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Description:	Written comments due December 20, 2024. Request for Information to solicit stakeholder feedback and responses to a range of questions that will inform staff development of a potential Flexible Demand Appliance Standard (FDAS) for electric vehicle supply equipment.
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CEC-057 (Revised 1/21)

Request for Information (RFI)
Flexible Demand and Load Shifting in California for Electric Vehicle Support Equipment

Docket # 24-FDAS-04

Written Comments Due 12/20/2024

The California Energy Commission (CEC) is publishing this Request for Information (RFI) to solicit stakeholder feedback and responses to a range of questions that will inform staff development of a potential Flexible Demand Appliance Standard (FDAS) for Electric Vehicle Supply Equipment (EVSE). 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 49 (Skinner, 2019), which authorized the CEC to pursue standards that enable appliances to schedule, shift, or curtail their operations with consumer consent. The expansion of flexible demand resources in California supports the alignment of electric demand with clean energy production to reduce greenhouse gas (GHG) emissions and 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 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.

AB 2127 projects a need for 2.1M public and private shared electric vehicle chargers to support 15.2M light duty electric vehicles as well as 264,500 depot and en route electric

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.

vehicle chargers for 377,000 medium and heavy duty electric vehicles by 2035.[3] The 2023 Integrated Energy Policy Report projected an additional 4810MW impact in 2035 net peak demand attributed to light duty, medium duty and heavy duty electric vehicles.[4] SB 59 (Skinner, 2024) requires any weight class of battery electric vehicle (BEV) to be bidirectional capable if determined there is a sufficiently compelling beneficial bidirectional-capable use to the BEV operator and the grid.[5] From a flexible demand perspective, the potential for offsetting peak loads with a vehicle's battery, especially with the larger battery capacities of medium and heavy-duty electric vehicles, presents a load shift opportunity. Implementing standards and incorporating flexible demand appliance standards for EVSE can help transform the marketplace, allowing innovation by industry to ensure each of these chargers meet the needs of customers while supporting efficient and low-carbon operation of the electricity grid.

CEC continues to examine potential flexible demand standards for a range of appliances in parallel to this RFI for EVSE. Other appliance categories under consideration include electric storage water heaters, low-voltage thermostats[6], and battery storage systems, among others. CEC staff will periodically request public input on any other candidate appliance types that should be considered. The focus of this immediate RFI is on potential measures to facilitate load flexibility for electric vehicle supply equipment.

Purpose of Request

As part of the work to develop FDAS, the CEC is investigating methods and practices for shifting the power draws by EVSE, also known as electric vehicle (EV) chargers. The goal is to enable shifting the time and rate of vehicle charging to enhance grid reliability, lower GHG emissions, and save consumers money. Bidirectional electric vehicle supply equipment employed as a gateway for mobile battery storage on electric vehicles can add resilience benefits and enhanced grid-support capabilities to a site's building infrastructure. Bidirectional vehicles can provide backup power to buildings or specific loads, sometimes as part of a microgrid, through vehicle to building (V2B) charging, or provide power to the grid through vehicle to grid (V2G) charging.

CEC staff is issuing this request for information (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-making process for EVSE.

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3 CEC 2024. "Assembly Bill 2127 Second Electric Vehicle Charging Infrastructure Assessment: Assessing Charging Needs to Support Zero-Emission Vehicles In 2030 and 2035." Available at https://www.energy.ca.gov/data-reports/reports/electric-vehicle-charging-infrastructure-assessment-ab-2127.

4 CEC 2023. "2023 Integrated Energy Policy Report" Available at https://www.energy.ca.gov/publications/2023/2023-integrated-energy-policy-report.

5 LegInfo.legislature.ca.gov 2024. "Senate Bill 59 Battery Electric Vehicles: Bidirectional Capability" Available at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320240SB59#.

6 CEC 2024. "RFI for Low-Voltage Thermostat Flex Demand" Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-FDAS-03.

Request for Comments
CEC staff has provided some framing 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 information provided.

1. Please provide information to assist the CEC in determining whether the scope of devices in Table 1 meets the needs of FDAS or if the CEC needs to consider revisions to the scope.

Table 1: Examples of In and Out-of-Scope Electric Vehicle Supply Equipment

Potential In-Scope Devices	Potential Out-of-Scope Devices
▪Level 1 Electric Vehicle Supply Equipment ▪Level 2 Electric Vehicle Supply Equipment ▪DC-output Electric Vehicle Supply Equipment ▪Wireless Electric Vehicle Supply Equipment ▪Medium voltage AC input supply Electric Vehicle Supply Equipment ▪Power electronic components inside the vehicle	▪Pantograph Electric Vehicle Supply Equipment ▪Equipment with an automated connection system

Source: California Energy Commission

2. What is the current landscape of options for charging schedules that prioritize the driver experience, emissions reductions, financial savings, and/or other factors? Please provide information or data on customer receptiveness to various charging schedules, such as charge immediately, charge by departure, etc. and the entity who possesses such information.
3. Please comment on the various EVs or EVSE consumer charging preferences such as charge immediately or "charge by departure", where the EV is charged to a specified percentage with a set time to be ready.
    a. How does using charge strategy balance factors as battery life, price, etc.?
    b. What consumer data is available that provides customer charging habits such as: demographics and population percentages that prefer to charge at home, at work, or in public shared spaces? What times of day?
    c. What charger types are typically used?

d. How do charging patterns change as EV owners gain experience with their vehicle?
e. What percentage of battery capacity is typically charged per session?
f. How is this behavior expected to change as ownership of EVs expands beyond the early adopters?

