



**CALIFORNIA
ENERGY COMMISSION**



**California Energy Commission
February 14, 2024 Business Meeting
Backup Materials for California Clean Energy Funds dba CALCEF Ventures**

The following backup materials for the above-referenced agenda item are available in this PDF packet as listed below:

1. Proposed Resolution.
2. Project Summaries and CEQA Analysis for Proposed Prototype Small Grant Awards Under the CalSEED Initiative,

STATE OF CALIFORNIA

**STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION**

RESOLUTION: California Clean Energy Fund dba CALCEF Ventures

WHEREAS, pursuant to Public Resources Code section 25710 et seq. the State Energy Resources Conservation and Development Commission ("CEC") is authorized to establish and administer the Electric Program Investment Charge ("EPIC") Program; and

WHEREAS, the CEC has recognized that California's electricity ratepayers benefit from energy research, development and demonstration ("RD&D") activities conducted by individuals, small businesses, academics and small non-profit institutions; and

WHEREAS, the CEC has created the California Sustainable Energy Entrepreneur Development ("CalSEED") Initiative within the EPIC Program to provide funding for the aforementioned public interest RD&D activities; and

WHEREAS, New Energy Nexus dba California Clean Energy Fund or CalCEF Ventures ("CalCEF") is the administrator of the CalSEED Initiative under CEC Agreement Number 300-15-007 and is responsible for soliciting grant applications, recommending grant awards to the CEC, and managing approved grant projects; and

WHEREAS, CalCEF, in compliance with its duties under Agreement Number 300-15-007, in August 2023 held a competitive solicitation, and as a result has proposed to CEC small grant projects for funding; and

WHEREAS, CEC staff has reviewed the small grant projects CalCEF has proposed, and recommends the following 6 small grant projects for funding:

1. \$500,000 is being requested for the Piloting a Grid-interactive, Autonomous, Clean Energy Building Control System at School Campuses project with Community Energy Labs, Inc., a project to further develop a grid-interactive, autonomous clean energy building control system for small to mid-sized commercial building operators; and
2. \$500,000 is being requested for the Building High-Performance Lithium-ion Batteries (LIBs) to Obsolete Diesel in Heavy Duty project with Tyfast Energy Corp., a project to scale up a vanadium-based anode lithium-ion battery to a five amp-hour pouch cell; and
3. \$500,000 is being requested for the Demonstrating Automated Assembly of a Ready-to-Install All-in-One Residential Solar Panel project with Solvari, a

- project to verify and certify a solar PV system that installs four times faster and is 25% cheaper than what is currently available; and
4. \$500,000 is being requested for the Prototyping a Low-Cost, Next Level Zinc Battery for Stationary Storage project with Ariya Energy, a project to further develop a water and zinc-based low-cost, non-flammable battery for stationary storage; and
 5. \$500,000 is being requested for the Demonstrating a Real-Time Aerodynamic Modification Technology to Improve Energy Efficiency for the Trucking Industry project with Aeromutable Corporation, a project to build and test a real-time software adjusted aerodynamic modification technology for the trucking industry with an add-on device; and
 6. \$500,000 is being requested for the Energy Utilities Decision Support Tool: Highly Accurate Localized Near-to-Long Term Prediction of Extreme Weather Events project with Climformatics Inc., a project to further develop a machine learning technology that uses large-scale local climate data to predict localized near-to long-term extreme climate, fire-weather, solar power, and net load up to a year in advance with great accuracy; and

WHEREAS, CEC staff has reviewed the projects and determined that each project is exempt from the California Environmental Quality Act, as described in CEC staff's "Project Summaries and California Environmental Quality Act (CEQA) Analysis For Proposed Concept Small Grant Awards Under the California Sustainable Energy Entrepreneur Development (CalSEED) Initiative" Memorandum ("Memorandum") dated February 2, 2024, a document that is included in the backup materials to this Business Meeting item.

