Sierra Club Beverage Container Guidance

The Sierra Club has consistently supported beverage container deposit programs from 1974 until the present – nearly 50 years– as programs that promote the highest and best use of the materials, raise reuse and recycling, and result in high quality raw materials, while dramatically reducing roadside litter (see box).

How deposit programs work

Beverage container deposit programs (also known as deposit-return legislation or "bottle bills") add a small deposit to the purchase of beverages in containers. The containers can be redeemed by customers when the containers are returned for refilling or recycling. The visible deposit creates a financial incentive for consumers to return the containers instead of littering or throwing them in the trash. The refundable deposit also incentivizes the public to collect littered beverage containers for redemption.

Ten states in the U.S., covering about 90 million people (more than a quarter of the US population), have longstanding, successful, and cost-effective beverage container deposit programs, with deposits set at 5-15 cents per container.[1] Beverage container recycling rates in these states in 2019 averaged 75%, ranging from 59% to 91%, highest for states with the highest deposit (Figure 1).[2,3] Across these deposit states, redeemed containers account for 93% of the beverage container recycling rate, on average. The programs are financed in part or entirely through unredeemed deposits, revenues from the sale of raw materials, and/or expenditures by retailers and distributors to manage the programs, with different degrees of producer responsibility and public oversight.[4] As of early 2020, there were 58 container deposit programs worldwide,[5] covering 613 million people,[6] with a big increase in interest in the past decade as public concern about plastic pollution has increased.

Sierra Club's Policies on Beverage Containers through the Years

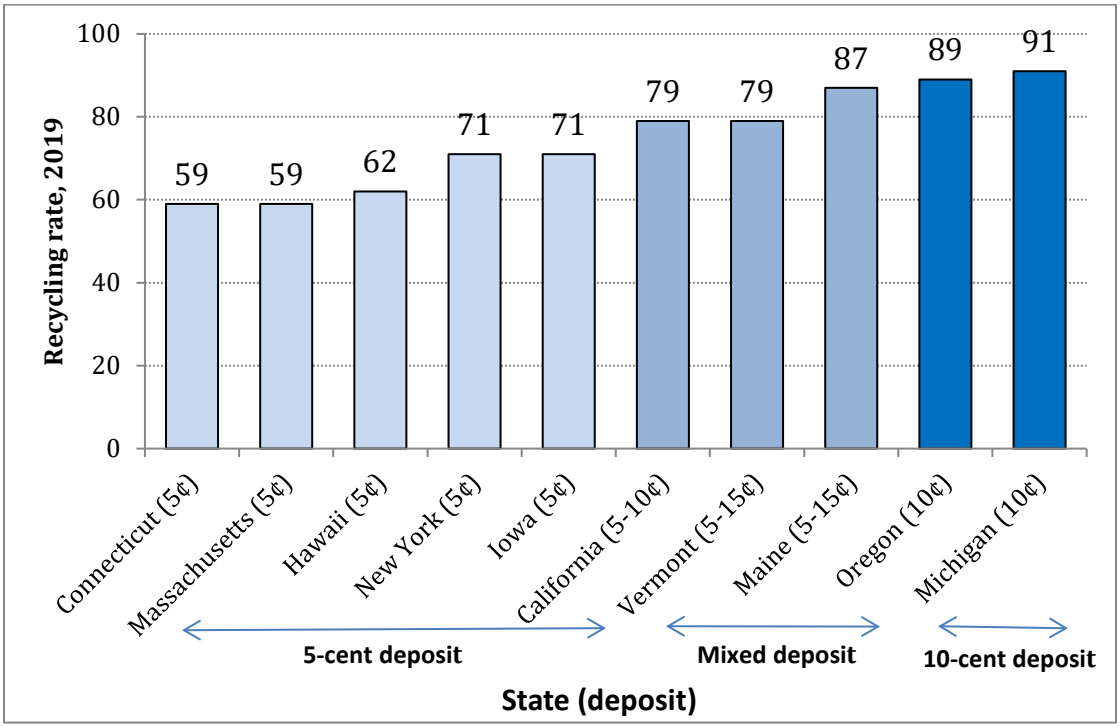
"The Sierra Club endorses the principle that all soft drink and beer containers should be refillable and returnable for a mandatory minimum deposit. [It was intended that the mandatory deposit be applied at all levels of distribution back to the manufacturer.]" (May 1974)

