

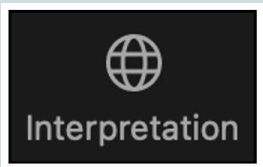


2028 Rate Determination Survey Methodology Workshop

June 8, 2026



Interpretation Services | Servicios de Interpretación



Zoom – Select your language on the Interpretation icon
Zoom - Seleccione su idioma en el icono Interpretación



Questions and Comments

During the workshop, use the Q&A feature to submit questions or comments

Questions and comments will be accepted until 5 p.m.

June 15, 2026. Please e-mail your questions and comments to:

RateDetermination@CalRecycle.ca.gov



Introductions

Division of Recycling:

- Amy Cameron – Assistant Director
- Monica Torres – Branch Chief



Introductions (Cont'd)

Rate Determination Section

Ramon Rossman

Kevin Fobes

Jose Covarrubias

Francine Chua

Alex Prado

Abraham Alcaraz

Renzo Ortiz

Duane Vallesteros

Section Manager

Analyst

Analyst

Analyst

Analyst

Analyst

Analyst

Analyst



Agenda

- **Workshop Purpose**
- **Financial Risk & Refund Value**
- **Confidence Level and Error Rate**
- **Survey Samples and Sites Selection**
- **Site Data Collection Methodology**
- **“Commingled & Segregated Rates Survey Study”**
- **Questions / Comments**



Workshop Purpose

Per Public Resources Code Section 14549.5 “. . . the department shall . . . consult with private and public operators of curbside recycling programs, collection programs, and recycling centers concerning . . .”



Our Goal

To ensure the most accurate rates feasible to properly compensate consumers and industry, and to protect the solvency and integrity of the California Beverage Container Recycling Fund



Assess the Financial Risk to:

- Determine the refund value of each material for each program
- Rank the redemption frequency from high to low
- Based on confidence level and error rate goals, determine the number of containers to sample for each material at each program
- Determine the number of sites to survey for each program



Number of CRV Containers Sold in California (January 1, 2025 – December 31, 2025)

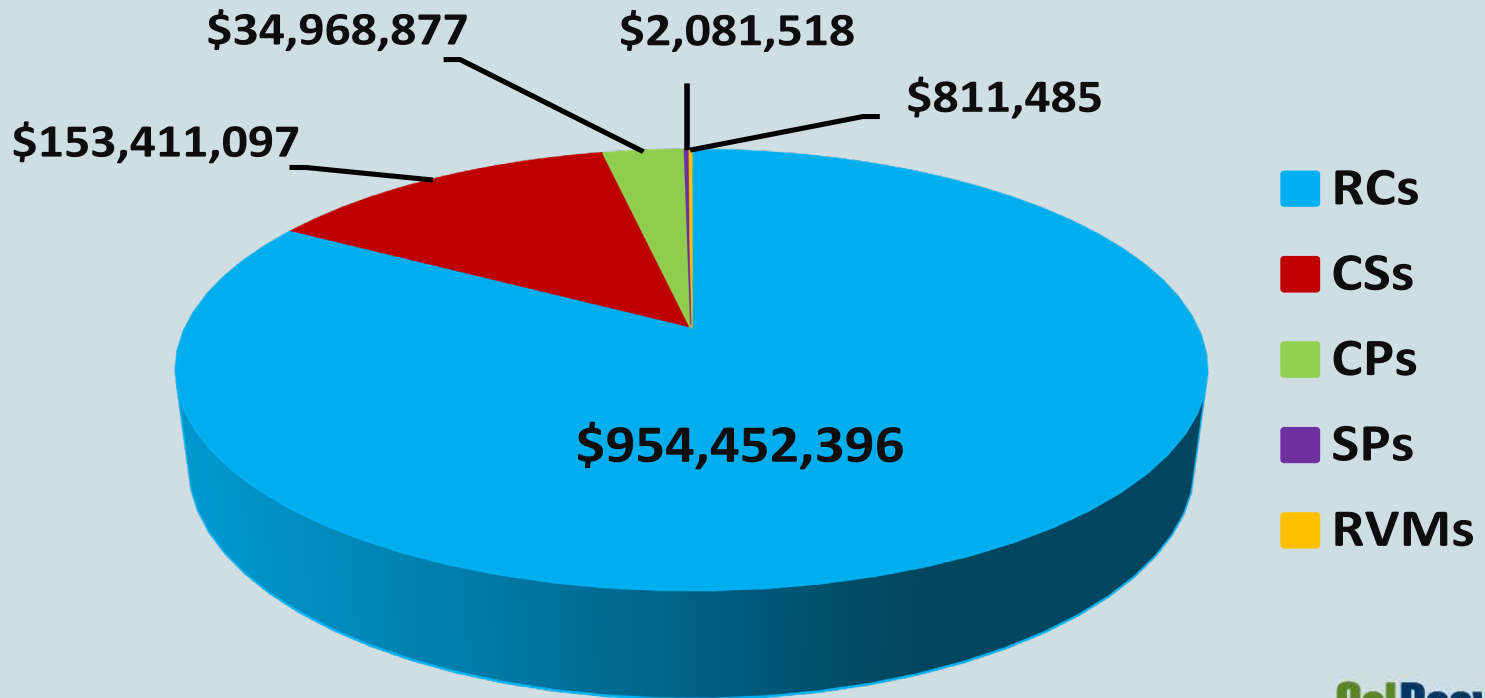
PET	14.1 Billion
Aluminum	10.7 Billion
Glass	3.03 Billion
HDPE	194.5 Million
Bi-metal, Plastics 3 – 7, BIB, PC, & MLP	490.1 Million
<hr/>	
Total	28.5 Billion