THEREFORE, BE IT RESOLVED, that the CEC adopts CEC staff's CEQA findings contained in the Memorandum for the 6 small grant projects; and

FURTHER BE IT RESOLVED, that the CEC approves the 6 small grant projects for a total of \$3,000,000; and

FURTHER BE IT RESOLVED, that the CEC directs CalCEF to execute grant agreements with the approved awardees pursuant to the requirements of Agreement Number 300-15-007.

CERTIFICATION

The undersigned Secretariat to the CEC does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the CEC held on February 14, 2024.

AYE:

NAY:

ABSENT:

ABSTAIN:

Dated:

Kristine Banaag
Secretariat

Memorandum

To: Chair David Hochschild
Vice-Chair Siva Gunda
Commissioner Noemí Gallardo
Commissioner Patty Monahan
Commissioner Andrew McAllister

Date: February 2, 2024

From: Ayat Osman
Electric Generation System Specialist

Telephone: (916) 931-8010

Subject: **PROJECT SUMMARIES AND CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ANALYSIS FOR PROPOSED PROTOTYPE SMALL GRANT AWARDS UNDER THE CALIFORNIA SUSTAINABLE ENERGY ENTREPRENEUR DEVELOPMENT (CALSEED) INITIATIVE**

New Energy Nexus dba California Clean Energy Fund or CalCEF Ventures (CalCEF) is the administrator of the Energy Commission's CalSEED Initiative under Agreement No. 300-15-007. The CalSEED Initiative awards small grants in the form of "Concept Awards" or "Prototype Awards" and provides access to business and technical services for entrepreneurs seeking to develop a technical feasibility case for their technologies.

CalCEF held a Business Plan Competition in August 2023, in which twelve former Concept Award winners competed for an additional "Prototype Award". The six highest scoring projects are being proposed to receive \$500,000 Prototype Award grants at the February 14, 2024 Energy Commission Business Meeting.

I am an Electric Generation System Specialist in the Energy Research and Development Division of the California Energy Commission. I have reviewed the project information and CEQA compliance forms submitted by each applicant. Below are project summaries and my CEQA analysis for each proposed project:

Prototype Awards

1. PROJECT TITLE: PILOTING A GRID-INTERACTIVE, AUTONOMOUS, CLEAN ENERGY BUILDING CONTROL SYSTEM AT SCHOOL CAMPUSES

Applicant: Community Energy Labs, Inc.

Principal Investigator: Tanya Barham

Subcontractors and Vendors: TBD

Project Summary: The goal of this project is to further develop a grid-interactive, autonomous clean energy building control system for small to mid-sized commercial building operators. The system can be installed in under a week (as opposed to months or years for traditional BAS) for a one-time installation fee of under \$20,000 (as opposed to \$250-700,000); requires minimal intervention or engineering; and autonomously manages complex energy and building performance objectives within the comfort bounds set by operators. During the CalSEED

agreement, Community Energy Labs will complete customer self-service training and support such as in-app enhancements at pilot sites, as well as demonstrate a working prototype in at least two additional climate zones and building types.

CEQA Exemption Status: 14 CCR 15306 “Data Collection, 14 CCR 15301 “Existing Facilities”, 14 CCR 15061 (b)(3) “Common Sense Exemption”

Reason Why Project is Exempt: This project is exempt under CEQA because it is limited to software-based work and will consist of controlling existing building energy systems in response to signals such as occupant behavior and electrical grid demand. There will be no construction activities, changes to land or buildings, generation of excessive noise or odors, or handling of hazardous materials. The project will not result in an expansion of existing or former use of the sites.

2. PROJECT TITLE: BUILDING HIGH-PERFORMANCE LITHIUM-ION BATTERIES (LIBS) TO OBSOLETE DIESEL IN HEAVY DUTY, CONSTRUCTION AND MILITARY VEHICLE APPLICATIONS

Applicant: Tyfast Energy Corp.

