State of California **California Natural Resources Agency**

M e m o r a n d u m

To: Chair David Hochschild
Vice-Chair Janea A. Scott
Commissioner Karen Douglas
Commissioner Patty Monahan
Commissioner Andrew McAllister

Date: October 2, 2020

From: Eleanor Oliver

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Subject: **CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ANALYSIS FOR PROPOSED SUBAWARDS UNDER THE CALIFORNIA SUSTAINABLE ENERGY ENTREPRENEUR DEVELOPMENT (CALSEED) INITIATIVE, AGREEMENT NO. 300-15-007**

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

CalCEF held an open application period, Solicitation 20-01, in February 2020 and received 212 applications that passed initial screening. As a result of the open application, CalCEF has proposed small grant projects for funding. Energy Commission staff has reviewed the projects CalCEF has proposed and is recommending 28 small grant projects for funding at the October 14, 2020 Energy Commission Business Meeting. Each of the applicants is proposed to receive a $150,000 grant award.

I am an Associate Energy Specialist in the Energy Research and Development Division of the California Energy Commission. I have reviewed the CEQA compliance forms submitted by each applicant. Below is my CEQA analysis for each proposed project:

1. Project Title: NeoCharge Smart Plug Load Splitter

Applicant: NeoCharge Corporation
Principal Investigator: Spencer Harrison

Project Summary: The goal of this project is to construct and demonstrate a software platform that enables existing EV charging splitters to provide the ability to utilize cleaner and more affordable energy. This integrated solution will analyze usage patterns with predictive grid conditions to optimize EV and appliance loads to take advantage of clean energy on a 5-minute interval. The team will gamify clean charging by providing rewards for charging during less grid intensive times, creating a more efficient and reliable grid for California. During the CalSEED agreement, the team will build an integrated software platform with clean charging algorithms, demand response, rewards for using cleaner energy, and charging analytics for utilities and EV drivers.

CEQA Exemption Status: 14 CCR 15306 "Basic Data Collection", 14 CCR 15061(b)(3) "Common Sense Exemption"

Reason Why Project is Exempt: This project is exempt under CEQA because the team will be coding software at computer stations - making no physical direct effects on the environment. This computer work will not generate noise or odors, does not involve any construction, and does not include disposal or handling of hazardous materials. Therefore it can be seen with certainty that there is no possibility the project will have a significant effect on the environment.

2. Project Title: Improving Situational Awareness of Distribution Equipment during Extreme Weather Conditions

Applicant: Gridware Inc.
Principal Investigator: Timothy Barat

Project Summary: The goal of this project is to develop a system of low-cost, solar-powered, sensor platforms, deployed across a distribution grid to provide real-time monitoring and fault anticipation. During the CalSEED agreement, the team will develop and deploy a swarm of robust sensor platforms across a grid and train algorithms that can identify weakening or precursors to critical faults. The team will develop and attach 250 low-cost vibration sensors to poles on the distribution grid and develop algorithms that can predict where faults may occur and spark a wildfire.

CEQA Exemption Status: 14 CCR 15301 “Existing Facilities”; 14 CCR 15306 “Basic Data Collection”; 14 CCR 15311 “Accessory Structures”

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to the development and attachment of approximately 250 small sensors to existing electricity distribution poles and data collection from those sensors. The project does not involve any construction activities. The sensors will not generate noise or odors and will not affect the existing use of the poles.

3. Project Title: Green Hydrogen from Biogas

Applicant: Hago Energetics, Inc.
Principal Investigator: Wilson Hago

Project Summary: The goal of this project is to engineer a low cost and profitable system for generating green hydrogen from biogas. This hydrogen generation technology is comprised of mobile hardware that uses renewable energy to convert biogas to green hydrogen and sequesterable carbon. During the CalSEED project, the team will complete the engineering design, build a small pilot and validate the products from this process. The team will build a small mobile facility that takes biogas from an actual farm and converts this biogas to green hydrogen and carbon black.

CEQA Exemption Status: 14 CCR 15311 “Minor Structures”; 14 CCR 15303 “Small Structures”

Reason Why Project is Exempt: This project is exempt under CEQA because it is limited to lab scale work done in an existing laboratory as well as a demonstration of technology to convert biogas to green hydrogen at a farm.The biogas conversion technology will be mobile, skid-mounted, and temporary. This project will have a small physical footprint (less than trailer sized), does not involve any construction or permanent alterations to any structures or

facilities, will not generate noise or odors in excess of permitted levels, and therefore will not have a significant effect on the environment.

4. Project Title: Portable Solar & Utility CAPEX Optimization

Applicant: Portable Solar, Inc.
Principal Investigator: Dennis Nickerson

Project Summary: The goal of this project is to develop a low-cost, ground-based portable solar photovoltaic system. This innovation uses glassless, frameless modules that have one-third the weight of traditional solar modules. During the CalSEED agreement, the team will complete the design work on the solar device to make it prototype-ready and leverage scientific expertise to engineer a lightweight module with a long-expected lifetime. Work will be performed inside the office of a mechanical engineering firm, and will include designing, developing the solar prototype, and developing geospatial charts of rural California using GIS software.

CEQA Exemption Status: 14 CCR 15306 "Basic Data Collection", 14 CCR 15061(b)(3) "Common Sense Exemption"

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to the development of a portable solar photovoltaic system which will occur inside an existing facility. The project will not involve construction or land use or other outdoor activities that might affect the environment. The actual physical activities will be inside and limited to largely office-type and mechanical design/engineering work. Therefore, it can be seen with certainty that there is no possibility that the project may have a significant effect on the environment.

