

DOCKETED

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California Energy Commission

Business Meeting Agenda

September 13, 2023
10:00 a.m. – 3:30 p.m.

In-person at:

California Natural Resources Agency Building
715 P Street
First Floor Auditorium
Sacramento, California 95814
(Wheelchair Accessible)

Remote Access via Zoom™

<https://zoom.us/> Meeting ID: **938 6923 0237** Passcode: **mtg@10am**

Remote participation instructions are below, after line items.

Please note that the California Energy Commission (CEC) aims to begin the business meeting promptly at the start time and the end time is an estimate based on the agenda. The meeting may end sooner or later than the time indicated depending on various factors.

Pursuant to the California Code of Regulations (CCR), title 20, section 1104(e), any person may make an oral comment on any agenda item. To ensure the orderly conduct of business, such comments will be limited to two minutes or less per person.

THE CEC WILL CONSIDER AND MAY TAKE ACTION ON THE FOLLOWING:

1. Public Comment.

Any person wishing to comment on information items (non-voting items) shall provide comments during this period.

2. Agency Announcements.

The Chair may announce relevant matters to the public and the CEC, including agency updates, events, and other opportunities. Discussion may follow.

3. Consent Calendar.

Items will be taken up and voted on as a group. A commissioner may request that an item be moved and discussed later in the meeting.

- a. National Association of State Energy Officials (NASEO). Proposed resolution approving agreement 400-23-001 with NASEO for a \$27,380 one-year membership. The membership gives staff the opportunity to connect with key policy and decision makers, officials from other state and regional energy offices, and affiliates from private and public sectors. Membership also provides a forum for exchanging information, ideas, and resources, as an opportunity to learn about funding and partnership opportunities. (ERPA Funding) Contact: Elizabeth Butler
- b. Women of Renewable Industries and Sustainable Energy (WRISE). Proposed resolution approving agreement 100-23-001 with WRISE for an \$18,000 contract to co-sponsor the WRISE Leadership Forum to be held October 10-12, 2023 in Minneapolis, MN. The WRISE Leadership Forum will bring together professionals from across the country to discuss current renewable energy trends and policy issues. The forum will provide staff the opportunity to learn and share strategies and ideas on how to advance and inspire systemically excluded communities in pursuing a sustainable and equitable future. (ERPA Funding) Contact: Erik Stokes
- c. Trinity Public Utility District's Application for Solar Photovoltaic Determination. Proposed resolution approving Trinity Public Utility District's non-residential application to the CEC for a determination, pursuant to Title 24, Part 1, section 10-109(k), that the 2022 Energy Code solar photovoltaic and battery storage requirements for newly constructed nonresidential and high-rise residential buildings in the 2022 Energy Code are not cost effective in Trinity's service area and therefore should not be required. Contact: Muhammad Faisal Saeed
- d. Ocean Protection Council. Proposed resolution approving agreement OSW-23-001 with the Ocean Protection Council for the CEC to receive \$124,900 to collect and compile cultural resources data for California North Coast offshore wind energy development affecting state lands and waters, and adopting staff's determination that this action is exempt from the California Environmental Quality Act (CEQA). CEC staff will compile cultural resources data into a geographic information system as a common platform for state agencies and North Coast California Native American tribes to make management decisions concerning cultural resources on shore, near shore, and offshore that may be affected by offshore wind development. (Ocean Protection Council Funding) Contact: Gabriel Roark
- e. Ocean Protection Council. Proposed resolution approving agreement OSW-23-002 with the Ocean Protection Council for the CEC to receive \$172,124 to collect and compile cultural resources data for California Central Coast offshore wind energy development affecting state lands and waters, and adopting staff's determination that this action is exempt from CEQA. CEC staff will compile cultural resources data into a geographic information system as a common platform for state agencies and California Native American tribes south of San Francisco Bay to make management decisions concerning cultural resources on shore, near shore, and offshore that may be affected by offshore wind development. (Ocean Protection Council Funding) Contact: Gabriel Roark