Refund Value Paid for Material Calendar Year (CY) 2025

Material	Redeemed Value	% of Total CRV
PET	\$585,098,821	51.1%
Aluminum	\$435,290,366	38.0%
Glass	\$112,324,269	9.8%
Total		98.9%

CRV Paid by Program - 2025





Minimum Rate Calculation Goals

**CALIFORNIA CODE OF REGULATIONS
TITLE 14. NATURAL RESOURCES, DIVISION 2.,
CHAPTER 5., SUBCHAPTER 1., § 2000. -
DEFINITIONS**

**"Statistical Sample" means an estimate with
an 85% confidence level**



Confidence Level

A number, shown as a percentage, that represents the likelihood that the value of survey results will fall within a specified range (dollar value), compared to the value of the whole population.



Error Rate

The Error Rate or “margin of error” is a number, shown as a percentage, that expresses the difference between our survey sample result and the true value of the entire population. The highest error rate used is 5%.



Why Are the Confidence Level and Error Rate Important?

- **Impact rates and the health of the Beverage Control Recycling Fund**
- **Impact every consumer and industry stakeholder who deals with CRV material**
- **Provide confidence and assurance that the rates are reliable and accurate**



How are Sample Sizes Determined?

- **Data from previously survey cycle**
- **Binomial Formula for commingled (percentage of CRV to Non-CRV materials)**
- **Standard Deviation of container weights**
- **Achievement of a minimum 85% confidence level with a 5% error rate**
- **CalRecycle staff resources**



Binomial Formula

- **Used to determine sample size based on proportions**
 - **i.e. proportion of CRV containers to non-CRV containers**
- **The closer the proportion is to 0% or 100%, the fewer containers needed to sample**
- **Is not appropriate for segregated-only programs**



