2022 RECOVERY RATE REPORT

FOR DEPOSIT BEVERAGE CONTAINERS

CREATED FOR THE IOWA DEPARTMENT OF NATURAL RESOURCES

May 2024

Prepared For:

Iowa Department of Natural Resources
6200 Park Avenue
Des Moines, Iowa 50321
(515)-725-8200

Prepared By:

Container Recycling Institute
4361 Keystone Ave
Culver City, California 90232
(310)-559-7451

IOWA | Iowa Department of Natural Resources

CRI CONTAINER RECYCLING INSTITUTE

ABOUT CRI

Founded in 1991, the nonprofit Container Recycling Institute is a leading authority on the economic and environmental impacts of used beverage containers and other consumer product packaging. Its mission is to make North America a global model for the collection and quality recycling of packaging materials. We do this by producing authoritative research and education on policies and practices that increase recovery and reuse; by studying container and packaging reuse and recycling options, including deposit systems; and by creating and sponsoring national networks for mutual progress. CRI envisions a world where no material is wasted and the environment is protected. It succeeds because companies and people collaborate to create a strong, sustainable domestic economy.

Table of Contents

SUMMARY OF FINDINGS

CRI calculates that the overall recovery rate for deposit beverage containers was 49% in the state of Iowa for 2022. We first calculated the percentage of deposit beverage container units landfilled statewide compared to the total deposit containers sold statewide in 2022. Then we subtracted the landfilled deposit container percentage from one hundred percent to arrive at the recovery rate for deposit beverage containers. In this report, the term, "recovery rate" is used to refer to containers that are recycled both through the beverage container deposit law program (redeemed), as well as containers that are recycled through curbside recycling or recycling drop-off programs.

The recovery rates were also calculated separately for each of the three material types that are covered in Iowa's "Beverage Container Control Law" program: PET plastic (polyethylene terephthalate), aluminum, and glass. The respective rates are: 56%, 42% and 76%.

INTRODUCTION

Iowa's Beverage Container Control Law was enacted in 1978. Iowa's "bottle bill," or deposit-return system (DRS), is a law that requires a minimum refundable deposit on beer, carbonated soft drinks, wine and liquor in the state of Iowa. The refundable deposit creates an incentive for consumers to return their containers for recovery, and ensures high return rates. The state's bottle bill is a privately-funded and operated collection infrastructure for beverage containers.

The Iowa Department of Natural Resources (DNR) contracted with the Container Recycling Institute (CRI) in December of 2023 to calculate the recovery rate of the state's beverage container deposit law, also known as the "bottle bill." This study continued DNR's history of calculating the recovery rate of the deposit program in the state in order to assess its efficacy.

CRI also previously assisted the state of Iowa with a recovery rate calculation project in 2017, using a substantially similar methodology. This study provides the DNR, and other agencies, with valuable information to track the status of the statewide program in order to maximize the efficiency of the program. This current study was conducted from December 2023 to May 2024.

BACKGROUND

There are ten states in the U.S. that have beverage container deposit-return (DRS) laws. Iowa's process for calculating a recovery rate for deposit beverage containers is different from the other nine states with beverage container deposit laws.

In nine of the ten DRS states, beverage distributors are required to report beverage container sales data to state agencies, and the state agencies, in turn, calculate statewide redemption rates for beverage containers. Those nine DRS states produce an official statewide redemption rate for beverage containers. In Iowa, beverage distributors are not required to report sales and redemption data to the state, so DNR has created a way to estimate the recovery rate for deposit beverage containers.

In seven of the ten DRS states (Maine, Vermont, New York, Massachusetts, Connecticut, Michigan and Oregon), beverage distributors are required by law to report the number of beverage containers sold and the number of beverage containers redeemed to the relevant state agency at least annually. In two states, California and Hawaii, the beverage distributors are required to report deposit beverage sales to the appropriate state agencies, but the state agencies are responsible for the management of the redemption systems and therefore produce the redemption numbers themselves, as well as the overall recovery rates.

There are additional details about data collection in Oregon. Most of the beverage distributors in Oregon belong to a cooperative called the Oregon Beverage Recycling Cooperative (OBRC). OBRC members report their sales figures to OBRC, which then collectively reports total sales and redemption numbers to the Oregon Liquor and Cannabis Commission (OLCC). In addition, the distributors that are not members of OBRC must report their sales and redemption numbers directly to OLCC. OLCC, in turn, compiles the numbers and calculates the statewide deposit beverage container redemption rate.

