DATE: February 21, 2013

TO: SJVUAPCD Governing Board

FROM: Seyed Sadredin, Executive Director/APCO
Project Coordinator: Samir Sheikh/Errol Villegas

RE: **APPROVAL OF PROJECT SELECTIONS FOR THE DISTRICT'S TECHNOLOGY ADVANCEMENT PROGRAM**

RECOMMENDATIONS:

1. Approve the following project selections totaling $3,820,179 from the District's Technology Advancement Program's September 11, 2012 Request for Proposals evaluated under the Board-approved scoring criteria:

    a. $500,000 for Colony Energy Partners, LLC's proposal to demonstrate a biogas cleaning and pipeline injection system; and

    b. $500,000 for Oberon Fuels, Inc.'s proposal to demonstrate dimethyl ether as a clean alternative fuel for heavy-duty trucking; and

    c. $254,500 for Aramark Uniform & Career Apparel's proposal to demonstrate a series hydraulic hybrid delivery truck; and

    d. $500,000 for Transportation Power, Inc.'s proposal to demonstrate a zero-emission electric yard tractor at the IKEA Distribution Center; and

    e. $486,229 for Capstone Turbine Corporation's proposal to demonstrate CNG-powered turbine extended range electric class 7 truck; and

    f. $470,000 for Ruby Mountain Inc.'s proposal to demonstrate a small scale biogas liquefaction system to produce LNG for vehicle fuel; and

g. $417,050 for Biogas & Electric, LLC's proposal to demonstrate engine after-treatment system for use at Bakersfield Wastewater Treatment Plant #3; and

h. $500,000 for Industrial Waste & Salvage's proposal to demonstrate a landfill gas to CNG for vehicle fuel project; and

i. $192,400 for The Green Station LLC's proposal to demonstrate zero-emission commercial leaf blower; and

2. Authorize the Executive Director/APCO, on behalf of your Board, to execute agreements with the Board Chair's signature for selected projects.

BACKGROUND:

Despite major reductions in emissions and corresponding improvements in air quality, San Joaquin Valley continues to face difficult challenges in meeting the federal ambient air quality standards. As an extreme non-attainment area for ozone, the District's *2007 Ozone Plan* contains a "black box" that represents necessary reductions in emissions for which a technology has not yet been identified. At the same time, the United States Environmental Protection Agency (EPA) is in the process of promulgating more stringent air quality standards. It is virtually impossible for the San Joaquin Valley to attain the new standards for ozone and particulates without significant advancements in low-emission technologies for mobile and stationary sources.

On March 18, 2010, your Board approved the District's Technology Advancement Program, a strategic and comprehensive program to identify, solicit, and support technology advancement opportunities. The program's primary goal is to advance technology and accelerate the deployment of innovative clean air technologies that can bring about emission reductions as rapidly as practicable.

The program has competed two requests for proposals, with your Board approving selection of projects on December 16, 2010 and December 15, 2011. These project approvals have resulted in eleven projects under contract and progressing. Many of these eleven projects have put into operation clean technologies that are reducing our current emissions as well as providing useful data to improve these technologies for future clean projects. The City of Manteca has recently received two advanced serial hydraulic hybrid refuse trucks as a clean alternative to conventional diesel refuse trucks, and will be demonstrating the system in their daily curbside pick-up. Another project testing an innovative thermal energy storage system at the DLM Ranch in Stanislaus County, enabling round the clock irrigation from the solar-thermal array pictured below

as an alternative to remove internal combustion engine irrigation pumping. In Kern County, a zero-emissions autonomous robotic agricultural spray rig is beginning field testing. In Tulare County, a project demonstrated an innovative modification to traditional methods used for commercial scale composting of organic wastes. Other funded projects are moving forward as expected through various demonstration stages, including equipment and prototype manufacturing and deployment.

—Program funded, solar-thermal powered agricultural irrigation pump in Waterford, CA.

With the most recent approval of projects, your Board allocated a further $3,000,000 in incentive funding for the third Technology Advancement Program RFP. To that end, District staff issued a competitive RFP on September 11, 2012. An additional $1,000,000 in funding was reallocated to this RFP from the previous RFP as three of the twelve selected projects were cancelled.