"The Sierra Club enthusiastically supports the passage of minimum deposit legislation nationwide, and opposes passage of the currently proposed "litter tax" approach to the beverage container litter problem." (February 1979)

"The Sierra Club specifically supports state and national bottle bills as a vital strategy to increase the collection and reclamation of clean materials for recycling into new materials." (December 2019)

[1] California, Connecticut, Hawaii, Iowa, Massachusetts, Maine, Michigan, New York, Oregon, Vermont. See the Appendixfor a table that compares the characteristics of programs in these ten states.
[2] The recycling rate includes materials from deposit programs and curbside, though the latter amounts to only a few percentage points. Materials are not the same across states, however, depending on what types of containers and beverages are included in the program.
[3] In contrast, the estimated beverage container recycling rate in Maryland, without a deposit, is only 22%.
[4] Among programs in the US, those in California and Hawaii are operated by government, the others by industry.
[5] Collins, Susan. 2020. "International Embrace," *Plastics Recycling Update,* Winter, p. 40. The number of container deposit programs worldwide increased from 38 in 2010 to 58 by 2020. The May 2019

Figure 1. Recycling rates (%) for covered beverage containers in deposit states, 2019



Source: Container Recycling Institute (2020)."2019 Beverage Market Data Analysis."

The benefits of beverage container deposit programs

(1) Deposit programs are highly effective at increasing recovery and recycling, and reducing litter[7]

Beverage container deposit programs result in dramatically higher recycling rates for materials than conventional recycling programs. For example, the recycling rate for aluminum cans in states with deposits (77%) is nearly double the rates for aluminum cans when there is no deposit (41%, Figure 2, next page). The contrast between recycling rates for deposit and non-deposit containers is even greater for polyethylene terephthalate (PET) plastic and glass – five times higher for deposit containers compared with containers in non-deposit states.

In 2016, a beverage container deposit program was launched in Lithuania for glass, non-refillable plastic, and metal beverage containers. Before the program was launched, only a third of beverage containers in Lithuania were recycled. After launching the program with a €0.10

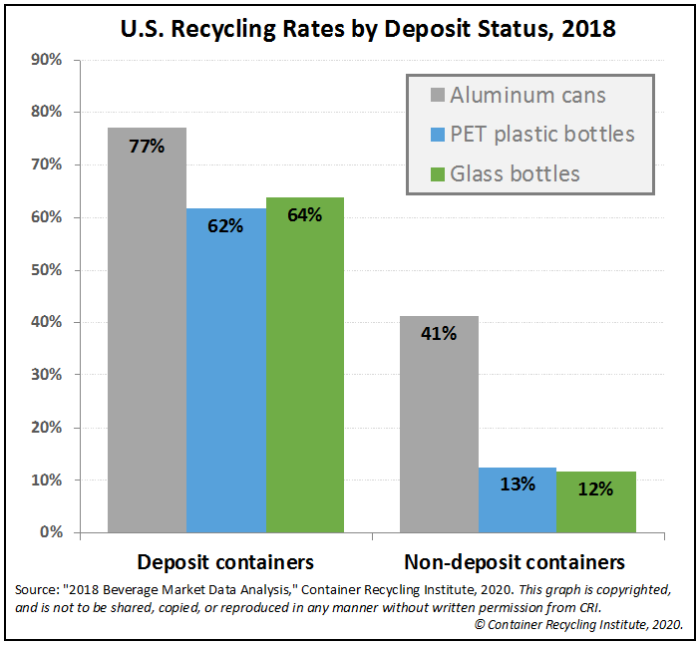
European Union (EU) Single-Use Plastics Directive that requires member states to achieve a 90% collection rate for beverage containers by 2029 will most likely lead to adoption of deposit laws in most, if not all, EU member states.

