

DOCKETED

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Holistic barrier assessment

Additional submitted attachment is included below.



**ELECTRIC PROGRAM INVESTMENT CHARGE 2021-2025 (EPIC 4)
RESEARCH CONCEPT PROPOSAL FORM**

The CEC is currently soliciting research concept ideas and other stakeholder input for the EPIC 4 Investment Plan. For those who would like to submit an idea for consideration, we ask that you complete this form and submit it to the CEC by 5:00 p.m. on **July 2, 2021**.

To submit the form, please visit the e-commenting [link](https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=20-EPIC-01), <https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=20-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 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:

Sarah Outcault, smoutcault@ucdavis.edu, 530-752-2779

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

UC Davis Energy and Efficiency Institute

3. Please provide a brief description of the proposed concept you would like the CEC to consider as part of the EPIC 4 Investment Plan. What is the purpose of the concept, and what would it seek to do?

A broader understanding is needed on the barriers and challenges associated with building electrification. There are many salient topics. A research team should work with stakeholders to obtain actual costs of electrical upgrades and conversions across the California housing sector, relying on local contractors and conditions. For example, the actual steps in converting homes should be tracked, from the initial decision-making to acquisition of contractors, to permits, to installation times (including delays) and, ultimately, commissioning. An important unknown is the steps involved in panel upgrades. Such tracking would help policy-makers fully appreciate the pain points and bottlenecks. Other research should cover workforce requirements, permitting cost, and real estate valuation. Examining the experience of early adopters of lower carbon building designs would also be useful. All research in these areas would benefit from a holistic approach, considering multiple dimensions (e.g., technical, economic, social, environmental) and perspectives (e.g., customers, service providers, other stakeholders). Research into these areas should identify additional challenges for low-income and disadvantaged communities and strategies

to mitigate them, and consider potential equity issues that could be created or exacerbated by electrification. Another useful topic would be: How much of electrification investment stays in California? Electrification requires huge investments from generators to the end uses and is, implicitly, an economic development policy. How much of this investment stays in California? Separate studies could focus on generation, transmission, or consumption aspects. The consumption side – heat pumps, electrical panels, advanced windows, electric vehicles, etc. – appears especially important because it is so labor intensive and potentially affects the demand for less-skilled workers. The findings could influence the state’s policies regarding industrial development, education, and energy research.

4. In accordance with Senate Bill 96, 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 technologies? 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, what data and information gaps would the proposed concept help fill, what specific stakeholders will use the results, and for what purpose(s)?

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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 costs and/or increase performance to improve the overall value proposition of the technology? What is the potential of the technology at scale?

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

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

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