Public Workshop
2015 Rate Determination Field Study Methodology

CalRecycle

Introductions

Michael Vanderburg - Supervisor
Division of Recycling
Market Statistics Section

Field Survey Team

Darald Walther, Elias Muniz, Cameron Swinko, Amy Seyfried, Tina Novoa, Nick Valenzuela, Tracy Redifer, Alex Grewal

CalRecycle

Field Survey Team

Agenda

- Workshop Purpose
- 2015 Commingled Rate Study (CMRS)
  - Purpose
  - Definitions
  - Survey Methodology
  - Rate Calculations
- 2015 Rate Year Calendar
- Questions / Comments / Input

CalRecycle

Workshop Purpose

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 the size of the statewide sample, appropriate sampling methodologies, and alternatives to exclusive reliance on a statewide commingled rate . . . "

CalRecycle

Commingled Rate Study (CMRS) Purpose

The CMRS collects data to estimate the statewide average:

- **Number of CRV containers per pound (CPP)**
- **Refund value per segregated pound (RVSP)**
- **Refund value per commingled pound (RVCP)**

CalRecycle

Containers per Pound (CPP)

- **Estimates the average number of CRV containers per pound**
- **Specific to each material type and program, used in:**
  - **Recycling and redemption rate calculations**
  - **Processing fee and payment calculations**

CalRecycle

Refund Value per Segregated Pound (RVSP)

- **Estimates the average value of CRV in a pound of segregated material**
- **Calculated for all programs and materials, but only applied to Recycling Centers (RCs)**
- **Allows redemption of 100% CRV loads by weight at RCs**

CalRecycle

Refund Value per Commingled Pound (RVCP)

- **Estimates the average value of CRV weight to total weight in commingled loads**
- **Allows redemption of mixed loads by weight**
  - **Specific to each program type**
  - **Specific to each material type**

CalRecycle

CMRS Study Methodology

Financial Risk Assessment

- Determine financial risk for each program and material type
  - Determine the monetary value of each material type for each program type
  - Rank the monetary value from high to low

CalRecycle

Financial Risk Assessment

- Based on the financial risk
  - Determine confidence levels and error rates for each program and material type
  - Determine the number of containers to sample for each material for each program type
  - Determine the number of sites to survey for each program type

CalRecycle

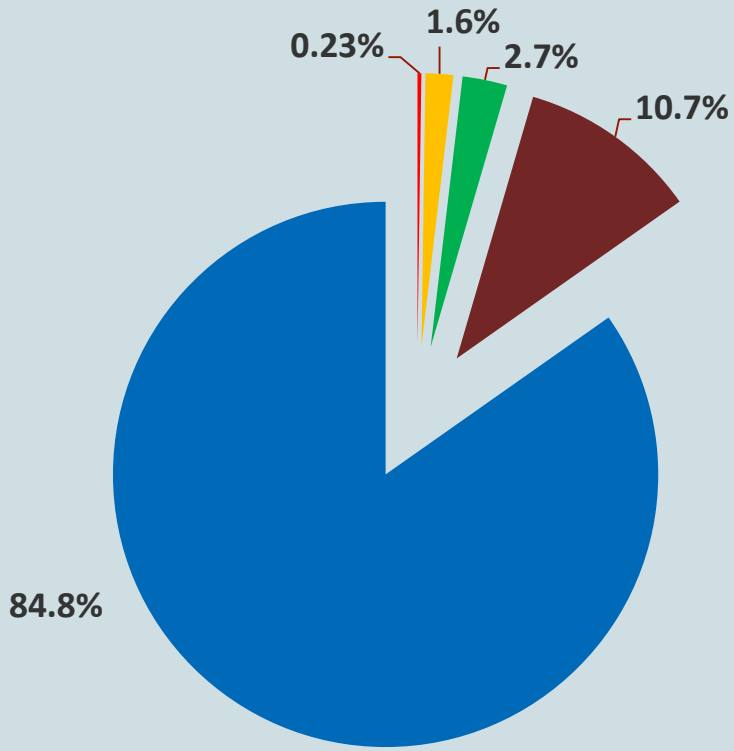
2015 CMRS Risk Assessment – All Programs

- Annual Value of All Materials Redeemed

$1.066 billion

CalRecycle

Monetary Value – All Recycling Programs



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

CalRecycle

CMRS Sample Size Calculation

- Mathematically adjusted to account for weight
  - Standard Deviation
- Variable data based on the results of previous studies