5. Project Title: Predictive Modeling & Analytics Performance Optimization Software

Applicant: Waterhound Futures, Inc.
Principal Investigator: Anthony Jones

Project Summary: The goal of this project is to demonstrate an online software system that enables companies and municipalities to optimize performance and cost efficiencies of water and wastewater treatment, ultimately reducing the use of energy and freshwater in conventional treatment processes. Waterhound applies machine learning/AI to preventative maintenance, energy management and recovery, water reuse and recycling, water and wastewater treatment. It is technology and industry agnostic, it models and analyzes historic and real-time data and 'big data' sets. During the CalSEED agreement, the team will develop five technology features, demonstrated over 3-pilot projects, to lower operating costs between 8 percent and 38 percent over time and show proportionate reductions in energy and water footprints. Waterhound will conduct pilot projects at water treatment plants. The physical setup and implementation activities of Waterhound's projects during the CalSEED grant will be conducted by Waterhound's chemist and engineers at an office, in collaboration with in-house engineers from the pilot company who are on site at the project plant (via simultaneous video, digital photographs and audio descriptions). Waterhound's predictive modeling and analytics software is cloud-based and Waterhound's work and training of in-house engineers will be carried out virtually and will involve the online input of environmental,

technical data (including from P&ID drawings) and economic data from operations of the project treatment plants to produce feed studies and monitoring reports on the performance and cost-efficiencies for each plant under the CalSEED grant. There is no direct or indirect physical environmental change as a result of this project. Setup can be done on-site or remotely via mobile phone or other hand-held video camera and telephone call with the in-house operator or engineer. No change to land, building or generation of noise, odors, or handling of, or disposal of hazardous materials occurs. Reports generated by the software are captured online and in digital format for dissemination.

CEQA Exemption Status: 14 CCR 15306 "Basic Data Collection", 14 CCR 15061(b)(3) "Common Sense Exemption"

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to computer/online data collection and analysis for the development of a software system. There is no physical interference or intervention caused, directly or indirectly, from the set-up or implementation of the project The physical activities are carried out in an existing office and involve online data collection, simulation, modeling and analytics using digital software. Therefore, it can be seen with certainty that there is no possibility that the project may have a significant effect on the environment.

6. Project Title: EV Climate Lending Platform

Applicant: EV Life, LLC
Principal Investigator: Peter Glenn

Project Summary: The goal of this project is to develop an EV Climate Loan and Lending Platform that will save ratepayers over $200 per month on electric vehicle loan payments by engineering algorithms that verify applicants for thousands of dollars in EV incentives, reducing overall loan size. During the CalSEED agreement, the team will develop five technology features: EV incentive prequalification algorithms, applicant credit prequalification algorithms, automated underwriting, applicant-facing user interface, and application dashboard. There will be no physical setup for this project. The team will build financial software technology using computers in existing home offices.

CEQA Exemption Status: 14 CCR 15306 "Basic Data Collection", 14 CCR 15061(b)(3) "Common Sense Exemption"

Reason Why Project is Exempt: This project is exempt under CEQA because the project is limited to the development of financial software technology using computers in existing individual home offices. Physical activities include working from computers using cloud based software and occasional car travel to work together as a team or meet with potential project customers. The project does not involve any construction or land use or other physical activities that may have an effect on the environment. Therefore, it can be seen with certainty that there is no possibility that the project may have a significant effect on the environment.

7. Project Title: Power Line Analysis System

Applicant: inRG Solutions, LLC
Principal Investigator: Kerry McBee

Project Summary: The goal of the project is to develop a power line analysis system that can be installed in locations susceptible to wildfires. The system consists of numerous power line sensors and data collectors/analyzers located at substations. The CalSEED award will be utilized to develop and test the Radar System, Infrared Camera System, Power Delivery System, and positioning equipment. Testing the devices on a high voltage power line will be performed within a controlled environment inside the inRG Solution office and then on a real power system disconnected from the grid.

CEQA Exemption Status: 14 CCR 15306 "Basic Data Collection"; 14 CCR 15311 "Accessory Structures"

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to the development of small sensors that can be attached to a power line to test wildfire susceptibility, and data collection and analysis. The designing and building of the sensors will occur at an existing facility. The sensors are small (6 inches x 6 inches) and will be attached to an overhead power line outdoors without any interference to the power line. This project will not impact land, change a building, produce noise, produce odors, or utilize any hazardous material. Development and testing will be conducted in an existing facility and will not make a significant impact on the environment.

8. Project Title: Low Cost, Safe and Sustainable Grid Energy Storage

Applicant: UNIGRID LLC
Principal Investigator: Darren Tan

Project Summary: The goal of this project is to design and demonstrate low cost, safe and sustainable batteries for electrical grid storage that have the potential to solve peak demand, renewable energy storage, and power disruption problems during emergencies. The technology, a sodium solid-state battery, eliminates risks of battery fires and can operate under any climate without sophisticated cooling support systems. During the CalSEED agreement, the team will fabricate a prototype to demonstrate practical pathways toward commercialization and validate it for performance evaluation and practical applications. This CalSEED project will involve material synthesis, cell assembly and battery testing/evaluation, all conducted in an indoor laboratory environment within UC San Diego's main campus. All materials will be handled in inert environments (glovebox setups) and abide to on-campus Environment, Health & Safety guidelines.

