

## Best Practices in Designing Recycling Refund (Bottle Bill) Programs

**Specific Intervention:** A collection incentivization program that requires a deposit to be charged for every eligible beverage container sold, which is fully refunded upon the return of that container for recycling.

**Intervention Type:** Regulatory

**Scope of Impact:** Statewide

**Materials Targeted:** Glass, metal, and plastic beverage cans and bottles

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### Background

To reduce beverage container litter and increase recycling, Recycling Refund programs (often known as Bottle Bills or Deposit Return Systems) were adopted in many Northeast states in the 1970s and 80s.<sup>1</sup> The programs were successful in reaching collection rates above 90% in several states<sup>2</sup> and reducing beverage container litter between 69 and 80% in others<sup>3</sup>. Over time performance has waned along with the value of the nickel deposit. Today, Recycling Refund programs provide an outsized role in terms of supplying high quality feedstock for America's aluminum, plastic and glass container manufacturers, providing between 20–60% of their collective materials input batch<sup>4</sup>. To renew these collection programs to their full potential, several states including Maine, Connecticut and Oregon adopted legislation to

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<sup>1</sup> Bottlebill.org

<sup>2</sup> [“Roadside Litter Control: A Survey of Programs and Practice.”](#) Maryland Transportation Technology Center. 2001.

<sup>3</sup> [“Litter studies in bottle bill states.”](#) Bottlebill.org.

<sup>4</sup> “Re: Importance of Connecticut’s Beverage Container Deposit Program to Essential Supply & Manufacturing Operations,” Glass Packaging Institute, Can Manufacturers Institute, National Association of PET Container Resources. April 2020.

modernize these collection programs with stated goals to reach return rates<sup>5</sup> of 85%<sup>6</sup> and 80%<sup>7</sup>, respectively.

This case study will review the best practices in the design of Recycling Refund public policy that lead to increased supply of recycled material to manufacturers.

High-performing container refund programs all provide financial incentives for collection, convenient access to collection locations and material separation.

U.S. Deposit Tons Redeemed vs. Total Beverage Tons Recycled (2019)					
	Aluminum Cans	PET Bottles	HDPE Bottles	Glass Bottles	Total
All beverage container sales (tons)	1,449,039	2,929,031	702,180	12,307,403	17,387,993
Deposit beverage container sales (tons)	349,093	681,783	49,565	1,860,643	2,941,084
All beverage container recycling (tons)	667,334	774,334	218,008	3,539,849	5,199,525
All U.S. beverage container recycling rate (units/containers)	46.1%	27.9%	30.9%	31%	34.9%
All U.S. beverage container recycling rates (tons)	46.1%	26.4%	31.0%	28.8%	29.9%
Deposit beverage container recycled (tons)	268,981	391,917	15,679	1,222,387	1,898,964
Deposit beverage container recycling rate (tons)	77.1%	57.5%	31.6%	65.7%	64.6%
Deposit beverage containers recycled as a percentage of all beverage recycled in the U.S. (tons)	40.3%	50.6%	7.2%	34.5%	36.5%
Source: 2022 Beverage Market Data Analysis, The Container Recycling Institute, 2022. © Container Recycling Institute, 2022.					

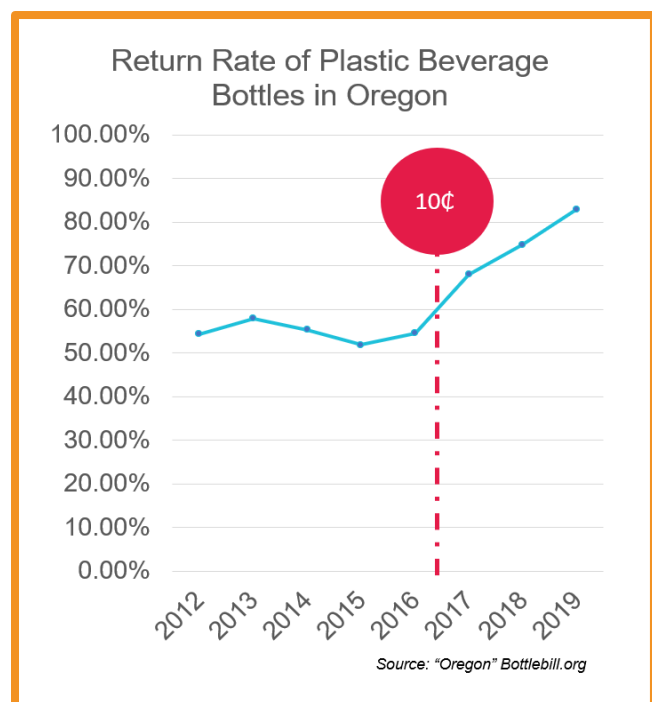
<sup>5</sup> “Return rate” refers to the percentage of beverage containers sold with a deposit that are returned for their redemption value at stores or redemption centers.