CalRecycle

Rate Calculation Goals

<u>Minimum Goal</u>:

95% Confidence Level

5% Error Rate (or better)

Most materials are at 95% Confidence Level

with a 2% - 5% Error Rate

CalRecycle

Rate Calculation Goals

For Highest Value Materials:

99% Confidence Level

1% - 2% Error Rates

(RC Aluminum & PET material – 74% of all redeemed CRV)

CalRecycle

CMRS Survey Sites

Number of Sites Surveyed for 2015 Rate Year

• Recycling Centers	70 sites
• Curbside Programs	30 sites
• Drop-Off/Collection Programs	20 sites
• Reverse Vending Machines	20 sites
• Community Service Programs	10 sites
• Total	150 sites

CalRecycle

Site Selection

Population Determination:

- **Currently operational programs**
- **Certified at least 8 months during prior fiscal year**
- **Reported volume to DORiiS during prior fiscal year**
- **Not receiving an Individual Commingled Rate (ICR)**

CalRecycle

Site Selection

Sites are grouped by region:

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

CalRecycle

Site Selection

- Sites selected using random number generator
- Sites placed in volume strata for each region
- Proportional number of sites selected from each volume strata

Stratified Random Sampling with Proportional Allocation Sampling Techniques,
3rd Edition, William Cochran, Professor of Statistics, Emeritus, Harvard University

CalRecycle

Site Selection

Sites are stratified based on received PET volumes

- Strata #1 Top 50% of volume (high volume)
- Strata #2 Next 25% of volume (medium volume)
- Strata #3 Lowest 25% of volume (low volume)

CalRecycle

Site Selection For 2015 Survey Year

Example: 70 Recycling Centers to be surveyed. 66% of RC PET volume is in the South. 70 RC sites X .66 = 46

Stratum	PET Volume	# of Sites
1	50%	23
2	25%	12
3	25%	11
Total	100%	46

CalRecycle

Site Selection For 2015 Survey Year

Example: 70 Recycling Centers to be surveyed. 34% of RC PET volume is in the North. 70 RC sites X .34 = 24

Stratum	PET Volume	# of Sites
1	50%	12
2	25%	6
3	25%	6
Total	100%	24

CalRecycle

CMRS Study Periods

- 12 Month Study / Two 6-month Periods
  - Period #1 - October 1, 2013 to March 31, 2014
  - Period #2 - April 1, 2014 to September 30, 2014
- Same sites surveyed in each 6-month period
- The same number of containers are surveyed for each material type at each type of recycling program

CalRecycle

CMRS Study Periods

- Surveys are scheduled most weeks of the year
- Surveys are distributed evenly over all seasons
- To reflect “seasonality”

CalRecycle

Materials Sampled

- Recycling Centers (RCs)
  - Aluminum
  - Glass
  - HDPE plastic
  - PET plastic
  - Bi-Metal
  - #3 - #7 plastics

CalRecycle

Materials Sampled

- Curbside, Drop-Off/Collection, RVMs, Community Service Programs
    - Aluminum
    - Glass
    - HDPE plastic
    - PET plastic

CalRecycle

Materials Sampled

- No line breakage containers
- No rejected containers
- No out-of-state containers
- Plastics must be labeled with resin number
- Whole containers only

CalRecycle

Containers Surveyed at Each Site: Recycling Centers (70 Total)

- Aluminum = 150 containers
- Glass = 120 containers
- HDPE = 60 containers
- PET = 250 containers
- Bi-Metal = 40 containers
- #3 - #7 plastics = 40 containers

CalRecycle

Annual Sample: Recycling Centers

- Aluminum = 18,000+ containers
- Glass = 15,000+ containers
- HDPE = 7,000+ containers
- PET = 30,000+ containers
- Bi-Metal = 2,500+ containers
- #3 - #7 plastics = 2,500+ containers

CalRecycle

Containers Surveyed at Each Site: Curbside Programs (CS) (30 Total)

- Aluminum = 60 containers
- Glass = 120 containers
- HDPE = 60 containers
- PET = 120 containers

CalRecycle

Annual Sample: Curbside Programs

- Aluminum = 3,000+ containers
- Glass = 6,000+ containers
- HDPE = 3,000+ containers
- PET = 6,000+ containers

CalRecycle

Containers Surveyed at Each Site: Drop-Off/Collection Programs (20 Total)

