

Covered Battery-Embedded Waste Recycling Fee Methodology

The Electronic Waste Recycling Act of 2003 (Act) (Public Resources Code (PRC) section 42460, et seq.) as amended, established the Covered Electronic Waste (CEW) Recycling Program (Program) to finance the collection and recycling of covered electronic devices (CEDs). The Program is financed through a CEW recycling fee paid by consumers at the point of retail purchase of a new or refurbished CED. The consumer fees are used to fulfill the statutory responsibilities established by the Act, including the disbursement of recovery and recycling payments to approved collectors and recyclers. In 2022, Senate Bill (SB) 1215 (Newman, Chapter 370, Statutes of 2022) expanded the scope of the Program by adding covered battery-embedded products (CBEPs)¹ to the statutory definition of CED.

Pursuant to PRC section 42463(f)(1), CBEP means “a product containing a battery from which the battery is not designed to be easily removed from the product by the user of the product with no more than commonly used household tools.” The law includes several exclusions, which are detailed in the statute. (PRC sections 42463(f)(2)(A)-(D)).²

Pursuant to PRC section 42464(b)(3), on or before October 1, 2025, and on or before October 1 each year thereafter, CalRecycle is required to establish a CEW recycling fee for CBEPs based on the reasonable regulatory costs to administer CEW recycling. The CEW recycling fee for CBEPs is referred to as the “covered battery-embedded waste recycling fee.”

On and after January 1, 2026, the covered battery-embedded waste recycling fee must be charged at the point of retail purchase of a new or refurbished CBEP. (PRC section 42464(b)(1)).

Beginning on August 1, 2028, CalRecycle may, if necessary, establish more than one covered battery-embedded waste recycling fee based on categories of CBEPs. (PRC section 42464(b)(2)).

¹ As defined in PRC section 42463(g)(1)(B).

² Public Resources Code section 42463(f)

(1) “Covered battery-embedded product” means a product containing a battery from which the battery is not designed to be easily removed from the product by the user of the product with no more than commonly used household tools.

(2) “Covered battery-embedded product” does not include any of the following:

(A) A medical device, as defined in Section 321(h) of Title 21 of the United States Code, if either of the following applies:

(i) It is a Class I device as defined in Section 360c of Title 21 of the United States Code, and either of the following applies:

(I) It is a device described in Section 414.202 of Title 42 of the Code of Federal Regulations.

(II) Either of the following applies:

(ia) The device is predominantly used in a health care setting by a provider.

(ib) The device is predominantly prescribed by a health care provider.

(ii) It is a Class II or Class III device as defined in 360c of Title 21 of the United States Code.

(B) A covered electronic device, as defined in subparagraph (A) of paragraph (1) of subdivision (g).

(C) An energy storage system, as defined in subdivision (a) of Section 2835 of the Public Utilities Code.

(D) An electronic nicotine delivery system, as defined in Section 375(7) of Title 15 of the United States Code.

Estimate of Continuing Costs to Administer Covered Battery-Embedded Waste Recycling

PRC section 42464(b)(3) requires CalRecycle to establish the covered battery-embedded waste recycling fee based on the reasonable regulatory costs to administer CEW recycling on or before October 1, 2025, and annually review the fee thereafter.

To establish the initial January 1, 2026, covered battery-embedded waste recycling fee, CalRecycle considered multiple factors, including the volume of video display device (VDD)³ CEW claimed for payment by recyclers in 2024 (the most recent year from which complete payment data was available). This VDD CEW volume served as a useful benchmark because it reflected existing processes within the electronic waste recycling industry. CalRecycle also drew on available program cost information, industry input, and other relevant data in setting the initial fee. To determine program costs and the fee structure for 2027, CalRecycle utilized new market and industry data to more accurately reflect costs for CBEP CEW recycling.

Estimating Annual CBEP Sales in California

The scope of covered products is ever evolving. The statutory definition of CBEP is broad and can include thousands of different product types such as electronics, toys, shoes, etc.

