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Research Concept Proposal Form

Additional submitted attachment is included below.

CALIFORNIA ENERGY COMMISSION

CALIFORNIA NATURAL RESOURCES AGENCY

Electric Program Investment Charge 2026–2030 (EPIC 5) Research Concept Proposal Form

The California Energy Commission (CEC) is currently soliciting research concept ideas and other input for the Electric Program Investment Charge 2026–2030 (EPIC 5) Investment Plan. For those who would like to submit an idea for consideration, please complete this form and submit it to the CEC by **August 8, 2025**. More information about EPIC 5 is available below.

To submit the form, please visit the e-commenting link: https://efiling.energy.ca.gov/EComment/ECommentSelectProceeding.aspx and select the Docket **25-EPIC-01**. Enter your contact information and then use the "choose file" button at the bottom of the page to upload and submit the completed form. Thank you in advance for your input.

1. Please provide the name, email, and phone number of the best person to contact should the CEC have additional questions regarding the research concept:

   Rupert Mayer
   rupert@brightsaver.org
   415-781-9160

2. Please provide the name of the contact person's organization or affiliation:

   Bright Saver, Inc.

3. Please provide a brief description of the proposed concept that you would like the CEC to consider as part of the EPIC 5 Investment Plan. What is the purpose of the concept, and what would it seek to do? Why are EPIC funds needed to support the concept?

   Residential solar has been a great success, but 70% of Americans are excluded from enjoying its benefits: renters, apartment dwellers, homeowners with unsuitable roofs, and anyone who doesn't have tens of thousands dollars to spend upfront on a rooftop solar array or the credit score to get financing.

   Plug-in distributed energy resources (DERs) are the solution to this problem. Easy to set up without permits or complicated installations and

40% more cost-efficient (in $/W) than rooftop solar, they backfeed power to a home's electrical circuit through a standard plug. They include backyard and balcony solar, plug-in car ports, battery-integrated appliances, and non-hardwired bidirectional EV chargers.

While close to one in 10 households in Germany has a balcony solar system, the technology faces substantial regulatory barriers in most U.S. states.

It doesn't have to be this way. Utah has recently passed a landmark bill that enables the simple and unbureaucratic deployment of small plug-in solar devices, opening the doors for this beneficial technology to gain ground in the U.S.. However, the dominant investor-owned-utility companies in California have a strong history of opposition against residential solar, and the path toward similar legislation here seems rocky.

This concept would seek to identify a municipality and a municipal or communal electrical utility in California that are open to supporting plug-in DER technology. Partnering with that municipality and utility, the concept would include running a pilot program that makes plug-in solar+battery systems available to underserved residents and studies the benefits, with the goal of enabling large-scale adoption.

In the absence of favorable rules, vendors of plug-in DERs are staying out of California. Bright Saver is a non-profit dedicated to scaling plug-in DER adoption. It depends on grants and donations to advance this movement.

4. In accordance with Senate Bill 96[1], please describe how the proposed concept will "lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory energy goals." For example, what technical and/or market barriers or customer pain points would the proposed concept address that would lead to increased adoption of clean energy technology or innovation? Where possible, please provide specific cost and performance targets that need to be met for increased industry and consumer acceptance. For scientific analysis and tools, provide more information on what data and information gaps the proposed concept would help fill, and which specific parties or end users would benefit from the results, and for what purpose(s)?

[1] See section (a) (1) of Public Resources Code 25711.5 at: https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PRC&sectionNum=25711.5.

The concept addresses the following barriers:

Regulatory: partner with a municipal utility to create an exception for the interconnection requirement in Rule 21 – or a substantially shortened, interconnection/registration process like most European countries – for very small generation systems, typically defined as outputting ≤1.2 kWp.

Technical: support amending motions to the National Electrical Code to remove gray areas around feeding power into electrical circuits.

Market: encourage vendors that are currently selling plug-in solar+battery systems only in Utah to bring these products to California.

