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CEC-057 (Revised 1/21)

Request for Information (RFI)
Flexible Demand in California for Battery Energy Storage Systems (BESS)

Docket # 25-FDAS-01

Written Comments Due December 12, 2025

The California Energy Commission (CEC) is publishing this Request for Information (RFI) to solicit feedback and responses to a range of questions that will inform staff development of a potential Flexible Demand Appliance Standard (FDAS) for residential Battery Energy Storage Systems (BESS). See instructions below on how to submit responses to this RFI.

Background

The CEC is developing flexible demand standards for appliances to meet the requirements of Senate Bill (SB) 49 (Skinner, 2019), which authorizes the CEC to pursue standards that enable appliances to schedule, shift, or curtail their operations with customer consent. The expansion of flexible demand resources in California supports the alignment of electric demand with clean energy production to avoid greenhouse gas (GHG) emissions and to enhance grid reliability. The CEC has established a goal for realizing at least 7000 MW of flexible load by 2030, with at least 3000 MW expected to be enabled by FDAS or similar load flexibility standards.[1]

To implement SB 49, the CEC began considering FDAS candidates and approaches in 2020 and has provided stakeholders and interested members of the public with opportunities to provide input.[2] The first FDAS for pool controls was adopted in October 2023, introducing an overall framework for future standards to expand upon.

CEC staff continues to examine potential flexible demand standards for a range of appliances alongside this RFI for BESS. Other appliance categories under consideration

1 CEC 2023. "Senate Bill 846 Load Shift Goal Report." Available at https://www.energy.ca.gov/publications/2023/senate-bill-846-load-shift-goal-report.
2 Steffensen, Sean. 2020. Introduction to Flexible Demand Appliance Standards. California Energy Commission. Publication Number: CEC-400-2020-013.

include electric storage water heaters, low-voltage thermostats[3], and electric vehicle supply equipment[4], among others. CEC staff will periodically request public input on any other candidate appliance types that should be considered. The focus of this RFI is on potential measures to facilitate load flexibility for BESS.

Purpose of Request

The CEC is investigating opportunities for incorporating flexible demand functionality for BESS. Facilitating flexible demand in BESS can support electric grid reliability, avoid GHG emissions associated with non-renewable generation sources, and save customers money.

CEC staff is issuing this RFI to assist in gathering information from interested members of the public, stakeholders, and others that will better inform CEC's load flexibility appliance standards development process for BESS.

Request for Comments

CEC staff has provided some guiding questions to help inform public feedback. It is not required to respond specifically to these guiding questions if there are other topics of feedback that merit consideration or if some of the subjects are not relevant for a particular commenter. Where feasible, please provide supporting references and any other related documents that will assist staff in reviewing the information provided.

1. **Scope:** Please provide information to assist the CEC in assessing whether Table 1 captures an adequate range of devices within the broader class of BESS.

Table 1: Examples of Potential In and Out-of-Scope Residential Battery Energy Storage Systems

Potential In-Scope Devices	Potential Out-of-Scope Devices
Residential Battery Storage Capacities: • Battery Energy Storage Capacity for individual energy storage units between 5 kWh to 20 kWh • Battery Energy Storage Capacity for units sold as aggregate between 5 kWh to 600 kWh **Inverters**: Multi-mode Inverters 120/240 VAC between 3 kW to 15 kW Rated Continuous AC Power Output	Off-Grid Inverters, batteries, and energy storage systems Grid-Tie Inverters (non Multi-mode) Marine Inverters Commercial Inverters ≥ 480 VAC Battery system without an inverter Three-phase alternating current (AC) Inverters Uninterruptible Power Supplies Front-of-the-meter battery systems not associated with customer load

Source: California Energy Commission

3 CEC 2024. "RFI for Low-Voltage Thermostat Flex Demand" Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-FDAS-03.
4 CEC 2024. "RFI for Electric Vehicle Supply Equipment" Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-FDAS-04.