Principal Investigator: Gerardo Jose la O'

Subcontractors and Vendors: TBD

Project Summary: The goal of this project is to scale up a vanadium-based anode lithium-ion battery to a five amp-hour pouch cell. The proprietary vanadium-based anode replaces standard graphite anodes to deliver sub ten-minute fast charging and 10x more cycle life (>10,000 cycles) and is capable of charging in below-freezing temperatures. Tyfast has already interfaced with customers to verify these battery specifications would likely unlock electrified heavy duty and construction applications that require high power and constant use. During the CalSEED agreement, Tyfast will design and optimize the current small batch process to be fully compatible with larger-scale processing and will pursue third party validation. This work will be done at the existing Sustainable Power and Energy Center at UC San Diego where established the battery R&D center and fabrication pilot line will be utilized.

CEQA Exemption Status: 14 CCR 15306 “Data Collection, 14 CCR 15301 “Existing Facilities”

Reason Why Project is Exempt: This project is exempt under CEQA because it is limited to battery prototype development and testing work at an existing laboratory suited for the project. The laboratory scale fabrication and testing of battery cells will be small in size and quantity and will be performed under laboratory controlled conditions. There are no construction activities, changes to land or a building, or generation of excessive noise or odors. The project will not result in an expansion of existing or former use of the site.

3. PROJECT TITLE: DEMONSTRATING AUTOMATED ASSEMBLY OF A READY-TO-INSTALL ALL-IN-ONE RESIDENTIAL SOLAR PANEL

Applicant: Solvari

Principal Investigator: Samuel Truthseeker

Subcontractors and Vendors: TBD

Project Summary: The goal of this project is to verify and certify a solar PV system that installs four times faster and is 25% cheaper than what is currently available. Solvari ships complete all-in-one, single SKU solar panels directly to the jobsite where labor of any skill level can install it using a single common household tool. The simplification of rooftop solar from an average of 425 individual parts for a typical 7kW residential solar system to only 22 Solvari SR modules results in a 50% reduction in operation and installation costs. During the CalSEED agreement, Solvari will construct and demonstrate operability of two automated assembly stations and obtain UL certifications. This includes buying materials and equipment and building the stations, proving their operability, and then adding them into the assembly line. These assembly stations will use standard manufacturing conveyer line equipment along with sensors for product location as well as motors to move the conveyers to move product down the assembly line. The line will also include robots for adhesive dispensing that uses pumps at target locations and for component placement onto the solar panel as well as panel handling/motion. The adhesive is non-toxic and stable as are all other components. The total length of the two stations will not exceed 20 feet. There will be no changes to the land or building.

CEQA Exemption Status: 14 CCR 15306 “Data Collection, 14 CCR 15301 “Existing Facilities”, 14 CCR 15303 “Installation of Small Equipment”

Reason Why Project is Exempt: This project is exempt under CEQA because it is limited to the building and operability testing of two small solar panel assembly stations at an already zoned for this purpose. The structures built will be small (under twenty feet long total) and will not result in an expansion of existing or former use of the site. There will be no hazardous materials or excessive noise or odors as a result of the project.

4. PROJECT TITLE: PROTOTYPING A LOW-COST, NEXT LEVEL ZINC BATTERY FOR STATIONARY STORAGE

Applicant: Ariya Energy

Principal Investigator: Arthur Kariya

Subcontractors and Vendors: TBD

Project Summary: The goal of this project is to further develop a water and zinc-based low-cost, non-flammable battery for stationary storage. While other zinc-based batteries are being developed for low cost, they require expensive membranes and/or suffer from dendritic protrusions forming on the zinc surface. This zinc battery has a membrane-less design with a unique electrochemistry to inhibit the growth of the dendrites. During the CalSEED agreement, the team will further optimize their methodology to inhibit the growth of dendrites and build a prototype that could achieve a higher capacity and longer lifetime. Development work of battery components and subsequent testing will be performed on basic benchtops. Work constructing battery components will consist of: weighing the constituents, making a water-based slurry and subsequent drying of the slurry onto a substrate in a simple low temperature oven (<350 F).