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

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to the development and testing of a prototype sodium solid-state battery within an existing laboratory. The project will not require any physical changes to the building, will not involve construction activities, will not generate noise or odors. Routine laboratory waste that is generated (gloves/wipes, washing solvents, powders) will be handled and disposed as per UC San Diego's on-campus Environment, Health & Safety guidelines.

9. Project Title: High-Efficiency, Low-Cost, Non-REM Motor for DC & AC Power Supplies

Applicant: Cyclonatix, Inc.

Principal Investigator: Jae Y. Lim

Project Summary: The goal of this project is to design and demonstrate an industrial-sized motor and controller with the potential to perform with very high system efficiencies of over 95 percent at a low cost. During the CalSEED agreement, the team will design, build, and test a 50 hp prototype to validate performance at a laboratory.

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

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to the development and testing of a 50 horsepower motor and controller inside of an office and laboratory. The project will not involve any construction or installation activities, will not generate noise or odors in excess of permitted levels, and does not involve the handling or disposal of hazardous materials. Designing, prototyping and testing of the motor and controller will involve computer work, machining and assembling of motor parts, making and assembling of PCB, software and hardware of the controller, and testing of motor/controller system. which don't include any activities to cause any significant direct effect on the environment.

10. Project Title: Alkali Metal-Ion Solar Battery

Applicant: MIplus Solar Inc.
Principal Investigator: Alfredo A. Martinez-Morales

Project Summary: The goal of this project is to demonstrate an alkali metal-ion solar battery that has the potential to drive down fabrication & installation costs, overcome spatial limitations, mitigate safety risks, and improve system round-trip efficiency. During the CalSEED agreement, the team will demonstrate the manufacturability and performance of the technology while developing a commercialization plan. The technical and scientific work including synthesis, characterization, fabrication, measurements and testing will be done in a research lab environment, while the commercialization work will be done in an office environment. The technical and scientific work will be done in a research lab environment where the facilities, equipment, and protocols necessary for the handling and disposal of chemicals are in place by following the University of California, Riverside (UCR) environmental health & safety (EH&S) guidelines and compliance requirements. The experimental work will be conducted at the Advanced Materials and Energy Devices Laboratory (aka Martinez-Morales Lab), located at the University of California, Riverside Bourns College of Engineering Center for Environmental Research and Technology. Small, plug-in equipment may be setup in the lab space for the purposes of measurements, testing, and data collection.

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

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to the development and testing of an alkali metal-ion solar battery in an existing laboratory and modeling and analysis work at an existing office. Small plug-in equipment may be setup in the laboratory for the purposes of measurement, testing and data collection. Any chemicals will be handled and disposed of according to UC Riverside's

environmental health and safety guidelines. The project does not involve any construction or installation activities or any other activities and involves negligible or no expansion of an existing use of the laboratory and office. Therefore, the project will not have a significant effect on the environment.

11. Project Title: Recharge to Full Energy in Ten Minutes

Applicant: Sonocharge
Principal Investigator: An Huang

Project Summary: The goal of the project is to develop a lithium metal battery that has the potential to provide rapid charging, high energy density, and improved cycle life. During the CalSEED agreement, the team will develop a standard commercial prototype and expand commercialization efforts. The project team will strictly comply with the Environmental, health, and safety (EH&S) guidelines set by UCSD, where the batteries will be manufactured.

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

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to the the fabrication and testing of a prototype lithium metal battery at an existing laboratory. The project will not require any modifications to the laboratory facility. No pollution will be generated during the process of developing the battery and EH&S guidelines set by UCSD will be strictly followed. The project does not involve any construction or any other activities and involves negligible or no expansion of an existing use of the laboratory facility. Therefore, the project will not have a significant effect on the environment.

12. Project Title: Breakthrough Nanotechnology Significantly Elevating Battery Energy Density and Rapid Charging

Applicant: Innovasion Labs PINC, Inc.
Principal Investigator: Inanc Ortac

Project Summary: The goal of this project is to develop a nanotechnology battery solution that has the potential to improve the energy density by ten times that of Lithium-ion technology. During the CalSEED agreement, the team plans to further simulation and design efforts in order to complete a prototype device for the technology. The team will complete the final assembly of the network of nanocomponents and characterization of its physical/structural features by AFM and STEM, and will fabricate a fully functional prototype and test its electronic features, from conductivity to charging rates, capacitance and breakdown voltages. Based on these empirical results and substantiated through computer simulations, the team will further optimize the chemistry, test alternative chemistries and advance to larger scale synthesis.

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

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to the fabrication and testing of a prototype battery technology in an existing laboratory. The project will involve small scale chemical synthesis, imaging of

synthesis products and computer simulations. The project will not involve any construction, large scale, specialized handling or production of physical, mechanical hardware units or chemicals. The project involves negligible or no expansion of an existing use of the laboratory facility. Therefore, the project will not have a significant effect on the environment.

13. Project Title: Novel Composites to Increase Power Line Capacity and Decrease Sag

Applicant: ALD Technical Solutions LLC
Principal Investigator: Davoud Zamani

Project Summary: The goal of this project is to develop a structural composite reinforcement system that has the potential to prevent galvanic corrosion of aging transmission line infrastructure while also increasing power capacity and power efficiency. The technology, which uses carbon fiber as a structural reinforcement component, embedded in basalt fiber as a barrier layer, will be installed and cured-in-place around existing Aluminum Conductor Steel Reinforced transmission lines. During CalSEED agreement, the team will complete the design and fabrication of a hybrid composite system and perform a large-scale onsite demonstration to validate the technology. All activities will be done in existing lab space.