1. **Scope:** Should the CEC consider expanding the scope of FDAS to include commercial-scale, greater than 20kWh, BESS? What are the potential benefits, limitations, and challenges of including commercial BESS alongside residential systems in this regulation? Are there specific market segments, system sizes, or control capabilities that would make commercial BESS appropriate for inclusion?
2. **Control Point:** Should the CEC consider defining the "controllable node" as the point of regulation for residential BESS instead of focusing on multimode inverters? The controllable node refers to the component within a system that manages battery charging and discharging in response to external signals and user preferences. Would this approach better reflect the diversity of system designs and control architectures currently in use? What benefits or challenges might this shift present?
3. **Capabilities:** What software and hardware capabilities could enable residential BESS to relieve/eliminate grid congestion? How can control software be configured to respond to automated and/or manual override signals from the customer's BESS?
4. **Technology:** How can a standard that integrates battery operation with grid conditions account for different BESS (AC coupled versus DC coupled) and use cases (self-consumption, backup power, and DR events)? What technical constraints could limit a BESS's ability to participate in flexible demand programs? What are the various operational modes (ex. backup, self-consumption, etc.) used for BESS, and how does BESS software prioritize between modes? What hardware and software are needed to enable BESS to provide grid services and optimize costs for customers? What percentage of residential BESSs currently receive grid signals (e.g., electricity prices, GHG emissions, and California Independent System Operator Flex Alerts) to schedule load shifting, demand response?
5. **Connectivity:** What are the most common methods for communicating grid signals to BESSs (e.g., Ethernet, Wi-Fi, Cellular)? What are the costs and benefits of these methods that are identified? What are the strategies and technologies employed to enhance communication and connectivity for BESS in areas with limited infrastructure, poor communication, and connectivity?
6. **Protocols and Interoperability:** What are the communication protocols or components of existing communication protocols that are used to enable load shifting capabilities for residential BESSs? What are the advantages and disadvantages of each of the communication protocols? What is the implementation status of these communication protocols? What are the industry-wide standard communications protocols currently in use or planned for BESS? What are the gaps and challenges to implementing load shifting capabilities? How can the standard ensure interoperability between BESS and

other flexible demand appliances (e.g. EVSE, space conditioning and electric water heating), and various control systems (such as home management systems)?

7. **Cost Optimization and MIDAS Integration:** How can a residential BESS best minimize customers' electricity costs both with and without self-generation (such as solar PV)? How can residential BESSs best utilize the CEC's Market Informed Demand Automation Server (MIDAS), which provides free access to utilities' time-varying rates, GHG emission signals, and California Independent System Operator (California ISO) Flex Alerts? More details can be found here: Market Informed Demand Automation Server (MIDAS) (ca.gov).
    a. Are there options for BESS systems to leverage signals from CEC MIDAS? What are the key functionalities that are required for BESS to respond to CEC MIDAS signals? Are there changes to MIDAS that would better support BESS load flexibility than the existing configuration?
    b. Are there any strategies to best utilize BESS with Demand Response events? What is the role of BESS charging and discharging from the grid?
8. **Cybersecurity:** What are the cybersecurity challenges and needs associated with communicating signals from the grid or a third-party, and interacting with BESS? How would these cybersecurity protocol challenges be used to address the risks to both customer data and grid reliability? What are the risks and benefits of enabling remote software updates to incorporate new standards, and what processes can be used to mitigate these risks?
9. **Resilience:** In the event of a loss of communication and/or connectivity, how should the residential BESS function? What are the potential risks and benefits of each approach, especially in terms of grid reliability, user experience, and long-term sustainability? What is the current status of interoperability standards that would allow previously installed BESS to point to a different cloud-software control layer if the original control layer is disbanded for business reasons?
10. **Valuation Tools:** Staff is considering using the California Public Utilities Commission's (CPUC) Avoided Cost Calculator (ACC) for internal data evaluation while CEC continues to draft a standard for residential BESS. To what extent is the ACC a reliable and valuable tool for forecasting hourly value for electricity import or export to the grid? Are there specific strengths or limitations in the ACC's methodology or assumptions that should be considered when valuing Net Billing Tariff for BESS? Are there other sources that CEC staff should consider in valuing or forecasting hourly value for electricity imports or exports to the grid?
11. **Customer Experience:** What types of information or awareness campaign do the Load Serving Entities (LSE) or other entities provide participants in the BESS installation program to help customers understand the benefits BESS provides? What percentage of customers have a residential BESS? What reasons do

customers give for installing BESS at their residence? Do customers with residential BESSs have options for more than one rate structure? What tariff structure or options are utilized by the installed stock of BESS? Do customers with a residential BESS prefer a specific rate structure that LSEs or other entities provide? Do customers who add a BESS to their residence stay with their previous rate structure? What financial incentives or rate structures are most effective in encouraging customers to adopt and use for BESS? What are the estimated costs and benefits for customers of participating in the flexible demand program for BESS, including potential bill savings and the impact on BESS lifespan?

