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Consumer Technology Association comments on Low Power Mode

Additional submitted attachment is included below.



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July 14, 2026

California Energy Commission
Docket Unit, MS-4
715 P Street
Sacramento, CA 95814

RE: Docket No. 17-AAER-12 — Comments of the Consumer Technology Association on the Draft Staff Report, Voluntary Performance Framework for Low-Power Modes, Version 1.0 (TN #270018)

Dear Commissioners and Staff:

The Consumer Technology Association (CTA)¹ appreciates the opportunity to submit comments on the California Energy Commission's (CEC) Draft Staff Report, Voluntary Performance Framework for Low-Power Modes Version 1.0 (VPF-LPM), docketed May 15, 2026.

These comments focus on the following in-scope, in-focus product categories identified in Table 2 of the draft report: speakers (including smart speakers), streaming media players, receivers and audio amplifiers, home-theater-in-a-box systems, soundbars, video projectors, and computer speakers. Our members design and manufacture products across each of these categories, and the comments below reflect their direct engineering and compliance experience testing inactive power consumption under prior versions of the Data Collection Procedure (DCP).

CTA's principal request is set out in Section I below: the CEC should clearly and consistently state, in the body of the framework document itself, that battery-embedded products are excluded from the VPF-LPM, and should apply that exclusion uniformly across all product

¹ CTA is North America's largest technology trade association. Our members are the world's leading innovators – from startups to global brands – helping support more than 18 million American jobs. Our members have long been recognized for their commitment and leadership in innovation and energy efficiency, often taking measures to exceed regulatory requirements on environmental design.

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categories rather than leaving it to inference from scattered provisions. Section II provides market data for the categories addressed in these comments, including CTA's discontinuation of "computer speakers" as an independent market-research category. Sections III, IV, and VI address specific technical elements of the DCP-LPM (Appendix A) that affect the accuracy, reproducibility, and practicality of testing for our members' product categories, and Section V addresses future performance target methodology for products whose primary functionality depends on persistent connectivity or availability.

I. The CEC Should Clearly and Consistently Exclude Battery-Embedded Products From the VPF-LPM, Across All Product Categories

CTA's principal request is that the CEC amend the framework to state, explicitly and in one clear location, that products with embedded batteries — including products with embedded battery-charging functionality — fall outside the scope of the VPF-LPM. As currently drafted, the exclusion for battery-related functionality is implied rather than stated, and it is scattered across provisions that are easy to read in tension with one another.

The Executive Summary and Chapter 2 state that the VPF-LPM's scope excludes only two categories of products: those subject to federal preemption and those already subject to a state-mandated standby power standard. Federally regulated battery chargers fall within the first exclusion. Under 10 CFR 430.2, a "battery charger" is defined to include chargers "embedded in other consumer products," meaning that the federal definition — and the associated preemption of state regulation — extends to products that incorporate battery-charging functionality as a feature, not only to stand-alone chargers sold separately.

Separately, Chapter 4 of the draft report states that "[t]he DCP-LPM is not developed for individual parts or devices that are primarily powered by an integrated battery," which further supports excluding battery-embedded products, but this statement addresses only integrated, non-removable batteries. It does not address products that charge external or removable rechargeable batteries and therefore meet the federal definition of a battery charger.

At the same time, two provisions of the DCP-LPM (Appendix A) could be read to contradict this exclusion. Section 3.2.1.2 instructs testers to ensure that a peripheral's battery is "fully charged" before warmup and testing, and Section 6.1.2 instructs testers to confirm that a UUT's rechargeable battery is fully charged at the end of the warmup period. CTA understands the intent of these provisions is to address the narrow case where a stand-alone charger — external to the UUT — is used to charge a removable battery that is then inserted into the product being tested. However, as written, a reader could reasonably conclude that products with their own built-in battery-charging circuitry are within scope, which would be inconsistent with both the federal preemption exclusion and Chapter 4's own statement about integrated-battery products.

This ambiguity is not limited to the categories addressed in these comments. Battery-embedded designs are increasingly common across many of the 18 in-focus product categories listed in Table 2 — including, for example, portable and battery-backed speakers, streaming media remotes and accessories, and other battery-powered accessories associated with the products at issue here. Leaving the scope exclusion to inference invites inconsistent interpretation by

manufacturers and test laboratories and creates unnecessary compliance uncertainty and risk of duplicative data submission for products already addressed by federal battery charger standards.

CTA respectfully requests that the CEC:

- Add express language to Chapter 2 (Scope) stating that products incorporating battery-charging functionality — whether for integrated/non-removable or removable/external batteries — are federally regulated battery chargers under 10 CFR 430.2 and are therefore excluded from the VPF-LPM, consistent with the federal preemption exclusion already recognized in the framework;
- Revise DCP-LPM Sections 3.2.1.2 and 6.1.2 to clarify that the “rechargeable battery” referenced in those sections is one charged by an independent, stand-alone charger external to the UUT, and not a battery charged by circuitry built into the UUT itself; and
- Apply this clarified exclusion consistently across all in-scope, in-focus and in-scope, out-of-focus product categories in future iterations of the VPF-LPM, so that manufacturers of battery-embedded products in any category can rely on a single, unambiguous statement of scope rather than inferring their status from provisions addressed to a different purpose.