SB 1215 states that, on or before July 1, 2025, and every year thereafter, a manufacturer of a CBEP(s) is required to send a notice to all retailers in California selling that product(s) and to send a copy of the notice to CalRecycle. (PRC section 42466.2).⁴ While CalRecycle maintains a data set based on notifications submitted by CBEP manufacturers, this list may not encompass all covered products.

Given these data constraints, CalRecycle reviewed and analyzed existing sales data of certain CBEPs to estimate future costs, as well as the associated waste streams of these products and

³ As defined in PRC section 42463(g)(1)(A).

⁴ PRC section 42466.2:

(a) A manufacturer of a "covered electronic device," as defined in subparagraph (B) of paragraph (1) of subdivision (g) of Section 42463, shall send a notice in accordance with the schedule specified in paragraph (1) or (2), as applicable, of subdivision (c), to any retailer that sells that covered electronic device, as defined in subparagraph (B) of paragraph (1) of subdivision (g) of Section 42463, manufactured by the manufacturer. The notice shall identify the covered electronic device, as defined in subparagraph (B) of paragraph (1) of subdivision (g) of Section 42463, manufactured by the manufacturer. The notice shall identify the covered electronic device, as defined in subparagraph (B) of paragraph (1) of subdivision (g) of Section 42463, by brand and model number, and shall inform the retailer that the electronic device, as defined in subparagraph (B) of paragraph (1) of subdivision (g) of Section 42463, is a covered electronic device, as defined in subparagraph (B) of paragraph (1) of subdivision (g) of Section 42463, and is subject to a covered battery-embedded waste recycling fee in accordance with subdivision (b) of Section 42464.

(b) A manufacturer subject to this subdivision shall also send copies of the notice to CalRecycle

(c) The notice required by this subdivision shall be sent in accordance with the following schedule:

(1) On or before July 1, 2025, and every year thereafter, the manufacturer shall send a notice covering any covered electronic device, as defined in subparagraph (B) of paragraph (1) of subdivision (g) of Section 42463, manufactured by that manufacturer that is subject to this chapter.

(2) On or before July 1, 2025, and every year thereafter, the manufacturer shall send a notice covering any product manufactured by that manufacturer that is exempt from the covered battery-embedded product definition, pursuant to paragraph (2) of subdivision (g) of Section 42463.

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anticipated expenditures related to paying for battery-embedded CEW recycling payment claims in 2027.

To estimate potential unit volumes and revenue generated by the covered battery-embedded waste recycling fee, CalRecycle reviewed the types of products that meet the statutory definition of CBEP along with notifications identifying CBEPs submitted by manufacturers pursuant to PRC section 42466.2. It is worth noting, however, that while CalRecycle has received manufacturer notices identifying more than 30,000 products as CBEPs, the notices may not encompass all CBEPs sold in California. Furthermore, these notices do not include information on the volume of units or dollar sales, both of which are necessary to adequately estimate product volumes and total sales, projected recycling volume, and anticipated fee revenue.

To address this data gap, CalRecycle purchased market data for a range of product categories likely to include CBEPs. CalRecycle used this information to develop estimates of CBEP sales, including unit volumes to project fee revenue. However, the inclusion of specific products or product types in this analysis does not formally indicate that those products will be subject to the covered battery-embedded waste recycling fee.

The first step in estimating annual sales of CBEP in California was to collect the best data available for products that appear to meet the definition of a CBEP. CalRecycle purchased historical unit sales and price data for 2023 through 2025 from two leading market research companies, International Data Corporation (IDC) and Circana, as referenced in Appendix 1. CalRecycle utilized this data to estimate annual units and dollar sales volumes for product categories likely to include CBEPs. The data sets provided by IDC and Circana were complimentary, with each covering different product categories. IDC supplied data for devices with a higher price-point, such as smartphones, smartwatches and VR headsets. Circana provided data for a broader range of consumer products with lower price-points, including electric shavers, headphones and traditional watches.

