

BOARD MEETING DATE: October 6, 2017

AGENDA NO. 3

**PROPOSAL:** Execute Contracts to Implement Advanced Building Energy Management Projects

**SYNOPSIS:** In November 2016, the CEC released two competitive solicitations to fund efficiency projects using pre-commercial technologies and advanced renewable energy coupled with battery storage. During CEC's open solicitation process, staff was approached by two firms, Willdan Energy Solutions and Advanced Microgrid Solutions, to utilize the SCAQMD building as a site for their proposed energy projects. CEC subsequently awarded Willdan Energy Solutions \$3,994,265 for pre-commercial efficiency projects; and Advanced Microgrid Solutions \$2,731,862 for advanced renewable energy with a battery storage project. This action is to execute contracts with Willdan Energy Solutions in an amount not to exceed \$2,293,645 from the Infrastructure Improvement Fund (02) and Advanced Microgrid Solutions for a 20-year power efficiency agreement.

**COMMITTEE:** Technology, September 15, 2017; Recommended for Approval

**RECOMMENDED ACTIONS:**

Authorize the Chairman to execute sole source contracts with the following contractors:

1. Willdan Energy Solutions, a subsidiary of Willdan Group, Inc., in an amount not to exceed \$2,293,645 using the Infrastructure Improvement Fund (2); and
2. Advanced Microgrid Solutions for a 20-year power efficiency agreement for the implementation of additional solar and battery storage at a cost not to exceed 75 percent of the savings from the annual reduction in utilities expense from District General Fiscal Years 2017-18 through FY 2037-38 Budgets, Services and Supplies Major Object, Utilities Account and up to \$600,000 from the California Public Utilities Commission's Self Generation Incentive Program, if awarded to SCAQMD.

Wayne Nastri  
Executive Officer

## **Background**

In November 2016, the CEC released two competitive solicitations. The Emerging Energy Efficient Technology Demonstrations (EEETD) solicitation requires projects to demonstrate at least 20 percent energy efficiency improvement through the use of pre-commercial technologies on existing buildings within four funding categories: Government, Colleges/Schools, Privately Owned Buildings, and Military. The second solicitation entitled “Solar+: Taking the Next Steps to Enable Solar as a Distribution Asset” (Solar+) requires projects to explore pathways to reduce the environmental, public health, and air quality impacts of electricity generation, distribution and storage, as well as improve overall resiliency of the electrical grid infrastructure.

Staff was approached by two firms proposing to use SCAQMD’s headquarters building as the demonstration site for the above-mentioned solicitations.

- 1) Willdan Energy Solutions proposed to use SCAQMD’s headquarters as a demonstration site for the EEETD solicitation to implement several pre-commercial technologies to reduce energy use over 20 percent and provide capability to participate in utility-driven demand response events. Staff previously worked with Willdan in 2012. They reviewed the building’s systems and energy usage patterns, developed an energy model for the building, and provided recommendations to improve energy efficiency of the building through a Southern California Edison (SCE) funded program.
- 2) Advanced Microgrid Solutions (AMS) proposes to utilize SCAQMD’s headquarters as a demonstration site for the Solar+ solicitation to expand the current solar generation to include the latest photovoltaics, smart inverters, energy storage technologies, and advanced energy forecasting.

In March 2017, both firms were awarded CEC funding for their proposals. Willdan received an award in the amount of \$3,994,265 and AMS received an award in the amount of \$2,731,862. In June 2017, the AMS project was also notified by the California Public Utilities Commission’s (CPUC) Self-Generation Incentive Program (SGIP) that SCAQMD will be awarded an additional \$600,000 towards the Solar+ project. Once received, the SGIP funds will be paid to AMS to help cover the construction costs of the project. The proposed technologies from Willdan and AMS are shown in Table 1.

SCAQMD’s headquarters was opened in 1993 and has not been updated to incorporate the latest energy-efficient technologies or onsite power management systems that include renewable energy generation, battery storage, and the building’s energy usage profiles. Additionally, when SCAQMD’s headquarters building was designed, the electrical utility rate structures did not include time-of-use demand charges that now constitute the largest portion of SCAQMD’s electrical utility bills. Improving the

SCAQMD's headquarters building efficiency, adding additional onsite solar generation, and improved energy load shifting through battery storage and energy management will significantly lower SCAQMD's electricity costs, while also reducing emissions associated with power generation.

## **Proposal**

### *Willdan Pre-Commercial Efficiency Project*

This project implements pre-commercial technologies for commercial buildings and will demonstrate efficiency solutions for buildings with critical environments, such as laboratories. The projects include: (1) Replacing the SCAQMD building chillers with high-efficiency low global warming potential refrigerant chillers; (2) Improving SCAQMD's lighting with LED fixtures and innovative controls with off-grid exterior parking lot LED lighting, direct current (DC) LED lighting for the laboratory, and implement advanced zone-level building management system (BMS) controls; (3) replace the laboratory's constant flow fume hoods with advanced variable flow laboratory exhaust systems; and (4) develop a demand response platform for SCAQMD.