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

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to the design, fabrication and testing of a composite system to prevent corrosion of transmission line infrastructure in an existing laboratory. This project will involve no construction activities, changes to land or laboratory facilities and there are no hazardous materials involved. All activities will be done in existing lab space at ALD Technical Solutions Lab or a third party lab. Therefore, the project will not have a significant effect on the environment.

14. Project Title: BusID Power Grid Topology and State Estimation Software

Applicant: Topolonet Corporation
Principal Investigator: Reza Sabzehgar

Project Summary: The goal of this project is to test and implement a software solution for real-time and accurate topology identification and state estimation of the transmission power grid. During the CalSEED agreement, the team will complete the engineering design and implementation of the commercial product.

CEQA Exemption Status: 14 CCR 15306 "Basic Data Collection", 14 CCR 15061(b)(3) "Common Sense Exemption"

Reason Why Project is Exempt: This project is exempt under CEQA because project activities are limited to the use and analysis of existing data and available communication infrastructure to test a software solution for accurate topology of the power grid. The project does not involve any construction or installation activities. This project will only need computers, software and interface system to receive, analyze and produce accurate topology of the grid. There will be no direct or indirect physical impact on the environment. Therefore,

it can be seen with certainty that there is no possibility that the project may have a significant effect on the environment.

15. Project Title: Zero-emission Community Solar with Built-in Long-Duration Storage

Applicant: Planet A Energy, Inc.
Principal Investigator: Brad Hines

Project Summary: The goal of this project is to design a new modular form of concentrated solar power with tolerance to hurricane-force winds, earthquakes, and grid outages while remaining inexpensive and efficient. The design will use insulated shipping containers, basalt sand, and a small Stirling engine and expects to achieve $1/kWh and store energy with a loss of more than 1 percent per day. During the CalSEED agreement, the team will decide between different optical designs and insulation options and assemble a prototype. The prototype unit will be placed in the garage at the company's current office and will consist of a container filled with sand and outfitted with solar focusing optics, that will be wheeled outdoors for testing. The setup will be silent and will consist of sand, lenses, insulation, and small motors.

CEQA Exemption Status: 14 CCR 15311 "Accessory Structures"; 14 CCR 15303 "Small Structures"

Reason Why Project is Exempt: This project is exempt under CEQA because it involves the temporary placement of small accessory structures at an existing facility. The test setup is a modest wheeled container, has no intake or exhaust (its only input is sunlight), is portable, and can easily be disassembled back into its constituent components – a container that can be reused, and sand, acrylic, and aluminum that can be recycled. The project will collect solar heat and store it temporarily in a bed of sand, much like a car in the sun on a hot day, with no more environmental impact than a parked car.

16. Project Title: Empower-Power Anything, Anywhere, and Ultrafast Recharge under 2hrs

Applicant: Whisper Energy Systems, Inc.
Principal Investigator: Michael Gould

Project Summary: The goal of this project is to design and build a prototype zero-emission power backup device that can provides power to any device that uses a 120VAC wall outlet. During the CalSEED award, the team will build two prototypes and will initiate the electrical safety certification process. There will be no direct or reasonably foreseeable indirect physical changes as a result of the project, as it will not involve any construction activities, changes to land or buildings, generation of excessive noise or odors, or the handling or disposing of hazardous materials.

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

Reason Why Project is Exempt: This project is exempt under CEQA because it involves basic data collection and research activities which do not result in a serious disturbance to an environmental resource. The prototypes will be designed and tested at an existing facility

involving negligible or no expansion of existing or former use. The project will not involve any construction activities, changes to land or buildings, generation of excessive noise or odors, or the handling or disposing of hazardous materials; therefore, it will not cause a significant direct effect or reasonably foreseeable indirect physical changes to the environment.

17. Project Title: Rapid AI Screening to Significantly Reduce Cost of Battery Manufacturing

Applicant: Parthian Energy
Principal Investigator: Mahshid (Michelle) Roumi

Project Summary: The goal of the project is to reduce the cost of battery manufacturing with an intelligent screening technology. The innovation is a novel electromagnetic battery testing device and process that may reduce the cost of lithium ion battery manufacturing by up to 15 percent. The CalSEED award will be used to finalize the engineering design and validate the technology for suitability in the manufacturing process with a project partner. During the CalSEED project, the team will run conventional charge/discharge battery testing for battery cells of cellphone size or smaller. The electromagnetic field of the battery will be monitored with an electromagnetic antenna and fed to computer software.

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

Reason Why Project is Exempt: This project is exempt under CEQA because it involves basic data collection and research activities which do not result in a serious disturbance to an environmental resource. The activities consist of conventional battery charge/discharge in an appropriate existing lab that is set up for battery testing involving negligible or no expansion of existing or former use.

18. Project Title: Providing Frequency Regulation, Voltage Support and Synthetic Inertia with Synchronverters

Applicant: Trianon Renewable Grid Reliability, LLC
Principal Investigator: Bill Golove

Project Summary: The goal of this project is to demonstrate a scalable, proprietary software-based control algorithm that is designed to integrate seamlessly with existing inverter’s control software and transform conventional inverters into “synchronverters” that enable large-scale interconnection without additional hardware. The CalSEED award will be used to demonstrate software integration on a standard commercial inverter and to then test the design in a lab. The project will consist primarily of a series of model runs, simulations and lab tests, including simulation and test design, and a software integration exercise. There will not be any construction activities, changes made to land or a building, excessive nose or odors, the handling of hazardous material, the generation of pollution or any other direct or indirect adverse change to the environment as a result of the project.