- f. Aspen Environmental Group. Proposed resolution approving amendment 1 to contract 700-22-003 with Aspen Environmental Group to increase the agreement's budget by \$1,000,000 and amend the scope of work to support an environmental impact assessment in the regulatory matter of the Replacement Tire Efficiency Program rulemaking. (Clean Transportation Program Funding) Contact: Sebastian Serrato
- g. Recurve Analytics, Inc. Proposed resolution approving agreement 800-23-004 with Recurve Analytics, Inc., for up to \$1,992,447 to analyze customer energy use data, including advanced meter infrastructure data, and adopting staff's determination that this action is exempt from CEQA. The agreement will initially be for \$1,000,000. Additional funding, up to the \$1,992,447 total, will require approval from the CEC's Executive Director through an amendment. This agreement will help the CEC better understand the state's energy load, the impact of decarbonization actions and equipment on the grid, buildings, ratepayer energy costs or burden, and energy usage, and the performance of decarbonization equipment and measures, including distributed energy resources. (One Time General Fund and ERPA Funding) Contact: Tom Flynn
- h. ADM Associates, Inc. (ADM). Proposed resolution approving agreement 800-23-002 with ADM for a \$350,000 contract to provide technical support for updating the Commercial Forecast Model, and adopting staff's determination that this action is exempt from CEQA. ADM will migrate forecast model code to modern software, revise key inputs (e.g., energy use intensities, saturations), improve forecasting capabilities, create a user manual, and provide training to staff. (General Fund Funding) Contact: Mohsen Abrishami

4. Information Item – Residential Solar and Storage Permit Streamlining.

Staff will provide an overview of California's residential solar permitting landscape highlighting the California Automated Permit Processing Program (CalAPP). Soft costs, including permitting and fees, can add substantial time and money to the adoption of residential solar and storage systems in California. The CEC's CalAPP Program provides funding to assist cities and counties with offering immediate solar permit approvals and expanding access to these clean energy systems. Contact: Lucio Hernandez (Staff Presentation: 5 minutes)

5. Commercializing Industrial Decarbonization (2022 CID Program) – GFO-22-301.

This solicitation sought to fund promising pre-commercial technologies to accelerate decarbonization of industrial processes that will be needed to meet statewide energy and carbon reduction goals. This item includes four projects totaling \$23,342,737. (EPIC Funding) Contact: Michael Lozano (Staff Presentation: 10 minutes)

- a. Porifera, Inc. Proposed resolution approving agreement EPC-23-011 with Porifera, Inc. for a \$4,998,521 grant to install a Porifera Forward Osmosis Recycler System to maximize reclamation of hard-to-treat paper pulp wastewater for on-site reuse at the Procter & Gamble Paper Products Company facility in Oxnard, and adopting staff's determination that this action is exempt from CEQA.

- b. Element 16 Technologies, Inc. Proposed resolution approving agreement EPC-23-012 with Element 16 Technologies, Inc for a \$3,000,000 grant to fund the technology development and demonstration of sulfur thermal energy storage and demonstrating flexible operation to support economically feasible electrification and decarbonization of industrial processes in Trona, and adopting staff's determination that this action is exempt from CEQA.
- c. Caliskaner Water Technologies, Inc. Proposed resolution approving agreement EPC-23-013 with Caliskaner Water Technologies, Inc. for a \$7,190,593 grant to implement and demonstrate three innovative advanced sludge separation treatment technologies to reduce wastewater treatment plant energy consumption and greenhouse gas emissions at a facility in Olivehurst, and adopting staff's determination that this action is exempt from CEQA.
- d. Capture6 Corp. Proposed resolution approving agreement EPC-23-014 with Capture6 Corp for a \$8,153,623 grant to use the waste brine from Palmdale Water District's Pure Water Antelope Valley augmentation program to produce sodium hydroxide for Capture6's direct-air-capture of carbon dioxide technology in Palmdale, and adopting staff's determination that this action is exempt from CEQA.