In the state of Iowa, the state-owned Iowa Alcoholic Beverages Division produces data regarding the sales and redemption of beverage containers for only those beverage types that are under their control (wine and liquor). The only deposit beverages in the U.S. for which there are no annually required reports of containers sold and containers redeemed are beer, carbonated soft drinks and other carbonated beverages sold in Iowa. The process for calculating a redemption rate in Iowa is therefore unique because the state of Iowa does not require beverage distributors to report either sales or returns data, making a straightforward calculation impossible.

This study has created an alternative process to determine the recovery rate for deposit beverage containers. This study relies on the use of the state's Material Characterization Study ("MC Study") to estimate the weight of landfilled deposit beverage containers and CRI's Beverage Market Data Analysis (BMDA) for the weights of deposit beverage containers sold. Using those two figures, we are then able to back into a recovery rate by determining the deposit containers wasted statewide and comparing that to deposit containers sold in 2022. This results in a percentage of deposit containers wasted. [1] One hundred percent minus the percent wasted gives us the percentage of deposit beverage containers recovered. Note that of this percentage "recovered," some of the containers are redeemed through redemption locations, and other containers are recycled through curbside and drop-off programs.

The redemption and recovery rate data collection methodologies for all ten U.S. deposit states are summarized in the tables that follow.

Iowa	Beverage distributors are NOT required to report to the state and as such the recovery rate is calculated by using a material characterization study to back into a recovery rate.

California	Beverage distributors are required to report the number of beverage containers sold to CalRecycle monthly.
Connecticut	Beverage distributors are required to report the number of beverage containers sold and redeemed to the Connecticut Department of Revenue Services.
Hawaii	Beverage distributors are required to report the number of beverage containers sold in the state to the Hawaii Department of Health.
Maine	Beverage distributors are required to report the number of beverage containers sold and redeemed to the Maine Department of Environmental Protection.
Massachusetts	Beverage distributors are required to report the number of beverage containers sold and redeemed to the Massachusetts Department of Revenue.
Michigan	Beverage distributors are required to report the number of beverage containers sold and redeemed to the Michigan Department of Treasury.
New York	Beverage distributors are required to report the number of beverage containers sold and redeemed to the New York Department of Taxation and Finance.
Oregon	Beverage distributors report their figures to the Oregon Beverage Recycling Cooperative (OBRC) if they are member. Distributors that are not a member of OBRC must report to the Oregon Liquor Control Commission (OLCC), which totals all non-member data and compiles it with OBRC data.
Vermont	Beverage distributors of non-alcoholic beverages are required to report the number of beverage containers sold and redeemed to the Commissioner of Taxes. Alcoholic beverages sales data are maintained by the Department of Liquor Control.

[1] The end-of-life fate of beverage containers can include "wasting," where containers are sent to landfills, or recovery via redemption, curbside or drop-off recycling programs. Small percentages of beverage containers are also littered; we assume those are less than one percent of the total for the purposes of this report.

METHODOLOGY

The following pages describe our calculation methodology, step-by-step.

1 **We derived tons of deposit beverage containers landfilled statewide** by multiplying the percentage of each deposit container category (PET bottles, aluminum cans, and glass bottles) by total tons of municipal solid waste (MSW) landfilled in Iowa in 2022 (2,538,762 tons).

The MC Study was designed to gather data specifically on **deposit beverage containers**, separate from other types of beverage and non-beverage containers. The MC Study found that 0.249% of the total MSW was PET plastic deposit beverage bottles, 0.525% of the total MSW was deposit aluminum cans, and 0.774% of the total MSW was deposit glass beverage bottles.

These percentages were sourced from the Iowa Material Characterization Study that was finalized in October 2022. [2] The MC Study reported on sampling taken at 10 sites ("host facilities") from May – July 2022, and included both residential and Institutional/Commercial/Industrial (ICI) waste.

Table 1. Deposit Beverage Containers Disposed in Iowa, tons, 2022

Type of Deposit Container	% of Total MSW by Type (Deposit Only)	Total Tons MSW Landfilled, 2022	Deposit container tons landfilled statewide	Deposit container tons landfilled statewide, scaled for seasonality
PET plastic bottles	0.249%	2,538,762	6,322	5,961
Aluminum cans	0.525%	2,538,762	13,328	12,569
Glass bottles	0.774%	2,538,762	19,650	18,530
TOTAL			**39,300**	**37,059**

[2] "2022 Iowa Statewide Material Characterization Study," SCS Engineers for Iowa DNR, October 2022.

