

reloop

NORTHEAST

Reimagining the Bottle Bill

Embargoed until 12:01AM March 15

Embargoed until 12:01AM March 15

EXECUTIVE SUMMARY



Embargoed until 12:01AM March 15

Every year in the US, \$5.1 billion in valuable and reclaimable beverage containers — glass, metal, and plastic — are lost to litter, incinerators, and landfills¹.

In the Northeast region alone, 403 beverage containers per person are wasted every year². In addition to wasted materials, we are also losing investment in infrastructure and technology; suffering supply chain shortages and disruptions; and losing opportunities for local economic development centered on jobs that cannot be outsourced. All of these can be addressed through better collection and use of empty aluminum, glass, and plastic packaging. Curbside recycling has been ineffective in addressing beverage containers. Fortunately, there is a well-developed, cost-effective intervention that already works: the bottle bill.

As part of its three-year Reimagining the Bottle Bill initiative, ReLoop North America spearheaded comprehensive research to determine regional and state-specific impacts of a successful deposit return system, and identified a set of 10 high-performance principles to guide the modernization of existing US systems and the establishment of new ones. The data in this report makes a compelling case for immediate legislative action to modernize bottle bills in the Northeast region.

Need and Opportunity for Change

As we mobilize to address climate change, ocean pollution, pressure on supply chains, and the US's overconsumption, circular economy tools — like bottle bills, and the deposit return systems they establish — become increasingly important.

Deposit return systems are cost-effective, enjoy widespread public support and they work. Modern, high-performing deposit return systems can more quickly advance circular economy principles and practices in ways that curbside recycling, even if enhanced, cannot.

The Northeast states targeted in this initiative present a unique opportunity to adopt modern deposit return systems immediately. Connecticut, Maine, Massachusetts, New York, and Vermont have already laid the groundwork for successful deposit return systems, and can make changes now. These states are also particularly impacted by global warming and plastic waste along extensive

coastlines and waterways — both issues that expanded and modernized DRS address. Litter is a major problem far beyond unsightliness. Plastic leakage along our coasts and in our waterways poses a threat to public health, with research showing that microplastics in air, water and food impact human and fetal neurological and physical development.³

Deploying improvements in these states will have an immediate environmental and economic benefit, and will act as a model for other states across the US.

Modernized deposit return systems address the real and urgent need for quality recycled material. Corporate producers have made ambitious commitments to use more recycled materials in their packaging. At the same time, China's 2017 National Sword policy, which effectively put an end to plastic scrap imports, has resulted in increased costs and logistical challenges for municipal recycling programs. Without better supplies of beverage container materials, the industry's overreliance on carbon-intensive virgin material will continue, resulting in an increase in net material consumption.

Principles of a High-Performing DRS

To evaluate the costs, benefits, and impacts of modernized bottle bills, Reloop worked with an array of stakeholders, and Eunomia Research & Consulting, an international sustainability consultancy, to create a model for the five Northeast states, based on the 10 high-performance principles.



Accessible & Accountable

- 1 EASY & EQUITABLE
- 2 90% COLLECTION RATE
- 3 \$0.10 MINIMUM DEPOSIT
- 4 INCLUSIVE CIRCULAR SYSTEM



Industry Financed

- 5 PRODUCER FUNDED
- 6 FAIR PAY FOR SERVICE PROVIDERS
- 7 FINANCIAL SUPPORT FOR MUNICIPAL RECYCLING PROGRAMS



Well Managed & Regulated

- 8 CLEAR SYSTEM STANDARDS & FUNCTIONS
- 9 PRODUCER REPORTING ON UNITS SOLD
- 10 GOVERNMENT OVERSIGHT AND ENFORCEMENT

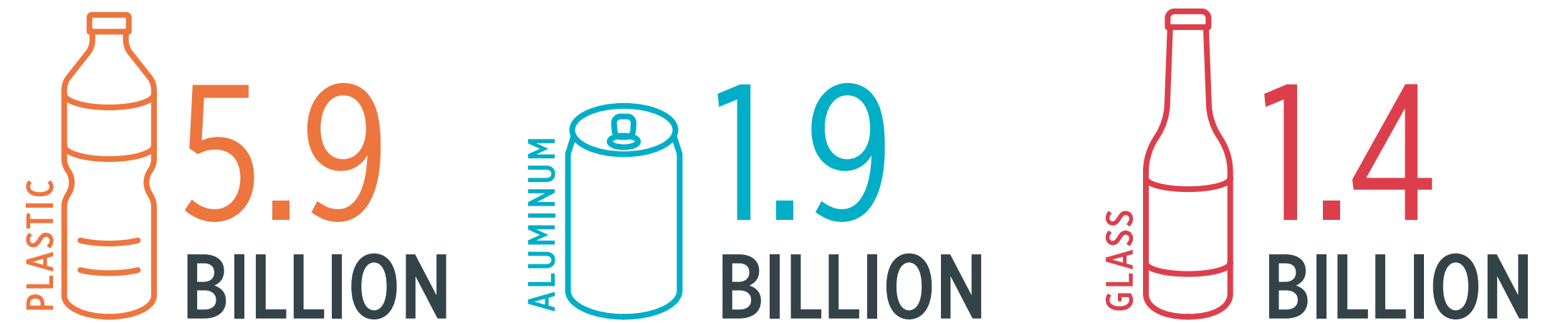
Modeling Impacts: the Potential of Modernized DRS

Under the conditions of the model, every targeted Northeast state would see an increase in the return rate for beverage containers.