6. California Clean Energy Fund DBA CALCEF Ventures. Proposed resolution approving 27 concept award grants totaling \$4,050,000 from the EPIC California Sustainable Energy Entrepreneur Development (CalSEED) Initiative administered by CalCEF Ventures, and adopting staff's determination that this action is exempt from CEQA. These grants were competitively selected by the CalSEED Technical Advisory Committee and are recommended for funding. Concept awards are for a maximum of \$150,000 each. (EPIC Funding) Contact: Josh Croft (Staff Presentation: 10 minutes)

- a. Activated Energy, LLC. Liquid Adsorbed CO₂ Energy Storage, Cullen Quine, \$150,000. The goal of this project is to design and demonstrate a long-duration energy storage system for urban environments in the form of compressed liquified carbon dioxide that will use commercially evaluated and certified components. The team plans to enhance the efficiency and compactness of these systems with solid-state solution gas storage - providing more than 30X volumetric reduction over what is currently being used.
- b. BioZen Batteries, Inc. Low-cost, Abundant, pH-neutral, Aqueous-soluble Organic Redox-active Electrolytes ("redoxolytes") for Redox Flow Batteries (RFBs), Nate Kirchofer, \$150,000. The goal of this project is to develop a low-cost, carbon-based electrolyte fluid for RFBs. This electrolyte leverages modular molecular modifications to tune capacity, cell voltage, lifetime, and cost based on customer need. This technology has the potential to significantly reduce the cost of deploying long-duration RFB energy storage on the grid.

- c. EarthEn, Flexible CO₂ Based Thermo-Mechanical Energy Storage, Manas Pathak, \$150,000. The goal of this project is to develop a flexible energy storage solution that uses carbon dioxide in a closed loop to store energy cheaply and safely. The proposed innovation uses supercritical carbon dioxide (sCO₂) combined with a patented cascading turbine system for the conversion of stored energy back to electricity.
- d. EELI Technology, Inc. Electrifying Lithium Extraction: Transforming Unconventional Brines into Economically Feasible Sources, Mert Akin, \$150,000. The goal of this project is to develop an economical, efficient, and scalable direct lithium extraction technology using electricity rather than carbon-intensive chemicals. This technology also uses unique innovations that maximize the lithium recovery rate while minimizing operational expenses.
- e. ExPost Technology, Inc. Next-Generation Recycling/Upcycling of Lithium-ion Batteries by Integrated Process, Weikang Li, \$150,000. The goal of this project is to develop a reuse and recycling process for end-of-life lithium-ion batteries that is closed-loop, free from toxic substances, and uses little wastewater. ExPost Technology uses a combination of physical and chemical processes to purify and regenerate high-quality cathode active materials from manufacturing scraps and spent batteries, improving the profitability of battery recycling.
- f. Kinetix Energy Storage Corp. Integrated Reluctance Motor with Carbon Fiber Flywheel Energy Storage System, Eric Martinez, \$150,000. The goal of this project is to engineer an integrated reluctance motor with a carbon fiber flywheel energy storage system to fit two complete 500 kW/1 MWh flywheel energy storage systems inside a 20-foot shipping container for short-duration energy storage applications. This innovation can support high-power electric vehicle charging stations and expand access to affordable clean energy storage.
- g. Leeta Materials, Inc. Microwave-Assisted Manufacturing of Battery Cathode Materials, Kira Wyckoff, \$150,000. The goal of the project is to develop and demonstrate a microwave-assisted manufacturing process for battery cathode materials. This technology reduces energy and water consumption while increasing the speed and consistency of the manufacturing line.
- h. Project K Energy, Inc. K4LE: Potassium-ion Batteries for Lithium-free, Low-Cost, Long-Lived, Large-Scale, Energy-Efficient Energy Storage, Kevin Hurlbutt, \$150,000. The goal of this project is to develop a potassium-ion battery that replaces lithium, cobalt, nickel, and copper with inexpensive and ubiquitous potassium, iron, and aluminum for grid-scale energy storage. The innovation combines old and new battery features to offer longer life, higher energy efficiency, and potentially higher energy density while keeping a similar architecture as contemporary, mass-produced lithium-ion batteries.