[6] *Ibid,* p. 41.

[7] For a more comprehensive discussion of the benefits of beverage container deposit programs, see http://www.bottlebill.org/index.php/about-bottle-bills/benefits-of-bottle-bills

deposit and use of reverse vending machines, the recycling rate rose to 74% in 2016 and 91.9% by the end of 2017 (PET 92%, cans 93%, glass 83%).[8]

Figure 2. US Recycling Rates by Deposit Status, 2018



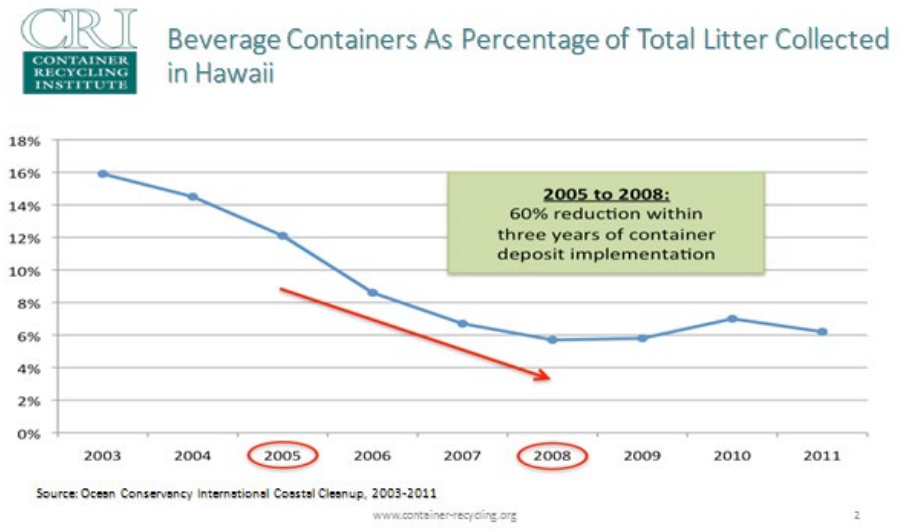
Beverage container deposit programs also are among the most effective policies for reducing litter.[9] Within the first three years following implementation of Hawaii's beverage container deposit program, beverage containers as a share of total litter declined by 60 percent (Figure 3). A multivariate analysis using coastal cleanup data for Australia and the United States found that the share of beverage containers is about 40% lower in areas with a container deposit law than in those without, and that deposit laws are most effective in reducing coastal beverage container litter in low-income communities.[10]

[8] *https://www.tomra.com/en/collection/reverse-vending/case-studies/roll-out-lithuania See also: https://www.openaccessgovernment.org/recycling-lithuania-deposit-system-exceeds-all-expectations/45003/*

[9] "…there is little evidence that any other program, in and of itself, is nearly as effective as deposit programs at reducing litter rates." University of Maryland, Environmental Finance Center (EFC). 2011. "2011 Impact Analysis of a Beverage Container Deposit Program in Maryland." December 15. page 4. Also see Reloop/CRI, Fact Sheet: Deposit Return Systems Reduce Litter, January 2021.

[10] Qamar Schuyler *et al.*2018. "Economic incentives reduce plastic inputs to the ocean," *Marine Policy* 96: 250-255. A shortcoming of the study is that it did not control for the share of all beverage containers covered in each jurisdiction with a bottle deposit program. Inclusion of that parameter might have resulted in an even higher impact of litter reduction for programs covering most containers.

