

BOARD MEETING DATE: March 3, 2017

AGENDA NO. 4

PROPOSAL: Execute Contract to Develop and Demonstrate Electric School Buses with Vehicle-to-Grid Capability 

SYNOPSIS: DOE recently awarded the Blue Bird Body Company, Inc. \$4,902,237 for the development and demonstration of electric school buses with vehicle-to-grid (V2G) capability. Blue Bird Body Company proposes to develop and manufacture V2G electric school buses and demonstrate them in the Rialto Unified School District. Staff proposes to cost-share this project. This action is to execute a contract with Blue Bird Body Company for the development, manufacture and demonstration of electric school buses in an amount not to exceed \$1,900,000 from the Lower-Emission School Bus Fund (33).

COMMITTEE: Technology, February 17, 2017; Recommended for Approval

RECOMMENDED ACTION:

Authorize the Chairman to execute a contract with Blue Bird Body Company for the development, manufacture and demonstration of electric school buses in an amount not to exceed \$1,900,000 from the Lower-Emissions School Bus Fund (33).

Wayne Natri
Executive Officer

MMM:FM:NB:JI

Background

Blue Bird Body Company (Blue Bird) is one of the largest suppliers of school buses in the South Coast and has previously developed and commercialized alternative fuel buses. Blue Bird has been investigating methods of introducing electric vehicles into the national school bus market for the last decade. In 2010, Blue Bird hired consulting firm National Strategies, LLC, (NSI) to conduct an independent evaluation of market entry strategies. In 2015, Blue Bird reengaged with NSI and in parallel conducted its own independent evaluation of potential electric drivetrain suppliers. At the end of the process, Blue Bird reaffirmed the selection of TransPower, located in Escondido,

California, as the company best qualified to support development of battery-electric school bus technologies and components. With TransPower's input, Blue Bird has taken the lead role in moving electric school buses toward commercial production. For nearly a year, Blue Bird and TransPower have been collaborating to develop designs, test procedures and manufacturing plans to enable mass production of Blue Bird buses using electric drive components developed by TransPower.

Two prototype buses were previously developed by NSI and TransPower, cofunded by the SCAQMD, and are currently being demonstrated by the Torrance Unified School District (USD).

As a follow-up to the prototype buses, Blue Bird applied to the DOE for funding to further develop components and systems required for the commercialization of electric school buses. The DOE recently awarded Blue Bird \$4,902,237 to develop, manufacture and demonstrate eight electric school buses with vehicle-to-grid (V2G) capabilities in the Rialto USD.

Proposal

Blue Bird proposes to develop a plug-in battery-electric drive system optimized for use in Types C and D (Class 6-7) school buses with V2G and vehicle-to-building (V2B) power export capabilities. The project goal is to advance the technology readiness of medium-duty electric drive components developed by TransPower and subject them to Blue Bird's intensive testing and certification procedures.

Blue Bird's strategy is to improve performance and efficiency, thereby reducing operating costs, and create new opportunities for school districts to generate revenues through the export of battery power to the grid. This strategy led the Blue Bird team to select three critical powertrain technologies for refinement: automated manual transmission (AMT), battery management system (BMS) and inverter-charger unit (ICU). TransPower's AMT allows the drive motor to operate at peak efficiency across the vehicle speed range without performance compromises. Further energy system gains can be achieved with advanced BMS technologies that are being developed by TransPower. These technologies promise to minimize parasitic energy losses and optimize usable energy from a battery subsystem of a given size. Finally, the high-efficiency ICU used in TransPower's drive system further enhances efficiency, facilitates export of power to external markets, and enables VTB capability in support of micro-grid and emergency response scenarios.

In the proposed project, the team will focus on building four electric school buses that will be subjected to Blue Bird's usual safety and durability test program. This includes crash testing of one to two buses and durability testing of another. This will be followed by the manufacture and integration of eight additional buses to be deployed by Rialto USD.

The eight production buses, upon receipt of certification from the California Highway Patrol, will be placed into service with Rialto USD. The final task will be development of a Market Transformation Plan describing how Blue Bird, with the assistance of its team members, will commercialize electric school buses using the demonstrated drive system.

Sole Source Justification

Section VIII.B.2 of the Procurement Policy and Procedure identifies provisions by which sole source awards may be justified. This request for a sole source award is made under provision B.2.d: Other circumstances exist which in the determination of the Executive Officer requires such waiver in the best interest of the SCAQMD. This request for sole source award is made under provision B.2.d(1): Projects involving cost-sharing by multiple sponsors. Project partners include the DOE, TransPower, Rialto USD, Blue Bird Body Co, and NSI.

Benefits to SCAQMD

Projects to support implementation of various clean fuel vehicle incentive programs are included in the *Technology Advancement Office Clean Fuels Program 2017 Plan Update* under the core category of “Electric/Hybrid Technologies & Infrastructure”. This project is to develop and demonstrate zero emission electric school buses with V2G capability. Successful demonstration of such projects will contribute to the attainment of clean air standards in the South Coast Air Basin by eliminating PM and NOx emissions from replaced diesel and alternative fuel school buses.

Resource Impacts

The total cost for this proposed project is \$9,804,528, with cash contributions comprised of \$4,902,237 from DOE, \$160,000 from Rialto USD and up to \$1,900,000 proposed from the SCAQMD from the Lower-Emissions School Bus Fund (33). In addition, a combination of cash and in-kind contributions are comprised of \$2,648,653 from TransPower, \$128,040 from Blue Bird and \$65,598 from NSI. Proposed funding is broken down in the table below.

Table: Proposed Funding

Project Partner	Funding Amount	Percent
DOE	\$4,902,237	50%
TransPower	\$2,648,653	27%
Rialto USD	\$160,000	2%
Blue Bird Body Co.	\$128,040	1%
NSI	\$65,598	1%
SCAQMD (<i>requested</i>)	\$1,900,000	19%
Total	\$9,804,528	100%