



**South Coast
Air Quality Management District**

21865 Copley Drive, Diamond Bar, CA 91765
(909) 396-2000, www.aqmd.gov

TECHNOLOGY COMMITTEE MEETING

Committee Members

Council Member Joe Buscaino, Chair
Supervisor Sheila Kuehl, Vice Chair
Mayor Pro Tem Larry McCallon
Council Member Judith Mitchell
Council Member Dwight Robinson
Supervisor Janice Rutherford

**November 17, 2017 ♦ 12:00 p.m. ♦ Conference Room CC8
21865 Copley Drive, Diamond Bar, CA 91765**

TELECONFERENCE LOCATION

**8575 Haven Avenue, Suite 110
Rancho Cucamonga, CA 91730**

**One Gateway Plaza, 12th Floor
Vanderbilt Conference Room
Los Angeles, CA 90012**

(The public may participate at any location listed above.)

Call-in for listening purposes only is available by dialing:

Toll Free: 866-244-8528

Listen Only Passcode: 5821432

In addition, a webcast is available for viewing and listening at:

<http://www.aqmd.gov/home/library/webcasts>

AGENDA

CALL TO ORDER

ACTION ITEMS – Items 1 through 5

DECEMBER BOARD AGENDA ITEMS

**1. Amend and Execute Technical Assistance Contracts for
Implementation of Incentive Funding Programs (*Motion Requested*)**

On June 3, 2016, the Board approved contracts for technical assistance for the demonstration and deployment of mobile and stationary source advanced technologies and implementation of incentive funding programs. The contractors were selected from proposals received in response to a solicitation issued in February 2016. Since that time, the SCAQMD has been successful in generating large amounts of incentive program funding that must be encumbered and expended expeditiously. Thus, it is necessary to increase funding for technical assistance for the

Mei Wang
Program
Supervisor

implementation of incentive funding programs, including the Carl Moyer Program and the Enhanced Fleet Modernization Program (EFMP). This action is to execute two agreements with Clean Fuel Connection, Inc., a contract amendment for Carl Moyer Program technical support in an amount not to exceed \$150,000 and a new contract for EFMP implementation support in an amount not to exceed \$150,000 from, respectively, the administrative portions of the Carl Moyer Program AB 923 Fund (80) and the HEROS II Special Revenue Fund (56).

2. Amend Contract to Improve Online Application Database for Carl Moyer Program and Reimburse General Fund for Administrative Costs (*Motion Requested*)

Walter Shen
Program
Supervisor

In November 2015, the Board approved a contract with Trinity Technology Group to develop an online application database for the Carl Moyer Program. This online database, which successfully launched for the “Year 19” Carl Moyer Program, greatly facilitated the application submittal process and expedited evaluation of applications. However, improvements are necessary to incorporate changes in the newly revised Carl Moyer Program Guidelines, including updated cost-effectiveness calculations and new funding categories. Other modifications are needed to improve the online application submittal experience for the participants as well. This action is to amend a contract with Trinity Technology Group to modify and enhance the existing online application database for the Carl Moyer Program in an amount not to exceed \$85,000 from the administrative portion of the Carl Moyer Program AB 923 Fund (80) and reimburse the General Fund up to \$187,500 for administrative costs from the Carl Moyer Program SB 1107 Fund (32).

3. Execute Contract to Develop Thermal Management Strategy Using Cylinder Deactivation for Heavy-Duty Diesel Engines (*Motion Requested*)

Adewale
Oshinuga
Program
Supervisor

West Virginia University, Jacobs Vehicle Systems, Inc., and Cummins Inc. propose a collaborative effort to evaluate integration of cylinder deactivation hardware in a heavy-duty 15-liter diesel engine to create better thermal management. The proposed study aims to develop a strategy to decrease fuel consumption and reduce NOx at low-load conditions to achieve 0.02 g/bhp-hr NOx over the duty cycle of a heavy-duty diesel engine. This action is to execute a contract with West Virginia University-Center for Alternative Fuels Engines and Emissions to develop a thermal management strategy using cylinder deactivation for heavy-duty diesel engines in an amount not to exceed \$250,000 from the Clean Fuels Fund (31).

- 4. Execute Contract to Develop and Demonstrate Near-Zero Emission Opposed Piston Engine (*Motion Requested*)**
CALSTART, Inc., and Achates Power, Inc., have been awarded \$7 million to develop and demonstrate emission opposed piston (OP) engine technology in Class 8 heavy-duty, line-haul trucks that meet a 0.02 g/bhp-hr NOx target, with concurrent reductions in CO2 emissions. The project was awarded under CARB's Low Carbon Transportation Greenhouse Gas (GHG) Reduction Fund Investments, with total project costs estimated at \$15.55 million. The trucks will provide revenue service on regional long haul routes within California. Staff proposes to cost-share this project. This action is to execute a contract with CALSTART, Inc., to develop and demonstrate near-zero emission OP engines in an amount not to exceed \$1 million from the Clean Fuels Fund (31).
- 5. Adopt Resolution Recognizing Funds and Accepting Terms and Conditions for Funds Appropriated Under AB 134 (*Motion Requested*)**
On September 16, 2017, the Governor approved AB 134 to amend the Budget Act of 2017. This amendment adds appropriations to the Budget Act of 2017, taking effect immediately as a Budget Bill. Under Schedule 3 of this Bill, \$250 million is to be distributed by CARB to air districts for implementation of projects pursuant to the Carl Moyer Memorial Air Quality Standards Attainment Program. SCAQMD's allocation of these funds is \$107.5 million. This action is to adopt a Resolution recognizing funds up to \$107.5 million from CARB into the Carl Moyer Program Fund (32) and accepting terms and conditions for funds as appropriated under Schedule 3 of AB 134 Budget Act of 2017.

