

BOARD MEETING DATE: August 7, 2020

AGENDA NO. 3

PROPOSAL: Execute Contract to Investigate Effects of Ethanol-Gasoline Fuel Blend from Light-Duty Vehicles on Criteria Emissions and Secondary Organic Aerosol Formation

SYNOPSIS: In May 2019, the U.S. EPA approved the use of gasoline blended with up to 15 percent ethanol by volume (E15) for year-round use to support renewable fuel standards and energy independence. Past studies have shown that light-duty gasoline vehicles are significant sources of NO_x, VOC and other precursor gas emissions, which together contribute to secondary organic aerosol (SOA) formation and higher PM_{2.5} in the South Coast Air Basin. CARB, along with the ethanol industry and the University of California, Riverside (UCR)/CE-CERT, has proposed a fuel study measuring criteria and toxic pollutant emissions from 20 gasoline vehicles using E15. This action is to execute a contract with UCR/CE-CERT to perform investigation of E15 gasoline fuel effects on criteria and toxic pollutant emissions and SOA formation from light-duty vehicles in amount not to exceed \$200,000 from the Clean Fuels Program Fund (31).

COMMITTEE: Technology, June 19, 2020, Recommended for Approval

RECOMMENDED ACTION:

Authorize the Chairman to execute a contract with UCR/CE-CERT to perform an investigation study of E15 gasoline fuel effects on criteria and toxic pollutant emissions and SOA formation from light-duty vehicles in amount not to exceed \$200,000 from the Clean Fuels Program Fund (31).

Wayne Nastri
Executive Officer

Background

In May 2019, the U.S. EPA approved the use of gasoline blended with up to 15 percent ethanol by volume (E15) for year-round use to help regulated parties comply with the Federal Renewable Fuels Standard (RFS) and California's Low Carbon Fuels Standard (LCFS). Higher levels of ethanol in gasoline would also reduce petroleum reliance and has the potential to reduce GHGs and criteria pollutant emissions from refineries. Currently, gasoline in California contains up to 10 percent ethanol by volume (E10).

The 2016 AQMP estimates gasoline contributes to over 45 percent of total energy consumed in the South Coast Air Basin (Basin), and the emissions inventory reflects that light-duty gasoline vehicles are the fourth highest category of NOx emissions and the second highest category of VOC emissions. Previous work has shown the potential for emission reductions with higher ethanol blends, but results are inconsistent with lower ethanol blends such as E15. In a 2019 CARB Staff Concept Paper, the gasoline predictive model estimates higher NOx emissions from E15 based on data from existing studies. The 2016 AQMP also identified that the precursor gas emissions, such as volatile and semi-volatile organic compounds, NOx, CO and PM emitted from gasoline vehicles, together contributed to higher PM2.5 concentrations in the Basin. The introduction of a new gasoline blend will likely have important implications in the air quality of the Basin and UCR/CE-CERT's evaluation of the fuel impacts on criteria emissions and SOA from gasoline vehicles is an important step in understanding air quality in our region.

Proposal

CARB, Renewable Fuels Association (RFA), Growth Energy and UCR/CE-CERT have partnered together and are proposing to evaluate criteria and toxic pollutant emissions from 20 gasoline vehicles of different model years, emission standards, manufacturers and engine technology on both E10 and E15 fuels. Triplicate testing will be conducted using U.S. EPA's Federal Test Procedure-75 typically used for passenger cars. Emission measurements will include regulated pollutants, fuel economy, carbonyl compounds and VOCs. CE-CERT proposes to expand the scope and add in-depth characterization of the SOA forming potential from a subset of ten vehicles that best represent vehicle populations in the Basin. Both primary and secondary aerosols will be characterized in each experiment.

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 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 interest of the South Coast AQMD. 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. The proposed project will

include in-kind contributions and cost-share by CARB, RFA and Growth Energy. UCR is also an educational institution and CE-CERT is their research center with multidisciplinary resources to engage in diverse environmental and transportation research programs.

Benefits to South Coast AQMD

The proposed E15 fuel study will help to better understand the air quality and public health impact of the new fuel formulation on light-duty vehicles, which are significant contributors to the emissions in the Basin. Projects to assess emissions of light-duty vehicles are included in the *Technology Advancement Office Clean Fuels Program 2020 Plan Update* under the category of “Fuel/Emissions Studies”.

Resource Impacts

The total estimated cost for the proposed project is \$1,300,000, of which South Coast AQMD’s proposed cost-share will not exceed \$200,000 from the Clean Fuels Program Fund (31). Proposed cost-sharing is summarized below:

Project Partner	Cost-Share	Percent
CARB	\$500,000	39
RFA/Growth Energy	\$600,000	46
South Coast AQMD <i>(requested)</i>	\$200,000	15
Total Project Cost	\$1,300,000	100

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