Over nine billion additional containers — roughly 1.9 million tons of material — would be recycled across the five states each year, providing a 33% increase in the material available to replace virgin material in new beverage containers. In terms of increased beverage container recycling, plastic is estimated to see the largest increase, with an additional 5.9 billion units being recycled; aluminum and glass follow with an additional 1.9 billion and 1.4 billion containers processed respectively. Under high-performance DRS principles, about 463,000 tons of additional material will be recycled across the Northeast region annually.

This would both help cities and states to meet their climate, recycling and landfill diversion goals, and allow consumer packaging goods brands to meet up to half recycled content corporate commitments and regulatory obligations. The system would cost producers just one to 3.6 cents per container (differs by state), and much of their costs would be offset by material revenue and a portion of unclaimed deposits.

ADDITIONAL UNITS RECYCLED



Modeling Impacts, Continued: the Potential of Modernized DRS

Deposit eligibility would be expanded to include 95% of beverage containers, and the deposit value raised to ten cents from the five cents that is typical across the region.

Across the region, 89% of redemption sites would be retailer-based, while total redemption points would be expanded to one per 1,400 consumers, ensuring access within two miles for residents in urban areas (within 1/2 mile in New York City), and within five miles for rural residents. Not only would the system become more accessible and easy to use for consumers, but litter would decline by up to 34% overall.

Overall, a modernized system would reduce regional greenhouse gas emissions by roughly 550,000 metric tons, save municipalities between \$111 million and \$160 million, and create over 2,700 jobs.

An equitable transition will be critically important. The phase-in of modernized policies will result in approximately \$822 million in unclaimed deposits in the first two years — funds that can be dedicated to aid material recovery facilities (MRFs), municipal recycling programs, and other stakeholders in the transition through investments in equipment and technology, training, and other key needs. Canners likewise will be engaged positively in the transition to an inclusive DRS. State agencies, too, will get the resources they need — more than \$44 million annually — to effectively regulate modernized DRSs.



Time to Act

Deposit return systems work, and they work well. But reforming established systems can be complicated: diverse stakeholders who are involved have a varied set of interests, sometimes aligned, sometimes competing, that must be considered in any reform effort. This research, and this report, are just the first step in Reloop's three-year Reimagining the Bottle Bill campaign.

The time for comprehensive waste policy reform is now. The principles presented here offer an immediate opportunity to build on a familiar, successful policy that has been in use for decades; to establish a modernized, replicable model within the US for other states to follow; and to create a springboard for the widespread use of refillable containers, higher recycled content rates, and longer-term policy goals like Extended Producer Responsibility that will operationalize a circular economy.



Letter from the Director

Elizabeth Balkan

DIRECTOR, RELOOP,
NORTH AMERICA



Time is not on our side. The environmental implications of our waste-based manufacturing and overconsumption, and the public health risks posed by the plastics crisis, demand decisive and urgent action now.

Transforming our current economy — which operates in linear take-make-and-dispose terms — into a circular economy, where resources remain resources, will require capital investments, technological innovations and regulatory shifts. At the same time, we can't ignore proven solutions like deposit return systems, which cost taxpayers nothing, enjoy broad public support, and stimulate local, job-intensive economic development.

I am grateful for the many diverse stakeholders — from individuals throughout the supply chain to advocates, agency experts, and government leaders — who inspired and contributed to this work, as well as those who will disseminate these findings locally in support of meaningful, immediate change. Thank you for helping us get closer to realizing a circular economy.

We have an obligation to sustainably manage our resources so that current and future generations can enjoy just and healthy communities. As the data in this report irrefutably show, bottle bills are one solution that can help us make that change. Thank you for being part of the solution.

Table of Contents

Introduction

- Understanding the Circular Economy
- Deposit Return Systems: A Tool for Effective Recycling
- Spotlighting the Northeast
- The Need for Action

Modern, High-Performing DRS: A Key Part of the Solution

- What is a DRS?
- What is a High-Performing DRS?

Modeling State-Level Modernization Impacts

- Methodology
- Current / Future Conditions
 - CONNECTICUT
 - MAINE
 - MASSACHUSETTS
 - NEW YORK
 - VERMONT

Regional Impacts of DRS Modernization

- Environment / Climate
- Healthy and Just Communities
- Economic Impacts
- Impacts on Municipalities and State Agencies
- Impacts on Producers