- i. Root 121, Inc. Data-Accelerated Sodium-ion Cathode Manufacturing for Domestically Resilient and Affordable Batteries, Spencer Gore, \$150,000. The goal of this project is to demonstrate a high energy density sodium-ion cathode manufacturing technology. Root 121, Inc. has developed a tool that uses data collected during manufacturing and testing to enable rapid battery materials innovation cycles and reduce the time for battery materials development from 5-10 years down to 1-2 years.
- j. Waste Salt Technologies, LLC. Repurposing Desalination Salt for Thermal Energy Storage in Pilot Scale, Reza Baghaei Lakeh, \$150,000. The goal of this project is to demonstrate a process that repurposes unseparated and minimally processed salt from desalination for use in thermal energy storage. Waste Salt Technologies, LLC's approach includes physical and chemical steps to prepare the salt and a heat exchanger that can thermally interact with the processed salt to provide and extract thermal energy.
- k. Ceja Engineering Solutions, LLC. Project Phoenix – An Early Wildlife Detection and Mitigation System, Jose Ceja, \$150,000. The goal of this project is to develop a self-powered, line-mounted wildfire detection system that will employ vibration, carbon dioxide, and infrared sensors to provide ultra-long range wildfire monitoring. Upon detection of a fire, the monitoring device will wirelessly transmit a trip signal to the power line circuit feeder breaker upstream of it. The device can also monitor line sag due to ice build-up on power lines and detect for power line galloping when ice and wind components are imparting force on the lines.
- l. Conusant, Inc. Permanent Load Shifting Using Consumer Refrigeration as Renewable Energy Storage, Tim Lockwood, \$150,000. The goal of this project is to develop and implement a micro-controller in residential refrigerators to efficiently store thermal energy and shift load. This micro-controller will use off-peak energy to cool the refrigerator freezer compartment below the normal set point of 0° Fahrenheit, which can turn off the compressor usage for up to 8 hours. The algorithm can adapt to the behavior patterns of the consumer to determine pre-cooling needs.
- m. ENAMP, Inc. Empowering Affordable Home Electrification through Intelligent Load Management by ENAMP, Mahsa Nicknam, \$150,000. The goal of this project is to advance a distributed energy resources (DER) management and electric vehicle charging hub for residential buildings with limited utility power capacity. ENAMP, Inc. will use real-time data to implement artificial intelligence-enabled control of major electric loads and integrate interoperable DERs while connected or islanded from the grid without the need to upgrade system components such as utility service and electric panels.
- n. Grid Science, LLC. AI Value Targeting to Accelerate DER, Byron Kaufman, \$150,000. The goal of this project is to determine the value of behind-the-meter DER such as battery storage using supply and demand conditions, load capacity, and reliability of the local utility circuit. Grid Science, LLC will

- use sensors to deliver real-time distribution power flow telemetry. This data will be used to determine the value of DER at any node on the electrical system.
- o. Helios Climate Industries, Inc. Intelligent Adaptive Heat Pump Controller for Space Heating and Cooling, Jeremy Osborne, \$150,000. The goal of this project is to develop a variable-speed heat pump controller to maximize comfort, minimize operating costs, and provide demand response capabilities. The controller will make machine learning-assisted decisions by monitoring the indoor and outdoor climate conditions, time-of-use billing, forecasted weather, solar photovoltaic production and consumption, thermal and battery storage charge levels, and grid demands.
 - p. Sea Dragon Energy, Inc. Lynx mPower, Stefan Sillen, \$150,000. The goal of this project is to develop an energy management system for homeowners to monitor and control circuits using their existing circuit breaker panel. The innovation is designed to be agnostic to the make of panel and breaker type as well as to other components in the customer's energy system and is easily installed by snapping it into an empty slot of the existing panel. The software provides real-time consumption data, generation data, and battery charge status, and it allows the user to better control their energy during a black-out.
 - q. C-Crete Technologies, LLC. Next-Generation Cementitious Materials from Non-Carbonate Rocks, Rouzbeh Savary, \$150,000. The goal of this project is to develop a process that turns naturally occurring, abundant rocks such as zeolite to cementitious binders with significant energy savings, affordability, flexibility, and emissions reductions while maintaining similar comfort level and performance for end users. The carbon neutrality comes from two key innovations: use of rocks whose processing would not produce carbon dioxide, and room-temperature manufacturing via industrially scaled impact milling.
 - r. Calion Technologies, Inc. Ionocaloric Heat Pumping, Drew Lilley, \$150,000. The goal of this project is to develop a zero global warming potential carbon-negative heat pump using ionocaloric heat pumping technology that will provide a drop-in replacement for vapor compression technologies. Because the ionocaloric technology uses the solid/liquid transition instead of the liquid/vapor transition there is never any vapor produced during the heat pumping process.
 - s. Carbon Blade Corporation, Carbon Blade: Renewable Energy, Self-Powered, Distributed Direct Air Carbon Capture System, Josh Franklin, \$150,000. The goal of this project is to build a self-powered, distributed direct-air-capture system that reduces carbon dioxide concentrations in the atmosphere. Compared to most engineered direct-air-capture systems that require large fans to move substantial volumes of air over the absorption surface, Carbon Blade uses a leaf-like blade design that uses natural wind conditions to move air over the contactor.