CEQA Exemption Status: 14 CCR 15306 “Data Collection, 14 CCR 15301 “Existing Facilities”

Reason Why Project is Exempt: This project is exempt under CEQA because it is limited to the development and testing of a battery prototype. The battery work will be done in an existing laboratory designed for this purpose and will not result in an expansion of existing or former use at the site. Additionally, the battery components are nonhazardous and non-reactive. The project will not result in an expansion of existing or former use of the site.

5. PROJECT TITLE: DEMONSTRATING A REAL-TIME AERODYNAMIC MODIFICATION TECHNOLOGY TO IMPROVE ENERGY EFFICIENCY FOR THE TRUCKING INDUSTRY

Applicant: Aeromutable Corporation

Principal Investigator: Sandra Manosalvas-Kjono

Subcontractors and Vendors: TBD

Project Summary: The goal of this project is to build and test a real-time software adjusted aerodynamic modification technology for the trucking industry with an add-on device that will improve the energy efficiency of the trucking industry by up to 16%, which is over three times higher than commercial solutions currently available. Unlike the static technologies on the market today, this technology actively changes the aerodynamic signature of a tractor trailer to minimize drag and reduce energy consumption and emissions when driven at highway speeds by injecting air into the back of the trailer to optimize the vehicle energy consumption. During the CalSEED Prototype Award, Aeromutable will build an additional prototype as well as develop and execute a testing methodology that will leverage simultaneous on-road testing and commercial developmental pilots to demonstrate industry-trusted energy efficiency improvements. Aeromutable will focus on developing a robust methodology to test on-road heavy vehicle performance, build a second device that will enable our team to increase our testing and piloting capabilities, and use this methodology to increase the functionality of the technology by performing on-road testing and commercial pilots.

CEQA Exemption Status: 14 CCR 15306 "Data Collection, 14 CCR 15301 "Existing Facilities"

Reason Why Project is Exempt: This project is exempt under CEQA because it is limited to the building and testing of a trucking attachment designed to improve energy efficiency. Assembly work will occur in an existing facility suitable for this purpose and will involve negligible or no expansion of existing or former use of the site. The truck driven with this attachment will not significantly affect the environment in any ways outside of normal truck noise, operation, and pollution.

6. PROJECT TITLE: ENERGY UTILITIES DECISION SUPPORT TOOL: HIGHLY ACCURATE LOCALIZED NEAR-TO-LONG TERM PREDICTION OF EXTREME WEATHER EVENTS

Applicant: Climformatics Inc.

Principal Investigator: Subarna Bhattacharyya

Subcontractors and Vendors: TBD

Project Summary: The goal of this project is to further develop a machine learning technology that uses large-scale local climate data to predict localized near-to long-term extreme climate, fire-weather, solar power, and net load up to a year in advance with great accuracy. The platform offers a decision-making tool that combines proprietary extreme heat and fire-weather forecasting capabilities with improved energy distribution models to bridge the gap between

short-term weather and long-term climate modeling technologies. In addition, the tool helps the user to identify and decide when and where to increase energy supply for increased air conditioning usage and when to shut down power to prevent fire ignition more accurately. During the CalSEED agreement, Climformatics will enhance the fire-danger forecasting, heat stress forecasting, solar power and net load forecasting capabilities. The team will also build out an early alert system and user interface for extreme events, design seasonal outlook reports, and design use cases for marketing materials. The Climformatics team will work remotely on computation and analytics machines.

CEQA Exemption Status: 14 CCR 15306 “Data Collection , 14 CCR 15301 “Existing Facilities” , 14 CCR 15061 (b)(3) “Common Sense Exemption”

Reason Why Project is Exempt: This project is exempt under CEQA because it is limited to modeling and analytics activities performed on computers with no construction or similar types of activities. The project therefore will not cause direct or foreseeable indirect changes to the environment nor on the facilities in which the activities would take place.