<sup>6</sup> [“An Act to Modernize Maine’s Beverage Container Redemption Law,”](#) Legislature.Maine.Gov. 2023.

<sup>7</sup> [“Public Act 21-58,”](#) CGA.CT.Gov. Section 9.

## Key Program Elements

**Material separation enables effective recycling** — America’s aluminum, PET and glass container manufacturing trade bodies report, “The high quality of recyclables collected and purchased by our industries from these beverage container deposit programs are generally unmatched, require very little sortation and can go quickly back into our manufacturing processes.”<sup>8</sup> The reason why the material is high quality is that recycling refund programs separate containers by material type. This enables manufacturers to recycle virtually all of the eligible deposit containers collected, with most of the material utilized for the same product or one of similar quality like food grade packaging, known as “closed loop recycling”.



**A meaningful deposit value increases collection rates** — The “Global Deposit Book 2022” compiles the return rates of every legislated recycling refund program in existence in the world, 39 in total. The data shows that systems with a higher deposit value tend to have a higher redemption rate, presumably due to the fact that the user has more motivation to return containers for the financial refund value. Programs with deposit value below 7¢ achieve a median return rate of 68% whereas programs with a deposit value of 15¢ achieve a median return rate of 93%.<sup>9</sup> Oregon is the only US Recycling Refund program where data is available to assess the impact of raising the deposit value. When the deposit value increased

in 2017 from five to ten cents, the redemption rate for plastic bottles increased from 54.6% in 2016 to 83% in 2019 (and 64% to 86% for all material types).<sup>10</sup>

**Recycling refund programs with a broad scope leads to more material effectively recycled** — The Container Recycling Institute estimates that making a container eligible for deposit refund substantially increases the likelihood the container will be recycled in the U.S. (see “Nominal Recycling Rates”).<sup>11</sup> Also, in 2009, both New York and Connecticut made bottled water eligible for a refund for the first time. While other factors are likely at play, it is notable

<sup>8</sup> “Re: Importance of Connecticut’s Beverage Container Deposit Program to Essential Supply & Manufacturing Operations,” Glass Packaging Institute, Can Manufacturers Institute, National Association of PET Container Resources. April 2020.

<sup>9</sup> “Global Deposit Book 2022,” Reloop. 2022.

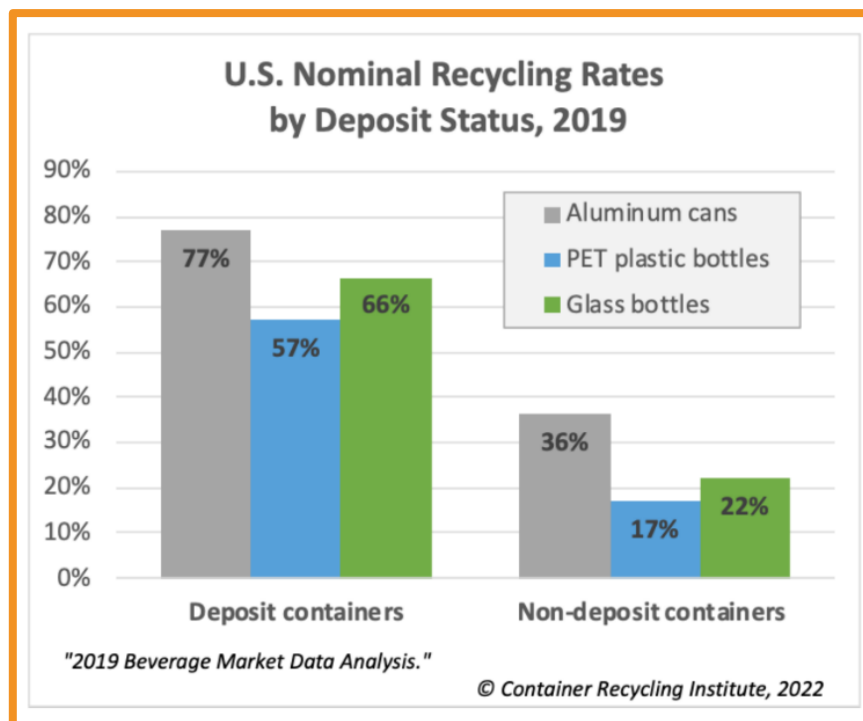
<sup>10</sup> “Oregon,” Bottlebill.org. 2023.