Figure 3. The Decline in Beach Litter in Hawaii following Implementation of its Beverage Container Deposit Program



(2) Deposit programs produce higher quality materials for feedstock

Materials collected through deposit programs are much cleaner and less contaminated than materials collected through curbside programs. For example,

- PET plastic recyclers prefer to purchase materials from deposit programs over curbside material recovery facilities because the bales are less contaminated with things like thermoform clamshells or trash.[11]
- Glass in deposit programs is cleaner, sorted by color, with a higher value, and recycled, rather than used for daily landfill cover or roadbeds. Wineries and breweries want clean glass: it is more energy-efficient and cost-efficient to recycle glass cullet, than to make glass out of virgin materials. However, they can't accept contaminated glass from curbside programs that has not been cleaned by a beneficiator.[12]
- Because of the need for high quality feedstock, the ten states with beverage container deposit laws provide a disproportionate share of the feedstock for manufacturers meeting recycled content goals that they have adopted.[13]

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[11] Balkan, Elizabeth. 2021. "Deposit return systems are a key part of solving the plastic paradox," *Waste Dive,* March 29. https://www.wastedive.com/news/deposit-return-systems-solution-plastic-reloop/597277/

[12] When glass is recycled through curbside programs it is often intentionally broken in order to remove it from the processing system. This crushed glass can be recycled at a glass beneficiator (where the glass is cleaned and optically sorted), but it is often downgraded and used for insulation or road base instead of glass containers.

[13] Balkan, *Ibid,* quotes trade associations that 40-45% of used aluminum beverage cans and more than half of recycled glass is sourced from the 10 states with beverage container deposits. She also notes that the suspension in 9 states of beverage container deposit enforcement during the covid epidemic resulted in "a significant decline in the amount of high-quality recyclables moving to processors," forcing "some recyclers to instead accept feedstock from curbside programs, which have much higher levels of contamination than the deposit stream."

(3) Deposit/return programs complement curbside collection and save money for local governments

In states with beverage container deposit programs, curbside and deposit coexist to maximize recycling. Deposit programs provide an option to recycle for people who consume beverages away from home;[14] who live in rural areas that don't have curbside collection; who live in multifamily residences with fewer recycling options; and at special events that otherwise would have no convenient recycling options. Glass shards are a major contaminant of other materials in single-stream recycling operations. Deposit systems remove most glass beverage containers from curbside programs, reducing contamination and harm to the recycling workforce, and raising the value of other recycled materials. Finally, deposit programs reduce the volume and costs of curbside recycling of materials to local government by diverting most covered beverage containers from curbside recycling and from the landfill. Different things motivate different people; a mix of curbside, drop-off, and deposit/return is needed to appeal to different sectors of society.

(4) Deposit/return systems save energy and reduce greenhouse gas emissions that contribute to climate change

The higher recovery rate and higher quality materials generated by beverage container deposit programs for reuse or refill maximize recycling and reuse of the materials. This results in greater energy savings and greater reductions in greenhouse gas emissions from the extraction of raw materials (for example, fracked gas for plastic production, bauxite for aluminum cans) than can be achieved by conventional single-stream recycling programs. Glass from states with beverage container deposit programs is far more likely to be recycled into new bottles – also with energy and greenhouse gas savings – than in non-deposit states, where it is often used as landfill cover or in roadbeds.