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

Reason Why Project is Exempt: This project is exempt under CEQA because it involves basic data collection and research activities which do result in a serious disturbance to an

environmental resource. The project will be conducted entirely in offices and labs with computers. Accordingly, it can be seen with certainty that there is no possibility that this activity may have a significant effect in the environment.

19. Project Title: An Optical Pressure Sensor Array to Optimize Geothermal Energy Production

Applicant: Paulsson, Inc.
Principal Investigator: Bjorn Paulsson

Project Summary: The goal of this project is to design a technology that uses an array of fiber optic-based pressure sensors to dramatically improve the information available from geothermal well operations to the operators allowing them to efficiently and economically develop and operate geothermal energy resources. During the CalSEED project, the team will determine the appropriate materials needed for a prototype, create a design, and test the technology in a laboratory environment. The activities under this project will be entirely within one 12,000 sq ft building in an industrial park. There will be no noise, no emissions, no odor, no additional traffic generated by the project.

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

Reason Why Project is Exempt: This project is exempt under CEQA because all design, prototyping and testing will be performed at an existing facility located in an industrial park involving negligible or no expansion of existing or former use. Research activities consist of computer modeling and prototyping in an existing in-house machine shop and all testing will be performed at an existing facility. No environmental disturbance will be generated. There will be no noise or chemical byproducts generated. There will be no use of chemicals and toxins.

20. Project Title: Advanced Air Stirling Cycle Based Heat-pump for Air-conditioning and Heating

Applicant: Idealab Studio
Principal Investigator: Chiranjeev Kalra

Project Summary: The goal of this project is to develop an Advanced Air Stirling Engine Cycle (AASEC) based heat pump with liquid piston for air-conditioning and heating applications. The goal of this CalSEED project is to complete development of an operational system and build a lab-scale functional prototype of the proposed design. The prototype will be <10kWe in nominal power rating and expected to be about 1m3 in size. The materials of construction will be metal (steel or aluminum) piping and uses air and water as working fluids. There will be no direct or reasonably foreseeable indirect physical change as a result of the project.

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

Reason Why Project is Exempt: This project is exempt under CEQA because the project involves lab scale testing at an existing facility involving negligible or no expansion of existing or former use. The project's basic data collection and research activities will not cause a

serious disturbance to an environmental resource. The materials of construction for the prototype testing will be steel and aluminum. In addition, air will be the primary working fluid and water will be used as the fludic piston as well as the heat transfer fluid. These materials of construction and working fluids are benign and will not cause a significant direct effect on the environment.

21. Project Title: Compact, Efficient & Cheap Hydrogen Electrolyzer

Applicant: EH Group Technologies Inc.
Principal Investigator: Sven Dybdahl

Project Summary: The goal of this project is to develop and test a bipolar plate construction technology that is expected to significantly reduce the cost to produce an electrolyzer while also increasing its efficiency. During the CalSEED project, the team will complete the engineering design and will complete testing in a laboratory environment.

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

Reason Why Project is Exempt: This project is exempt under CEQA because the project’s main activities will be focused on computational studies & simulations, design & planning, as well as business development activities. As such none of these activities will cause a significant direct effect on the environment or a serious disturbance to an environmental resource. Activities will take place in an existing laboratory involving negligible or no expansion of existing or former use.

22. Project Title: Zero-Emission, Dispatchable and Efficient Power Cycle

Applicant: Noble Thermodynamic Systems, Inc.
Principal Investigator: Miguel Sierra Aznar

Project Summary: The goal of this project is to demonstrate the dispatchability features of a new power system model called the Argon Power Cycle. This technology is a new engine design that delivers emission-free electricity from natural gas or hydrogen at an efficiency above current power generation systems. During the project, the team will investigate and experimentally demonstrate the feasible ultra-low load operation of a natural gas fueled engine operating under the argon power cycle conditions. This project involves the modification and operation of a single cylinder (<1liter) reciprocating engine (already in place at UC Berkeley) with the argon power cycle and fueled by natural gas.

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

Reason Why Project is Exempt: This project is exempt under CEQA because the project involves negligible or no expansion of the existing or former use of an existing experimental facilities. These facilities possess the right engine management equipment to dispose of consumables such as unused fuel, exhaust gases. UC Berkeley is dedicated to proper handling of combustible gases so that these gases would not pose risk to the public. All personnel are required to be properly trained to handle hazardous materials in accordance with Federal, state, and local environmental regulations. The research activities will not result in any serious or major disturbance to an environmental resource.

23. Project Title: Paintable Heat-Reflective Coatings for Cool Building Retrofits

Applicant: Cypris Materials, Inc.
Principal Investigator: Ryan Pearson

Project Summary: The goal of this project is to develop a transparent solar control coating capable of being directly painted onto complex architectural geometries commonly found on residential and commercial buildings. During the CalSEED agreement, the team will address the necessary technical risk to increase the TRL for this technology from 3 to 5. Cypris Materials manufacturers their own coating building blocks (polymers). The production of these polymers inherently requires the use hazardous materials (removed from final product). These polymers are built from various building blocks including siloxanes, olefins, acrylics, styrenics, carbonates, and ethers. All waste handling is done in compliance with Lawrence Berkeley National Lab's EH&S procedures.