The Transition to a Modernized DRS

- Equitable Transitioning
- Modernized DRSs Enable the Transition to Refillables

Conclusion

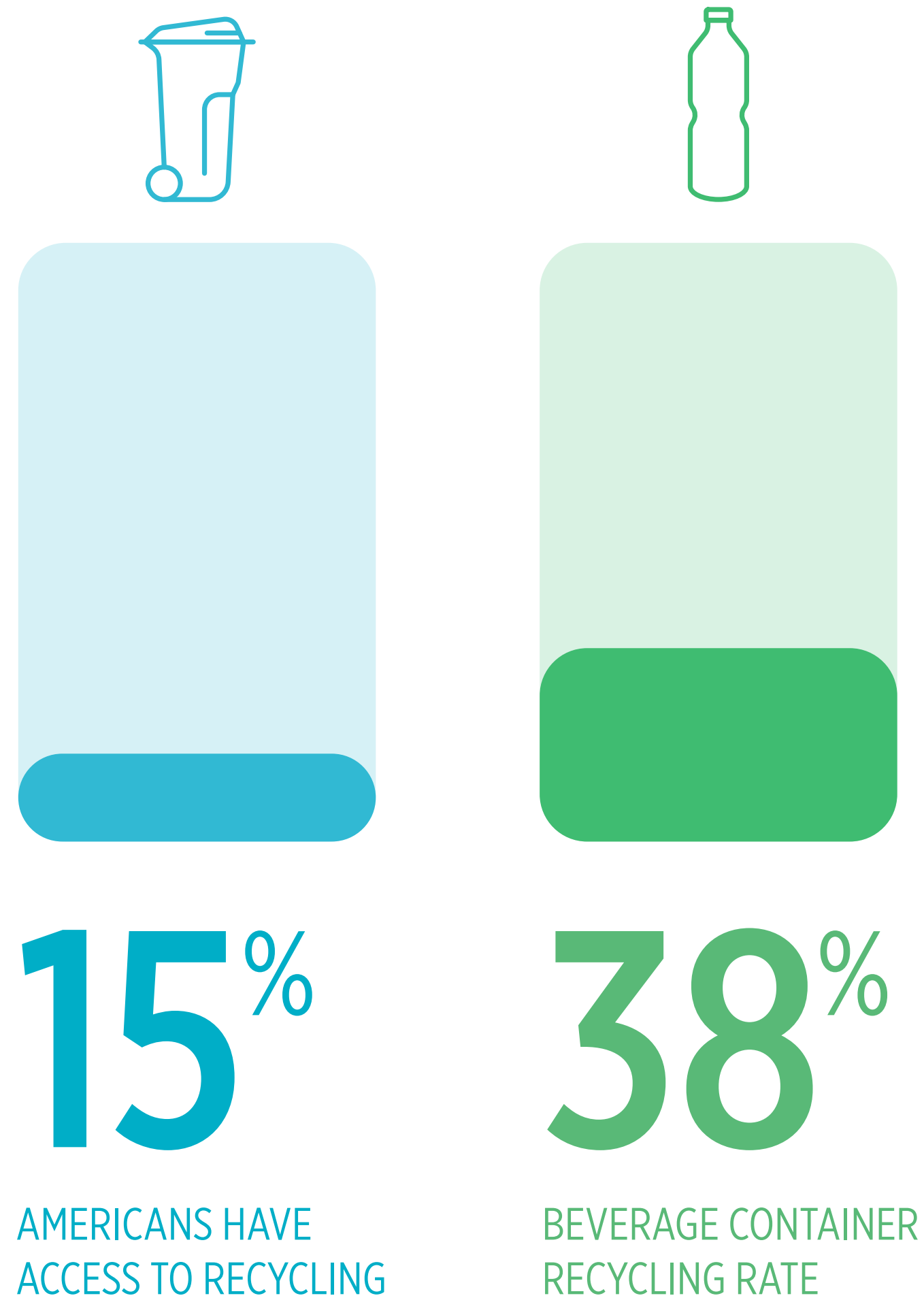
Appendix

Embargoed until 12:01AM March 15

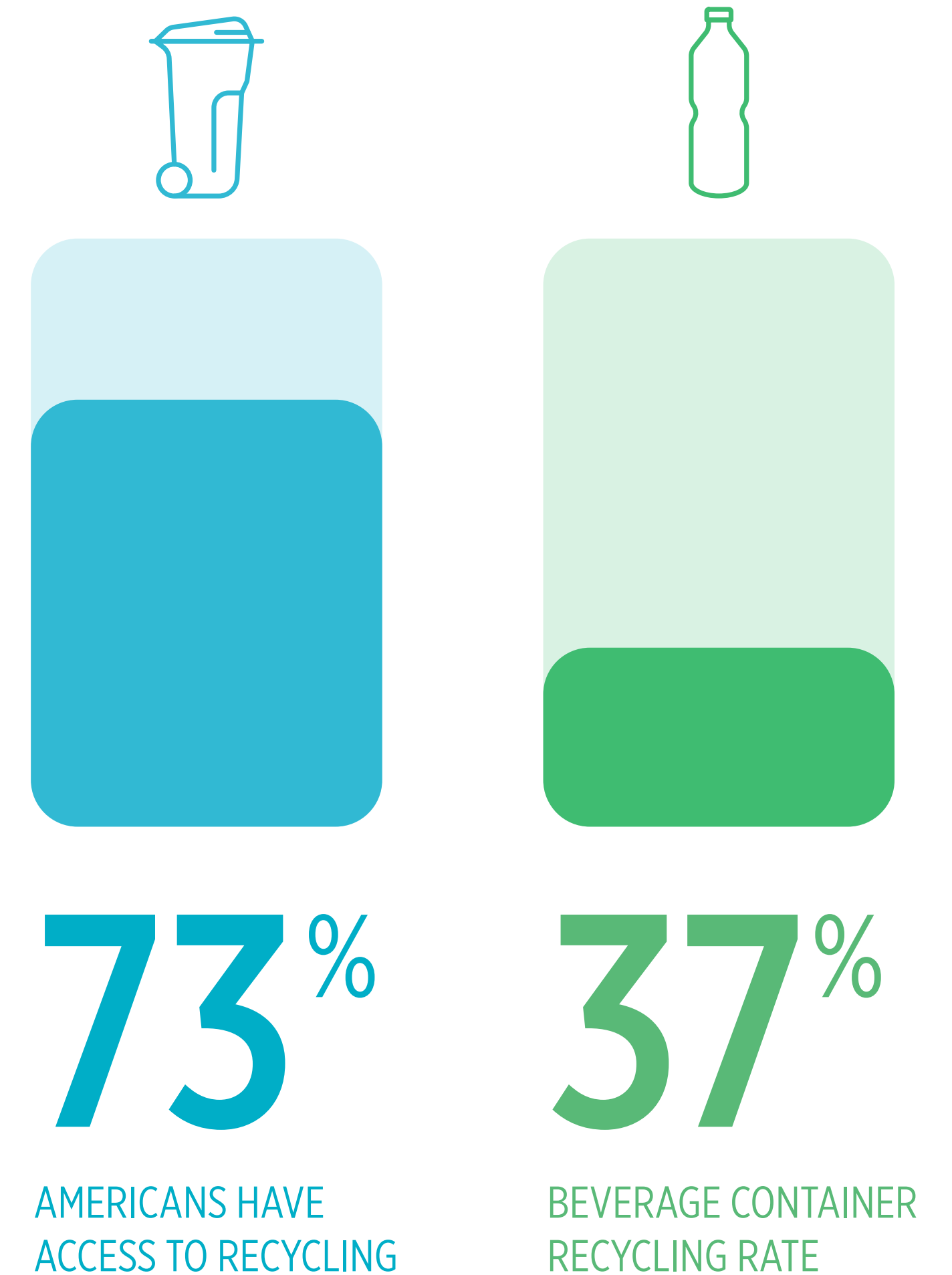
INTRODUCTION

Every year in the US, **\$5.1 billion** in valuable and reclaimable beverage containers — glass, metal, and plastic — **are lost to litter, incinerators, and landfills.**⁴ That amounts to 140 billion individual containers, or the equivalent of a 12-pack of empty soda bottles wasted every second of every day for 370 years. In the Northeast region alone, 403 beverage containers per person are discarded every year.⁵

This unacceptable status quo exists despite widespread efforts to reduce waste: according to official numbers, **more than 73% of the US population had access to curbside recycling** as of 2011 — up from only about 15% in the early 1990s⁶. However, **the percentage of beverage containers that are recycled has hovered at just under 40%** over the same period⁷. By weight and volume, beverage containers are the number one item found littered in coastal areas in the US and around the world. Despite their ready recyclability, curbside recycling is simply not working for beverage containers.



1990



2017

Fortunately, there is a well-developed, cost-effective intervention that already works: the bottle bill. Bottle bills establish deposit return systems that incentivize both producers and consumers to recycle containers, and have been used for decades in multiple states and countries all over the world.

Reloop has researched deposit return systems across the world to understand the elements common to successful systems. This analysis has enabled Reloop North America to identify a set of **10 high-performance principles to guide the modernization of existing US systems** and the establishment of new ones. The goal is simply to lay the groundwork for a vastly improved materials management system, where resources remain resources rather than becoming waste that fills our neighborhoods, our landfills, and our oceans.

What is Reloop North America?

Reloop's vision is a world free of pollution, where an ambitious and integrated circular economy allows our precious resources to remain resources, so that people, businesses, and nature can flourish.

The organization has been active in Europe since 2015, and launched in the US as a 501(c)(3) / 501(c)(4) in 2020. Reloop uses research and multi-stakeholder education to drive public policy and accelerate the transition to a circular economy.

Reloop believes a thriving circular economy is built on policy that:

- Supports the waste hierarchy
- Encourages existing best practices and fosters innovation
- Applies economic instruments when necessary
- Strives for continuous improvement