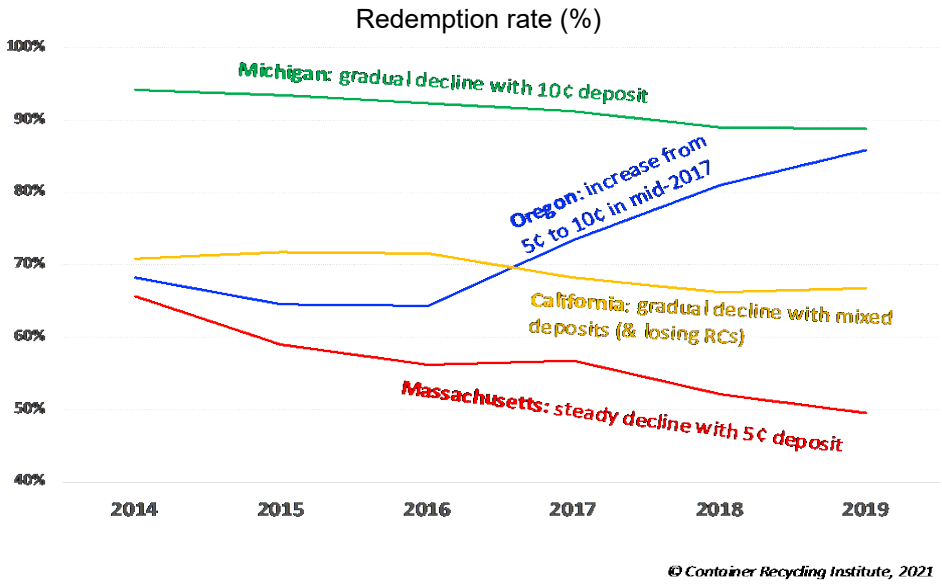
Lessons

(1) The higher the deposit, the higher are the recovery and recycling rates

- The recycling rate for beverage containers included in deposit programs increases with the amount of the deposit. Deposits in existing programs range from 5 cents to 15 cents, and the recycling rate is strongly correlated (Figure 1).
- It's important to update the deposit level over time to ensure it remains an effective incentive. For many states, the 5-cent deposit has not been raised since the programs were launched back in the 1970s. When Oregon increased its deposit from 5 cents to 10 cents in 2017, the redemption rate rose from about 65% to nearly 90% (Figure 4).[15]

[14] About 30% of beverage containers are used away from home.
[15] Legislation passed in Connecticut in 2021 will double the deposit from 5 cents to 10 cents in 2024.

Figure 4. Deposits must be updated over time to remain a strong incentive for return



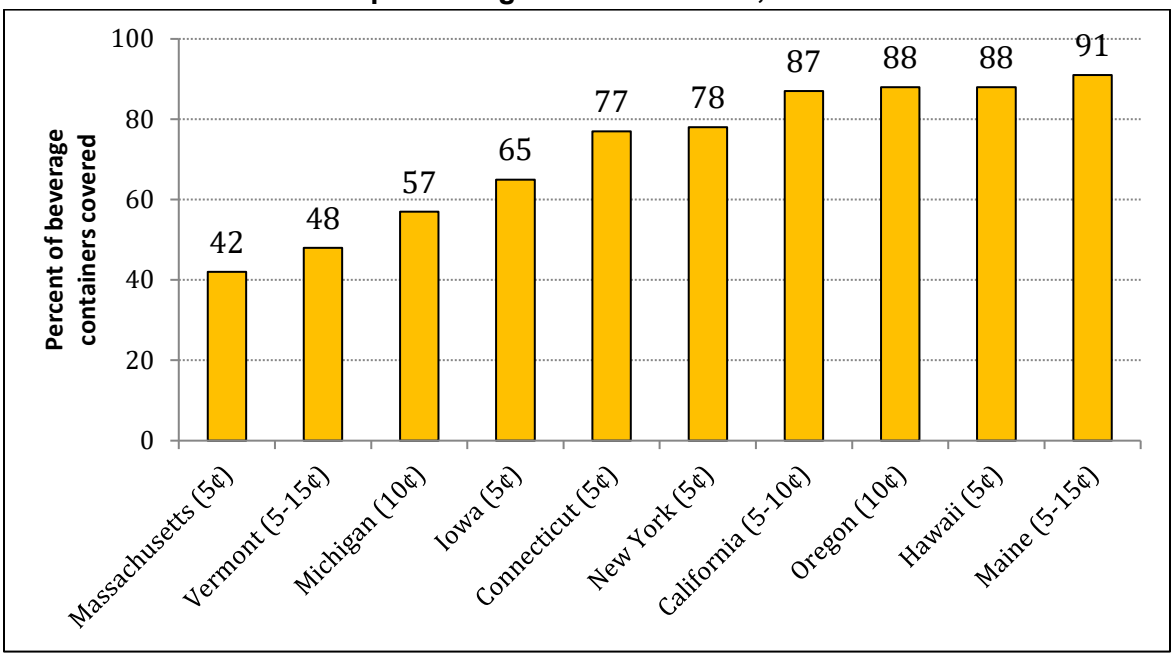
Source: Used with permission from the Container Recycling Institute (CRI).