Naveen Berry
Technology
Demonstration
Manager

Fred Minassian
Assistant
Deputy
Executive
Officer

OTHER MATTERS

- 6. Other Business** – *Any member of the Committee, or its staff, on his or her own initiative or in response to questions posed by the public, may ask a question for clarification, may make a brief announcement or report on his or her own activities, provide a reference to staff regarding factual information, request staff to report back at a subsequent meeting concerning any matter, or may take action to direct staff to place a matter of business on a future agenda. (Gov't. Code Section 54954.2)*
- 7. Public Comment Period**
Members of the public may address this body concerning any agenda item before or during consideration of that item (Gov't. Code Section 54954.3(a)). All agendas for regular meetings are posted at District Headquarters, 21865 Copley Drive, Diamond Bar, California, at least 72 hours in advance of a regular meeting. At the end of the regular meeting agenda, an opportunity is also provided for the public to speak on any subject within the Committee's authority. Speakers may be limited to three (3) minutes each.

8. Next Meeting Date – Friday, January 19, 2018 at 12:00 pm

ADJOURNMENT

Americans with Disabilities Act

The agenda and documents in the agenda packet will be made available, upon request, in appropriate alternative formats to assist persons with a disability (Gov't. Code Section 54954.2(a)). Disability-related accommodations will also be made available to allow participation in the Stationary Source Committee meeting. Any accommodations must be requested as soon as practicable. Requests will be accommodated to the extent feasible. Please contact Pat Krayser at 909.396.3248 from 7:30 a.m. to 6:00 p.m., Tuesday through Friday, or send the request to pkrayser@aqmd.gov.

Document Availability

All documents (i) constituting non-exempt public records, (ii) relating to an item on an agenda for a regular meeting, and (iii) having been distributed to at least a majority of the Committee after the agenda is posted, are available prior to the meeting for public review at the South Coast Air Quality Management District, Public Information Center, 21865 Copley Drive, Diamond Bar, CA 91765.

[Go to SLIDES](#)

DRAFT
Technology Committee Agenda #1

BOARD MEETING DATE: December 1, 2017

AGENDA NO.

PROPOSAL: Amend and Execute Technical Assistance Contracts for Implementation of Incentive Funding Programs

SYNOPSIS: On June 3, 2016, the Board approved contracts for technical assistance for the demonstration and deployment of mobile and stationary source advanced technologies and implementation of incentive funding programs. The contractors were selected from proposals received in response to a solicitation issued in February 2016. Since that time, the SCAQMD has been successful in generating large amounts of incentive program funding that must be encumbered and expended expeditiously. Thus, it is necessary to increase funding for technical assistance for the implementation of incentive funding programs, including the Carl Moyer Program and the Enhanced Fleet Modernization Program (EFMP). This action is to execute two agreements with Clean Fuel Connection, Inc., a contract amendment for Carl Moyer Program technical support in an amount not to exceed \$150,000 and a new contract for EFMP implementation support in an amount not to exceed \$150,000 from, respectively, the administrative portions of the Carl Moyer Program AB 923 Fund (80) and the HEROS II Special Revenue Fund (56).

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

RECOMMENDED ACTION:

Authorize the Chairman to execute the following agreements with Clean Fuel Connection, Inc.:

1. A contract amendment for technical assistance for the Carl Moyer Program for an additional \$150,000 from the administrative portion of the Carl Moyer Program AB 923 Fund (80); and
2. A new contract for technical assistance for the Enhanced Fleet Modernization Program in an amount not to exceed \$150,000 from the administrative portion of the HEROS II Special Revenue Fund (56).

Wayne Nastri
Executive Officer

Background

The Carl Moyer Program is a voluntary grant program that offers incentive funding to vehicle and equipment owners to implement cleaner-than-required engines, equipment and other sources of air pollution. The SCAQMD administers and implements the Carl Moyer Program on an annual basis, and this year marks the 19th year of implementation. Following the issuance of Program Announcements in April 2017, the SCAQMD received a total of 164 proposals requesting over \$118 million in program funding. Staff completed the evaluation of these proposals in accordance with the new 2017 Revisions to the Carl Moyer Program Guidelines, which were approved by CARB on April 27, 2017. Subsequently, last month, the Board approved the execution of contracts for “Year 19” of the Carl Moyer Program in an amount totaling \$27,379,771 using available funds from Carl Moyer Program SB 1107 Fund (32) and AB 923 Fund (80).

In September 2017, the Governor signed AB 134 making \$250 million available statewide for the Carl Moyer Program, of which 43% will be allocated to SCAQMD. As stated in AB 134, these funds must be encumbered by June 30, 2019, and liquidated by June 30, 2021. Due to the early encumbrance and liquidation deadlines, last month the Board also approved the execution of contracts for all remaining eligible projects submitted under the “Year 19” Carl Moyer Program in an amount totaling \$51,573,116 with funds to be allocated by CARB as approved under AB 134. The new funding allocated to the Carl Moyer Program through AB 134 will require additional staffing resources and administrative support to manage the implementation of the additional projects.

Additionally, the SCAQMD has experienced increased participation and interest in the Enhanced Fleet Modernization Program (EFMP). Given the popularity of the EFMP and the increased funding allocated to SCAQMD by CARB for this program, staff anticipates the need for additional case management support to process the applications and assist with program implementation.