2 **We scaled statewide beverage container tons landfilled for seasonality.** We obtained Iowa monthly beer volume sales data from the Beer Institute, and determined that May, June, and July (when the waste sampling was carried out) are some of the highest months for beverage sales: altogether, the sales in those 3 months are 6% higher than the 3-month average for the entire year. Therefore, we corrected (scaled) by dividing the weighted tons landfilled by 106%.

3 **We converted seasonally scaled beverage container *tons* landfilled into *units* landfilled.** First, we used conversion factors specific to both container type and beverage type, and calculated conversion factors that are specific to Iowa's deposit beverage container program. (The conversion factors reflect the specific mix of containers and beverages sold in the state's program.)

This resulted in the following conversion factors: 12.89 units/pound for PET bottles, 31.62 units/pound for aluminum cans, and 1.38 units/pound for glass bottles.

Table 2. Derivation of Deposit Beverage Container Recovery Rate in Iowa, 2022

Type of Deposit Container	Container conversion factors (units per pound)	Units landfilled (using previous column conversion factors)	Deposit Units Sold in Iowa, 2022 (from CRI BMDA)	Proportion unrecovered (units landfilled ÷ unit sold)	Deposit Recovery rate (= 100% - proportion unrecovered)
PET plastic bottles	12.89	153,694,433	351,699,170	44%	56%
Aluminum cans	31.62	794,767,055	1,378,003,332	58%	42%
Glass bottles	1.38	51,212,047	214,553,608	24%	76%
TOTAL		**999,673,535**	**1,944,256,109**	**51%**	**49%**

4 **Used data for units sold** for calendar year 2021 from the Iowa portion of CRI's Beverage Market Data Analysis, a compendium of national and state-by-state data on beverage container sales, recycling, and wasting. [3]

[3] "2021 Beverage Market Data Analysis," The Container Recycling Institute, 2024.

5 **Derived proportion unrecovered:** divided units landfilled by units sold, for 3 materials.

6 **Derived material-specific recycling rates:** subtracted unrecovered percentages from 100%.

RESULTS

The resulting recovery rates are 56% for PET plastic bottles, 42% for aluminum cans, and 76% for glass bottles, and 49% overall. Note that because this derivation was conducted using the MC Study and sorting of materials at a landfill (rather than direct reporting from distributors), it includes containers that were recovered through methods other than deposit-refund (curbside and dropoff, for example), and should be referred to as a "recovery rate" rather than a "redemption rate."

For comparison, Iowa's deposit container recovery rate of 49% is below the average recovery rate of 64% for containers on deposit across the ten container deposit states. However, Iowa's deposit container recovery rate is substantially higher than the national average for non-deposit containers which have a recovery rate of 25%. The redemption rates for the other nine deposit states are included in Table 3 on page 11.

LIMITATIONS AND UNCERTAINTIES

Since Iowa's law does not require the reporting of beverage containers sold and redeemed to a state agency, we instead followed the calculation methodology that is described in this report. There are limitations and uncertainties associated with the underlying data that was used.

1 **Percentages used for each deposit beverage type** are sourced from a material characterization study that is designed to create general, statewide estimates of landfilled materials. The MC Study did take care to sample deposit beverage containers, however, if the MC Study had been designed to study ONLY deposit beverage containers, the sampling protocol and number of samples taken might have been different. That is, if the MC Study had been very specifically focused on only this one type of material, rather than the entire MSW stream, the entire MC Study might have been designed differently, and may have yielded different results. For example, samples taken from the commercial sector might have focused on types of businesses to ensure a representative sample of materials from Hotels, Restaurants, and Catering (HORECA), where many deposit beverage containers are generated.

2 **Seasonality -** We also would like to note that due to the MC Study taking place in the months of May – July, seasonality plays a role in skewing the data. We account for this by using Iowa beer sales data, however, beer sales may not be reflective of all other beverage types and have the same seasonality as other beverage types.

