large energy VAP systems to be procured from Freewire Mobi or another provider are larger than originally proposed, and will be demonstrated within a portable IC generator application. One large energy VAP system will focus on replacing portable IC generators in applications such as a fiber optics splicing vehicle, or underground cable installation vehicle, that have constant and high loads to run air blowers, welders, climate control systems and tools currently being supplied by on-board IC generators. The other 48 kWh large VAP system will be demonstrated as a DC fast charger application with a dedicated SAEJ177- compliant Combined Charging System (CCS) fast charger connection to evaluate the usefulness and demand of a DC fast charger without the high cost of infrastructure installation costs. These Freewire Mobi units re-use lithium ion (LiMn2O4) cells from Nissan Leaf EVs, but are liquid-cooled for improved life in stationary applications.

SCE will support the deployments and evaluate the VAP systems based on the real-world needs of participants, including feedback regarding ideal sizing of energy storage systems in the most effective manner. Additional VAP systems may be produced and demonstrated in additional applications, if additional cofunding is provided. Data will be collected from each VAP system for at least 12 months, then compiled and analyzed by EPRI in a publicly available report.

Benefits to SCAQMD

The AQMP relies upon the expedited implementation of advanced technologies in Southern California to achieve air quality standards and to continue reductions in air toxic exposure. This project will apply advanced energy storage technologies in various platforms to identify best fit applications, determine their viability, gauge fleet interest and provide a pathway to commercialization. The proposed project is included in the *Technology Advancement Office Clean Fuels Program 2017 Plan Update* under "Demonstrate Alternative Energy Storage."

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. These requests for sole source awards are 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 and B.2.d.(8): Research and development efforts with educational institutions or nonprofit organizations.

EPRI, founded in 1973 as a non-profit energy research consortium, manages a far-reaching program of scientific research, technology development and product implementation and has a long history of managing and supporting similar projects involving development and commercialization of new technologies. The team brought together by EPRI has significant experience in demonstration support, data acquisition,

system evaluation, emissions and performance assessment and new technology commercialization.

Resource Impacts
Funding from the Clean Fuels Program Fund (31) shall not exceed $125,000. Project partners and proposed funding for Phase 2 demonstration are as follows:

Project Partner	Funding	(In-kind)
SCE	$128,000	Labor for VAP operation in SCE fleet, data collection
Utility/Military/Police/Fire	$20,000	LADWP invited or other partner*
SCAQMD *(requested)*	$125,000	
Total	**$273,000**	

*EPRI is in negotiation with LADWP and/or another potential demonstration partner

Sufficient funds are available in the Clean Fuels Fund (31), which is established as special revenue 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.