Standard Deviation

- The variability of the CRV containers surveyed

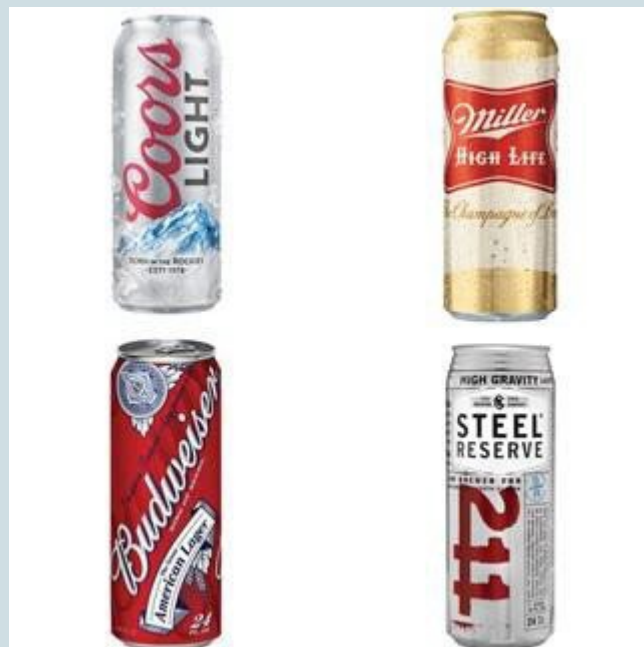


Aluminum

Generally, low standard deviation



5¢ AL containers



10¢ AL containers



PET Plastic #1

- Generally, high standard deviation



So many different containers!





Glass

- Generally, low standard deviation





High-Density Polyethylene (HDPE)

- Generally, high standard deviation





New CRV Containers

As of January 1, 2024:

- **Wine and distilled spirits added to the program per SB 1013**
 - Includes new beverage containers for wine and distilled spirits
- **Fruit and vegetable juices regardless of size are part of the program per SB 353.**
 - Previously fruit juices less than 46 oz and vegetable juices 16 oz or less part of program



New CRV Containers (cont'd)

CRV for new container types:

- **Bag in a Box - \$0.25**
- **Multi-layer Pouch - \$0.25**
- **Paperboard Carton - \$0.25**

CRV for existing container types

- **\$0.05 or \$0.10 based on container type and size**



New CRV Containers (cont'd)





Recycling Centers Samples per 6-month Round

• Aluminum	=	446+	containers
• Glass	=	772+	containers
• HDPE	=	1,259+	containers
• PET	=	5,728+	containers
• Bi-Metal	=	504+	containers
• BIB, PC, MLPs	=	317+	containers
• #3 - #7 plastics	=	243+	containers
			<hr/>
		9,269+	containers



Curbside Programs Samples per 6-month Round

• Aluminum	=	484+	containers
• Glass	=	1,421+	containers
• HDPE	=	1,930+	containers
• PET	=	5,180+	containers
		<hr/>	
		9,015+	containers



Drop-Off / Collection Programs per 6-month Round

• Aluminum	=	253+	containers
• Glass	=	557+	containers
• HDPE	=	2,958+	containers
• PET	=	1,937+	containers
		<hr/>	
		5,705+	containers



Community Service Programs per 6-month Round

• Aluminum	=	165+	containers
• Glass	=	478+	containers
• HDPE	=	1,431+	containers
• PET	=	1,160+	containers
<hr/>		3,234+	containers



Reverse Vending Machines Samples per 6-month Round

• Aluminum	=	272+	containers
• Glass	=	207+	containers
• HDPE	=	32+	containers
• PET	=	1,537+	containers
		<hr/>	
		2,048+	containers



Who Do We Survey?

- **Recycling Centers (RC)**
- **Curbside Programs (CS)**
- **Drop-Off / Collection Programs (CP)**
- **Community Service Programs (SP)**
- **Reverse Vending Machines (RVM)**



How Are Survey Sites Selected?

- **Currently operational programs:**
 - **Certified at least eight months during prior Fiscal Year**
 - **Reported volume to DORiiS during prior Fiscal Year**
 - **2 or more months of reporting in DORiiS during the prior year.**
 - **If only 2 months reported, they can't be consecutive.**
 - **Not receiving an Individual Commingled Rate (ICR)**
- **Location**
- **Volume**



Survey Site by Regions

RC and CS sites are grouped by region:

- **Southern California (8 counties)**
 - Los Angeles, San Diego, Orange, Riverside, San Bernardino, Ventura, Santa Barbara, and Imperial
- **Northern California (50 counties)**
 - All other counties



What are Strata?