(2) Maximize recycling by including as many types of beverages and containers as possible in the deposit program

While recycling rates for covered beverage containers are high, some programs fall short of covering most container types. Programs in Massachusetts and Vermont, for example, cover fewer than half of all beverage containers (Figure 5). Michigan, with a 10-cent deposit, has a very high recycling rate for the containers in its program (91%) but the deposit applies to only 57% of all beverage containers. The four states with the lowest coverage do not include non-carbonated water; seven states do not cover wine and/or liquor/distilled spirits containers.[16] To maximize the impact of the program on recycling and reduced litter, best practice is to set a high financial incentive for return and ensure high coverage of container types.

[16]The Connecticut deposit program will expand covered containers in 2023 to include hard seltzer and hard cider among the carbonated drinks, and containers for many types of non-carbonated drinks (teas, coffee, sports drinks, energy drinks, juices and juice drinks, kombucha, and plant-infused drinks). The program was updated to include bottled water in 2009.

Figure 5. Percent of all Beverage Containers Covered by Deposit Programs in 10 States, 2018



Source: Used with permission from the Container Recycling Institute (CRI), based on estimates of the sales of deposit and non-deposit containers in their "2018 Beverage Market Data Analysis." (CRI 2020).

Alternatives Not Recommended

Opponents of beverage container deposit programs often advocate alternatives, such as a litter tax, universal recycling laws, and extended producer responsibility laws for packaging, described below. Although these alternatives can be complementary to a beverage container deposit if designed properly, they are not a substitute. Beverage container deposits create an incentive not to litter, to return containers for recycling, and create more options for people in multifamily residences and who consume beverages away from home. The three alternatives described below, in lieu of a deposit program, will not provide the same magnitude of benefits in litter reduction, increased recycling or reuse for beverage containers as would a beverage container deposit program.

(a) Litter tax with no deposit

Some have proposed "litter taxes" as a solution to litter, in lieu of a beverage container deposit program. These are taxes levied on manufacturers, wholesalers, and/or retailers that produce or sell products that are frequently littered, and the cost is passed onto consumers. The revenue is used to fund public anti-litter education, litter clean-up, and in some cases, municipal recycling programs.[17]

[17] At least seven states currently have litter taxes, adopted in the 1970s and early 1980s – Hawaii, Nebraska, New Jersey, Ohio, Tennessee, Virginia, and Washington – in most cases in lieu of a beverage container deposit program. In Hawaii, the litter tax was implemented in 1979, long before their beverage

Unlike beverage container deposit programs, litter taxes do not create any financial incentive not to litter, to collect litter, or to return containers for recycling or reuse. They create a government bureaucracy and tax everyone, whether or not the consumer is responsible for the litter. These taxes have failed to reduce litter or reduce waste.

(b) "Universal Recycling" laws in lieu of a beverage container deposit

In an effort to raise overall recycling rates, states have adopted "universal recycling" laws that extend recycling mandates to households, businesses, and government. The beverage container industry has argued that with universal recycling, a beverage container deposit is not necessary.

However, beverage deposit programs complement conventional recycling programs, providing more access for beverages consumed away from home, for residents in rural areas or in multifamily residences, and for special events. The recycling rate for beverage container materials from deposit states is 2-5 times higher than for the same materials in states without deposits (Figure 2), and this difference would be even higher for programs with high coverage of container types and a high deposit. Finally, beverage container deposit programs reduce litter, an issue that universal recycling programs do not address.