Proposal

This action is to amend a contract with Clean Fuel Connection, Inc., (CFCI) for an additional \$150,000 from the administrative portion of the Carl Moyer Program AB 923 Fund (80) to provide additional staffing resources and administrative support for the Carl Moyer Program. The existing contract with CFCI for technical assistance, implementation and outreach support for the Carl Moyer Program was awarded by the Board in June 2016 after a formal solicitation process.

In addition, this action is to execute a new contract with CFCI in an amount not to exceed \$150,000 from the administrative portion of the of the HEROS II Special Revenue Fund (56) to provide case management support, including but not limited to: processing applications, bilingual support, assisting participants with retirement and

replacement of vehicles or other mobility options, such as transit passes or car-sharing, for the EFMP.

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 a 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 interests of the SCAQMD. Such circumstances may include but are not limited to: (4) Level-of-effort expert consultation services. In 2016, CFCI was selected through a competitive bid process to provide technical assistance to the SCAQMD for programs involving alternative fuels, electric vehicles, charging and fueling infrastructure, renewable energy as well as the continued implementation of the SCAQMD incentive funding programs. While CFCI hasn't previously provided support on the EFMP, they have extensive experience in assisting SCAQMD with implementation of incentive funding programs.

Benefits to SCAQMD

The proposed awards will support the implementation of the Carl Moyer Program and EFMP and reduce emissions by accelerating the turnover of high-emitting vehicles and equipment with cleaner and/or more fuel-efficient options.

Resource Impacts

The total amount of funding for these contract awards will not exceed \$300,000, comprised of \$150,000 each from the administrative portions of the Carl Moyer Program AB 923 Fund (80) and the HEROS II Special Revenue Fund (56). Sufficient funds are available in the administrative portions of the Carl Moyer Program and EFMP.

Agenda Item #1

Mei Wang

Amend and Execute
Technical Assistance Contracts
for Implementation of
Incentive Funding Programs

Background

- Carl Moyer Program: in November 2017, the Board approved over \$78 million in eligible projects, including AB 134 funds as approved by CARB
- Due to the anticipated early encumbrance and liquidation deadlines specified in AB 134, additional technical assistance and support will be needed to help manage the high number of projects and their timely implementation
- Enhanced Fleet Modernization Program (EFMP): Due to increased funding from CARB and the high level of participation by motorists, staff anticipates the need for additional case management support
- Clean Fuel Connection Inc. (CFCI) has assisted SCAQMD in the implementation of various incentive programs for the past 15 years

Proposal

- Current contract with CFCI for technical assistance, implementation and outreach support for the Carl Moyer Program was awarded by the Board in June 2016 after a formal solicitation process (RFP #P2016-15 issued February 2016)
- Amend contract with CFCI for Carl Moyer Program implementation support:
 - Implementation of additional projects
 - Provide technical support



Proposal (cont'd)

- Execute new sole source contract with CFCI for EFMP support:
 - Case management support
 - Assist with program implementation



Recommended Action

- Authorize the Chairman to execute the following agreements with CFCI:
 - A contract amendment for technical assistance for the Carl Moyer Program adding an additional \$150,000 from the administrative portion of the Carl Moyer Program AB 923 Fund (80)
 - A new sole source contract for technical assistance for the EFMP in an amount not to exceed \$150,000 from the administrative portion of the HEROS II Special Revenue Fund (56)



[Go to SLIDES](#)

DRAFT
Technology Committee Agenda #2

BOARD MEETING DATE: December 1, 2017

AGENDA NO.

PROPOSAL: Amend Contract to Improve Online Application Database for Carl Moyer Program and Reimburse General Fund for Administrative Costs

SYNOPSIS: In November 2015, the Board approved a contract with Trinity Technology Group to develop an online application database for the Carl Moyer Program. This online database, which successfully launched for the “Year 19” Carl Moyer Program, greatly facilitated the application submittal process and expedited evaluation of applications. However, improvements are necessary to incorporate changes in the newly revised Carl Moyer Program Guidelines, including updated cost-effectiveness calculations and new funding categories. Other modifications are needed to improve the online application submittal experience for the participants as well. This action is to amend a contract with Trinity Technology Group to modify and enhance the existing online application database for the Carl Moyer Program in an amount not to exceed \$85,000 from the administrative portion of the Carl Moyer Program AB 923 Fund (80) and reimburse the General Fund up to \$187,500 for administrative costs from the Carl Moyer Program SB 1107 Fund (32).

COMMITTEE: Technology Committee, November 17, 2017; Recommended for Approval

RECOMMENDED ACTIONS:

1. Authorize the Chairman to amend the contract with Trinity Technology Group to modify and enhance the existing online application database for the Carl Moyer Program in an amount not to exceed \$85,000 from the administrative portion of the Carl Moyer Program AB 923 Fund (80).
2. Reimburse the General Fund up to \$187,500 for administrative costs from the Carl Moyer Program SB 1107 Fund (32).

Wayne Nastri
Executive Officer

Background

In November 2015, the Board approved a contract with Trinity Technology Group to develop an online application database to receive and process applications for the Carl Moyer Program. This online database, referred to as CMP Online Application Program, was successfully launched in April 2017 for the “Year 19” Carl Moyer Program. It greatly facilitated the online application submittal process for participants this year as well as expedited the application evaluation process. Staff proposes to amend the contract with Trinity Technology Group to modify and enhance the existing online application database.

In October 2016, the Board adopted a Resolution recognizing funds for the “Year 18” Carl Moyer Multidistrict Program including administrative funds in the amount of \$187,500. At this time, there is a need to reimburse the General Fund for these administrative costs.