For more information, see www.reloopplatform.org



Understanding the Circular Economy

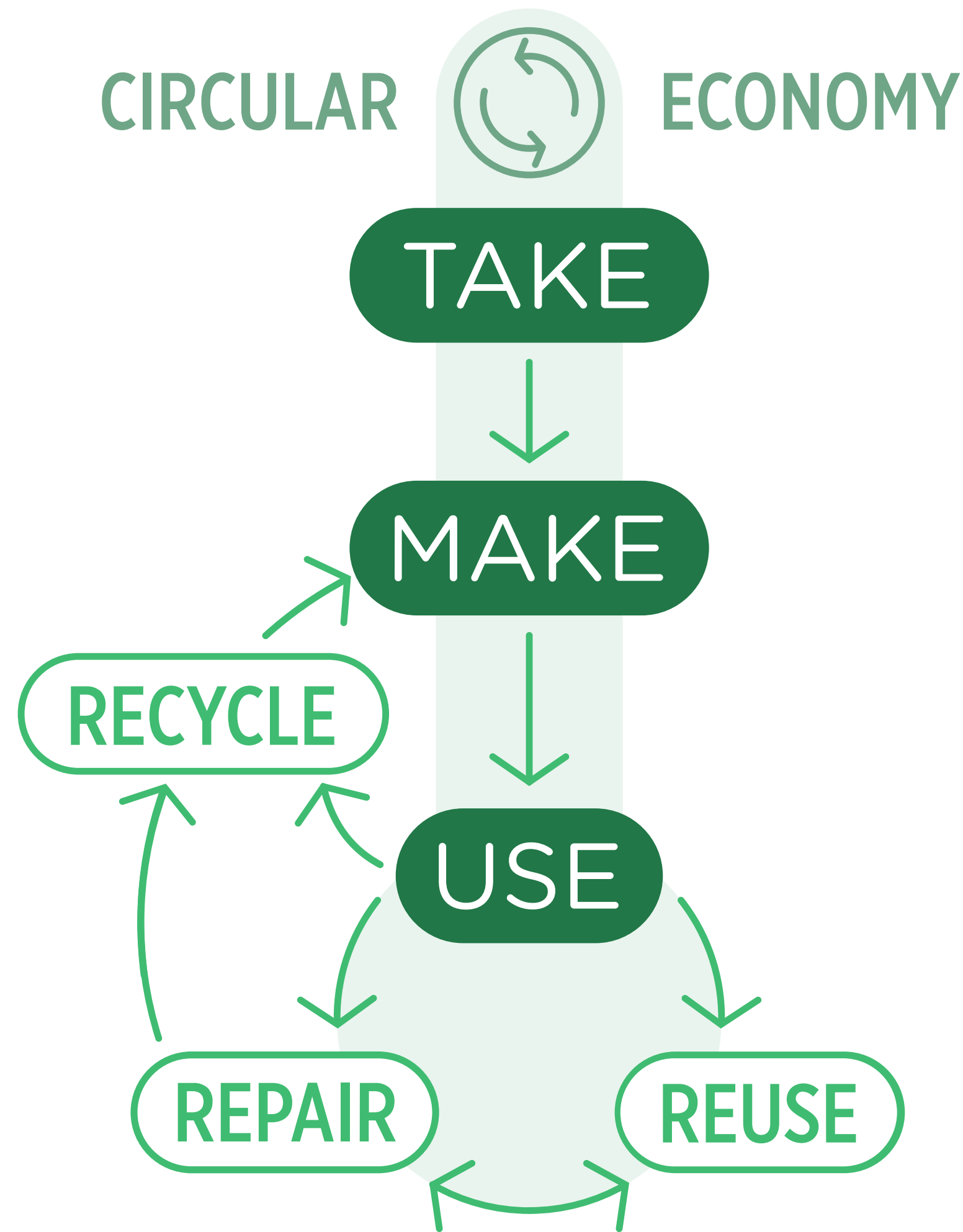
The driving force behind deposit return systems, recycled content mandates, and other policy tools is the concept of a circular economy. According to the Ellen MacArthur Foundation, a circular economy eliminates waste and pollution, circulates products and materials through reuse, repair, or remanufacture, and regenerates and enhances nature⁸.

In the case of beverage containers, the circular economy is best embodied through reuse (where a container is refilled many times without being remanufactured) or bottle-to-bottle (or can-to-can) recycling. Bottle-to-bottle recycling refers to recycling processes where captured material streams are sufficiently high quality to be recycled directly into new containers rather than downcycled to a lesser use. Bottle-to-bottle recycling is the best remanufacturing use for material because it allows material to be used again and again. One analysis found that raising recycling rates for plastic, aluminum, and glass by 50%-80% in Europe would cut its industrial emissions by a third⁹. Despite this obvious carbon reduction potential, current research reveals that **less than 2% of plastic is currently recycled in a closed-loop capacity**.¹⁰

Downcycling, on the other hand, devalues materials by using them for a downgraded purpose, typically one where they can not be recycled again, such as turning plastic beverage containers into carpet and clothing textiles.

To ensure recycling actually takes place, packaging should not be considered recyclable unless:

- It can be effectively and efficiently recycled
- It gets recycled at scale and turned into secondary raw material
- New packaging is designed for circularity and is recyclable or compostable at scale across the US
- At least 95% of a packaging unit will be recyclable
- Recycling the packaging is accessible and easy for all¹¹



DEPOSIT RETURN SYSTEMS ARE JUST ONE OF MANY TOOLS THAT HELP SHIFT PRODUCER AND CONSUMER THINKING TO RECOGNIZE THE VALUE OF RESOURCES – THE FIRST STEP IN SHIFTING FROM A SYSTEM THAT FACILITATES DISPOSAL TO ONE THAT PRIORITIZES REDUCTION, LONGEVITY, AND REUSE.