3 **Sales –** CRI derived deposit beverage container sales data for 2022 based on 2021 "Beverage Market Data Analysis" numbers. These were scaled up using growth percentages taken from the Beverage Marketing Corporation to adjust sales from 2021 to 2022. These growth rates are by material type, not by individual container type. Growth rates may vary from state to state, so the growth rates in Iowa may not be exactly the same as the national average growth rates.

4 **Variability of container types and sizes-** For marketing purposes, beverage container offerings are constantly changing. Consumers' tastes are also constantly changing, and there are also new types of beverages being offered and promoted as time goes on. Some of the data we use to estimate state by state beverage sales actually comes from regional data that we apportion to each state. In reality, regional data may not correctly represent the container mix in a given state, as some may be more popular in one state than another.

COVID DISRUPTIONS

Covid-19 had major repercussions on nearly every bottle bill system within the U.S., the vast majority of which experienced declining recovery rates that have not recovered to their pre-pandemic levels. In early 2020, redemption rates plummeted from the temporary suspension of the requirement that retailers accept back empty containers, the decision by some redemption centers to temporarily close, and consumers' adherence to shelter-in-place orders. Since 2021, the trend has seen an increase in recovery rates, albeit marginal. The decrease in the redemption rate from 2019 to 2020 was most pronounced in Michigan, because that state experienced a mandatory and complete closure of all redemption sites for a period of a few months, longer and more extensive than any other state. Michigan experienced a 16-percentage point drop in its redemption rate from 2019 to 2020.

The apparent decrease in Iowa's redemption rate over this same time period is similar to the redemption rate decline in other states. Iowa's retailers were allowed to suspend in-store beverage container redemption for four months in 2020.

Table 3. Pre-Pandemic and Post-Pandemic Redemption Rates in the other Nine U.S. States with Beverage Container Deposit Laws, 2018 to 2022

Redemption Rates						
State	2018	2019	2020	2021	2022	Change from Pre-to-Post Pandemic
	Pre-Pandemic		Post Pandemic			
California	66%	67%	60%	58%	59%	-8%
Connecticut	52%	50%	44%	46%	45%	-6%
Hawaii	68%	64%	64%	58%	59%	-5%
Maine	2017: 84%		76%	75%	78%	-6%
Massachusetts	52%	50%	43%	38%	38%	-12%
Michigan	89%	89%	73%	75%	76%	-13%
New York	64%	64%	64%	70%	70%	5%
Oregon	81%	86%	77%	81%	86%	0%
Vermont	2013: 76 %		78%	78%	72%	-4%

Source (for citation purposes): Redemption Rates and Other Features of 10 U.S. State Deposit Programs," Container Recycling Institute, 2024.

CHANGE IN LAW OCCURRED DURING MATERIAL CHARACTERIZATION SAMPLING PERIOD

Iowa's law was changed in 2022, with a key provision effective in 2022, and the remainder of the law's changes effective on January 1, 2023. Senate File 2378 (SF 2378) was signed by the Governor on June 17, 2022. One provision of the law took effect on the date the law was signed: the option for retail stores to discontinue redemption of beverage containers if any of the following applied:

- The dealer has entered an agreement with a mobile redemption system and all of the following apply:
  - The dealer provides adequate space, utilities, and internet connection to operate the mobile redemption system.
  - The agreement does not require additional payment to the dealer or the mobile redemption system.

- If the dealer designates another point of redemption (including mobile redemption systems) within 10 miles if the county's population is more than 30,000 or within 15 miles if the county's population is 30,000 or less.
    - Dealer must display notice on the front door notifying the public that they do not redeem containers and relevant information for their redemption designation location.

Prior to the passage of SF 2378, most retail stores were legally required to take back beverage containers in-store and issue refunds to consumers. If a retailer had an agreement with a nearby redemption center (within ten minutes, per policy), that retailer did not have to redeem containers in-store and could instead direct consumers to the redemption center (per their agreement).

On June 17, 2022, some beverage retailers became eligible to opt out of the take-back provisions of the law. We do not know how many stores stopped accepting beverage containers for redemption, or how quickly those changes took place. Therefore, we do not know what affect, if any, this change in law had on the number of deposit beverage containers that were found in the MSW disposal stream during the sampling period of the MC Study.

On January 1, 2023, another provision of SF 2378 took effect: retailers that have on-site, government-regulated, controlled food preparation can refuse to redeem containers. SF 2378 also made a change that affected redemption centers. The law now allows a new modality of redemption: "mobile redemption systems."