Proposal

Improvements to the CMP Online Application Program are necessary to incorporate changes in CARB’s newly revised Carl Moyer Program Guidelines, including updated cost-effectiveness calculations and new funding categories, such as on-road vehicle replacements and infrastructure projects. Other modifications are needed to improve the online application submittal experience and functionality for the participants based on the results of the “Year 19” process. Additional functionality will include email notifications and improved application interface. Trinity Technology Group will design, develop and conduct testing of the enhanced online application database for the Carl Moyer Program and provide technical support after the launch of these enhancements. This action is to amend the contract with Trinity Technology Group to modify and enhance the existing online application database for the Carl Moyer Program.

This action is to also reimburse the General Fund up to \$187,500 for administrative costs for the “Year 18” Carl Moyer Multidistrict Program from the Carl Moyer Program SB 1107 Fund (32).

Benefits to SCAQMD

The Carl Moyer Program is an important and successful program that provides incentive funding to owners of diesel vehicles and equipment to reduce emissions beyond regulatory requirements by replacing, repowering or retrofitting their older engines. The Carl Moyer Program provides significant reductions of NOx and PM emissions for the life of the projects resulting in long-term emission reduction and public health benefits. The modifications and enhancements of the existing online application database will further facilitate the online application submittal process for participants as well as streamline the project evaluation process.

Resource Impacts

Total funding for this project will not exceed \$85,000 from the administrative portion of the Carl Moyer Program AB 923 Fund (80). Funding to reimburse the General Fund for administrative costs up to \$187,500 for “Year 18” is available from the Carl Moyer SB 1107 Fund (32).

Agenda Item #2

Walter Shen

Amend Contract to Improve Online Application Database for Carl Moyer Program and Reimburse General Fund for Administrative Costs

Background

- In November 2015, the Board approved a contract with Trinity Technology Group to develop an online application database for the Carl Moyer Program
- The online application database (CMP Online Application Program) was launched in April 2017

The screenshot displays the user interface for the South Coast AQMD Online Carl Moyer and SOON Application. The header includes the South Coast AQMD logo, the title "Online Carl Moyer and SOON Application", and a "Log Off" button with the text "Welcome Walter Shen!". A navigation bar contains links for "Home", "Account Management", "Accounting", and "Proposal". The main content area is titled "Account Home" and contains a welcome message: "Welcome to the SCAQMD Online Application System for the Carl Moyer Program and the Surplus Off-Road Opt-In for NOx (SOON) Programs. To prepare your online application, please go to the Proposal tab and click on 'Create New Carl Moyer or SOON Proposal'." Below this is a section for "SCAQMD's Account" with "User Info" for Walter Shen, including his address: "21865 Copley Drive, Diamond Bar, CALIFORNIA 91765". A "Proposal Filter" section contains several dropdown menus: "Program" (set to CMP), "Organization" (set to ALL), "Proposal Category" (set to ALL), "Solicitation Year" (set to Year 19), "Status" (set to ALL), and "Proposal Sub Category" (set to ALL). There are also input fields for "Submit From Date", "User Last Name", "Submit To Date", and "Proposal Number", each with a red "X" icon. A "Search" button is located at the bottom right of the filter section.

Background (cont'd)

- Greatly facilitated the online submittal process for participants
- Improved and expedited the evaluation process for staff
- Improvements needed to further enhance CMP Online Application Program
- In October 2016, the Board adopted a Resolution recognizing funds for “Year 18” Carl Moyer Multidistrict Program including administrative funds in the amount of \$187,500

Proposal

- Incorporate CARB's new 2017 revisions to the Carl Moyer Program Guidelines
- Improve the online functionality for participants
- Add additional capabilities to streamline evaluation of applications
- Provide additional technical support after launch of enhancements
- Authorize reimbursement of administrative costs

Recommended Actions

- Amend the contract with Trinity Technology Group to modify and enhance the existing online application database for the Carl Moyer Program in an amount not to exceed \$85,000 from the administrative portion of the Carl Moyer Program AB 923 Fund (80)
- Reimburse the General Fund up to \$187,500 for administrative costs from the Carl Moyer SB 1107 Fund (32)

DRAFT
Technology Committee Agenda #3

BOARD MEETING DATE: December 1, 2017

AGENDA NO.

PROPOSAL: Execute Contract to Develop Thermal Management Strategy Using Cylinder Deactivation for Heavy-Duty Diesel Engines

SYNOPSIS: West Virginia University, Jacobs Vehicle Systems, Inc., and Cummins Inc. propose a collaborative effort to evaluate integration of cylinder deactivation hardware in a heavy-duty 15-liter diesel engine to create better thermal management. The proposed study aims to develop a strategy to decrease fuel consumption and reduce NOx at low-load conditions to achieve 0.02 g/bhp-hr NOx over the duty cycle of a heavy-duty diesel engine. This action is to execute a contract with West Virginia University-Center for Alternative Fuels Engines and Emissions to develop a thermal management strategy using cylinder deactivation for heavy-duty diesel engines in an amount not to exceed \$250,000 from the Clean Fuels Fund (31).

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

RECOMMENDED ACTION:

Authorize the Chairman to execute a contract with West Virginia University-Center for Alternative Fuels Engines and Emissions to develop a thermal management strategy using cylinder deactivation for heavy-duty diesel engines in an amount not to exceed \$250,000 from the Clean Fuels Fund (31).