CEQA Exemption Status: 14 CCR 15301 "Existing Facilities";

Reason Why Project is Exempt: This project is exempt under CEQA because the activities will be performed in an existing laboratory involving negligible or no expansion of existing or former use. Cypris Materials designs its coating technology from commercially available feedstocks that could be found on grocery store shelves. The solvents used will be Non-VOC (Volatile Organic Compound), VOC-Exempt, and Non-Hazardous Air Pollutants (HAPs). Project activities will be done in an existing laboratory designed for this use.

24. Project Title: Eco-Efficient Produce Packaging with Improved Shelf Life by Passive Cooling

Applicant: Photia Incorporated
Principal Investigator: Joseph Geddes

Project Summary: The goal of this project is to develop environmentally benign and affordable packaging to improve shelf-life of agricultural produce by passive cooling during harvest, storage, and transport. This technology uses passive cooling by directing thermal energy flow away from a packaged object in ambient conditions with a novel multilayered 2D nanostructured material that can be manufactured at low cost. During the CalSEED agreement the team will develop the key functional layers of the 2D nanostructured material with the required remittance control to achieve optimal passive cooling below ambient temperature. This project will involve both laboratory research making material samples via photolithography and measuring their optical properties, in addition to paper and computer calculations.

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

Reason Why Project is Exempt: This project is exempt under CEQA because it will use existing lab space specifically designed for the activities that will be conducted. The project will involve negligible or no expansion of existing or former use of this existing lab.The activities conducted under the project including laboratory research and calculations will be

similar to those already conducted under applicable permits and will therefore not cause a significant direct effect on the environment.

25. Project Title: Remote Inspection Platform for Utility Infrastructure

Applicant: Tolo Inc.
Principal Investigator: Thomas Karagianes

Project Summary: The goal of this project to demonstrate the efficacy of a "Parallax Imagery"-based software platform for remote inspection of utility assets. During the CalSEED agreement, the team will collect imagery of several utility assets and have inspectors use the software platform to perform inspection of said assets. Tolo will run a pilot program in collaboration with one or more utility operators to demonstrate the efficacy of the remote inspection process. They will collect imagery by flying UAV-mounted camera systems along designated stretches of transmission lines, then have line inspectors review the imagery with an inspection application. This project involves no construction or physical modifications. The field survey is photographic and doesn't impact the infrastructure being surveyed.

CEQA Exemption Status: 14 CCR 15306 "Basic Data Collection"

Reason Why Project is Exempt: This project is exempt under CEQA because it involves basic data collection and research activities which do not result in a major or serious disturbance to an environmental resource. Photographic field survey via UAV produces no direct or lasting effect on the environment being surveyed. The only physical effect the project will generate is a buzzing sound produced by the UAV motors, but this sound is quieter than neighborhood yardwork and only present during flight.

26. Project Title: Inverter Health Scanner

Applicant: infiniRel Corporation
Principal Investigator: Bert Wank

Project Summary: The goal of the project is to develop a health diagnostics and control system for solar plants. This technology is an inverter health scanner that predicts failure risk by measuring and processing more data faster than incumbent monitoring-only systems, and offers real time intervention capability. During the CalSEED agreement, the team will develop predictive capabilities, including confidence level and self-learning, and develop a recommendation engine to mitigate failure risk by power throttling or soft shut-down. Working with UC Riverside (UCR) to provide independent validation testing and possible augmentation of the solar inverter health scanning technology, the team will furnish decommissioned inverters for destructive and non-destructive testing on UCR operated sites. These sites include UCR's indoor battery lab for controlled conditions, UCR's solar array (up to 250kW), or UCR's AVL E-Power HV setup, which require re-configuration to accommodate different test unit sizes and power levels. The proposed project requires temporary changes in wiring and configuration of the inverters for testing of decommissioned inverters. Inverters that may catastrophically destruct during testing will be recycled at certified e-waste recyclers, which have been identified.

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

Reason Why Project is Exempt: This project is exempt under CEQA because it involves the minor alteration of existing structures with negligible or no expansion of existing or former uses.The project replaces only existing components during a limited test period for basic data collection and research. The project will not expand existing use of the existing electrical facilities.

27. Project Title: Cost and CapEx Reduction of Silicon Photovoltaics Through Streamlined Manufacturing

Applicant: Leap Photovoltaics Inc.
Principal Investigator: David Berney Needleman

Project Summary: The goal of this project is to develop a novel streamlined manufacturing process for silicon-based photovoltaic cells that will dramatically reduce operating cost, equipment cost, and energy consumption. During the CalSEED agreement, the team will interview solar cell purchasers to validate market demand and specifications for PV cell performance and cost. The team will then identify suppliers and test materials to validate key components of the proposed manufacturing process. During the project, the availability and performance of appropriate silicon feedstock, printable metal inks, and liquid precursors for coatable insulators will be evaluated. This evaluation will require use of acids, bases, and solvent in a fume hood, screen printing metal inks, spin-coating insulators, and handling of fine powders. Equipment for the activities described above, including fume hood, screen printer, spin coater, and electrical test equipment may need to be installed in a facility. This installation may require alterations to the ventilation, plumbing, and electrical systems of a building. Acids, bases, metal inks, and some solvents are considered hazardous materials and will need to be handled and disposed of properly. Permits will be obtained through the local Unified Program Agency through the California Environmental Reporting System. Waste will be disposed according to regulations by an endorsed contractor.

