| DOCKETED | |
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| **Docket Number:** | 25-FDAS-01 |
| **Project Title:** | Flexible Demand Appliance Standards for Battery Storage Systems |
| **TN #:** | 267899 |
| **Document Title:** | Carrier Energy Response to Request for Information on Flexible Demand in California for Battery Energy Storage Systems |
| **Description:** | N/A |
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| **Submitter Role:** | Applicant Consultant |
| **Submission Date:** | 12/12/2025 11:43:41 AM |
| **Docketed Date:** | 12/12/2025 |

**Comments to the California Energy Commission**

**December 12, 2025**

**Docket #25-FDAS-01**

**Request for Information**

**Flexible Demand in California for Battery Energy Storage Systems**

Carrier Energy, an organic startup within Carrier Global Corporation ("Carrier"), is pleased to provide the following comments and responses to the California Energy Commission's ("Commission") Request for Information ("RFI") concerning Flexible Demand in Battery Energy Storage Systems. As the leading global provider of intelligent climate and energy solutions, Carrier is deeply committed to advancing sustainability, grid reliability, and customer comfort. Carrier Energy commends the Commission for continuing to explore how residential consumers can contribute to maximizing grid flexibility and efficiency and contribute to state goals of "realizing at least 7000 MW of flexible load by 2030, with at least 3000 MW expected to be enabled by [Flexible Demand Appliance Standard ("FDAS")] or similar load flexibility standards."[1] Carrier Energy is bringing a flexible demand appliance with battery storage to the California market, beginning in 2026, and wants to ensure that initial and subsequent generations of the product meet and comply with the standards that the Commission may develop "that enable appliances to schedule, shift, or curtail their operations with customer consent."[2]

[1] RFI, page 1.
[2] *Id.*

**Overview of Carrier Energy Flexible Demand Solution:**

With a significant residential heating, ventilation, and cooling ("HVAC") customer base in California, Carrier focuses on offering customers new products and solutions, including variable speed heat pumps that operate more efficiently than traditional single speed HVAC units. In 2026, Carrier and Carrier Energy will commercially launch a new mid-tier battery-enabled, variable speed heat pump for the residential marketplace.

Carrier Energy's solution is designed to be simple and effective. A 5-kw battery converts alternating current ("AC") electricity from the grid to direct current ("DC") electricity stored in the battery. When called upon by the partner utility, the battery discharges DC power directly to the variable frequency drive of the heat pump, curtailing the demand of the heat pump's outdoor unit. During times of peak demand, the battery can then supply power to the heat pump's outdoor unit for one to four hours, shifting load off the grid. During periods of lower grid demand, the battery will recharge and prepare to serve the utility again when dispatched for the next peak demand event.

In partnership with California electric utilities, Carrier Energy will help customers who choose this new battery-enabled variable speed heat pump enroll in the appropriate demand response utility program and consent to allowing the battery to power their heat pump, and the grid to then recharge the battery during off peak hours selected by the utility. Carrier Energy and the utilities will coordinate, over advanced telemetry, to power the heat pumps from the batteries when doing so can help the utility shave peak demand.

Carrier Energy developed this solution to address continuing demand and load growth and to leverage the opportunity presented by the fact that residential HVAC is one of the largest single loads on the grid, particularly at daily peaks. In 2027, Carrier Energy will continue to

partner with utilities and stakeholders to establish fleets of load-shifting batteries across multiple utility service territories.

**Carrier Energy RFI Responses:**

*Scope and Table 1:*

Carrier Energy's innovative battery-enabled heat pump is flexible demand, behind-the-meter storage, without being a battery energy storage system ("BESS") as defined in California law, particularly the 2025 Energy Code, because the energy storage technology is appliance-specific. The system architecture does not include an inverter that enables the battery to send power back into the home or the grid, and the battery will not backfeed, even if discharging in response to a utility dispatch during a grid outage. However, Carrier Energy's solution fits the concept of flexible demand appliances as contemplated by the RFI and exhibited in Table 1 – "battery energy storage capacity for individual energy storage units between 5 kWh and 20 kWh."[3]

Carrier Energy welcomes discussion in this docket about the benefits of creating a class of FDAS standards clearly focused on and tailored for DC-coupled appliances with attached storage. Many use cases that currently include an AC-tied smart inverter in the requirements for incentives and programs could be fulfilled with these less expensive and more easily adopted device-level storage solutions that are coming to market.

*Control Point:*

The Commission should continue to explore the controllable node concept and invite robust stakeholder input. Carrier Energy's solution is a dispatchable DC-coupled load flexibility product that presents multiple controllable nodes. The goals of accurate measurement,

[3] RFI page 2.

verification, and capacity planning might point to different nodes as the ideal "controllable" node.

*Connectivity*:

Carrier has observed that a common methodology for communicating grid signals, from BESS and from non-BESS storage, is WiFi with Cellular backup. Homeowner agreements frequently require the homeowner to provide WiFi connectivity to minimize the technology provider's operating costs. Carrier Energy's solution uses cellular only, embedded in the unit, to ensure reliable communication that utilities can plan around.

*Protocols and Interoperability*:

California Smart Inverter Profile ("CSIP") IEEE 2030.5 is the dominant communications standard for residential BESS coupled with smart inverters that comply with UL 1741-SB. For this reason, many utility Distributed Energy Resource Management Systems are built to expect 2030.5 communications, though they may not support a full implementation of the standard but rather specifically CSIP. Manufacturers of other devices, such as Carrier Energy's, that support a subset of the CSIP capabilities and measurements tend to support either 2030.5, or, for simpler devices and use cases (such as thermostats), a mix of OpenADR and manual (email or phone) dispatch. Many manufacturers also offer time-of-use rate optimization via rate Application Programming Interfaces ("APIs") such as California's Market Informed Demand Automation Server (MIDAS) or by user input (such as EV charging schedules). Devices enrolled in wholesale (California Independent System Operator ("CAISO")) virtual power plants ("VPPs") rather than utility VPPs may also use custom APIs provided by market aggregators who in turn use CAISO's standard APIs.

*Cost Optimization and MIDAS Integration:*

Carrier Energy commends the Commission's focus on minimizing customers' electricity costs and acknowledging the diverse technologies and approaches that benefit consumers and the grid. As standards evolve, Carrier Energy encourages the Commission and stakeholders to develop standards that further enable stacking value from the capacity benefit and daily shifting benefits without relying on meter baselines.

*Cybersecurity:*

Carrier Energy is committed to robust cybersecurity planning and takes cybersecurity compliance very seriously from procurement to production, and throughout operation of products and digital solutions. Carrier Energy sees a benefit in conducting a full discussion of standards that enable secure Over-the-Air updates, in line with UL 5500.

*Equity:*

The Commission can help expand the universe of flexible demand appliances that are accessible to a wider range of income levels by including a robust discussion of non-inverter-based appliance standards. Solar-plus storage systems and whole-home batteries are out of the financial reach and planning horizon for many consumers. Non-inverter-based appliances, such as Carrier Energy's battery-enabled heat pump, and other nearly ubiquitous consumer appliances coming to market that incorporate batteries and provide utility benefits offer tremendous potential to shift load and ultimately save California consumers money, as utilities increasingly take larger steps toward realizing the state's flexible demand goals.

**Conclusion:**

Carrier Energy appreciates the opportunity to respond to the RFI in this important docket and looks forward to contributing information as the Commission and staff work to develop additional flexible demand appliance standards.

Respectfully submitted this 12th day of December 2025,

*/s/ Laura M. Schepis*

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