Wayne Nastri
Executive Officer

MMM:FM:NB:JL

Background

Diesel vehicles are currently one of the largest sources of NOx emissions, which are precursors to ozone formation, in the South Coast Air Basin. The high power efficiency of diesel trucks makes them a popular option among owners. Operations of heavy-duty trucks are plagued by higher NOx emissions typically due to high vehicle traffic density in the basin. In February 2017, the Board approved a project with CARB and Southwest Research Institute to develop near-zero NOx control strategies and aftertreatment systems

specific to the high levels of emissions at low loads and cold starts in a heavy-duty diesel engine. As an optional approach to decrease NOx emissions, without potential complexities associated with aftertreatment systems, cylinder deactivation in a heavy-duty diesel engine may have the potential to promote better thermal management.

Proposal

The project is intended to develop a control strategy using technology developed by Jacobs Vehicle Systems, Inc., (JVS) and Cummins Inc. to disable valve motion and control software in a Cummins 15-liter diesel engine. The study will be aimed at controlling the exhaust temperature over the standard Federal Test Procedure (FTP) on a dynamometer representative of real-world use prevalent in the air basin. Using low-fuel penalty thermal management strategy, a 90 % decrease in NOx can occur during the low-load part of the FTP drive cycle. The program will ultimately conclude with the engine being integrated into an on-road heavy-duty chassis and dynamometer tested over select driving cycles similar to port drayage operations to fully validate its performance and viability.

This action is to execute a contract with the West Virginia University-Center for Alternative Fuels Engines and Emissions (WVU-CAFEE) in a collaborative effort with JVS and Cummins Inc. to develop thermal management strategies using cylinder deactivation on a 15-liter diesel engine in order to achieve near-zero NOx with less fuel consumption.

Sole Source Justification

Section VIII.B.2. of the Procurement Policy and Procedure identifies provisions under which a sole source award may be justified. The request for sole source awards for this project is made under the provisions B.2.d.(1): Projects involving cost-sharing by multiple sponsors; and B.2.d(8): Research and development efforts with educational institutions or nonprofit organizations. The West Virginia University-Center for Alternative Fuels Engines and Emissions will conduct this project, which is cost-shared by U.S. EPA, Cummins Inc., JVS, and Environment Canada.

Benefits to SCAQMD

Projects to support development and demonstration of various electric container transport technologies are included in the *Technology Advancement Office Clean Fuels Program 2017 Plan Update* under the categories of “Engine Systems”. This project is to develop and demonstrate near-zero emission heavy-duty, liquid-fueled engines suitable for Class 8 trucks. Successful demonstration of such projects will contribute to the attainment of clean air standards in the South Coast Air Basin by significantly reducing NOx emissions from replaced diesel trucks. Development of a cylinder deactivation strategy is anticipated to lower NOx emissions and fuel consumption from the heavy-duty diesel engine.

Resource Impacts

The proposed project budget is \$700,000, which includes an in-kind contribution from JVS and Cummins Inc. The remaining funding is an anticipated \$100,000 from Environment Canada and \$250,000 from the U.S. EPA. The SCAQMD's cost-share will not exceed \$250,000 from the Clean Fuels Fund (31). The total cost-share for the proposed project is summarized below:

Proposed Project Cost-Share

Funding Source	Funding Amount	% of Project
Environment Canada	\$100,000	14
U.S. EPA	\$250,000	36
JVS (in-kind)	\$50,000	7
Cummins Inc. (in-kind)	\$50,000	7
SCAQMD (<i>requested</i>)	\$250,000	36
Total	\$700,000	100

Sufficient funds are available from the Clean Fuels Fund (31), 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.

Agenda Item #3

Adewale Oshinuga

Execute Contract to Develop Thermal Management Strategy Using Cylinder Deactivation for Heavy-Duty Diesel Engines

Background

- Heavy-duty diesel engines - largest NOx source
- Previous efforts on more robust aftertreatment systems for lowering NOx emissions to near-zero (0.02 g/bhp-hr) levels, especially low load and cold starts
- Other engine modification approaches to lower NOx also underway



Proposal

- Develop thermal management strategy using cylinder deactivation
- Operate a heavy-duty, six-cylinder diesel engine on three cylinders when required to increase exhaust gas temperatures
- Conduct dynamometer testing to assess NO_x emissions in real-world drive cycle



Proposed Project Cost-Share

Project Partner	Funding Amount	Percent
Environment Canada	\$100,000	14
U.S. EPA	\$250,000	36
Jacobs Vehicle Systems (in-kind)	\$50,000	7
Cummins Inc. (in-kind)	\$50,000	7
SCAQMD (<i>requested</i>)	\$250,000	36
Total	\$700,000	100

Recommended Action

- Execute contract with West Virginia University-Center for Alternative Fuels Engines and Emissions to develop a thermal management strategy using cylinder deactivation for heavy-duty diesel engines in an amount not to exceed \$250,000 from Fund (31)

[Go to SLIDES](#)

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Technology Committee Agenda #4

BOARD MEETING DATE: December 1, 2017

AGENDA NO.

PROPOSAL: Execute Contract to Develop and Demonstrate Near-Zero Emission Opposed Piston Engine

SYNOPSIS: CALSTART, Inc., and Achates Power, Inc., have been awarded \$7 million to develop and demonstrate emission opposed piston (OP) engine technology in Class 8 heavy-duty, line-haul trucks that meet a 0.02 g/bhp-hr NOx target, with concurrent reductions in CO2 emissions. The project was awarded under CARB's Low Carbon Transportation Greenhouse Gas (GHG) Reduction Fund Investments, with total project costs estimated at \$15.55 million. The trucks will provide revenue service on regional long haul routes within California. Staff proposes to cost-share this project. This action is to execute a contract with CALSTART, Inc., to develop and demonstrate near-zero emission OP engines in an amount not to exceed \$1 million from the Clean Fuels Fund (31).