CEQA Exemption Status: 14 CCR 15301 “Existing Facilities”;

Reason Why Project is Exempt: This project is exempt under CEQA because it involves operation and minor alteration of an existing private facility involving negligible or no expansion of existing or former use. The project may involve small quantities of hazardous materials that will be handled in a facility designed and permitted for this purpose. The team will work with local agencies to obtain the proper permits and follow all federal, state, and local regulations for safely handling and disposing of these materials.

28. Project Title: Advanced Solar Panels Combining Thin-Film PV & Solar Tubes for Agriculture & Flat Roofs

Applicant: Taka Solar Corporation
Principal Investigator: Christopher Barnes

Project Summary: The goal of this project is to develop a unique package system for Perovskites cells within solar panels that utilizes an advanced tube-based architecture. This technology solution can fully protect solar cells from oxygen and water, affordably, to realize the benefits of Perovskites cells with its improved operating life. This approach can outperform traditional solar flat panels with silicon cells in efficiency and energy production, with lower system and installation costs. During the CalSEED agreement, Taka will package various Perovskite cells to produce prototypes that demonstrate record low degradation

rates. Taka will source small solar cells that incorporate Perovskite material, use standard encapsulating techniques to adhere them inside glass tubes and then adapt proven techniques from other industries (metal stamping and glass melting) to make hermetic seals. The packaging steps and subsequent lifetime aging tests will all happen in laboratory environments. Taka will use existing labs and office spaces to do the research. Because the studies are on small objects at laboratory scale, no excessive noise is anticipated and hazardous materials are not present. The only expected waste materials are small amounts of excess glass and standard solar panel encapsulating materials which are chemically similar to polyethylene. Both are recyclable.

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

Reason Why Project is Exempt: This project is exempt under CEQA because it involves research activities performed in existing facilities with negligible or no expansion of existing use. No dangerous materials will be used and all work will be performed inside existing labs which have good environmental controls. The activities consist of making a small number of sealed glass tubes with all parts to remain indoors during any testing. Therefore, the project will not cause a significant direct effect or reasonably foreseeable indirect physical changes to the environment.

RESOLUTION NO: 20-1014-5

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: 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, the California Clean Energy Fund ("CalCEF") is the administrator of the CalSEED Initiative under 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, has completed Solicitation 20-01, a competitive solicitation, and as a result has proposed to CEC small grant projects for funding; and

WHEREAS, CEC staff has reviewed the projects CalCEF has proposed, and recommends the following 28 small grant projects for funding:

1. $150,000 is being requested for the "NeoCharge Smart Plug Load Splitter" project with NeoCharge Corporation, a project to construct and demonstrate a software platform that enables existing EV charging splitters to provide the ability to utilize cleaner and more affordable energy; and
2. $150,000 is being requested for the "Improving Situational Awareness of Distribution Equipment during Extreme Weather Conditions" project with Gridware Inc., a project to develop a system of low-cost, solar-powered, sensor platforms, deployed across a distribution grid to provide real-time monitoring and fault anticipation; and
3. $150,000 is being requested for the "Green Hydrogen from Biogas" project with Hago Energetics, Inc., a project to engineer a low cost and profitable system for generating green hydrogen from biogas; and

4. $150,000 is being requested for the “Portable Solar & Utility CAPEX Optimization” project with Portable Solar, Inc., a project to develop a low-cost, ground-based portable solar photovoltaic system; and
5. $150,000 is being requested for the “Waterhound Futures’ Predictive Modeling & Analytics Performance Optimization Software ” project with Waterhound Futures, Inc., a project to demonstrate an online software system that enables companies and municipalities to optimize performance and cost efficiencies of water and wastewater treatment, ultimately reducing the use of energy and freshwater in conventional treatment processes; and
6. $150,000 is being requested for the “EV Climate Lending Platform” project with EV Life, LLC, a project to develop an EV Climate Loan and Lending Platform that will save ratepayers over $200 per month on electric vehicle loan payments by engineering algorithms that verify applicants for thousands of dollars in EV incentives, reducing overall loan size; and
7. $150,000 is being requested for the “Power Line Analysis System” project with inRG Solutions, LLC, a project to develop a power line analysis system that is installed in locations susceptible to wildfires; and
8. $150,000 is being requested for the “Low Cost, Safe and Sustainable Grid Energy Storage” project with UNIGRID LLC, a project to design and demonstrate low cost, safe and sustainable batteries for electrical grid storage that have the potential to solve peak demand, renewable energy storage, and power disruption problems during emergencies; and
9. $150,000 is being requested for the “High-Efficiency, Low-Cost, Non-REM Motor for DC & AC Power Supplies” project with Cyclonatix, Inc., a project to design and demonstrate an industrial-sized motor and controller with the potential to perform with very high system efficiencies of over 95 percent at a low cost; and
10. $150,000 is being requested for the “Alkali Metal-Ion Solar Battery” project with MIplus Solar Inc., a project to demonstrate an alkali metal-ion solar battery that has the potential to drive down fabrication & installation costs, overcome spatial limitations, mitigate safety risks, and improve system round-trip efficiency; and
11. $150,000 is being requested for the “Sonocharge: Recharge to Full Energy in Ten Minutes” project with Sonocharge, a project to develop a lithium metal battery that has the potential to provide rapid charging, high energy density, and improved cycle life; and
12. $150,000 is being requested for the “Breakthrough Nanotechnology Significantly Elevating Battery Energy Density and Rapid Charging” project with Innovasion Labs PINC, Inc., a project to develop a nanotechnology battery solution that has the potential to improve the energy density by ten times that of Lithium-ion technology; and
13. $150,000 is being requested for the “Novel Composites to Increase Power Lines Capacity and Decrease Sag ” project with ALD Technical Solutions LLC, a project to develop a structural composite reinforcement system that has the potential to prevent galvanic corrosion of aging transmission line infrastructure while also increasing power capacity and power efficiency; and
14. $150,000 is being requested for the “BusID Power Grid Topology and State Estimation Software” project with Topolonet Corporation, a project to test and implement a software solution for real-time and accurate topology identification and state estimation of the transmission power grid; and