Table 1 identifies the product categories that were considered and may include at least some CBEP models. This table is not intended to represent an exhaustive list of all products that qualify as CBEPs. Rather, it identifies a large group of product categories considered and reflects the categories for which market data were available and used in the analysis.

Table 1 – Possible CBEP Categories

Category	Examples of Devices
Audio/Visual Professional Equipment	DJ Equipment, Production Equipment, Servers, Video Cameras
Audio/Visual Recording Devices	Body/Dash Cam, Camcorder, Camera, Voice Recorder
Automotive Parts and Accessories	Tire Pressure Sensor, Diagnostic Tools, Portable Jump Starter
Computer and Peripherals	Computer Tower, Hub, Keyboard, Microphone, Microphone Charging Case, Mouse, Stylus, Transceivers
Exercise Equipment and Accessories	Fitness Equipment, Fitness Trackers (Ring, Bracelet)
Gaming Devices	Gaming Systems
GPS Devices	Navigation, Weather
Kitchen Devices	Blender, Beverage Warmer, Coffee Maker, Electric Knife, Knife Sharpener, Rice Cooker, Thermometer/Probe, Tumbler, Water Filters
Musical Instruments	Amplifier, Guitar, Tuner
Office Equipment and Devices	Copiers, Label Maker, Printers, Scanners
Personal Audio Devices	Bluetooth Transmitters, Earbuds, Headphones, Music Players
Personal Care Devices	Adult Novelty, Curling Iron, Clippers, Blow Dryers, Massagers, Shavers, Skin Care, Skin Rejuvenation Lights, Toothbrushes
Pet Accessories and Training Devices	Buzz Collars, Nail Trimmers, Toys, Tracking Devices, Wireless Fencing
Phones	Cell Phones, Satellite Phones, Home Phones
Security and Smart Home Devices and Accessories	Doorbell Camera, Interface Devices, Security Camera, Sensors, Switches, Streaming Devices, Tracking Devices, Wi-Fi Hotspot
Speakers	Alarm Clock, Boombox, Karaoke Machine, Portable Speaker, Soundbar, Teleconference, Tuner/Radio/Turntable
Toys	Light-up Toys
Virtual Reality Devices	Goggles, Remote Controls
Watches	Smart Watches, Quartz Watches
Wearable Tech	Activity Tracker (Ring, Bracelet), Bluetooth Enabled Clothing, Light-up Clothing and Costumes

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Most of the purchased market data reflected data at the national level. To estimate sales in California, CalRecycle adjusted the data using California's share of the U.S. population based on population estimates provided by the US Census Bureau. As shown in **Table 2**, an 11.5 percent adjustment was made based on these estimates.

Table 2 -CA Population Adjustment

Region	Population Estimate	Source
US Total	341,784,857	Census - 2025 est
CA	39,355,309	Census - 2025 est
CA Share	11.5 percent	-

Manufacturer notices submitted to CalRecycle provided another key source of data. These notifications identified specific product models that manufacturers have designated as CBEPs and that are subject to the covered battery-embedded waste recycling fee at the point of sale. This information is available on CalRecycle's [Guidance for Manufacturers and Retailers webpage](#).

These manufacturer notifications also identified additional categories of CBEPs beyond those included in the purchased market data sets. Although CalRecycle purchased data for the major product categories likely to include CBEPs, those data sets did not include all possible CBEP products.

This "other" product group includes categories such as toys, pet devices, rice cookers, and numerous additional product types that may include qualifying CBEPs. Since reliable sales data is not available for these categories, the estimates are based on more limited information and therefore have a much greater margin of error.

Finally, to identify products that may meet the definition of a CBEP and estimate the percentage of products within each category that qualify as CBEPs, CalRecycle reviewed product specifications and publicly available sources to create estimates of the percentage of CBEPs within product categories, as well as product weight and price. This data set was then used to adjust unit volumes, resulting in a more accurate estimate of CBEP fee revenue and recycling volume. An overview of the data sources used in the analysis is shown in **Table 3**.