**Sites are stratified based on received
PET, AL, & GL volumes**

- **Strata #1** **Top 50% of volume**
- **Strata #2** **Next 25% of volume**
- **Strata #3** **Lowest 25% of volume**



Process for Selecting Sites

1. Each site is given a random number generated by a computer program.
2. Random site numbers are sorted in numerical order by program.
3. Sites are sorted by volume strata (high, medium, low volumes)
4. The needed number of sites are selected from each volume strata for each program



Sites not Included in Survey Selection

- **Recycling Centers not open adequate amount of time. RCs open less than 4 days a week will not be selected**
- **Programs that can not be surveyed seasonally. Programs that run historically less then 9 months a year will be not be selected**



2028 Planned Survey Sites

• Recycling Centers	80
• Curbside Programs	64
• Drop-Off/Collection Programs	32
• Community Service Programs	20
• <u>RVMs</u>	<u>12</u>
Total	208



Survey Site Strata Selection – Recycling Centers (RC)

Strata	Sites to Visit
#1 South (high)	24
#2 South (medium)	12
#3 South (low)	12
#1 North (high)	16
#2 North (medium)	6
#3 North (low)	6
Total	80



Survey Site Strata Selection – Curbside Programs (CS)

Strata	Sites to Visit
#1 South (high)	14
#2 South (medium)	7
#3 South (low)	7
#1 North (high)	18
#2 North (medium)	9
#3 North (low)	9
Total	64



Survey Site Strata Selection – Drop-Off / Collection Programs (CP)

Strata	Sites to Visit
#1 (high)	16
#2 (medium)	8
#3 (low)	8
Total	32



Survey Site Strata Selection – Community Service Programs (SP)

Strata	Sites to Visit
#1 (high)	10
#2 (medium)	5
#3 (low)	5
Total	20



Survey Site Strata Selection – Reverse Vending Machines (RVM)

Strata	Sites to Visit
#1 (high)	6
#2 (medium)	3
#3 (low)	3
Total	12



Survey Scheduling

- **Scheduled every month of the year**
- **Scheduled 35 - 40 weeks of the year**
- **Conducted every day of the week for RCs**
- **Distributed evenly over all seasons to reflect “seasonality”**



Site Visits

- **Site visits begin in October**

For each site survey:

- **Site hours, locations, material availability reviewed**
- **Draft schedule created**
- **Staff send scheduling emails (3 weeks prior)**
- **Staff call sites to schedule visit and confirm site details**



2028 Rate Survey Period

- 12-month study (two six-month survey rounds)
 - Round #1 - October 1, 2026 to March 31, 2027
 - Round #2 - April 1, 2027 to September 30, 2027
- Same sites surveyed in each six-month round
- The same number of containers are surveyed for each material type at each type of recycling program



Site Visit at RCs





RC Sample Collection

- **AL, GL, PET, HDPE**
 - **Collect material after customer transaction is completed (as purchased)**
 - **Collect CRV material “as-is”, including contaminants, residual product, etc., as purchased by the attendant**
 - **Survey whole containers only**



RC Sample Collection (cont'd)

- **Bimetal, Plastic 3-7, and New Container Types**
 - **Not typically collected from the consumer**
 - **Team members use material in RC's bins**
 - **Survey whole containers only**



CS / CP / SP Sample Collection

- For AL, GL, PET, HDPE, sample collection includes:
 - Whole containers only
 - Empty AL and Glass containers – no liquids
 - “As-is” plastics – residual product and other liquids
 - Containers from a pile based on baling methods



CS / CP / SP Sample Collection Process

- **AL, GL, PET, HDPE**
 1. **Confirm that material provided is from selected program**
 2. **Collect sample from pile dropped by route truck**
 3. **Collect from bins or bunkers if material types are separated and ONLY from program selected**
 4. **Collect from MRF line if material is ONLY from program selected (rare)**



Pile





Bunkers






Bins/Dumpsters





How are Collected Samples Analyzed?

- Containers of a single material type are counted and weighed into batches for programs as follows:
 - RC – as purchased from customers
 - CS / CP / SP – from piles, bins, and bunkers
 - RVMs – from the machine storage unit



How are Collected Samples Analyzed? (cont'd)

- Batches of containers are sorted, counted, weighed, and analyzed
 - CRV less than 24 oz. (5 cents)
 - CRV \geq 24 oz. (10 cents)
 - WDS – 25 cents
 - Non-CRV containers
 - Identify Product Type
 - Individual Weights for a Sub-Sample of Containers
 - Contaminants



Results of the Data Collected

- **Data from surveys is analyzed by program and material type:**
 - **To establish the Containers Per Pound (CPP)**
 - **To establish the Refund Value Per Segregated Pound (RVSP)**
 - **To establish the Refund Value Per Commingled Pound (RVCP)**
 - **Respond to Legislative questions**
 - **Provide data and analysis to internal and external stakeholders**



Segregated

"Segregated" means divided by material type and that such divided load consists of 100% California Refund Value material.