- Aluminum = 60 containers
- Glass = 120 containers
- HDPE = 60 containers
- PET = 120 containers

CalRecycle

Annual Sample: Drop-Off/Collection Programs

- Aluminum = 2,000+ containers
- Glass = 3,000+ containers
- HDPE = 1,500+ containers
- PET = 4,000+ containers

CalRecycle

Containers Surveyed at Each Site: Reverse Vending Machines (20 Total)

- Aluminum = 100 containers
- Glass = 120 containers
- HDPE = 60 containers
- PET = 300 containers

CalRecycle

Annual Sample: Reverse Vending Machines

- Aluminum = 3,500+ containers
- Glass = 4,000+ containers
- HDPE = 500+ containers
- PET = 10,000+ containers

CalRecycle

Containers Surveyed at Each Site: Community Service Programs (10 total)

- Aluminum = 60 containers
- Glass = 120 containers
- HDPE = 60 containers
- PET = 120 containers

CalRecycle

Annual Sample: Community Service Programs (SP)

- Aluminum = 1,000+ containers
- Glass = 1,500+ containers
- HDPE = 1,000+ containers
- PET = 2,000+ containers

CalRecycle

Total Containers Surveyed for 2015 Rates

125,000+ containers

(Aluminum, Glass, HDPE, PET, Bi-Metal, and #3 - #7 plastics)

CalRecycle

Survey Sample Selection

- Recycling Centers
  - After customer transaction completed
  - Confirm “basis” of purchase from customer
  - Random / unbiased selection
  - Survey whole containers only

CalRecycle

Recycling Centers

CalRecycle

Survey Sample Selection

- Reverse Vending Machines
  - Confirm containers went through machine
  - Random / unbiased selection
  - Survey whole containers only

CalRecycle

Reverse Vending Machine (RVM)

CalRecycle

Survey Sample Selection

- Material from Sort Lines (CS, CP, SP)
  - Rapid / random / unbiased selection
  - Survey whole containers only

Sort Lines

Survey Sample Selection

- Material from Piles & Bins (CS, CP, SP)
  - Grid method
  - Random / unbiased selection
  - Survey whole containers only

CalRecycle

Curbside Pile

CalRecycle

Curbside Pile with “Grids”

Recycling Bins

CalRecycle

Survey Sample Analysis

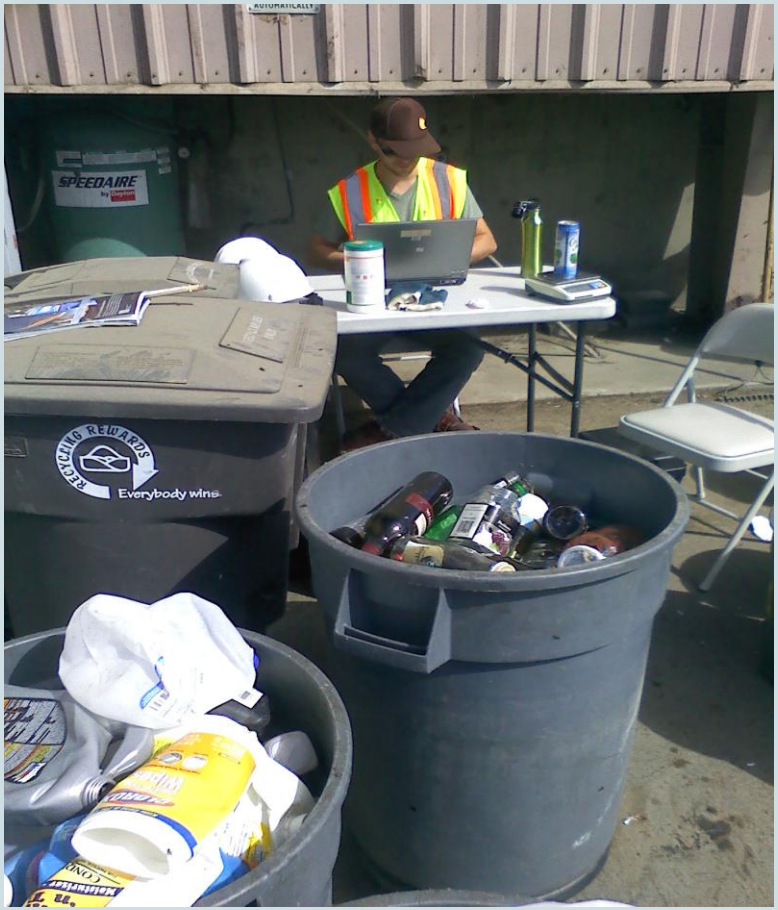
- Containers of a single material type are counted and weighed into batches
  - RC / RVM – as purchased
  - CS / CP / SP – in market ready condition

