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*Submitted On: 8/6/2025*
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## Multifamily Demand Flexibility

*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.

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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:

Siva Sankaranarayanan, ssankaranarayanan@epri.com, (510) 821-1756.

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

Electric Power Research Institute, Inc. (EPRI)

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?

- Title: **Investigating pathways to improve Multifamily Participation in Demand Flexibility**
- In 2022, CA passed SB 846, which more than doubled the state's load flexibility capacity from 3.1 GW (2024) to target 7 GW in capacity by 2030. Additionally, per the Governor's 2022 accelerated climate action goal, California officially set the target to install 6 million heat pumps by 2030.

- Thus, there is a need for a set of approaches that enable all market segments to participate and support the demand flexibility goals, leveraging heat pumps as a vital lever for enabling demand flexibility. However, multifamily communities (retrofit of existing stock) are an uphill challenge with affordability and split incentives being major hurdles.

  While the emergence of “retrofit-ready” heat pump technologies can potentially help, they require coordinated control of building loads for multifamily buildings, specifically.
- The proposed concept is to assess the following research questions:
  - What is the role of demand flexibility in creating value for multifamily housing stakeholders?
  - How could we improve multifamily demand flexibility participation?

4. In accordance with Senate Bill 96[i], 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)?

- Focus on customer targeting, education, and engagement for demand flexibility
- Determine the utility program opportunity and customer value proposition via monetization potential and strategy
- Determine optimal financial incentives for balancing customer and stakeholder value and utility program opportunity via monetization of reduced distribution impacts, e.g., infrastructure upgrade deferral, and other business models for scale-up.

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,[ii] reliability,[iii] affordability,[iv] environmental sustainability,[v] and equity?[vi]

- The CA **Multi-family** building stock consumes 18,410 GWh of electricity and 788 million Therms (2025 projected)[1]. Of this total electricity consumption, 2,235 GWh is estimated to be from controllable loads (space heating, cooling, water heating, pool pumps). Current data indicate that 539.93 million Therms of natural gas are used for space and water heating in existing multifamily buildings in California. Based on DOE building models analyzed by EPRI, electrifying space and water heating throughout the California **multifamily** building stock would add 9,075 GWh of electricity use statewide. Thus, the demand flexibility potential for CA **multifamily** buildings may amount to 11,310 GWh, assuming aggressive electrification efforts continue. ***As an estimated yearly average, CA would have the potential to tap into 1.29 GW of electrical load for flexibility capacity in its multifamily segment, i.e., 18% of the 7 GW goal.***
- To put that into perspective, using NREL ResStock data modeling of all CA residential building stock, the baseline for average controllable demand for all CA residential building types is 9.04 GW (typically around 7 pm). ResStock's hypothetical electrification modeling shows that full electrification (including some weatherization, which may be required in certain cases under Title 24) would lead to an average controllable demand of 10.47 GW. The multifamily segment's flexibility capacity of 1.29 GW represents 12.3% of this full electrification flexible capacity across all residential buildings.
- These estimates collectively indicate the importance of the multifamily segment towards achieving both the goals of 7GW by 2030 flexible capacity as well as the longer-term full decarbonization of the CA's residential building stock.
- However, achieving this potential is not going to be easy. To maximize the opportunity for flexing the multifamily market, projects would benefit from following a holistic community-based approach to solve the overall challenges to transition towards both electrification and demand flexibility, and not by simply implementing technology. Specifically, it's important to assess all the technologies in play (i.e., not isolate the technology) and determine how to integrate them altogether into the customer-grid-utility ecosystem.

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[1] Source: California Energy Commission Demand Analysis Office, calibrated estimates for end use model in CEC proposal documents – Attachment #12 (Example from: GFO-24-310 - Retrofitting Existing Residential Buildings with Innovative Envelope Solutions)

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

- Baseline metrics for measuring the impact of demand flexibility programs would continue to apply in this case, including:
  a. Peak load reduction in summer and winter – typically used to measure seasonal demand flexibility performance.
- Additional metrics to understand the broader impact include:
  a. Total flexible load – as a way to motivate a broader approach to maximize load flexibility beyond the standard HVAC and water heating loads, and be inclusive of approaches such as behavioral demand flexibility, which has high potential in the Multifamily Affordable Housing (MFAH) segment.
  b. Total residential participation – As a way to measure the scale-up potential and understand cost-benefit implications, measuring the total residential participation would be important.
  c. Customer satisfaction – Qualitatively understand the customer sentiment about participation in the research.

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.

References used for Q.5:


- California Energy Commission Demand Analysis Office, calibrated estimates for end-use model in CEC proposal documents – Attachment #12 (Example from: GFO-24-310 - Retrofitting Existing Residential Buildings with Innovative Envelope Solutions)
- NREL ResStock – Highly Granular Modeling of US Housing Stock - https://resstock.nrel.gov/
- Agatha Kazdan, Ram Narayanamurthy, Siva Sankaranarayanan, Evan Giarta, Morgan D. Smith, Andrea Mammoli, Ramakrishnan Ravikumar. 2021.Solar+: Enabling Clean Energy in Disadvantaged Communities with Integrated PV + Storage. California Energy Commission. Publication Number: CEC-500-2024-013.


8. The EPIC 5 Investment Plan must support at least one of five Strategic Goals:[vii]

☐ Transportation Electrification
☐ Distributed Energy Resource Integration
☒ Building Decarbonization
☐ Achieving 100 Percent Net-Zero Carbon Emissions and the Coordinated Role of Gas
☐ Climate Adaptation

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

Improving the market participation of multifamily buildings in the demand flexibility market supports the reduction of greenhouse gas emissions. Specifically, this concept addresses the Strategic Goals as follows:

| *Strategic Goal* | *Relevance* |
|---|---|
| *Climate Adaptation* | Broader impact: Demand flexibility offers the grid another means of load management that can defer installation of new power plants, thus mitigating further climate-related disasters due to any additional carbon emission sources. |
| *Building Decarbonization* | Core Focus: Demand flexibility of buildings is enabled after the electrification of controllable loads. Electrification supports building decarbonization as cleaner generation sources support the power grid. |
| *Distributed Energy Resource Integration* | Complementary Focus: Demand flexibility of buildings could entail the management of building-DER loads. |
| *Transportation Electrification* | Complementary Focus: Demand flexibility of buildings could entail the management of EV loads through managed charging. |
| *Net Zero Carbon Emissions and Role of Gas* | Complementary Focus: Building decarbonization entails working towards net zero carbon emissions, which means electrifying as many building loads from natural gas and other fuel sources. |

## About EPIC

The CEC is one of four EPIC administrators, funding research, development, and demonstrations of clean energy technologies and approaches that will benefit electricity ratepayers of California's three largest investor-owned electric utilities.

EPIC is funded by California utility customers under the auspices of the California Public Utilities Commission.

To learn more about EPIC, visit: https://www.energy.ca.gov/programs-and-topics/programs/electric-program-investment-charge-epic-program

EPIC 5 documents and event notices will be posted to: https://www.energy.ca.gov/proceeding/electric-program-investment-charge-2026-2030-investment-plan-epic-5

Subscribe to the EPIC mailing list to stay informed about future opportunities to inform the development of EPIC 5: https://public.govdelivery.com/accounts/CNRA/signup/31897

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i 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.

ii EPIC innovations should improve the safety of operation of California's electric system in the face of climate change, wildfire, and emerging challenges.

iii EPIC innovations should increase the reliability of California's electric system while continuing to decarbonize California's electric power supply.

iv 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.

v 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.

vi 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.

vii 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