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

RECOMMENDED ACTION:

Authorize the Chairman to execute a contract with CALSTART, Inc., to develop and demonstrate near-zero emission OP engines in an amount not to exceed \$1 million from the Clean Fuels Fund (31).

Wayne Natri
Executive Officer

MMM:FM:NB

Background

In May 2017, CARB issued a grant solicitation under the Fiscal Year 2016-17 Low Carbon Transportation and Fuels Investments and the Air Quality Improvement Programs for On-Road Advanced Technology Demonstrations. In August 2017, CALSTART, with technology provider Achates Power, Inc., (API), submitted a proposal to develop four and demonstrate two opposed piston (OP) engine equipped heavy-duty on-road trucks.

API, whose headquarters is located in San Diego, is leading the effort to modernize and commercialize opposed piston (OP) engines. The company supports original equipment manufacturer (OEM) development and commercialization of OP engines via engineering services and technology licenses and has ten global OEMs among its customers. The first OP engine with technology licensed from API is planned for market release in 2018 for stationary power applications. In addition, API is currently partnered with Cummins to develop a 1,000 horsepower advanced combat engine for the U.S. Army. The OP engines have previously been used in marine, military, stationary and other applications, and OP engines are on the cusp of commercialization in Class 8 line haul trucks. In addition to the efficiency advantages, OP engines have significant advantages in reducing criteria emissions, in part by addressing critical engine cold-start conditions. The unique rapid catalyst light-off capability of the OP engine uses high internal exhaust gas recirculation (EGR) to minimize NOx while elevating exhaust gas temperatures to accelerate catalyst activity during cold-start and low-load engine operation.

On October 19, 2017, CARB notified CALSTART that their project proposal had been selected for a grant award in the amount of \$7 million, with the remaining \$8.55 million in cost-share to be provided by project partners, which currently include API, Peterbilt Motors Company, Wal-Mart Logistics, LLC, (Walmart), Tyson Foods, Inc., San Joaquin Valley Air Pollution Control District and Sacramento Metropolitan AQMD. Staff proposes to cost-share this project to provide the remaining project funding needed. The project is intended to accelerate the adoption and commercial deployment of near-zero heavy-duty emission technologies by developing and deploying OP technology for long haul truck applications. This will be the first demonstration in the U.S. of a high-efficiency and low-NOx engine powertrain vehicle in Class 7-8 applications.

Proposal

The OP-engine Class 8 demonstration will deploy and validate engine design that will meet the near-zero NOx requirement (0.02 g/bhp-hr), while simultaneously providing a 15-20 percent increase in fuel efficiency compared to 2017 EPA requirements. Specifically, API will develop four 10.6-liter OP engines including aftertreatment systems and install two of the four engines into Class 8 trucks with Peterbilt, a subsidiary of Paccar, an American manufacturer of medium- and heavy-duty commercial vehicles. Peterbilt will secure tractors, perform integration services and support, and perform vehicle calibration and testing. Subsequently, the trucks will be placed into revenue service for a minimum of three months with Walmart and Tyson Foods in regional long haul routes, including disadvantaged communities, located in the jurisdictions of the Sacramento Metropolitan, San Joaquin Valley, San Diego and South Coast air districts. The demonstration will include the use of renewable diesel. The other two engines to be developed by API will be used for testing.

The overall goal of the project is to realize near- and long-term certification and commercialization goals and establish higher efficiency, near-zero emission, liquid-fueled engines as an industry standard. CALSTART, which will administer and provide oversight for this project, has previously worked with numerous manufacturers and fleets engaged in publicly funded programs to develop and deploy near-zero and zero emission heavy-duty vehicles. This action is to execute a contract with CALSTART, Inc., to develop and demonstrate near-zero emission OP engines.

Sole Source Justification

Section VIII.B.2. of the Procurement Policy and Procedure identifies provisions under which a sole source award may be justified. The request for sole source awards for this project is made under the provisions B.2.c.(1): The unique experience and capabilities of the proposed contractor or contractor team; B.2.c.(2): The project involves the use of proprietary technology; and B.2.d.(1): Projects involving cost-sharing by multiple sponsors. CALSTART has extensive experience in administering such projects, and API has extensive knowledge and experience in advanced OP engine technology needed to successfully complete this project and will utilize their proprietary technologies for this project. This demonstration project will be cost-shared by CARB and the other project partners, as described further in Resource Impacts.

Benefits to SCAQMD

Projects to support development and demonstration of various electric container transport technologies are included in the *Technology Advancement Office Clean Fuels Program 2017 Plan Update* under the categories of “Engine Systems”. This project is to develop and demonstrate near-zero emission heavy-duty, liquid-fueled engines suitable for Class 8 trucks. Successful demonstration of such projects will contribute to the attainment of clean air standards in the South Coast Air Basin by significantly reducing NOx emissions from replaced diesel trucks.

Resource Impacts

The SCAQMD’s cost-share will not exceed \$1 million from the Clean Fuels Fund (31). The estimated total project cost is \$15.55 million, as follows:

Proposed Project Cost-Share by Partner

Project Partner	Funding Amount (in millions)	Percent of Project
CARB	\$7.0	45.0
Achates Power, Inc.	\$6.55	42.0
San Joaquin APCD	\$1.0	6.5
SCAQMD (<i>requested</i>)	\$1.0	6.5
Total	\$15.55	100.0

Sufficient funds are available from the Clean Fuels Fund (31), 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.