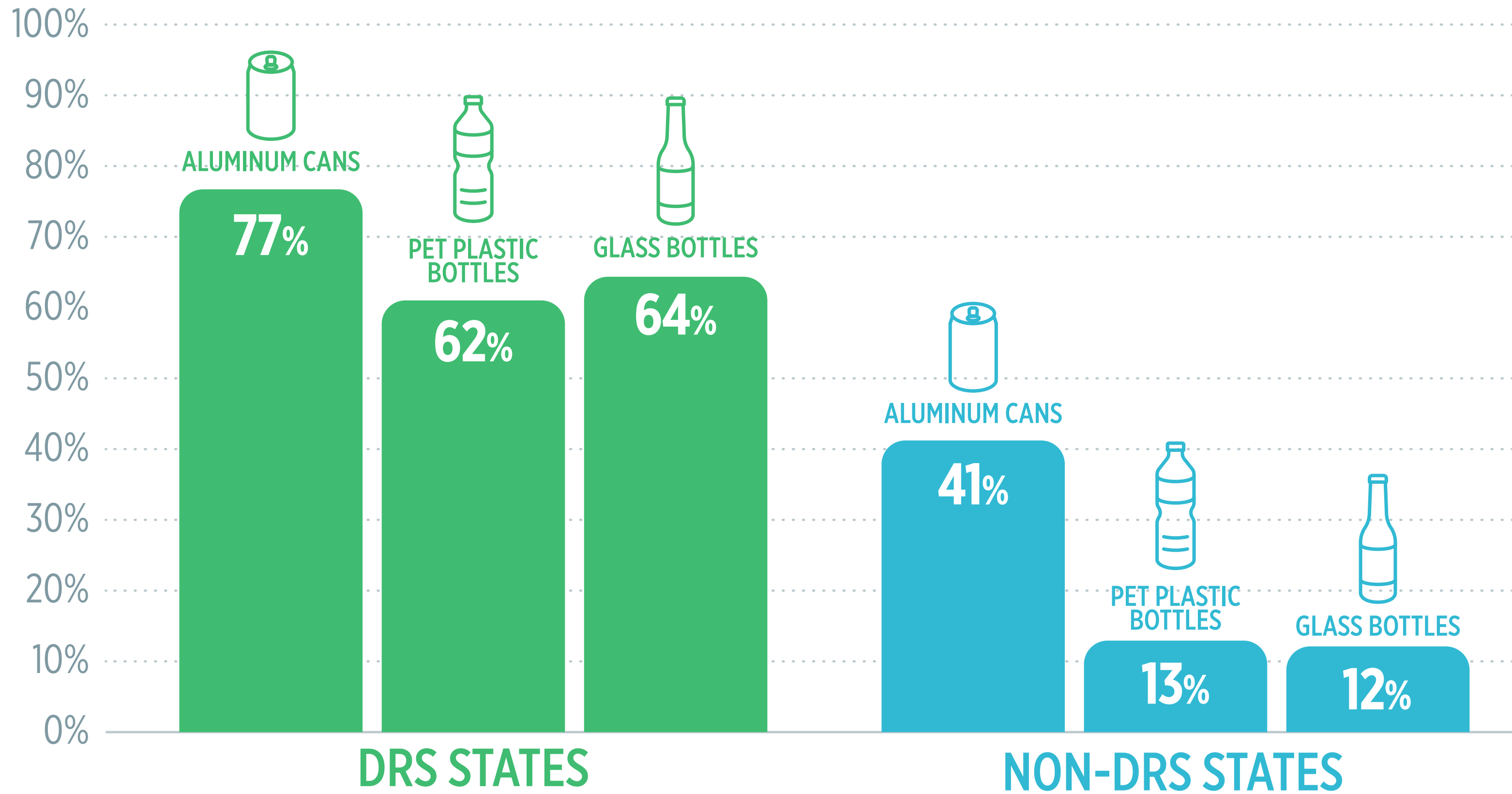


Deposit Return Systems: A Tool for Effective Recycling

Deposit return systems (DRSs) are effective. First adopted in the US in the late 1970s, deposit return systems require consumers to pay a deposit on any container they purchase that is included in the system. The deposit is then fully refunded when the container is returned. The result of this simple recycling incentive has been higher container recycling rates, higher-quality material for recycling or reuse, and reduced litter.

- Recycling rates for glass, aluminum, and polyethylene terephthalate (PET) plastic in states with a DRS are more than double the rates in states without one¹², and their litter rates are 30% lower.¹³
- Within bottle bill states, recycling rates for containers covered by bottle bill requirements are significantly higher than recycling rates for containers that are excluded. The trends in glass recycling are particularly notable, with recycling rates for included glass containers surging to more than six times higher than rates for excluded containers.¹⁴
- A study of the effects of DRSs when first adopted in the US showed **a consistent 70-84% reduction in beverage container litter and a 34-47% reduction in total litter.**¹⁵

U.S. Recycling Rates by Deposit Status, 2018



DRSs also encourage producer responsibility by shifting the cost of managing beverage container materials from municipalities and taxpayers to the producers of that material.

DRSs enjoy widespread public support: a 2020 survey by the World Wildlife Fund found that 88% of respondents supported the creation of a nationwide plastic beverage refund or deposit program.¹⁶

"2018 Beverage Market Data Analysis", Container Recycling Institute, 2020



Spotlighting the Northeast

This analysis focuses on the Northeast because five states in this region have already laid the groundwork for successful deposit return systems. Connecticut, Maine, Massachusetts, New York, and Vermont enacted their DRSs between 1976 and 1982, and have achieved return rates ranging from 44% to 84% for containers included in the systems. At the same time, outdated features in these systems result in the landfilling, incineration, or littering of more than 14 billion glass, plastic and aluminum beverage containers per year in these states at present. The DRS concept is familiar and proven in Northeast states, which can enact change in the immediate future.

Modernizing the systems across the Northeast region will enable each of these states to elevate their redemption rates to 90% or more, satisfy increasing demand for quality materials, intercept additional materials currently excluded from their systems, and serve as a nationwide model for other states to enhance their existing systems or adopt new DRSs based on high-performance principles.

The Northeast is particularly impacted by both climate change¹⁷ and plastic waste along its extensive coastlines and waterways — both issues that expanded and modernized DRSs directly address.



The Need for Action

In recent years, **recycling system conditions have eroded significantly**. Falling oil prices, the near-total ban of plastic exports to China, and the Covid-19 pandemic have all contributed to crumbling market conditions. Municipal recycling programs that generated revenue from their mixed recyclables now must pay more per ton for material processing than to landfill or incinerate the commodities.