<sup>11</sup> [Container Recycling Institute testimony to Senate Committee on Environment and Public Works](#). September 28, 2023.

that national PET container recycling rate gradually increased following this relatively minor change in two states. The rate increased from 27% in 2008<sup>12</sup> to 30.8% in 2012.<sup>13</sup>

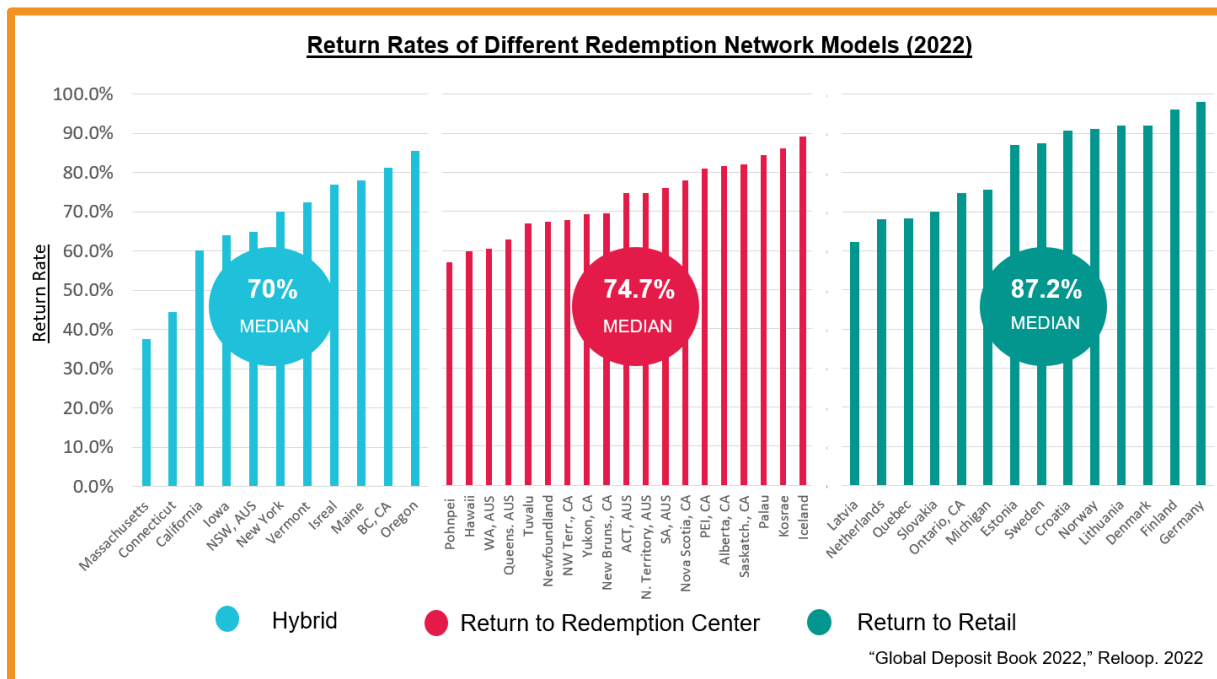
**Convenient access to redemption** – Performance data from the existing recycling refund programs shows that the more return locations available to the public, the higher the return rate tends to be. There are three general redemption system models:

- Return-to-Retail – All beverage retailers accept container types they sell for redemption.
- Return-to-Redemption Center – Returns can only be made at standalone redemption locations, not retail. Given the ubiquity of retail locations vs. new redemption locations, Return-to-Redemption Center models provides several hundred locations or less whereas pure Return-to-Retail systems offer several thousand return locations.
- Hybrid – Hybrid Refund systems allow returns at redemption centers and retailers. However, the design does not simply add redemption centers in addition to retail locations. Instead, the legislation typically allows retailers in the area to refuse redemption if they are located near a redemption center.