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Table 3 – Data Sources for CBEP 2027 Analysis

Method Acquired	Data Source	CBEP Products	Purpose
Purchased	International Data Corporation (IDC) (2023-2025)	Select High End Devices -	Estimate Product Unit and Dollar Sales
		<i>Smartphones</i>	
		<i>Desktops</i>	
		<i>Smart home devices</i>	
		<i>AR/VR</i>	
		<i>Wearable Devices</i>	
Received from Manufacturers	Circana (2023 – 2025)	Selected Consumer Electronics & Small Appliances	Identify “Other” CBEP categories
		<i>E.G. Electric Shavers, Headphones, Traditional Watches</i>	
		Potentially All	Separate models identified as CBEP
Staff Collected	Product Specifications	Various	CBEP inclusion, weight, price
		All	CA population adjustment
Public Data	US Census Bureau	All	CA population adjustment

Using these data components, CalRecycle developed estimates of the annual number of CBEP units sold in California as well as average sales prices and product weights. This data set was used to estimate potential recycling claim cost and revenue for different CBEP recycling fees.

Table 4 provides a high-level summary of the resulting estimates for CBEP sales based on the analysis. The result of this analysis estimates that about 63 million CBEPs are sold annually in California at a value of over \$26 billion. However, given the uncertainty surrounding the true scope of CBEPs, these estimates have a wide margin of error. The estimates should be taken as tools to set a fee based on reasonable data rather than as formal estimates of the CBEP market.

Table 4 – Annual CBEP Sales Estimates

CBEP Group	CBEP Units Sold	Average Price	Average Weight (LBS.)	Total Sales \$
Smartphone and High-End Electronics	32.3 M	\$ 513	0.73	\$ 17.02 B
Consumer Electronics and Small Appliances	24.8 M	\$ 232	1.03	\$ 1.5 B
Other CBEP	5.8 M	\$ 1,326	4.72	\$ 7.6 B
Total	62.9 M	\$ 234	1.03	\$ 26.2 B

The resulting data set provided estimates of CBEP unit sales, volumes, sales prices, and product weights that are specific to California. CalRecycle utilized this data set to estimate potential CBEP program cost for 2027 and establish a fee structure for 2027 based on these cost estimates.

Estimating Recycling Cost

Claims submitted to CalRecycle by approved Program participants for collection and processing of battery-embedded CEW were not accepted until April 2026. (PRC section 42478(b)(2)). As battery-embedded CEW is a new material stream for Program participants, the level of future collector and recycler participation in recovery and recycling, the volume of covered battery-embedded CEW claimed for payment, and the associated costs for participants to manage battery-embedded CEW are not known. To estimate potential recycling claim volume, CalRecycle relied on the estimated annual CBEP volume resulting from the sales analysis that is summarized in Table 4. This estimated unit sales volume was used to estimate potential battery-embedded CEW volume available for recycling in California.

An overview of the methodology for calculating a target estimate for battery-embedded CEW recycling volume is summarized below. Since CalRecycle does not have sufficient claim data to forecast recovery and recycling payment claim cost estimates at this time, the estimates presented here used 2025 data, assumed a typical CBEP lifecycle of 5 or more years, and compared three possible collection volume percentage scenarios. This resulted in an approximate 47 percent reduction in unit volume compared to sales.

This adjustment reflects several considerations. The maximum possible recycling amount would be processing 100 percent of battery-embedded CEW per year in California (estimated at 62.9 million units), but this amount is unrealistically high. In comparison, data from existing VDD CEW claims indicates that about 13 percent of VDDs are claimed each year compared to respective sales volumes. However, CBEPs represent a new and different CEW structure and CBEPs may be recycled at a higher volume percentage compared to VDDs. As a result, CalRecycle determined that a weighted average (2 x VDD percentage) provides a reasonable compromise. An overview of these estimates is shown in **Table 5**.