4. When will DC charging equipment be available for residential installation? What are the expected use cases, penetration, price range and power level of DC equipment used in the residential sector? Would certain DC chargers installed at private residences require a Battery Energy Storage System to manage peak load?
5. What software and hardware capabilities could enable public EVSEs to relieve/eliminate grid congestion at the Distribution (referring to Transmission and Distribution, T&D, for the grid) level? What control strategies are available to the grid operator and/or load aggregator to shift and/or curtail demand from EVSEs at the Distribution level to maintain grid reliability?
6. Similarly, what software and hardware capabilities are best suited enable residential EVSEs to relieve grid congestion at the Distribution level? What control strategies can be deployed by the grid operator and/or load aggregator to shift and/or curtail demand from residential EVSEs at the Distribution level support grid reliability?
7. What hardware and software are needed on the EV's Onboard Charging System to enable load shifting? What percentage of EVs currently receive grid signals (e.g., electricity prices, GHG emissions and California Independent System Operator Flex Alerts) to schedule load shifting, demand response, and/or bi-directional charging? What percentage of EVs require the EVSE to receive grid signals to schedule load shifting, demand response, and/or bi-directional charging? What are the most common methods for communicating signals to EVSEs and EVs (e.g. Ethernet, Wi-Fi, Cellular, AM/FM broadcast)?
8. (Focused on EV manufacturers) Is the EV telematics system used to receive grid signals (e.g., electricity prices, GHG emissions, and California Independent System Operator Flex Alerts) and schedule charging in response to those grid signals? If so, what is the monthly cost charged to the customer for these capabilities?
9. How can medium-duty and heavy-duty (MDHD) EVs and their EVSE fit into the CEC's goal of load shifting to avoid GHG emissions?
10. Should the scope of this regulation include load shifting criteria for EVs such as forklifts, boats, and other off-road vehicles? Do off-road vehicles typically have a defined use-cycle that fits the need for load shifting? If so, which types of off-road vehicles? Please provide off-road EV counts, types of EVSE for off-road EVs, and charging strategies for off-road EVs.
11. There are currently some buses that use wireless charging to top off batteries at bus stops. What are other applicable uses for wireless charging, and is wireless

charging planned in your product roadmap? If so, when is wireless charging expected to be more widely available?

12. What are the charging practices for commercial fleets? Bus fleets? Overnight depot level charging? What power levels? How is the charging of the fleet managed? Manually rotated? Management software?
13. Which communication protocols or components of existing communication protocols are used to enable load shifting capabilities for EVs and EVSE? What is the implementation status of these communication protocols? Are industry-wide standard communications and control protocols currently in use or planned? Are there remaining gaps to enabling load shifting capabilities?
14. Does data exist on the effect of bidirectional charging on EV battery life? How is battery capacity affected by the frequency and level of bidirectional charging (for example, power level, total energy discharge, and so on)? Does this affect the warranties or insurance of the EV owner? If so, can the loss in value, if any, be quantified over the life of the battery?
15. Can a load shift program work with EVSEs/EVs responding to generic signals, or must signals be tailored for each EVSE/EV?
16. What data or information is needed from the EV and/or EVSE to enable load shift while ensuring driver mobility and range needs are not compromised (for example, kWh needed by the vehicle)? How could this data or information be communicated across all vehicle and supply equipment models, regardless of the manufacturers' involvement?
17. What is the energy consumption impact from adding flexible demand capability to existing EVSE?
18. Please discuss strategies for EVSE to best utilize the CEC's Market Informed Demand Automation Server (MIDAS) which provides access to utilities' time-varying rates, GHG emission signals, and California Independent System Operator (California ISO) Flex Alerts? More detail can be found here: Market Informed Demand Automation Server (MIDAS) (ca.gov).
19. What are the cybersecurity challenges and needs associated with communicating signals from the grid, or a third-party, to accomplish supplying energy to electric vehicles?
20. Are there any considerations to ensure equity when developing a load shifting strategy for supplying energy to electric vehicles? For example, are there concerns that flexible demand will be disproportionately accessible based on income level?

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 from all stakeholders.

Written comments, proposals, and other technical material must be submitted to the Docket Unit by **12/20/2024.** 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=24-FDAS-04 which links to the comment page for this docket.[7] 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.[8] The maximum file size is 10 MB.

Written materials may also be submitted by email. Include the docket number 24-FDAS-02 and "Flexible Demand and Load Shifting in California for Electric Vehicle Supply Equipment" 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 24-FDAS-04
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, 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

The CEC's Public Advisor assists the public with participating in CEC proceedings. To request interpreting services, reasonable modification or accommodations, and other

7 CEC. Docket Log 24-FDAS-04. Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-FDAS-04.

8 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).

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 Bruce Helft at bruce.helft@energy.ca.gov, or by phone at (916) 232-9045.

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

Subscribing to E-mail List Servers
Interested parties 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. By subscribing to this list, interested parties are consenting to receive information, notices, and other communications, including information associated with CEC's load flexibility rulemaking proceedings, by electronic mail. rulemaking proceedings, by electronic mail.

Availability of Documents
All records for the process will be accessible in the Load Flexibility Policy & Planning, https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-FDAS-04. 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.