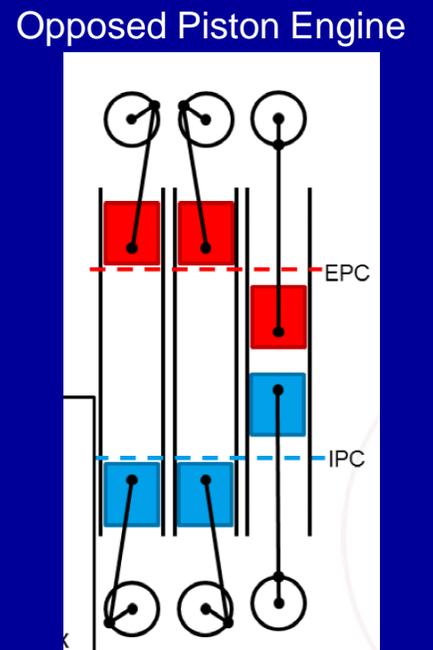
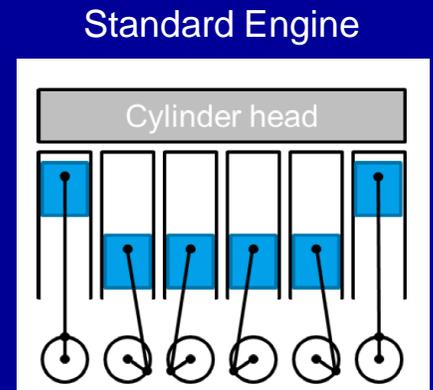
Agenda Item #4

Naveen Berry

Execute Contract to Develop and
Demonstrate Near-Zero Emission
Opposed Piston Engine

Background

- May 2017 – CARB released a solicitation for advanced engine and powertrain projects
- August 2017 – CALSTART, with technology partner Achates Power, Inc. (API), submitted a proposal to develop four and demonstrate two opposed piston (OP) engine equipped, heavy-duty on-road trucks
- API – leading effort to modernize and commercialize OP engines
 - Supports OEMs via engineering services and technology licenses
 - First OP engine technology licensed by API planned for market release 2018 for stationary power applications
 - Partnered currently with Cummins to develop 1,000 HP advanced combat engine for U.S. Army



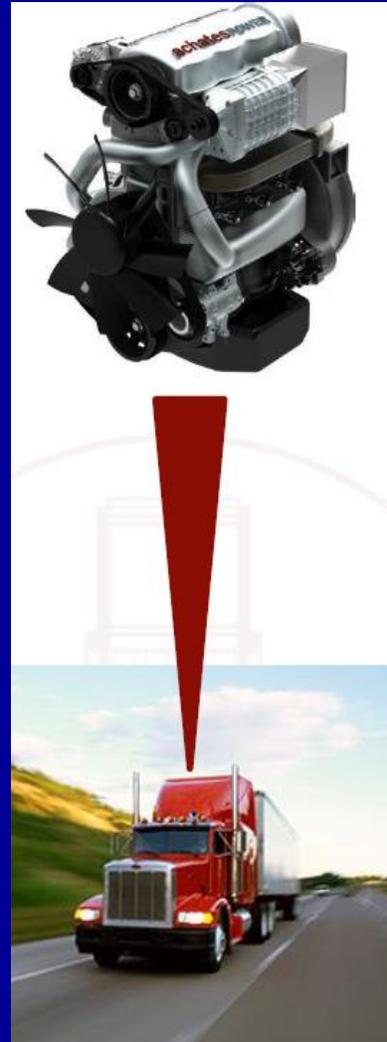


Background (cont'd)

- October 2017 – CARB notified CALSTART of \$7 million grant award
- Total project cost - \$15.55 Million
- Project partners currently providing cost-sharing
 - API, Peterbilt Motors Company – Technology providers
 - Walmart, Tyson Foods – Demonstration fleets
 - San Joaquin Valley APCD & Sacramento Metro AQMD
- Project goal – accelerate adoption and commercialize near-zero heavy-duty emission technologies by developing and deploying OP technology for long haul truck applications
- First demonstration in U.S. of high-efficiency, low-NOx engine powertrain in Class 7-8 applications

Proposal

- API - develop four 10.6-liter OP engines including aftertreatment systems
 - 55% brake thermal efficiency
 - 0.02 g/bhp-hr NOx
 - 15% reduction in CO2
 - Increased fuel economy
- API - install two of four OP engines into Class 8 trucks with subcontractor
- Peterbilt - secure tractors, perform integration services, perform vehicle calibration and testing
- Walmart and Tyson Foods - demonstrate trucks in revenue service in regional long haul routes
 - Routes >95% in disadvantaged communities
 - Jurisdictions: Sacramento Metro, San Joaquin Valley, San Diego and South Coast air districts



Proposed Project Cost-Share

Project Partners	Funding Amount (in millions)	Percent (%)
CARB	\$7.0	45.0
Achates Power, Inc.	\$6.55	42.0
San Joaquin APCD	\$1.0	6.5
SCAQMD (<i>requested</i>)	\$1.0	6.5
Total	\$15.55	100.0

SAE
INTERNATIONAL

AUTOMOTIVE
ENGINEERING



ICE's new life?

Achates Power's radical opposed-piston two-stroke heads for production

Deep dive:
Chevy Bolt EV

Honda's slick new 10-speed automatic

Edgy new tech from CES and Detroit auto show

Recommended Action

Authorize the Chairman to execute contract with CALSTART, Inc., to develop and demonstrate near-zero emission opposed piston engines in an amount not to exceed \$1 million from the Clean Fuels Fund (31)

[Go to SLIDES](#)

DRAFT

Technology Committee Agenda #5

BOARD MEETING DATE: December 1, 2017

AGENDA NO.