12. **System Design:** When developing policy for residential BESS, should the CEC define all-in-one battery, controls, and inverter systems as distinct from systems where these components are housed separately? What are the benefits and challenges of each configuration in terms of installation flexibility, system scalability, maintenance, and overall cost-effectiveness, and should all-in-one systems be handled differently in regulation?
13. **Data Sources:** CEC staff based their California residential BESS stock estimates, growth rates, and load shapes on data provided by the CEC 2024 Integrated Energy Policy Report. Are there other California-specific information sources that staff should consider?
14. **Multifamily Access:** What options are available for tenants and occupants in multifamily buildings to access financial benefits from BESS? How would the control software need to change to support load flexibility in this configuration? What, if any, BESS software options exist to allow building owners or operators to manage demand as well as provide grid services? Are there examples of tenant-or resident-owned BESS that could provide these services and could be cost-effectively moved with residents to future residences?
15. **Equity:** What are the equity considerations for BESS, and how can FDAS address these issues in regulation? For example, are there concerns that flexible demand will be disproportionately accessible based on income level? Are there other factors or impacts that should be considered if there were to be disproportionate accessibility?
16. **Miscellaneous:** After reviewing the scope and questions posed in this request for information, are there additional issues or considerations that should be addressed by CEC staff?

Submitting Comments to the CEC Docket

Participation in this RFI is highly encouraged. Public input is essential to ensuring the development of proposed regulations with the most current and relevant data and perspectives.

Written comments, proposals, and other technical material must be submitted to the Docket Unit by **December 12, 2025.** Written comments, attachments, and associated contact information (for example, address, telephone number, email address) will become part of the public record of this proceeding, with access available via any internet search engine.

The CEC encourages use of its electronic commenting system. Visit the e-commenting page, https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=25-FDAS-01 which links to the comment page for this docket.[5] Enter your contact information and a comment title describing the subject of your comment(s). Comments may be included in the "Comment Text" box or attached in a format consistent with CCR, Title 20, section 1208.1.[6] The maximum file size is 10 MB.

Written materials may also be submitted by email. Include the docket number 25-FDAS-01 and "Flexible Demand and Load Shifting in California for Battery Energy Storage Systems" in the subject line and send to docket@energy.ca.gov.

If preferred, a paper copy may be submitted to:

California Energy Commission
Docket Unit
Re: Docket 25-FDAS-01
715 P Street
Sacramento, CA 95814

If interested parties wish to maintain the confidentiality of specific data or information, they should submit an application for confidentiality and the confidential documents directly to the Docket Unit through the e-filing system. For information on applying for confidentiality, interested parties should contact the Docket Unit in the CEC's Chief Counsel's Office before submitting a response to this RFI. Otherwise, all responses received will become publicly available. Visit the Docket Unit page, https://www.energy.ca.gov/about/divisions-and-offices/chief-counsels-office/docket-unit, which links the application for confidentiality.

Questions regarding submitting comments to the docket, including inquiries regarding confidentiality, should be referred to the Docket Unit at docket@energy.ca.gov or (916) 654-5076.

Public Advisor and Other Commission Contacts

5 CEC. Docket Log 25-FDAS-01. Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-FDAS-01.
6 Thomson Reuters Westlaw California Code of Regulations. § 1208.1. Media, Format, Content, and Other Required Characteristics of Filed Documents; Electronic Signatures, Changes in the Requirements by the Executive Director. Available at https://govt.westlaw.com/calregs/Document/IC9B8C2B35CCE11EC9220000D3A7C4BC3?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default).

The CEC's Public Advisor assists the public with participating in CEC proceedings. To request interpreting services, reasonable modification or accommodations, and other modifications, contact the Public Advisor at publicadvisor@energy.ca.gov or by phone at (916) 957-7910. Requests should be made as soon as possible but at least five days in advance. The CEC will work diligently to meet all requests based on availability.

Direct questions on the subject matter of this RFI should be addressed to our program's inbox at: flexdemandstandards@energy.ca.gov or call (916) 232-9045.

Media
Direct media inquiries to the Media and Public Communications Office at mediaoffice@energy.ca.gov or call (916) 654-4989.

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Interested members of the public who would like to follow or participate in this and future proceedings should subscribe to the "Flexible Demand Appliances and Load Management and Demand Response" subscription list found at the CEC's subscriptions webpage, https://www.energy.ca.gov/subscriptions.

Availability of Documents
All records for the RFI will be accessible in the Load Flexibility Policy & Planning, https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-FDAS-01. When new information is posted, an email will be sent to those on the Flexible Demand Appliances and Load Management and Demand Response list. To receive these notices please subscribe to that list by visiting the Flexible Demand Appliances home page at: https://www.energy.ca.gov/proceedings/active-proceedings/flexible-demand-appliances.