As a part of the Technology Advancement Program, the District has participated in collaborative efforts as well as worked directly with other agencies to maximize the benefit of the program. The collaboration with the Clean Air Technology Initiative and the California/Federal Dairy Digester Working Group has resulted in additional funding directed to the Districts efforts for technology advancement. Outreach to innovators about the program has benefited from these collaborations as well as from the District's work with individual agencies such as CalRecycle and the California Energy Commission.

Your Board has requested that the Technology Advancement Program expand its efforts to engage local colleges and universities, and to expand the capacity of these local institutions to participate in advanced technology projects. To that end, the RFP soliciting these projects included ten percent of the total score for how a project builds capacity at local colleges and universities. Many proposed projects included such partnerships, and program staff will continue to work with applicants to increase opportunities for these institutions to participate in these technology development and demonstration efforts.

DISCUSSION:

Improved program recognition and extensive outreach for this Technology Advancement Program RFP resulted in a continued high level of interest in the program. In addition to distributing information through various email lists and online resources, the District conducted increased outreach to local universities and colleges to ensure that they were aware of the available funding. The District also leveraged interagency partnerships to further distribute information regarding available Technology Advancement Program funding.

The District received proposals for forty projects, requesting approximately $20 million in funding. The proposals included multiple projects from each of the three technology focus areas identified for the program; renewable energy, waste solutions, and mobile sources. The projects were scored in six weighted categories.

Scoring Categories

Relevance to Attainment Plans — This category includes an assessment of the benefit provided by a proposed technology in assisting the Valley comply with federal air quality standards, particularly for ozone and particulates. Important factors include the level of innovation of the technology, size of the source category that might benefit from the technology, and the potential emission control effectiveness of the technology. Another consideration includes the potential for the source category potentially benefitting from the proposed technology to significantly grow, and thus require the need for additional emissions reductions.

Co-Benefits — This category includes an assessment of other emissions benefits provided by a proposed technology, in addition to those that assist the Valley in complying with federal air quality standards assessed under Relevance to Plans. This includes reductions in air toxics emissions, and other environmental benefits, especially when such benefits occur in dense population areas or sensitive population groups and benefit public health. Co-benefits may also include reductions in greenhouse gases. Cases where a proposed technology could cause other emissions increases would be assessed unfavorably in this category.

Technology Cost-effectiveness — This category includes an assessment of the expected cost-effectiveness of a proposed technology, including the economic viability of a proposed technology upon commercialization. Information used to make this assessment includes the projected cost of the technology, and the expected control effectiveness of the technology. Final scores in the category were influenced by how well information was justified through supporting documentation.

Program Funding Required and Resource Leveraging — This category includes an assessment of the value a proposed project contains in terms of requested funding, the percentage of the total project cost that represents, and the amount of non-District

funding and other resources being brought into the project. Final scores in this category were influenced by how well funding and leveraging commitments were justified through supporting documentation.

Building Capacity at Local Colleges and Universities — This category assessment was based on the involvement of Valley colleges and universities. Proposals including such partnerships were evaluated based on the details of institution's involvement, including how the involvement would benefit the institution in participating in future demonstration projects, with higher scores being given to proposals in which funding is used to build research infrastructure, including through the purchase of durable equipment or creation of new research programs.

Project Readiness — This category includes an assessment of how prepared the project is to begin operations, and how likely the project is to succeed. Final scores in this category were influenced by supporting documentation from project partners, including host cites and funding partners, as well as the established reputation and history of the proposing company.

The scoring process resulted in the following ranking and recommendation to fund the top nine projects at the levels indicated in the table below:

Company	Score	Recommended Funding	% of Total Project Cost	% of Requested Funding
Colony Energy Partners	77.25	$500,000	11%	100%
Oberon Fuels, Inc.	74.63	$500,000	24%	100%
Aramark Uniform & Career Apparel	72.56	$254,500	49%	100%
Transportation Power, Inc.	70.69	$500,000	22%	50%
Capstone Turbine Corporation	70.50	$486,229	52%	100%
Ruby Mountain Inc.	70.44	$470,000	49%	100%
Biogas & Electric, LLC	69.56	$417,050	100%	100%
Industrial Waste & Salvage	68.81	$500,000	20%	50%
The Greenstation	68.45	$192,400	18%	50%
Total		$3,820,179		

Your Board's approval of this item will enable Staff to finalize contracts with the applicants. Three of the proposed projects are recommended for funding at a lower level than is requested in their proposals. Project budgets will be reviewed for potentially ineligible expenses. Budgets revised as a result of this review may result in lower project incentives.