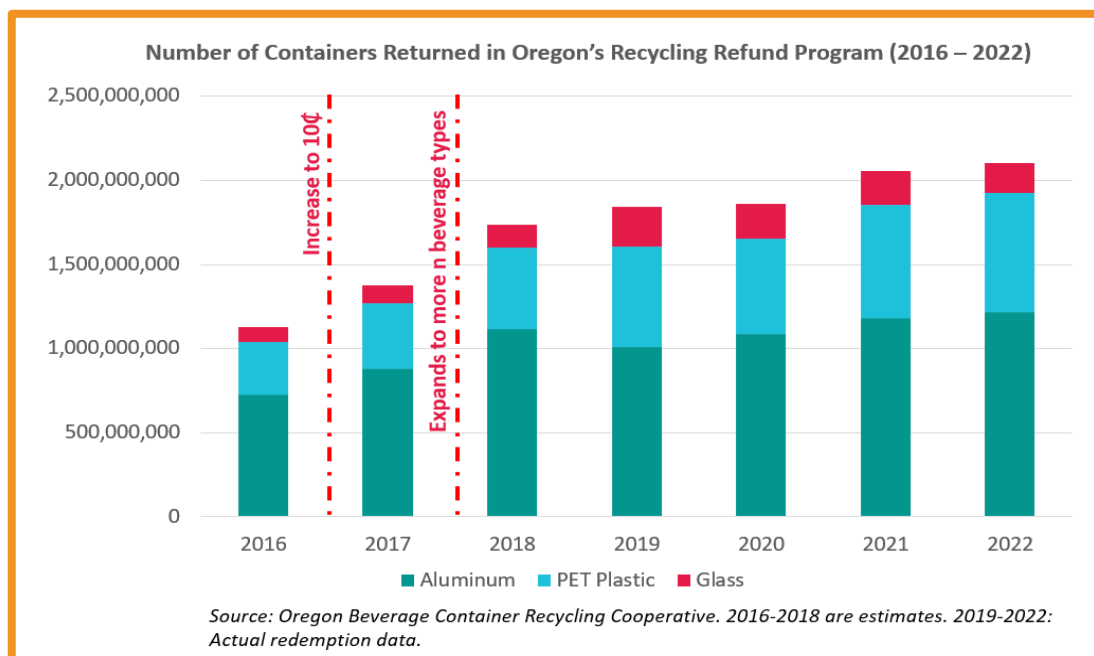
<sup>12</sup> "2008 Recycling Rate Report," PETNetology.com. October 22, 2009.

<sup>13</sup> "PET Container Recycling Rate Tops 30% in 2012," RecyclingToday.com. October 15, 2013.



## Measurable Increase in Supply

As mentioned above, Oregon is the only U.S. state where the deposit value has increased, and redemption data is available to evaluate the impact of this collection strategy. In April 2017, the deposit value increased and in 2018 the program made more beverage categories eligible for a refund. Prior to



2018, only beer, soda, and bottled water were eligible for a refund. In 2018, the program expanded to include nearly all beverage types with the exception of wine and liquor and milk-based products. These two measures increased the number of containers collected by the system by 86% between 2016 and 2022.

<sup>14</sup> The return rate performance should be viewed with the understanding that collection rates are also significantly affected by the deposit value, rather than the number of return locations alone.

## Economic Impacts

In 2019, Eunomia calculated the economic impact of New York's current Recycling Refund program. The authors concluded the program directly created an estimated 3,275 FTE jobs and provided a Gross Value Added (GVA) of \$272 million.

Economic Impact Summary of New York's Recycling Refund Program (Eunomia, 2019)	
Aspect	Value
Direct Jobs Created	3,275 FTE
Direct, Indirect and Induced Jobs Created	5,726 FTE
Canners (Informal Collectors)	4,000 – 8,000 FTE (NYC only)
Commodity Value of Deposit Material	\$55M
Unclaimed Deposits (80% to state, 20% to beverage industry)	\$134M
Gross Value Added	\$272M
Tax Revenue	\$14M
Source: Employment and Economic Impact of Container Deposits – New York, Eunomia, 2019.	