CalRecycle

Survey Sample Analysis

- Container batches are further sorted, counted, weighed, and analyzed
  - CRV less than 24 oz. (5 cents)
  - CRV greater ≥ 24 oz. (10 cents)
  - Non-CRV material
  - Contaminants

CalRecycle



Our Mobile Office

CalRecycle

Data Analysis & Rate Calculations

CalRecycle

Calculating Containers Per Pound (CPP)

$$\frac{\text{Total \# of CRV Containers}}{\text{Total Weight of CRV Containers}}$$

CalRecycle

Calculating Containers Per Pound (CPP) - Example

100 CRV Containers

Total Weight of 5 lbs.

CalRecycle

Calculating Containers Per Pound (CPP) - Example

CPP = 20 Containers per Pound

(100 containers / 5 lbs.)

CalRecycle

Calculating Refund Value Per Segregated Pound (RVSP)

$$\frac{\text{Refund Value of CRV Containers Sampled}}{\text{Total Weight of CRV Containers Sampled}}$$

CalRecycle

Calculating Refund Value Per Segregated Pound (RVSP)

$$\frac{(\#\text{ of CRV Containers} \geq 24\text{ oz.} \times 10\text{ cents}) + (\#\text{ of CRV Containers} < 24\text{ oz.} \times 5\text{ cents})}{\text{Total Weight of CRV Containers Sampled}}$$

CalRecycle

Calculating Refund Value Per Segregated Pound (RVSP)- Example

(40 containers X 10 cents)
+ (60 containers X 5 cents)

_____

Total Weight of 10 lbs.

Calculating Refund Value Per Segregated Pound (RVSP)- Example

$$\frac{(\$4) + (\$3)}{\text{Total Weight of 10 lbs.}}$$

CalRecycle

Calculating Refund Value Per Segregated Pound (RVSP)- Example

($7)

_____

Total Weight of 10 lbs.

Calculating Refund Value Per Segregated Pound (RVSP)- Example

RVSP = 70 cents per Pound

($7 / 10 lbs.)

Calculating Refund Value Per Commingled Pound (RVCP)

Refund Value of CRV Containers Sampled

Total Weight of All Containers Sampled

(CRV & Non-CRV)

CalRecycle

Calculating Refund Value Per Commingled Pound (RVCP)

(# of CRV Containers ≥ 24 oz. X 10 cents)
+ (# of CRV Containers < 24 oz. X 5 cents)

Total Weight of All Containers Sampled

CalRecycle

Calculating Refund Value Per Commingled Pound (RVCP)- Example

(20 containers X 10 cents)
+ (60 containers X 5 cents)

_____

Total Weight of 10 lbs.

CalRecycle

Calculating Refund Value Per Commingled Pound (RVCP)- Example

$$\frac{(\$2) + (\$3)}{\text{Total Weight of 10 lbs.}}$$

Calculating Refund Value Per Commingled Pound (RVCP)- Example

($5)

_____

Total Weight of 10 lbs.

Calculating Refund Value Per Commingled Pound (RVCP)- Example

RVCP = 50 cents per Pound

($5 / 10 lbs.)

CalRecycle

Calendar for 2015 CMRS Survey

• Organizing / Planning	May - Sep. 2013
• Public Workshop	Aug. 2, 2013
• First Period Surveys	Oct. 2013 – Mar. 2014
• Second Period Surveys	Apr. 2014 – Sep. 2014
• Public Hearing for 2015 Rates	October 2014
• Notice of 2015 Rates	Dec. 1, 2014
• 2015 Rates Effective	Jan. 1, 2015

CalRecycle

Questions? / Comments? / Input?

Thank You!

Contact Information:

Mike Miller
Division of Recycling, Operations
Branch Chief
(916) 323-0713
mike.miller@calrecycle.ca.gov

Michael Vanderburg
Division of Recycling, Operations
Market Statistics Section Supervisor
(916) 327-2769
michael.vanderburg@calrecycle.ca.gov

CalRecycle