(c) Extended Producer Responsibility programs for packaging, in lieu of a deposit/return program

Extended producer responsibility (EPR) legislation for packaging mandates that manufacturers or brand owners take responsibility for financing and/or providing for the end-of-life processing or management of their products and offers an opportunity to create incentives for product redesign that generates less waste and improves recyclability.[18] In fact, beverage container deposit programs run by the beverage industry are examples of EPR for collection and recycling of beverage containers.

However, many of the recently proposed EPR for packaging bills in the US propose to include beverage containers (without a deposit) among the packaging covered by the

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container deposit program was adopted in 2005; both continue until the present. In five other states – three of them with beverage container deposit programs (Connecticut, California, and Vermont) – litter taxes adopted in the same time frame have been repealed. In Connecticut, California, and Vermont, the litter taxes were later repealed because they were regressive, raised inadequate funds, and were ineffective in reducing litter and increasing recycling. Colorado and Kentucky adopted litter taxes in the late 1970s that were repealed (Colorado) or their passage declared unconstitutional (Kentucky), shortly after they went into effect.

[18] Northeast Waste Management Officials' Association (NEWMOA) and Northeast Recycling Council (NERC). 2020. "White Paper – Extended Producer Responsibility (EPR) for Packaging and Paper Products." April. A strong EPR for packaging program would include significant incentives or requirements for redesign of products, by adopting "eco-modulated fees" (e.g., higher fees for products with low recyclability, and lower fees for those with higher recyclability). However, to date there are few examples of product redesign to reduce waste or increase recyclability from EPR programs. (See p. 14 of the document.)

programs.[19] This can undermine a more effective and beneficial beverage container deposit program and create financial disincentives for adopting such a program in the future where one does not exist.

- Beverage container deposit programs are more effective at increasing recycling and recovery of materials and reducing litter than are conventional recycling programs financed through EPR for packaging programs. EPR for packaging programs that cover beverage containers and have no visible deposit to the consumer provide no incentive not to litter, to pick up the litter, and/or to return or recycle the container. They cannot hope to achieve the recovery rate of a beverage container deposit program with a 10-cent deposit (90%) -- a level of recycling that is unmatched by any conventional recycling program -- while producing source-separated, high quality, materials for refill or feedstock for manufacturers to close the loop.
- The subsidies from producers to local governments for collecting and processing beverage containers in EPR for packaging legislation have the potential to undermine local government support for continuation or adoption of more effective deposit programs. EPR for packaging programs don't necessarily reduce the amount of materials to be recycled or the collection or processing costs by local governments, but they do offer a visible financial incentive for local governments to support them – *reimbursement for some of the costs of recycling packaging*. On the other hand, beverage container deposit programs significantly *reduce costs* for local governments by: reducing the amount of materials that local government recycling operations have to collect and process; diverting most beverage containers from the recycling stream; and diverting most of those that aren't recycled from landfills or incinerators. Nevertheless, visible subsidies from an EPR for packaging program may entice local governments into supporting the EPR programs over beverage container deposit programs. The result is a resistance by local governments to a much more effective and cost-saving deposit program, to maximize subsidies from an EPR program.

Resources

Websites
Bottle Bill Toolkit: www.bottlebill.org
Container Recycling Institute: www.container-recycling.org
National Caucus of Environmental Legislators (NCEL): www.ncel.net/plastic-pollution. List of 2021 state bottle bill legislation: https://www.quorum.us/spreadsheet/external/iwkgPondbUwCByBKuxjD/
National Conference of State Legislatures (NCSL): https://www.ncsl.org/research/environment-and-natural-resources/state-beverage-container-laws.aspx
Reloop: www.reloopplatform.org

[19] These EPR bills often include both packaging and paper products; the inclusion of paper products, which are highly recyclable, balances the difficulty of hard-to-recycle multi-material packaging.