## How Stakeholder Buy-In Was Achieved and Lessons Learned

Of the Northeast deposit states, Connecticut is the only state to have passed legislation to increase the deposit value. Given such a measure can be considered controversial it is notable Connecticut passed the legislation on a bipartisan basis with a near unanimous vote in the Senate. What follows is a review of how different stakeholder needs were considered during the legislative debate:

- Prioritize performance — Making more popular beverage categories like sports drinks and juice eligible for a deposit refund and increasing the deposit value were important for the environmental community and container manufacturers as that was promoted as the most effective way to increase beverage container recycling rates. Previously only soda, water and beer were eligible for a refund. The 2021 law expanded deposits to most beverage categories with exception of liquor, wine and dairy products.
- Prioritize convenience — To address concerns about the public's access to regain their deposit money, the legislature adopted four measures: 1) Raising the handling fee to spur the creation of new redemption centers and support retail return locations, 2) Requiring redemption technology at larger chain stores, 3) Establishing a \$5M grant fund for redemption centers in underserved communities, and 4) Increasing the deposit value which is expected to increase redemption volume and therefore handling fee revenue for redemption locations. Between June 2021 and April 2023, these measures essentially doubled the number of active return locations available to the public from 358 to 699.
- Working with retailers — Retailers sought better compensation for their redemption services and to spread out the redemption volume throughout the state. The raise in the handling fee assisted retailers to better invest in their bottle room experiences and has spurred the creation of 12 new redemption centers as of January 2024. Retailers alone received an additional \$11M in handling fee revenue in 2022. The \$5M grant fund assisted eight redemption centers by 2023.<sup>15</sup> Retailers also sought proper size limits for eligible containers so all containers can be automatically redeemed through Reverse Vending Machines rather than accepted over the counter. The grocery industry also wanted to ensure other retailers were taking back their fair share of beverage containers so the requirement to install reverse vending technology expanded active redemption to hundreds of chain pharmacies, dollar stores and "big box" retailers.

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<sup>15</sup> "DEEP Announced \$1.6m in Beverage Container Recycling Grant Awards in Urban Centers and Environmental Justice Communities," Portal.CT.Gov. June 2023. Accessed via: <https://portal.ct.gov/DEEP/News-Releases/News-Releases---2023/DEEP-Announces-1-6-M-in-Beverage-Container-Recycling-Grant-Awards-in-Urban-and-EJ-Communities>

- Incentivizing Extended Producer Responsibility – The beverage industry was being asked to pay a substantial increase in handling fees to retailers and redemption centers, so lawmakers sought to balance the overall cost of the system. In return, Connecticut lawmakers gradually increased the percentage of unredeemed deposits that the beverage industry could retain from 0% up to 95%. The beverage industry is able to retain a greater share of the unredeemed deposits if they help reach higher return rate targets between 60% and 75%.<sup>16</sup> For example, in financial year 2025 the beverage industry is estimated to gain between \$40.7 and \$41.7M in unredeemed deposits.<sup>17</sup>
- Responding to municipalities – The Connecticut Council of Municipalities and the Council of Small Towns testified in support of the deposit modernization legislation in large part due to high recycling and waste costs borne by taxpayers.<sup>18</sup> The legislation diverts many containers to the refund program, which is paid for by the beverage industry.
- Concerns from the private hauler and MRF industry – Deposit modernization legislation eventually passed despite concerns from the private haulers and Material Recycling Facilities (MRFs). More material diverted from disposal and from the MRF results in less revenue for this industry due to less tipping fees and material revenue on the sale of recyclables. One concern is as more material shifts from the curbside waste and recycling bins, the fixed costs of haulers, waste management, and MRF operators remains while material revenue decreases. The Connecticut law passed without compensation for this anticipated loss to private haulers, waste management entities, and MRF operators. For states interested in replicating Connecticut’s refund program, there are examples where the refund system compensates curbside recycling operators in some way. For example, Quebec’s deposit modernization legislation passed in 2022 required the Producer Responsibility Organization that manages the refund program to negotiate compensation with curbside recycling operators in the province.<sup>19</sup>

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<sup>16</sup> “[Unclaimed Bottle Deposits](#),” Office of Legislative Research. 2023.

<sup>17</sup> Projects a redemption rate of 59% and 60%. *Sales figures based on “Beverage Market Data Analysis – 2018”, Container Recycling Institute. 2020.*

<sup>18</sup> “2021 Testimony,” Connecticut Council of Municipalities. March 2021. Accessed via:

<https://www.cga.ct.gov/2021/envdata/TMY/2021SB-01037-R000319-Hamzy,%20Donna,%20Advocacy%20Manager-Connecticut%20Conference%20of%20Municipalities-TMY.PDF>

<sup>19</sup> “[Regulation respecting the development, implementation and financial support of a deposit-refund system for certain containers](#),” *Legisquebec.gouv.QC.CA*. Sec. 102.