PROPOSAL: Adopt Resolution Recognizing Funds and Accepting Terms and Conditions for Funds Appropriated Under AB 134

SYNOPSIS: On September 16, 2017, the Governor approved AB 134 to amend the Budget Act of 2017. This amendment adds appropriations to the Budget Act of 2017, taking effect immediately as a Budget Bill. Under Schedule 3 of this Bill, \$250 million is to be distributed by CARB to air districts for implementation of projects pursuant to the Carl Moyer Memorial Air Quality Standards Attainment Program. SCAQMD's allocation of these funds is \$107.5 million. This action is to adopt a Resolution recognizing funds up to \$107.5 million from CARB into the Carl Moyer Program Fund (32) and accepting terms and conditions for funds as appropriated under Schedule 3 of AB 134 Budget Act of 2017.

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

RECOMMENDED ACTION:

Adopt the attached Resolution recognizing, upon receipt, up to \$107.5 million from CARB into the Carl Moyer Program Fund (32) and accepting the terms and conditions for the funds as appropriated under Schedule 3 of the AB 134 Budget Act of 2017.

Wayne Nastri
Executive Officer

MMM:FM

Background

On September 16, 2017, the Governor approved AB 134 to amend the Budget Act of 2017. This amendment adds appropriations to the Budget Act of 2017, taking effect immediately as a Budget Bill. Under Schedule 3 of this Bill, \$250 million is to be distributed by CARB to air districts for implementation of projects pursuant to the Carl Moyer Memorial Air Quality Standards Attainment Program. SCAQMD's allocation of these funds is \$107.5 million.

Proposal

This action is to adopt the attached Resolution recognizing up to \$107.5 million from CARB into the Carl Moyer Program Fund (32) and accepting the terms and conditions for the funds as appropriated under Schedule 3 of the AB 134 Budget Act of 2017.

Benefits to SCAQMD

The SCAQMD has supported a number of activities directed to the advancement of new technologies and commercialization of low-emission alternative fuel technologies. Utilizing the funds allocated to the SCAQMD for implementation of projects under AB 134 will expedite the penetration of advanced low-emitting commercial technologies in impacted communities and will result in emissions reductions of criteria pollutants. The vehicles and equipment funded under this Program will operate many years, providing long-term emission reductions.

Resource Impacts

SCAQMD will receive up to \$107.5 million from CARB under AB 134, which will be placed into the Carl Moyer Program Fund (32).

Attachment

A Resolution of the South Coast Air Quality Management District Board Recognizing Funds and Accepting the Terms and Conditions of the AB 134 Grant Award

RESOLUTION NO. 17-XXX

**A Resolution of the South Coast Air Quality Management District Board Recognizing
Funds and Accepting the Terms and Conditions of the
AB 134 Grant Award**

WHEREAS, under Health & Safety Code section 40400, et seq., the South Coast Air Quality Management District (SCAQMD) is the local agency with the primary responsibility for the development, implementation, monitoring and enforcement of air pollution control strategies, clean fuels programs and motor vehicle use reduction measures; and

WHEREAS, the SCAQMD is authorized by Health & Safety Code sections 40402, 40440, and 40448.5 as well as the Carl Moyer Memorial Air Quality Standards Attainment Program (§44275, et seq.) to implement programs to reduce transportation emissions, including programs to encourage the use of alternative fuels and low-emission vehicles; to develop and implement other strategies and measures to reduce air contaminants and achieve the state and federal air quality standards; and

WHEREAS, the Board has adopted several programs to reduce emissions from on-road and off-road vehicles, as well as emissions from other equipment, including the Carl Moyer Program and the Proposition 1B-Goods Movement Program; and

WHEREAS, the SCAQMD Board has prioritized funding of low-emitting on- and off-road vehicles and equipment in disproportionately impacted communities; and

WHEREAS, the SCAQMD is committed to further implement incentives to benefit disadvantaged communities as envisioned in AB 617 and to address AB 1550 targets for Greenhouse Gas Reduction Funds; and

WHEREAS, the SCAQMD is designated as an extreme non-attainment area for ozone and as such is required to utilize all feasible means to meet national ambient air quality standards.

THEREFORE, BE IT RESOLVED that the Board of the SCAQMD, State of California, in regular session assembled on December 1, 2017, does hereby accept the terms and conditions of the AB 134 Budget Act of 2017 grant award and recognize up to \$107.5 million in AB 134 funds.

BE IT FURTHER RESOLVED that the Executive Officer is authorized and directed to take all steps necessary to carry out this Resolution.

Date

Clerk of the Board

Agenda Item #5

Fred Minassian

Adopt Resolution Recognizing Funds and
Accepting Terms and Conditions for Funds
Appropriated Under AB 134

Background

- On September 16, 2017, the Governor approved AB 134 to amend the Budget Act of 2017
- Adds appropriations to the Budget Act, taking effect immediately
- Under Schedule 3 of AB 134, \$250M is available for projects pursuant to the Carl Moyer Program
- Funds are to be distributed to air districts by CARB
- SCAQMD's share is \$107.5M or 43% of the funds

AB 134 Program

- Funds must be encumbered by June 30, 2019, and liquidated by June 30, 2021
- A Resolution recognizing the funds and accepting the terms and conditions of the program is to be submitted to CARB

Recommended Action

Adopt Resolution recognizing upon receipt up to \$107.5 million from CARB into the Carl Moyer Program Fund (32) and accepting the terms and conditions for the funds as appropriated under Schedule 3 of AB 134 Budget Act of 2017