5. Please describe the anticipated outcomes if this research concept is successful, either fully or partially. For example, to what extent would the research reduce technology or ratepayer costs and/or increase performance to improve the overall value proposition of the technology? What is the potential of the innovation at scale? How will the innovation lead to ratepayer benefits in alignment with EPIC's guiding principles to improve safety,[2] reliability,[3] affordability,[4] environmental sustainability,[5] and equity?[6]

   An 800 W plug-in solar system with a 1.92 kWh battery can save a California household more than $500 per year and is currently available in Utah for $1,999. We expect system prices to fall and electricity prices to rise, so payback times of 3 years and less will soon be realistic.

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[2] EPIC innovations should improve the safety of operation of California's electric system in the face of climate change, wildfire, and emerging challenges.
[3] EPIC innovations should increase the reliability of California's electric system while continuing to decarbonize California's electric power supply.
[4] EPIC innovations should fund electric sector technologies and approaches that lower California electric rates and ratepayer costs and help enable the equitable adoption of clean energy technologies.
[5] EPIC innovations should continue to reduce greenhouse house gas emissions, criteria pollutant emissions, and the overall environmental impacts of California's electric system, including land and water use.
[6] EPIC innovations should increasingly support, benefit, and engage disadvantaged vulnerable California communities (DVC). (D.20-08-046, Ordering Paragraph 1.) DVCs consist of communities in the 25 percent highest scoring census tracts according to the most recent version of the California Communities Environmental Health Screening Tool (CalEnviroScreen), as well as all California tribal lands, census tracts with median household incomes less than 60 percent of state median income, and census tracts that score in the highest 5 percent of Pollution Burden within CalEnviroScreen, but do not receive an overall CalEnviroScreen score due to unreliable public health and socioeconomic data.

At the scale currently achieved in Germany, seven years after the technology gained initial traction and the first rules were created to make its deployment easy, California would have more than 1 million such systems deployed with a combined capacity of roughly 1 GWp, more than the state's largest utility-scale solar power project.

6. Describe what quantitative or qualitative metrics or indicators would be used to evaluate the impacts of the proposed research concept.

    - Accessibility and rollout strategy for low-income communities
    - Annual savings per household
    - GHG emission reduction
    - Impact on the electrical grid, reducing peak loads
    - VPP opportunities

7. Please provide references to any information provided in the form that supports the research concept's merits. This can include references to cost targets, technical potential, market barriers, equity benefits, etc.

    Germans Combat Climate Change From Their Balconies (NYT)
    Why Balcony Solar Panels Haven't Taken Off in the US (Wired)
    Plug-In Solar PV Briefing Paper (Solar Power Europe; note the irony of the full-page ad on phase 2 from Enphase, a California-based company)

8. The EPIC 5 Investment Plan must support at least one of five Strategic Goals:[7]
    a. Transportation Electrification
    b. Distributed Energy Resource Integration
    c. Building Decarbonization
    d. Achieving 100 Percent Net-Zero Carbon Emissions and the Coordinated Role of Gas
    e. Climate Adaptation

    Please describe in as much detail as possible how your proposed concept would support these goals.

    b. Plug-in DERs are a highly accessible type of distributed energy resource that enjoy positive public sentiment and great success stories in many countries. Promoting and enabling this technology in California

[7] In 2024 the CPUC adopted five Strategic Goals to guide development of the EPIC 5 Investment Plan. A description of the goals can be seen in Appendix A of CPUC Decision 24-03-007 available at:
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M527/K228/527228647.PDF

presents a unique opportunity to make DERs accessible, experienceable and relatable for consumers.

c. Home electrification is one of the key levers toward building decarbonization. With plug-in power, consumers can offset some of their increasing electricity use with onsite-generation even if rooftop solar is out of their reach.

e. Days with 100 degrees F and more are becoming the norm in many areas of California, and 19% of all electricity in the U.S. is used for air conditioning according to the EIA. In combination with rising electricity rates, the increasing need for cooling due to climate change will create a new energy poverty crisis in the absence of technologies that provide affordable electricity.

Plug-in solar is the simplest form of clean, affordable residential generation that is available, and it would be a shame for Californians to continue to miss out on it.