Table 5 – CBEP Recycling Volume Adjustment

Estimate Range	Source	Percentage	Units
High	Total CBEP Unit Sales	100 percent	62.9 M
Low	VDD Percentage Estimate	13 percent	8.2 M
Middle	Weighted Average	47 percent	29.6 M

Based on these assumptions, as shown in **Table 6**, CalRecycle estimated the total battery-embedded CEW claim costs for 2027 to be approximately \$45 million. This amount is approximately \$42 million for recycling payments, and \$3 million for administrative costs. The estimated recycling payment cost of \$42.2 million is based on an estimated 36.7 million pounds of battery-embedded CEW multiplied by the combined payment rate of \$1.15 per pound. The 36.7 million pounds resulted from multiplying each of the 29.6 million units by their respective weight in pounds on a product-by-product level.

Table 6 – Updated Expected Expenditure Target for 2027

Estimated 2027 Cost Components	
Projected CBEP Units	29.6 m
Projected CBEP Pounds	36.7 m

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CBEP Combined Payment Rate	\$1.15/lbs.
Estimated 2027 Expenditures	
CBEP Recycling Payments	\$ 42.2 m
State Operations and Allocations	\$ 3.0 m
Total	\$ 45.2 m

It should be noted that, compared to VDDs, CBEPs are much more numerous, but the average weight is considerably less (about 1 lbs., compared to 20 lbs. for VDD). As a result, the CBEP units estimate of over 29 million results in only about 36 million pounds of material claimed. At the current battery-embedded CEW recycling payment rate of \$1.15/Lbs., this leads to projected payments of over \$42 million dollars. When combined with the allocation from the CBEP fund for fiscal year 2026-27, the total estimated expenditure target is approximately \$45 million dollars.

2027 CBEP Consumer Fee Calculation

With a target cost estimate for 2027 set, the next step of the analysis was to structure a consumer fee that would result in the fee revenue meeting this target estimate. CalRecycle considered interested parties' concerns with the existing fee structure, including the fact that higher priced products such as battery-embedded smartphones had an outsized impact on revenue, while reportedly incurring relatively low recycling costs. For these high-priced devices, the fee cap was the primary concern. Lowering the cap would have the most impact in more evenly spreading the cost of the fee across more devices. For this reason, maintaining the 1.5 percent of retail price but lowering the cap was chosen as the preferred approach. As shown in **Table 7**, a CBEP fee cap of \$1 is estimated to result in almost \$48 million in revenue. This estimated revenue comfortably exceeds the target of \$45 million and includes a buffer to provide a level of fiscal stability appropriate given the cost uncertainty of this new and uniquely structured program.

Table 7 – Proposed CBEP Fee Estimates

Estimated CA CBEP Sales	Consumer Fee	Fee Cap	Estimated Fee Revenue
\$ 26.2 B	1.5 percent	\$ 1	\$ 47.9 M

2027 Covered Battery-Embedded Waste Recycling Fee Recommendation

Conclusion

Given the analysis provided above, the following covered battery-embedded waste recycling fee and an associated fee cap is expected to best meet the statutory requirements of PRC section 42464(b) during the second year of implementation:

- On or after January 1, 2027, 1.5 percent of the retail sales price for each CBEP sold for use in this state by a retailer. The covered battery-embedded waste recycling fee shall

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not exceed \$1.00. For the purposes of this section, “retail sales price” shall have the same meaning as “sales price” set forth in section 6011 of the Revenue and Taxation Code.

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Appendix 1

Data Sources (reports purchased from companies indicated, or web sources referenced on dates listed).

1. International Data Corporation (IDC) – The data packages listed here were purchased with data covering 2023 through 2025 used in the analysis.
 - a. Worldwide Quarterly Mobile Phone Tracker
 - b. Worldwide Quarterly Personal Computing Device Tracker (PC & Tablet)
 - c. Worldwide Quarterly Wearable Device Tracker
 - d. Worldwide Quarterly Smart Home Device Tracker
 - e. Worldwide Quarterly Augmented and Virtual Reality Headset Tracker
2. Circana – Custom data packages purchased – selected product categories for unit sales and price (2023 – 2025) for:
 - a. Consumer Electronics
 - b. Small Appliances**