Proposal Summaries

Colony Energy Partners
Renewable Energy and Waste Solutions
Colony Energy Partners is in the process of developing the Tulare Anaerobic Digester Facility and proposes to develop and demonstrate a novel packaged hardware system for gas purification and injection into the natural gas pipeline. The packaged hardware will have a smaller footprint, and enable much simpler future installations. Gas cleaning systems, which are used to upgrade biogas to pipeline quality for export to the utility, prevent emissions from the alternative use of the gas in power production systems. Development of a packaged combination of hardware capable of cost-effective gas purification may provide an option for reducing future emissions from power generation that use gas from digester systems. California State University, Fresno will be involved in the project in a technical advisory role and in the project will include paid internships for students.

Oberon Fuels, Inc.
Mobile Sources
Oberon Fuels, in partnership with Volvo and Safeway in Tracy, proposes to demonstrate two heavy-duty trucks modified to use dimethyl ether (DME) as a replacement for diesel. DME can be produced from biogas sources, and Oberon Fuels is in the process of developing a biogas to DME facility in California. The proposed demonstration will provide a real world use of this alternative fuel and demonstrate emissions benefits, with potential application to heavy duty trucks used in goods movement, the primary contributor to ozone and fine particulate matter problems in the Valley.

Aramark Uniform & Career Apparel
Mobile Sources
Aramark Uniform & Career Apparel proposes to demonstrate and test emissions on three series hydraulic hybrid package delivery vehicles in Fresno. Demonstration of a series hydraulic hybrid drivetrain on this type of vehicle has not yet been performed in the Valley. This demonstration will provide fuel savings and emission reduction information that would be useful in evaluating future opportunities to encourage adoption of this technology.

Transportation Power, Inc.
Mobile Sources
Transportation Power, Inc. proposes to demonstrate a zero emission electric yard tractor for use at IKEA's distribution center in Lebec. The electric yard tractor would replace diesel rigs currently used to move trailers around the facility. Key innovations that will be demonstrated with this project include the use of onboard "inverter-charger units" that simplify and accelerate battery charging. By demonstrating the feasibility of using two inverter-charger units on each vehicle, charging time will be cut in half. This will enable the tractors to support the demanding two-shift tractor operations at the

regional distribution center, with 8-10 hour shifts and only about 1 1/2 hour between shifts.

Capstone Turbine Corporation
Mobile Sources
Capstone Turbine Corporation, in collaboration with Kenworth, proposes to demonstrate a CNG-turbine powered range extended series electric truck in the Valley. The project seeks to demonstrate near-term commercialization and production capabilities in this class as well as illustrate the zero tailpipe emission pathway represented by electric-traction truck architecture proposed in this project. This technology has the potential of demonstrating near zero emissions technology in the goods movement sector, the primary contributor to ozone and particulate matter problems in the Valley.

Ruby Mountain Inc.
Renewable Energy and Waste Solutions
Ruby Mountain Inc. proposes to demonstrate a small scale gas liquefier system in Fresno County to produce LNG from bio-methane for use as an alternative to diesel in fleets throughout the Valley. This technology is typically applied to larger scale projects, and this demonstration will validate the cost-effective use of biogas liquefaction as a clean alternative to emissions-producing power generation on a scale more applicable to the biogas potential of the Valley, including dairy digesters.

Biogas & Electric, LLC
Renewable Energy and Waste Solutions
Biogas & Electric proposes to demonstrate a wet-scrubber based after-treatment system at the Bakersfield Wastewater Treatment Plant #3. The proposed system has the potential to reduce NOx and other emissions from electricity generation projects at anaerobic digesters to levels lower than the current Best Available Control Technology, with far lower operating expenses than the currently used catalyst-based systems.

Industrial Waste & Salvage
Renewable Energy, Waste Solutions, and Mobile Sources
Industrial Waste & Salvage proposes to demonstrate a compact skid mounted biogas to vehicle fuel system at the closed Orange Avenue landfill in Fresno, CA. The cost-effective use of biogas for vehicle fuel advances the District's needs for near-zero emission vehicle and clean alternative fuel goals, as well as provides a use for biogas with no net increase in criteria emissions in the Valley.