- t. EnergizedAI, Inc. Applied AI for EV Charger Reliability, Adam Mandel, \$150,000. The goal of this project is to increase electric vehicle fast charger uptime through the development of a predictive maintenance algorithm, allowing service to occur before failure. This algorithm accounts for multiple data points from each fast charger and local environmental information to derive a charger health score with continuously improving accuracy as feedback from each prediction is incorporated into the analysis.
- u. Furno Materials, Inc. Hydrogen-Fueled and Nimble with Recycled Fines: Modular Cement Plants for the 21st Century, Gurinder Nagra, \$150,000. The goal of this project is to produce carbon-neutral Portland cement using hydrogen fuel and recycled concrete fines. The novel reactor design and combustion technology increase the available surface area for heat transfer 1,000 times more than traditional cement kiln technology while increasing thermal efficiency from 50 percent to 90 percent.
- v. Mirai Solar Corp. Smart Algorithm for Greenhouse Energy and Food Production, Michael Salvador, \$150,000. The goal of this project is to develop, implement, and test a self-learning control logic for enhancing the energy use efficiency of greenhouses through the automation of retractable photovoltaic shade screens. This smart algorithm will optimize both the crop growth and electricity output of the greenhouse by choosing when to let the sun fall on the plants or photovoltaic shades.
- w. Scalvy, Inc. Fully Modular Drive System for Medium and Heavy-Duty Vehicles, Mohamed Badawy, \$150,000. The goal of this project is to design and demonstrate a modular drivetrain system for medium- and heavy-duty vehicles. The drivetrain system will be composed of self-controlled drivetrain building blocks operating to drive the traction motor, charge the battery packs, supply the electronic loads, and perform the battery management system functionalities.
- x. Solar Ice, LLC. Solar Thermal Absorption Cooling for a Warming World, Steven Goldstein, \$150,000. The goal of this project is to build a prototype of a solar thermal-powered air conditioning and hot water heating system using high efficiency solar collectors, modern absorption chillers, and phase change material. By using the sun's heat as well as waste heat to power the process, this technology will offer a cooling option that uses less energy and produces less noise and vibration.
- y. Sunchem, LLC. Nano Filters for the Precision Separation of Critical Metals, Dana Hernandez, \$150,000. The goal of this project is to develop and scale up a low-cost nano-filtration device that can continuously capture critical metals used for the clean energy transition from complex water mixtures. The technology is made up of a highly porous sponge-like metal-organic framework and polymer building blocks. A significant advantage of this technology over conventional activated carbon-based systems is the capacity

to operate with lower-grade streams that contain large amounts of interferents without being an energy-intensive system.

