

BOARD MEETING DATE: February 2, 2018

AGENDA NO. 5

PROPOSAL: Recognize Revenue to Develop Test Standard for Performance Verification of Low-Cost Indoor Air Quality Sensors

SYNOPSIS: DOE's Office of Energy Efficiency and Renewable Energy awarded its competitive research grant, "Building America Industry Partnerships for High Performance Housing Innovation," to Newport Partners, LLC, to develop an American Society for Testing and Materials test standard for performance verification of low-cost indoor air quality sensors. SCAQMD and researchers from Home Ventilating Institute and Texas A&M Riverside Energy Efficiency Laboratory will collaborate with Newport Partners, LLC, on the development of this test standard. This action is to recognize revenue up to \$56,106 from Newport Partners, LLC, to support collaboration of this project.

COMMITTEE: Technology, January 19, 2018; Recommended for Approval

RECOMMENDED ACTION:

Recognize revenue, upon receipt, up to \$56,106 from Newport Partners, LLC, to reimburse SCAQMD for Salary and Employee Benefits costs related to collaboration of the project to develop a test standard performance verification of low-cost indoor air quality sensors.

Wayne Natri
Executive Officer

MMM:JCL:AP

Background

With the advent of low-cost gaseous and particulate sensors, optimized, energy efficient ventilation techniques for maintaining acceptable indoor air quality (IAQ) are possible. However, research has shown that the accuracy of sensors being offered for this purpose varies widely. Until a standardized test method is developed for determining the accuracy of low-cost IAQ sensors, builders and designers cannot specify such sensors or the "smart ventilation" systems that they control with the assurance of adequate

performance. As a result, potential energy savings are lost, consumers can suffer from poor IAQ due to low quality sensors, and builders would be averse to using smart ventilation systems. To address the gap in standardized test methods for low-cost IAQ sensors, Newport Partners, LLC, has submitted a proposal to the DOE to source funding for the development of a test standard.

Through the development of the AQ-SPEC test methods for low-cost air quality sensors, SCAQMD has completed the elements of developing a consensus test standard. The building blocks that are now in place that creates a proof-of-concept for this project include:

- Acquisition of reference instruments needed for reference measurements;
- Identification of critical performance characteristics for test method verification, including but not limited to accuracy and precision;
- Development of performance evaluation test methods for criteria pollutants and air toxics sensors; and
- Performance of initial evaluations of sensors to the test methods (SCAQMD has tested over 30 sensors to date).

Proposal

SCAQMD will partner with Newport Partners, Home Ventilating Institute, and Texas A&M Riverside Energy Efficiency Laboratory to achieve the overarching objective of this project which is to develop and publish an American Society for Testing and Materials (ASTM) consensus test standard for performance verification of low-cost IAQ sensors. Critical success factors include:

- Convening a work group of industry-leading stakeholders including laboratories, manufacturers and industry groups;
- Transitioning SCAQMD's test methods applicable to outdoor/indoor air quality sensors to a consensus test standard focused on indoor air quality applications;
- Incorporating adequate stringency into test methods to ensure repeatability and reliability while minimizing testing costs for sensor manufacturers;
- Verifying test standard suitability through lab testing; and
- Communicating with ASTM staff and relevant subcommittees and committees to ensure publication of the standard within two years of the project's award.

For this purpose, SCAQMD will provide access to low-cost IAQ sensor test methods, engineering consulting with respect to development of the test standard, and conduct lab tests on low-cost test sensors in accordance with the draft test standard to identify opportunities for improvement.

The outcome of this project will be development of a consensus-based test standard for verifying IAQ sensor performance. Developing a standardized test method for IAQ sensors is essential to empower codes, standards and code programs to confidently approve smart ventilation solutions that can minimize ventilation energy use while safeguarding occupant health.

Benefits to SCAQMD

SCAQMD has the nation's leading laboratory with respect to evaluating and developing test methods for low-cost air quality sensors (AQ-SPEC). SCAQMD draft test methods are the most advanced guidelines available on this subject in both the U.S. and Europe. DOE funding is critical to advance SCAQMD's work in this area beyond draft methods. The results of this project will quickly transition the industry to a standardized, consensus-based test standard that can be referenced in mandatory ventilation codes and standards. This project will also lay the foundation for the development of performance standards for low-cost outdoor air quality sensors, an important step towards the development of a sensor certification program.

Resource Impacts

Sufficient funding is available for this project within the Science & Technology Advancement Budget using existing staff resources. The DOE has authorized funding of \$56,106 for this test standard development for SCAQMD through Newport Partners, LLC, and those funds will be recognized upon receipt to reimburse SCAQMD for Salary and Employee Benefits costs related to this project. SCAQMD shall provide cost-sharing in the amount of \$22,442 (Salaries and Employee Benefits only) for the project.