Corporate producers are making public commitments to use more recycling materials in their processes with mixed results,¹⁸ in part because of a lack of quality recycled material. Their shareholders and customers, meanwhile, are beginning to demand that they follow through with these promises.

These conditions, combined with increasing generation of single-use containers and packaging materials¹⁹ and mounting pressure to address plastic and other packaging-related environmental problems, have created a full-blown environmental crisis.

While several challenges confront our recycling systems and create the imperative for high-performing deposit return system, we detail here two of the most pressing ones.

1 China National Sword

The final destination of the material intercepted by curbside and other recycling programs has been questionable.

For decades, much of the recyclable waste the US produced was shipped to China, where it was accepted and processed with little regard for quality. That practice all but ended in 2017 when the Chinese government passed a series of policies known as the China National Sword, banning the import of some materials, and establishing tight restrictions on the amount of contamination permitted in others. These new policies resulted in a 41% decline in the value of curbside residential recycling materials between 2017 and 2020. ²⁰

The US's long dependence on China to enable its broken system of overconsumption and careless disposal is over.



2 Increasing Costs and Logistics Challenges

Even before the recent changes, municipalities faced processing challenges with contamination and market challenges in finding outlets for some materials.

Glass breakage and relative weight per unit of volume makes it particularly unattractive for mixed-materials recycling, with the result that glass collected as part of curbside programs is either substantially downcycled (e.g. as cover for landfills) or not recycled at all. Meanwhile, glass contamination has degraded the value of highly marketable commodities, like paper.

The US Environmental Protection Agency estimates that just 25% of the 12.3 million tons of glass produced in 2018 was recycled.²¹

Compounding all of the challenges within the recycling industry are the widespread impacts of resource mismanagement, particularly ocean and waterway pollution and climate change. The consequences of failing to modernize the industry are dire but diffuse, with little incentive for stakeholders, from households to industry players, to engage with and implement solutions.

Taken together, the effect of recent conditions has devastated municipal recycling programs. Cities that formerly received revenue for their collected recyclables are now spending precious funds to keep their recycling programs afloat.

- Of 62 Massachusetts towns surveyed, 57 (92%) saw the costs of their recycling programs increase between 2017 and 2020. Boston's program went from a net cost of \$89,000/year in 2017 to more than \$5,000,000 in 2020.²²
- Connecticut cities and towns saw similar increases, with revenues of roughly \$20-25/ton of recyclables shifting to a net cost of \$75/ton or more.²³