- z. ThermoShade Solutions, Inc. ThermoShade, Emily Dinino, \$150,000. The goal of this project is to develop a passive cooling panel that can be installed above outdoor spaces, creating a shady space that feels up to 20°F cooler without requiring electricity or water. The technology integrates ultra-reflective coatings that reflect greater than 90 percent of the sun's energy, and phase change materials that release stored cool thermal energy during the daytime heat and recharge at night when temperatures drop.
- aa. Westwood Aerogel Co. Advanced Manufacturing for Aerogel Technologies, Patricia McNeil, \$150,000. The goal of the project is to incorporate aerogel technology into energy efficient window designs and provide a retrofit solution for single-pane windows. Ambiently dried aerogel technology will be applied through an optically clear adhesive onto a pane of window that is transparent, has extremely low thermal conductivities, and unlike existing technologies can be mass produced in a continuous line process. This new material could quickly and economically enhance window insulation by up to 60 percent.

7. Information Item – Shultz Summer Fellowship.

Brief overview of the Schutz Summer Fellowship program, the experience the 2023 cohort had at the CEC, and presentation on the CADEMO Offshore Wind Project prepared by Schultz Fellow Fiona Mooney, as part of the Fellowship in Chair Hochschild's office. Contact: Katerina Robinson (Staff Presentation: 5 minutes)

8. Minutes.

Possible approval of the following:

- a. July 26, 2023 Business Meeting minutes.
- b. August 9, 2023 Business Meeting minutes.

9. Lead Commissioner or Presiding Member Reports.

A lead commissioner on a policy matter and a presiding member on a delegated committee may report to the CEC on relevant matters and discussion may follow.

10. Executive Director's Report.

11. Public Advisor's Report.

12. Chief Counsel's Report.

In-Person Instructions

Visitors of the CNRA building attending the business meeting held in the first-floor auditorium should proceed directly to the auditorium and do not need to sign in at the lobby security desk. Please note that visitors are solely permitted in the auditorium, restrooms, and cafeteria without a visitor badge or staff escort. Masks and social distancing are encouraged but not required.

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<https://energy.zoom.us/j/93869230237?pwd=Zm96c09ULzdXTjd4eldtUXdnUGErzd09>.

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Public comments are welcomed at the business meeting during announced times. Comments will be limited to two minutes or less per speaker and one speaker per entity depending on the proposed agenda and number of commenters.

If participating via Zoom's online platform, use the "raise hand" feature to indicate you would like to make a comment. The Public Advisor will open your line to speak. Please restate and spell your name for the record, indicate any affiliation, and begin your comments.

If participating by telephone, press *9 to "raise your hand" and *6 to mute/unmute. The Public Advisor will announce the last three digits of the phone number listed and open your line. Make sure to unmute your phone before speaking, restate and spell your name for the record, indicate any affiliation, and begin your comments.

Zoom's closed captioning service will be enabled for CEC business meetings. Attendees can use the service by clicking on the "live transcript" CC icon and then choosing either "show subtitle" or "view full transcript." The closed captioning service can be stopped by exiting the "live transcript" or selecting the "hide subtitle" icon. If using a phone, closed captioning is automatic and cannot be turned off. While closed captioning is available in real-time, it can include errors. A full and formal transcript rendered by a professional court reporter will be docketed in the CEC business meeting docket.

Public Advisor Assistance. Direct questions about how to participate in the business meeting or requests for interpreting services or other reasonable modifications and accommodations to the Public Advisor at publicadvisor@energy.ca.gov or by phone at (916) 957-7910. Requests for interpreting services, reasonable accommodations, and other modifications should be made as soon as possible and at least five days in advance. The CEC will work diligently to meet all requests based on the availability of

the service or resource needed. Additionally, the Public Advisor may upon the request of public participants who may be absent when a matter of interest to them is being considered, neutrally read their comments into the record during the public comment period. If you are interested in this service, please email concise comments before the start of the business meeting to the Public Advisor. Comments submitted after the business meeting starts or that cannot be read within a two-minute timeframe will be filed in the business meeting docket.

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Adjournment. Depending on time and the orderly management of proceedings, the CEC may adjourn, recess, or postpone any noticed hearing or meeting to be continued the next day, another specific date or time, or the next business meeting. Any such adjournment will be noticed at the time the order of adjournment is made. (Government Code sections 11128.5, 11129)