### *AMS Advanced Renewable Energy with Battery Storage*

This project will demonstrate an aggregated system composed of a PV smart inverter, a bi-directional storage inverter, behind-the-meter solar and storage, and an aggregator platform. The project will replace many of the older solar panels at the SCAQMD building along with adding new onsite solar panels, install a 750 kW battery storage system, and provide an uninterruptible power supply to protect sensitive equipment in the event of laboratory power outages or spikes.

**Table 1. Advanced Building Energy Management Project Technologies for SCAQMD Headquarters**

<b>Company</b>	<b>Project</b>	<b>Technology</b>
Willdan	Pre-Commercial Efficiency	Low GWP Refrigerant Variable Speed Chillers
		LED Interior Lighting with Integrated Controls
		Laboratory DC Lighting
		Low-Pressure-Drop Fume Hood Air Valves and Controls
		Advanced Lighting Controls with Demand Response Capability
		Building Management System with Plug Load Integration
		Off-Grid Exterior Lighting Poles
AMS	Advanced Renewable Energy with Battery Storage	500 kW High-Efficiency Solar Panels
		750 kW Lithium Ion Battery Racks
		(3) 250 kW Bi-Directional Inverters
		Energy Storage Controller

### **Sole Source Justification**

Sections VIII.B.2 of the Procurement Policy identifies provisions under which sole source awards may be justified. This request for a sole source award is made under provisions B.2c: (1) The unique experience and capabilities of the proposed contractor and contract team and (2) The contractor has ownership of key assets required for project performance. The EEETD project being implemented by Willdan uses a comprehensive building energy model and proprietary efficiency technologies. Additionally, the Willdan project was competitively awarded by the CEC under GFO-16-304–Emerging Energy Efficient Technology Demonstrations and staff is proposing to cost-share the project with the CEC. The solar, storage and advanced inverter project being implemented by AMS uses energy forecast and control programs that are proprietary to AMS along with bi-directional inverters that enable the solar and storage system to provide power to sensitive equipment to the laboratory along with reducing demand charges. Additionally, the AMS project was competitively awarded by the CEC under GFO-16-309–“Solar +: Taking the Next Steps to Enable Solar as a Distribution Asset” and a subsequent SGIP award by the CPUC.

### **Benefits to SCAQMD**

The project outlined above will update the building with the latest technologies to reduce energy demand, increase renewable energy generation through high-efficiency solar PV, and implement energy peak shaving, serving as a benefit to SCAQMD financially and also reducing reliance on the electricity grid while reducing power plant emissions. The current electricity usage and cost for the building is approximately 6.7 MWh and over \$900,000 annually. Energy savings achieved through implementation of these projects should improve the efficiency of the building by over 20 percent with annual electricity cost savings over \$350,000 for the building, which does not include the development of demand response capabilities. Cost savings will recover SCAQMD’s out-of-pocket expenditures in less than eight years. Furthermore, the projects will help accelerate commercialization of the various technologies and increase public awareness of opportunities for increased efficiency and air quality benefits in existing buildings.

### **Resource Impacts**

The total project cost for the Willdan Pre-Commercial Efficiency project is \$6,376,481 with an SCAQMD cost-share not to exceed \$2,293,645 from the Infrastructure Improvement Fund (02). Other leveraged funds include \$88,580 toward equipment from technology manufacturers, including Trane US, Inc., and Aris Renewable Energy.

The AMS Advanced Renewable Energy with Battery Storage project is a 20-year power efficiency agreement which is estimated to generate \$182,447 annual utility bill savings, of which AMS will receive 75 percent of shared savings with the remaining 25 percent to SCAQMD annually. Other leveraged funds include \$600,000 from the CPUC’s Self Generation Incentive Program. Fifty percent of the \$600,000 will be received upon

installation of the solar system and the remaining 50 percent will be received over a five-year period upon meeting required performance standards. The SGIP funds will be recognized and budget appropriated (for payment to AMS) as part of the budget process in the appropriate fiscal years and allocated to the contract, if received.

Details on project costs and funding are below:

**Table 2. Budget Summary Table for Advanced Building  
Energy Management Projects**

<b>Company</b>	<b>Project</b>	<b>CEC Awarded</b>	<b>SCAQMD Cost-Share</b>	<b>Other Leveraged Funds</b>
Willdan	Pre-Commercial Efficiency	\$3,994,256	\$2,293,645	\$88,580
AMS	Advanced Renewable Energy with Battery Storage	\$2,731,862	\$137,000 annually*	\$600,000

\*\$182,000 estimated total annual utility savings with approximately \$46,000 to SCAQMD