15. $150,000 is being requested for the “Zero-emission Community Solar with Built-in Long-Duration Storage” project with Planet A Energy, Inc., a project to design a new modular form of concentrated solar power with tolerance to hurricane-force winds, earthquakes, and grid outages while remaining inexpensive and efficient; and
16. $150,000 is being requested for the “Empower-Power Anything, Anywhere, and Ultrafast Recharge under 2 hours” project with Whisper Energy Systems, Inc., a project to design and build a prototype zero-emission power backup device that can provide power to any device that uses a 120VAC wall outlet; and
17. $150,000 is being requested for the “Rapid AI Screening to Significantly Reduce Cost of Battery Manufacturing” project with Parthian Energy, a project to reduce the cost of battery manufacturing with an intelligent screening technology; and
18. $150,000 is being requested for the “Providing Frequency Regulation, Voltage Support and Synthetic Inertia with Synchronverters” project with Trianon Renewable Grid Reliability, LLC, a project to demonstrate a scalable, proprietary software-based control algorithm that is designed to integrate seamlessly with existing inverter’s control software and transform conventional inverters into “synchronverters” that enable large-scale interconnection without additional hardware; and
19. $150,000 is being requested for the “An Optical Pressure Sensor Array to Optimize Geothermal Energy Production” project with Paulsson, Inc., a project to design a technology that uses an array of fiber optic-based pressure sensors to dramatically improve the information available from geothermal well operations to the operators allowing them to efficiently and economically develop and operate geothermal energy resources; and
20. $150,000 is being requested for the “Advanced Air Stirling Cycle Based Heat-pump for Air-conditioning and Heating” project with IdealabStudio, a project to develop an Advanced Air Stirling Engine Cycle (AASEC) based heat pump with liquid piston for air-conditioning and heating applications; and
21. $150,000 is being requested for the “Compact, Efficient & Cheap Hydrogen Electrolyzer” project with EH Group Technologies Inc., a project to develop and test a bipolar plate construction technology that is expected to significantly reduce the cost to produce an electrolyzer while also increasing its efficiency; and
22. $150,000 is being requested for the “Zero-Emission, Dispatchable and Efficient Power Cycle” project with Noble Thermodynamic Systems, Inc., a project to demonstrate the dispatchability features of a new power system model called the Argon Power Cycle; and
23. $150,000 is being requested for the “Paintable Heat-Reflective Coatings for Cool Building Retrofits” project with Cypris Materials, Inc., a project to develop a transparent solar control coating capable of being directly painted onto complex architectural geometries commonly found on residential and commercial buildings; and
24. $150,000 is being requested for the “Eco-Efficient Produce Packaging with Improved Shelf Life by Passive Cooling” project with Photia Incorporated, a project to develop environmentally benign and affordable packaging to improve shelf-life of agricultural produce by passive cooling during harvest, storage, and transport; and
25. $150,000 is being requested for the “Remote Inspection Platform for Utility Infrastructure” project with Tolo Inc., a project to demonstrate the efficacy of a "Parallax Imagery"-based software platform for remote inspection of utility assets; and

26. $150,000 is being requested for the “Inverter Health Scanner” project with infiniRel Corporation, a project to develop a health diagnostics and control system for solar plants; and
27. $150,000 is being requested for the “Cost and CapEx Reduction of Silicon Photovoltaics Through Streamlined Manufacturing” project with Leap Photovoltaics Inc., a project to develop a novel streamlined manufacturing process for silicon-based photovoltaic cells that will dramatically reduce operating cost, equipment cost, and energy consumption; and
28. $150,000 is being requested for the “Advanced Solar Panels Combining Thin-Film PV & Solar Tubes for Agriculture & Flat Roofs” project with Taka Solar Corporation, a project to develop a unique package system for Perovskites cells within solar panels that utilizes an advanced tube-based architecture; and

WHEREAS, CEC staff has reviewed the 28 projects and determined that each project is exempt from CEQA, as described in CEC staff’s “California Environmental Quality Act (“CEQA”) Compliance Analysis For Proposed Subawards Under the California Sustainable Energy Entrepreneur Development Initiative, Agreement No. 300-15-007” Memorandum (“Memorandum”) dated October 2, 2020, 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 28 projects; and

FURTHER BE IT RESOLVED, that the CEC approves the 28 projects for a total of $4,200,000; and

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

CERTIFICATION

The undersigned Secretariat to the Commission 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 California Energy Commission held on October 14, 2020.

AYE: [List of Commissioners]
NAY: [List of Commissioners]
ABSENT: [List of Commissioners]
ABSTAIN: [List of Commissioners]

Cody Goldthrite,
Secretariat