

California Energy Commission
AGENDA INPUT FORM (GENERAL)



CEC 36 (Rev. 3-91)

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DUE DATES: A listing of Commission Business Meetings and Contracts Office due dates are available from the Secretariat.

CONTACT PERSON: Raquel E. Kravitz

Date due to Contracts Office: N/A

PHONE NUMBER: 916-327 1450

Date due to Secretariat: April 24, 2013

MS: 43

Proposed Business Meeting Date: May 8, 2013

AGENDA ITEM SUBJECT AND DESCRIPTION – This is the description that will appear on the agenda)

TRUSTEES OF THE CALIFORNIA STATE UNIVERSITY. Possible approval of the 13 highest ranking grant applications totaling \$1,215,944 from the Public Interest Energy Research (PIER) program's Energy Innovations Small Grant Solicitation 12-02. There are two projects totaling \$178,383 under Transportation Electric, one project totaling \$91,070 under Transportation Natural Gas, two projects under Natural Gas totaling \$189,982 and eight projects under Electric totaling \$756,509 (PIER electricity and natural gas funding) Contact: Raquel E. Kravitz.(10 minutes)

- a) Transportation Electric (12-02TE)
 - i. Peaker Conversions, Fullerton, CA, *Safe High Capacity Ultra Capacitor Storage System for Locomotives*, \$83,383. This project is to determine the feasibility of a simple and inexpensive on-board electrical energy storage system using ultra capacitors instead of batteries to reduce the cost of energy storage in hybrid railroad locomotives. This technology will store more energy, operate at a higher peak voltage, and use a smaller number of cells, which will reduce the cost of energy storage in locomotives.
 - ii. Motiv Power Systems, Inc., Foster City, CA, *Flexible Inverter for Electric Accessories and Export Power in Trucks*, \$95,000. This project is to determine the feasibility of a flexible power inverter for medium- and heavy-duty trucks to electrify diesel truck accessories. The inverter will allow the hydraulic system to run off of electricity instead of the truck engines, decreasing fuel usage on diesel trucks and reducing air emissions.

CONSENT **DISCUSSION** Time needed for presentation: 10 Minutes

CHECK HERE IF YOU NEED A COPY OF YOUR SIGNED RESOLUTION/ORDER

SPECIFY AUDIO-VISUAL EQUIPMENT NEEDED FOR PRESENTATION

DEPUTY DIVISION DIRECTOR SIGNATURE

 Laurie ten Hope

Date:

b) Transportation Natural Gas (12-02TNG)

- i. Energy Conversions Inc., Tacoma, WA, *Development of Turbulent Jet Ignition for Large Bore Locomotive Engines*, \$91,070. This project is to determine the feasibility of improving combustion of railroad locomotive engines to increase thermal efficiency and reduce NOx emissions. This project will increase fuel injector turbulence as well as improve cylinder mixing during direct injection of natural gas into the engine, jump starting converting railroad locomotive engines to natural gas. More than 80% of the EISG funds will be spent in California working with Williams Machine Inc., located in Lake Elsinore, CA for design and fabrication and in Napa, Ca for testing.

c) Natural Gas (12-02G)

- i. Santa Clara University, Santa Clara, CA, *Solar Thermoelectric Energy for Residential Scale Combined Heat and Electricity*, \$94,982. This project is to determine the feasibility of developing inexpensive residential-scale electricity and heating by employing a heat pump and thermoelectric modules that use a low-profile solar tracker to convert solar energy into electricity and heating. The waste heat from this system will then be used in natural gas applications, reducing residential natural gas bills.
- ii. University of California San Diego, San Diego, CA, *Earth-Abundant and Scalable Nanostructured Thermoelectrics for Energy Harvesting*, \$95,000. This project is to determine the feasibility of developing inexpensive thermoelectric materials that capture waste heat from various sources such as vehicular, solar thermal and industrial waste heat, and convert it to energy, providing a scalable and inexpensive process to generate energy that will benefit the California ratepayers.

d) Electrical (12-02E)

- i. GroundMetrics, Inc., San Diego, CA, *New Electromagnetic Method to Map Geothermal Resources*, \$94,599. This project is to determine the feasibility of a new geothermal mapping method using borehole-to-surface electromagnetic reservoir imaging. Direct imaging of geothermal resources will dramatically change the nature of project development and increase the rate of finding geothermal wells, which is the biggest cost of exploration of geothermal resources.
- ii. Schatz Energy Research Center, Arcata, CA, *Measurement of Critical Energy/Mass Balances for Stand-Alone Biomass Torrefaction*, \$95,000. This project is to determine the feasibility of operating a commercial biomass torrefier in an energy self-sufficient manner that will convert woody biomass into an easily transportable, high-energy product such as bio-coals. This project will significantly reduce the cost of transporting biomass from the forest and converting it to power.
- iii. University of California, Berkeley, Berkeley, CA, *Model-Predictive Smart Lighting Commissioning System for Emerging Demand Management*, \$94,766. This project is to determine the feasibility of a low cost performance-oriented lighting commissioning system. This package will consist of reusable plug-and-play wireless sensor network platform, data processing and modeling software, which will be used to quickly commission lighting systems to verify their performance and allow for adjustments to be made in the field. This project will improve the efficiency and quality of lighting for California ratepayers.
- iv. Bandgap Engineering, Palo Alto, CA, *Silicon Nanowire Solar Cells on Low-Cost Silicon Substrates*, \$95,000. This project is to determine the feasibility of combining silicon nanowires

with low-cost silicon materials to produce high-efficiency, low-cost solar cells with an efficiency goal of 17.5%. This project will reduce the price of solar electricity, making it competitive with non-renewable resources and reducing the costs to electricity ratepayers across all markets in California.

- v. Engsys Research, Inc., San Diego, CA, *Adaptive Fan Demand Control for Low Energy Consumption Cleanrooms*, \$95,000. This project is to determine the feasibility of drastic reduction of cleanroom fan energy consumption by dynamically adjusting the airflow with an adaptive controller, potentially saving 50% of the fan energy in cleanrooms.
- vi. Visible Energy Inc., Palo Alto, *Cloud-Based Refrigeration Control System*, \$95,000. This project is to determine the feasibility of developing a Wi-Fi controller in a cloud-based control scheme to operate commercial refrigerators. This will insure proper functioning of refrigerated appliances, including demonstration of incorporating power consumption in the control method on a cloud-based platform, and will minimize overall energy usage of the refrigeration system.
- vii. University of California San Diego, San Diego, CA, *Estimation of Thermostatically Controlled Loads for Demand Response*, \$92,144. This project is to determine the feasibility of using practical differential equation techniques to monitor thermostatically controlled loads for demand response opportunities. This project will use a wireless sensor network to monitor real-time temperatures in a grouped system of thermostatically controlled loads rather than monitoring them piece-by-piece, reducing building energy consumption and electricity costs for California ratepayers.
- viii. University of California, Davis, Davis, CA, *Improving Solar Energy Conversion by Incorporating Broadband Absorption Upconversion Materials*, \$95,000. This project is to determine the feasibility of incorporating broadband absorption conversion to improve solar efficiency. This technology will use rare earth nanoparticles to convert the infrared portion of solar radiation into photovoltaic-ready photons, improving the overall utilization of solar energy by 1.5%.