Articles and publications

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Approved by Sierra Club Conservation Policy Committee August 2021

Appendix 1: Characteristics of Beverage Container Deposit Programs in the US, 2021

State	Year enacted/ imple-mented[a]	Deposit[b]	Beverages covered[b]	Beverage units covered by deposit (%)[b]	Redemp-tion rate (2019)[b]	System Admin/ Operator[a]	System Financing[a]
California	1986/1987	10¢ (≥24 oz) 5¢ (<24 oz)	--Beer & malt beverages --Carbonated soft drinks & mineral water -- All other non-alcoholic beverages --Wine coolers & distilled spirits coolers	87%	67%	Department of Resources Recycling and Recovery[c]	Unredeemed deposits
Connecticut[d]	1978/1980	5¢	--Beer & malt beverages --Carbonated soft drinks & mineral water --Bottled water, including flavored water	77%	50%	Beverage industry	Direct funding by producers with privately arranged payments to contracted collectors, transporters, and processors.
Hawaii	2002/2005	5¢	--Beer & malt beverages --Carbonated soft drinks & mineral water -- All other non-alcoholic beverages --Wine coolers & distilled spirits coolers	88%	62%	Department of Health	Unredeemed deposits, material revenues, and non-refundable container fee
Iowa	1978/1979	5¢	--Beer & malt beverages --Carbonated soft drinks & mineral water --Wine coolers --Wine & liquor	65%	65%[e]	Deposit initiators[f]	Unredeemed deposits, material revenues
Maine	1976/1978	15¢ (wine & liquor ≥50 ml) 5¢ (all others)	--All beverages except dairy products and unprocessed cider	91%	84%[g]	Administrator: Maine Dept of Environmental Protection Operator: Beverage industry	Material revenues
Massachusetts	1981/1983	5¢	--Beer & malt beverages --Carbonated soft drinks& mineral water	42%	50%	Beverage industry, TOMRA	Material revenues

State	Year enacted/ imple-mented[a]	Deposit[b]	Beverages covered[b]	Beverage units covered by deposit (%)[b]	Redemp-tion rate (2019)[b]	System Admin/ Operator[a]	System Financing[a]
Michigan	1976/1978	10¢	--Beer & malt beverages --Carbonated soft drinks, mineral water, kombucha --Wine coolers & distilled spirits coolers	57%	89%	Beverage industry	Materials revenue
New York	1982/1983	5¢	--Beer & malt beverages --Carbonated soft drinks & mineral water --Bottled water, including flavored water --Wine coolers	78%	64%	Beverage industry; TOMRA New York Recycling; Western New York Beverage Industry Collection & Sorting	Material revenues, 20% of unredeemed deposits
Oregon	1971/1972	10¢	--All beverages except wine, distilled liquor, dairy milk and plant-based milk, & infant formula	88%	86%	Beverage industry	Material revenues, unredeemed deposits
Vermont	1972/1973	15¢ (liquor) 5¢ (all others)	--Beer & malt beverages --Carbonated soft drinks & mineral water --Wine coolers & liquor	48%	77%[h]	Beverage industry	Material revenues

a. Reloop Platform. 2020. *Global Deposit Book 2020: An overview of Deposit Systems for One-Way Beverage Containers.* https://www.reloopplatform.org/wp-content/uploads/2020/12/2020-Global-Deposit-Book-WEB-version-1DEC2020.pdf

b. Container Recycling Institute, "Redemption Rates and Other Features of 10 U.S. State Deposit Programs," July 2021. Coverage rate estimated for 2018.

c. Also known as CalRecycle.

d. The Connecticut deposit program will expand covered containers in 2023 to include hard seltzer and hard cider, and containers for many types of non-carbonated drinks (teas, coffee, sports and energy drinks, juices and juice drinks, kombucha, and plant-infused drinks) and will be raising the deposit from 5 cents to 10 cents in 2024.

e. 2016 data

f. "The first agent (i.e., producer, bottler, distributor, importer) to collect the deposit on a beverage container sold in the jurisdiction."

g. 2017 data

h. 2020 data.