The Greenstation
Mobile Sources
The Greenstation proposes to demonstrate a backpack battery powered leaf blower in Fresno and Visalia using the most advanced battery and blower technology available designed for commercial use. The project will integrate the blower units into the daily institutional grounds maintenance schedules and demonstrate the technology will be capable of replacing high emitting gasoline powered leaf blowers in commercial lawn

maintenance operations. Given the neighborhood-level impacts of conventional gas powered lawn maintenance equipment, development of zero emissions alternatives has the potential of providing significant health benefits to Valley residents and lawn care workers.

Other Proposals

In addition to these projects, there were 31 proposals not recommended for funding (see attached list of projects). While some of these projects had strong merits, not all of them could be selected with the current funding. Applicants will be encouraged to resubmit their projects for future Technology Advancement Program funding opportunities, and District staff will work with the applicants to identify opportunities for enhancing project proposals. Some projects may be eligible for other grant programs, and the District commits to working with applicants to seek other avenues for funding.

FISCAL IMPACT:

Sufficient appropriations in the amount of $3,820,179 are included in the Adopted 2012-13 Budget to fund the recommended projects under the Technology Advancement Program.

Attachment:
Attachment A: List of Projects Not Selected (2 Pages)

San Joaquin Valley Unified Air Pollution Control District
Meeting of the Governing Board
February 21, 2013

APPROVAL OF PROJECT SELECTIONS FOR THE DISTRICT'S TECHNOLOGY ADVANCEMENT PROGRAM

Attachment A:

List of Projects not Selected
(2 PAGES)

Applicant	Description
Wrightspeed, Inc.	Range-extended EV Refuse Truck Demonstration with microturbine range extender in Visalia
Biogas & Electric, LLC (Modesto)	Engine after-treatment system for use at dairy in Modesto, including the construction of a new digester system
US Hybrid Corporation	Electric feed truck for dairy operation in Lodi
Electric Vehicles International, LLC	Convert 8 existing pre2007 diesel powered UPS trucks to all electric operation in Valley
Motiv Power Systems, Inc.	All-electric utility trucks (Fire, aerial lift, flatbed, and refrigerated box truck) in Fresno County
Complete Coach Works	All-electric transit bus for FAX in Fresno
California Clean Air Technologies	Propane-Diesel dual fuel retrofit system in Porterville and Riverdale
Pena's Disposal, Inc.	Series Hydraulic Hybrid refuse truck, in Cutler
inventev, LLC	Plug-in Hybrid Electric Diesel with grid backup support, demonstration by PG&E
Electricore, Inc.	Medium duty battery electric vehicle for use at the Port of Stockton
EcoPAS, LLC	VOC capture system for use during active wine fermentation
BYD America	Fully Electric Plug-in eBus to replace 40' transit bus for FAX in Fresno
Electricore, Inc.	Driverless Vehicle for Port Operations, Port of Stockton
Odyne Systems LLC	Advanced Diesel plug-in hybrid work truck, w/ PG&E
Innova Tech, Inc.	Under-fired charbroiler emissions control technology at UC Riverside lab
Cummins Inc.	Off-road equipment electrification demonstration at Cummins lab, Indiana
ergSol, Inc.	Solar thermal system for process heat in Fresno, CA
Energy & Emission Solutions Inc.	Dual-Fuel, Dual-Turbocharger Stoichiometric Diesel Engine for stationary applications in Fresno County
Eco-Edge, LLC	Catalytic mist introduced to air intake to reduce emissions in Kern and Fresno counties
NohBell Corporation	VOC capture system for use during active wine fermentation
City of Fresno, Public Works Department	Traffic light synchronization project in Fresno
Finaxo environnement SA represented by ARI	Pyrolysis to Syngas to Compressed Air for vehicle propulsion, in Kern or Tulare counties

Applicant	Description
Electricore, Inc.	Renewable hybrid engine system for agricultural water pumping in Earlimart
The Wind Turbine Company	Combination wind turbine air circulation machine
Clovis Unified School District	Propane School Bus Replacement in Clovis
GRID Alternatives	Installation of solar energy systems on 25 homes in southern Tulare and Kern counties
Interra Energy, Inc.	Pressurized-pyrolysis biomass processing system in Modesto
Kanslab	Pneumatic air/diesel hybrid engine system, lab testing in Newark, CA
EcoCut and Trim LLC	Zero-emission lawn care equipment
Hydrogen Injection Technology, Inc.	Onboard hydrogen generation via electrolysis, for injection to air intake
Pereia & Huffenberger Clean Air Tech	Propane fumigation through air intake to reduce diesel consumption