This clarification will prevent misinterpretation, avoid duplicative regulatory burden for products already subject to federal battery charger requirements, and ensure the VPF-LPM's stated scope exclusions operate as intended.

II. Market Data for the Categories Addressed in These Comments

To provide the CEC with current market context for the product categories addressed in these comments, CTA has compiled recent year-over-year shipment trend data from its market research department. This data illustrates that several of the traditional home audio categories addressed in the VPF-LPM are mature or declining markets, while also illustrating a shift in how consumers use and obtain audio and video playback functionality.

Table A: U.S. Unit Shipment Trends, 2023–2025 (Year-over-Year % Change)

Category	YoY 2023	YoY 2024	YoY 2025
Total Home Speakers	-2%	-7%	-6%
Soundbars	-3%	-8%	-7%
Total Receivers	-6%	-7%	-7%
Home Audio Amplifiers	1%	-1%	-1%
Streaming Media Players	-5%	8%	3%
Front Projectors	13%	4%	1%

Source: CTA Market Research, July 2026 Forecast. “Computer speakers” does not appear as a line item; see discussion below.

As Table A shows, unit shipments for several traditional home audio components have declined in each of the last three years, including total home speakers (-6% in 2025), soundbars (-7%), and receivers (-7%). By contrast, streaming media players grew 3% in 2025 after an 8% increase in 2024, and front (video) projector shipments have grown modestly but consistently since 2022.

Notably, Table A does not include a line item for “computer speakers.” CTA discontinued tracking computer speakers as an independent category in its market research because unit shipments and consumer usage of computer speakers as a distinct product type declined significantly, and the underlying playback function migrated into general-purpose, multifunction speaker products — for example, Bluetooth and wireless speakers that consumers pair interchangeably with computers, mobile devices, and other sources — rather than remaining tied exclusively to desktop or laptop computers. As a result, CTA does not maintain, and is unable to provide, current data specific to a standalone “computer speakers” category.

CTA recommends that the CEC consider this market reality in evaluating whether “computer speakers” should continue to be treated as a distinct product category under the VPF-LPM, given that this functionality is now largely captured within the broader “speakers (including smart speakers)” category listed in Table 2 of the draft report. This recommendation is further supported by CEC staff’s own statements at the June 24, 2026 public workshop on this proceeding, where staff indicated that the VPF-LPM’s data collection is intended to focus on products currently being sold into the market, rather than the installed base of products already in service. Because current shipment and market research data no longer support treating computer speakers as a distinct, actively-sold category separate from other speakers, consolidating computer speakers into the broader “speakers (including smart speakers)” category would align the framework’s scope with staff’s stated data collection focus. CTA welcomes the opportunity to discuss with staff how best to reflect this category consolidation in future iterations of the framework.

III. The DCP-LPM Should Permit Non-Intrusive Power Measurement Methods (Section 1.4.2)

DCP-LPM Section 1.4.2 requires that, for USB-powered UUTs, the DC side of the AC-to-USB power supply be connected to the power meter “by breaking the DC Vcc+ and wiring it through the power meter.” CTA has identified two concerns with this requirement as applied to streaming media players, speakers, and other USB-powered products in scope of this proceeding.

First, physically breaking the DC Vcc+ line and routing it through an in-line meter adds cable length, additional connector points, and impedance discontinuities. Because many USB-powered products rely on data communication and power-negotiation protocols (e.g., USB-PD, BC1.2) alongside power delivery, these modifications can introduce electrical noise, voltage drops, and signal reflections that alter the UUT’s operating behavior — potentially affecting the very low-power-mode characteristics the test is intended to measure.

Second, low-power-mode behavior is often dynamic, with devices transitioning among sub-states (sleep, standby, networked standby) in response to timers, network events, or sensor activity. Non-intrusive measurement using current probes or clamp-type analyzers can offer high sampling rates and continuous logging without altering the original cable assembly and can simplify setup where multiple devices or repeated tests are involved.

CTA recommends that Section 1.4.2 be revised to expressly permit non-intrusive measurement methods — such as power analyzers using current probes or equivalent techniques — provided the chosen method meets the accuracy and uncertainty requirements specified elsewhere in the DCP-LPM. This change would improve practicality and reproducibility without compromising measurement integrity.

IV. The DCP-LPM Should Clarify Network Connection Requirements for Products With Redundant IP/PAN Interfaces (Sections 4.2 and 4.3)

DCP-LPM Sections 4.2 and 4.3 address, respectively, IP network connections (e.g., Wi-Fi, Ethernet) and personal area network (PAN) connections (e.g., Bluetooth) to be established during testing. As written, these sections could be read to require that a UUT capable of both interfaces be connected to both simultaneously during testing.