Commingled

A commingled load is “a mix of empty beverage containers as defined in Section 14512 [CRV containers], and all other containers of the same material type.” §14506.5 PRC 12.1



Program Rates

- **Segregated rate:**
 - **Recycling Centers**
 - **Reverse Vending Machines**
- **Commingled rate:**
 - **Curbside Programs**
 - **Dropoff /Collection Programs**
 - **Community Service Programs**



Individual Commingled Rate Survey

- Program suspended August 2012
- Currently includes less than 60 participants
- Re-examining program



2028 Survey Cycle

- **Organize / Plan** March – Sept. 2026
- **1st Round Surveys** Oct. 2026 – March 2027
- **2nd Round Surveys** April 2027 – Sept. 2027
- **Public Hearing for Rates** October 2027
- **Notice of New Rates** December 2027
- **New Rates Effective** January 1, 2028



Workshop Purpose – Recap

California Beverage Container Recycling & Litter Reduction Act Section: 14549.5

“ . . . the department shall . . . consult with private and public operators of curbside recycling programs, collection programs, and recycling centers concerning . . . ”



Our Goal - Recap

To ensure the most accurate rates feasible to properly compensate consumers and industry, and to protect the solvency and integrity of the California Beverage Container Recycling Fund



“Commingled & Segregated Rates Survey Study”

Regents of the University of California, Davis



Principal Investigator

Dr. Alexander Aue, PhD. - UC Davis

Professor of Statistics

Program Director, Interdisciplinary Major in Data Science

University of California, Davis

- PhD in Applied Math, University of Cologne, 2004
- BS in Math, Philipps University Marburg, 2000
- Fellow of AAAS, ASA and IMS
- Research focuses primarily on time series analysis, often involving forecasting problems for complex data, with applications in finance, economics, climate, neuroscience, and others



“Commingled & Segregated Rates Survey Study” Scope

- Evaluate the current survey sampling and rate calculation methods CalRecycle uses to gather survey data and calculate commingled and segregated rates
- Compare CalRecycle's current methods, procedures, and processes for determining commingled and segregated rates with industry and academic best practices for statistical and mathematical sampling and rate calculation
- Results will confirm, modify, or replace CalRecycle's current sampling and rate calculation methods and procedures for determining commingled and segregated rates



“Commingled & Segregated Rates Survey Study” Timeline

April 2026 to April 2027

- Review applicable statutes & regulations**
- Review current Rate Determination processes, procedures, & methods**
- Review best practices in industry and academics applicable to current Rate Determination workloads**



“Commingled & Segregated Rates Survey Study” Timeline (cont’d)

June 2026 to March 2027

- **Engage recycling industry stakeholders through workshops to receive input related to processes and procedures employed by CalRecycle for surveying**



“Commingled & Segregated Rates Survey Study” Timeline (cont’d)

April 2027 to June 2027

- **Present findings and recommendations and seek input from recycling industry stakeholders**



“Commingled & Segregated Rates Survey Study” Timeline (cont’d)

June 2027 to September 2028

- **Implement recommended updates and improvements to the CalRecycle Rate Determination processes, procedures, and methods**



“Commingled & Segregated Rates Survey Study”

**Please email questions, comments, and input
related to the study to:**

RateDetermination@CalRecycle.ca.gov

“Attention Michael Vanderburg”



Discussion and Industry Input

- **Size of the statewide sample**
- **Appropriate sampling methodologies**
- **Alternatives to exclusive reliance on statewide commingled rate**



Questions and Comments

Questions and comments will be accepted until 5 p.m. June 15, 2026. Please e-mail your questions and comments to:

RateDetermination@CalRecycle.ca.gov



Thank You!