In practice, many products in scope of this proceeding — including certain speakers and soundbars,— are designed to deliver their primary function via either an IP network connection or a PAN connection, but not necessarily both at once. For example, a product may operate over Wi-Fi when a network is available and, alternatively, over Bluetooth when paired directly with a phone or other host device. In typical use, only one connection type is active at a time; requiring both to be active during testing does not reflect real-world usage and may artificially inflate measured low-power-mode consumption.

CTA requests that the CEC clarify Sections 4.2 and 4.3 to address this scenario, specifically by: (1) providing that, where the IP and PAN interfaces are functionally redundant or alternative rather than complementary, the DCP-LPM should require connection only to the network type representing the product's primary or default mode of operation; (2) treating the Section 4.3 PAN connection requirement as not applicable in that circumstance, with the manufacturer documenting the rationale for the chosen configuration; and (3) adding a clarifying note or decision tree to Sections 4.2 and 4.3 addressing products with redundant network capabilities. This clarification would improve consistency across test laboratories and produce data that better reflects real-world energy consumption.

V. Future Performance Targets Should Account for Products Whose Primary Functionality Depends on Persistent Connectivity or Availability

CTA has observed that many products in the categories addressed in these comments, as well as related product categories not currently listed in Table 2 (for example, docking stations), incorporate persistent connectivity, remote management, monitoring, control, communication, or other “always-available” functions as part of their core functionality. These technical and functional requirements may inherently limit how deeply a product can reduce power

consumption in an inactive state without compromising the feature set for which consumers, businesses, and enterprises purchase the product.

For example, several of the categories addressed in these comments — including streaming media players, receivers and audio amplifiers, and speakers (including smart speakers) — commonly rely on maintained network connectivity to support features such as remote firmware updates, voice-assistant responsiveness, multi-room audio synchronization, and app-based control, even while the product is not performing its primary playback or amplification function. Reducing power consumption further in these low-power or inactive states can involve an inherent trade-off with the responsiveness and availability that these features are designed to provide.

CTA requests that, as the CEC develops performance targets for future iterations of the VPF-LPM (see Chapter 3), it incorporates appropriate allowances, exemptions, or differentiated evaluation criteria for products whose primary functionality depends on maintaining connectivity, availability, or remote management capabilities. The CEC should clearly communicate, in the framework document itself, how such products will be evaluated under future target-setting methodologies, so as to avoid unintended impacts on products that provide essential consumer, commercial, or enterprise functionality.

VI. The CEC Should Authorize the Use of Regulated DC Power Supplies as an Alternative to AC-to-USB Adapters (Section 1.4.2)

Section 1.4.2 requires USB-powered UUTs to be powered through an AC-to-USB power supply connected to a regulated AC source, with measurement taken on the DC side. Because the measurement point is on the DC side, the losses associated with the AC-to-USB conversion stage are, by design, excluded from the recorded value. CTA has determined that a regulated DC power supply or performance analyzer meeting the voltage accuracy and ripple requirements already specified in Section 1.4.1 can provide equivalent or better measurement conditions, while improving reproducibility across laboratories (by removing variability introduced by different AC-to-USB adapters), reducing measurement uncertainty for low-power readings, and simplifying test setup for manufacturers.

CTA recognizes that AC-to-USB adapters may better approximate real-world electrical conditions in some cases, and we do not propose eliminating that option. We propose instead that the CEC add the following as an explicit alternative in Section 1.4.2:

“As an alternative, a regulated DC power supply/performance analyzer meeting the requirements of Section 1.4.1 may be used to directly power the UUT, provided that (a) the supplied DC voltage corresponds to the nominal USB voltage specified by the manufacturer, (b) the four-terminal (Kelvin) voltage measurement at the UUT input is maintained as specified, and (c) the test report documents the equipment used and confirms compliance with Section 1.4.1.”

Consistent with this proposal, CTA agrees that for UUTs requiring USB Power Delivery (USB-PD) negotiation, the AC-to-USB adapter route should remain the default test configuration; the proposed alternative is intended to apply primarily to fixed-voltage USB-powered devices.

VII. Conclusion

CTA appreciates the CEC's continued engagement with industry throughout the development of the VPF-LPM and the opportunity to comment on this draft staff report. We urge the CEC to (1) adopt clear, consistently applied language excluding battery-embedded products from the VPF-LPM across all product categories; (2) consider the market data provided in Section II, including CTA's discontinuation of "computer speakers" as an independent market-research category, when evaluating the continued treatment of that category under the VPF-LPM; (3) incorporate appropriate allowances for products whose primary functionality depends on persistent connectivity or availability, as described in Section V; and (4) incorporate the DCP-LPM refinements described in Sections III, IV, and VI to improve the accuracy, reproducibility, and practicality of testing for speakers, streaming media players, receivers and audio amplifiers, home-theater-in-a-box systems, soundbars, video projectors, and computer speakers. CTA and its members welcome the opportunity to discuss these comments further with staff.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Ally Peck". The signature is fluid and cursive, with the first name "Ally" and last name "Peck" clearly distinguishable.

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