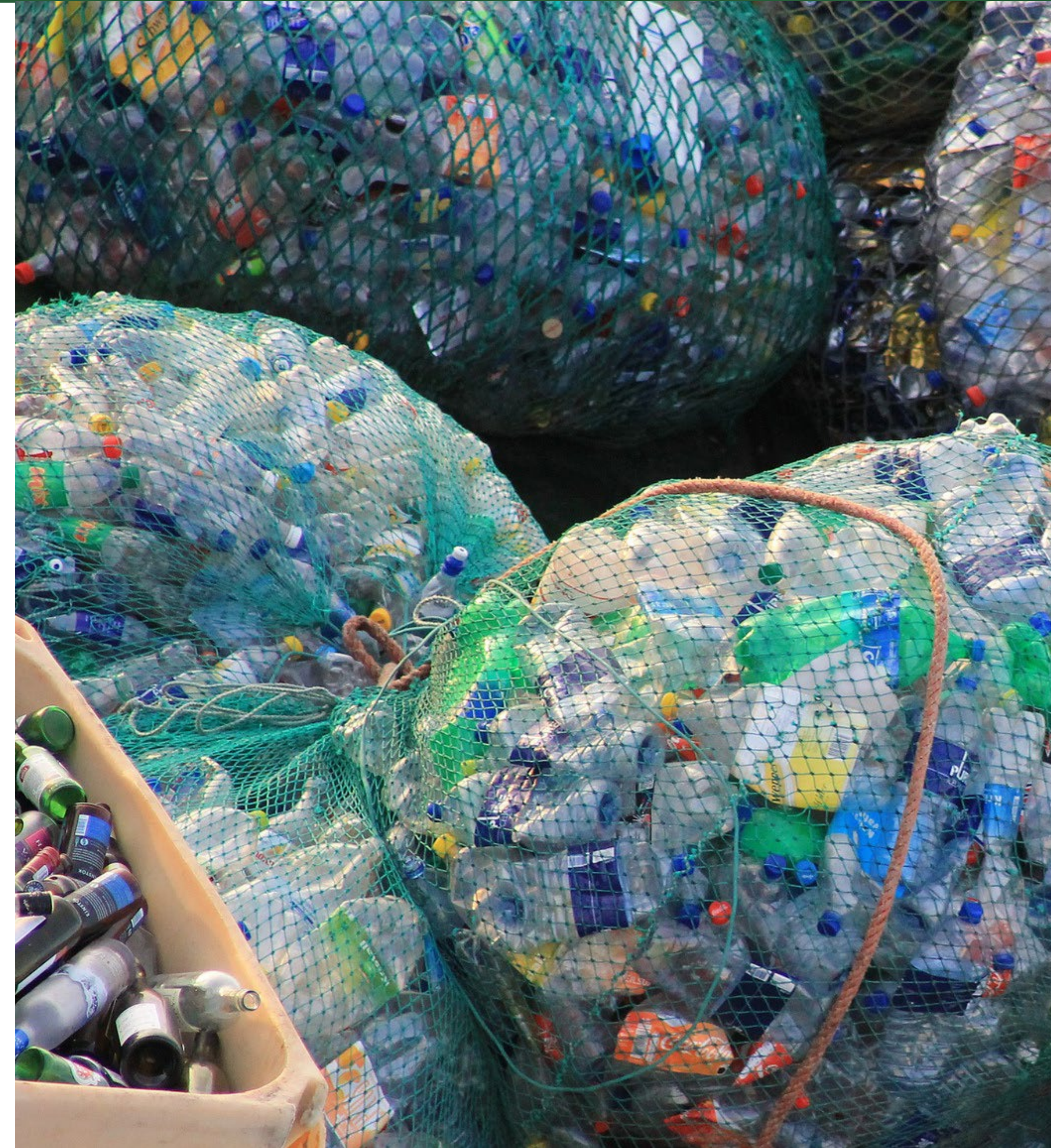


MODERN, HIGH-
PERFORMING DRS:
A KEY PART OF
THE SOLUTION

Even at their peak, curbside recycling programs offered only a partial solution to the US's waste problem.

While consumers may feel they are making a real difference, increasing access to curbside recycling has had only marginal impacts on the percentage of glass, aluminum, and plastic containers that are actually recycled. Meanwhile, some of plastics collected in many curbside recycling programs (especially single-stream recycling, where paper, cans, bottles, and all other materials are collected together) are no longer considered food grade, so typically cannot directly be used in bottle-to-bottle recycling, while mixed crushed glass is costly to process into new glass bottles, resulting in a dearth of quality materials needed to meet producer recycled content commitments. The Wall Street Journal reports a shortage of recycled PET plastic²⁴, but **the challenge is one of logistics: we need a better means of collecting a large volume of quality recycled materials.**

Deposit return systems offer an opportunity to divert critical materials from final disposal and litter streams, to ease the financial pressure on curbside recycling, waste disposal and litter abatement programs, and to ensure that valuable commodities end up where we need them: reused or reborn as new containers. Furthermore, reforming DRSs presents an economic development promise: stimulating investment in recycling infrastructure and building local, more resilient economies, with jobs that cannot be outsourced. Modern, high-performing DRSs can more quickly advance circular economy principles and practices in ways that curbside recycling, even if enhanced, cannot.





What is a DRS?

A Deposit Return System (DRS) is a producer-financed system that requires consumers to pay a deposit on beverage containers at the point of purchase.

The deposit is then fully refunded when the container is returned. DRSs are proven to be the most cost-effective way to deliver the quality and quantity of material needed to enhance closed-loop recycling and minimize the need for virgin resources.

DRSs work. The percentage of aluminum, PET plastic, and glass containers that is recycled in states with a DRS is more than double the percentage in states without one²⁵. Within DRS states, the recycling rates for included (deposit-eligible) containers is up to six times higher than the rate of recycling for excluded containers.





What is a High-Performing DRS?

DRSs have operated successfully in the US and globally for decades. Reloop determined a set of principles for what makes a high-performing DRS through extensive research of DRSs from all over the world, including in countries like Norway and Germany, which routinely achieve return rates above 90%.²⁶

The findings from Reloop's extensive and ongoing research are clear. High-performing DRSs share key policy or program elements that can be organized into three main categories:

- **Accessible and Accountable**

- **Industry Financed**

- **Well Managed and Regulated**

Each of the principles, detailed below, was used as the foundation for the cost/benefit analysis explained in Section 3. While it was not practical or possible to include all 10 principles in our analytical models, we note below how the principles relate to each component of the model, how they will be addressed in future steps, and what additional analysis may be needed to determine the practical cost implications. For additional details on the modeling conditions and relevant data refer to the Appendix.

TEN HIGH-PERFORMING PRINCIPLES



Accessible & Accountable

- 1 EASY & EQUITABLE
- 2 90% COLLECTION RATE
- 3 \$0.10 MINIMUM DEPOSIT
- 4 INCLUSIVE CIRCULAR SYSTEM



Industry Financed

- 5 PRODUCER FUNDED
- 6 FAIR PAY FOR SERVICE PROVIDERS
- 7 FINANCIAL SUPPORT FOR MUNICIPAL RECYCLING PROGRAMS



Well Managed & Regulated

- 8 CLEAR SYSTEM STANDARDS & FUNCTIONS
- 9 PRODUCER REPORTING ON UNITS SOLD
- 10 GOVERNMENT OVERSIGHT AND ENFORCEMENT



Accessible & Accountable

1 EASY & EQUITABLE

Make deposit return system (DRS) simple for all consumers to understand and use. Establish a large network of redemption points, focused on retailers, so returning empties becomes a routine part of everyday life. In jurisdictions where the informal sector plays a critical role in collection and redemption, legally recognize and protect the rights of canners.

2 90% COLLECTION RATE

Set a high redemption target through legislation to hold producers accountable for meeting it, with enforced penalties if they do not.

3 \$0.10 MINIMUM DEPOSIT

Motivate consumers to return containers by having a high-enough deposit, paired with easy access, to ensure higher levels of redemption.

4 INCLUSIVE CIRCULAR SYSTEM

Close the loop on recycling by including a full range of beverage containers and ensuring materials collected are uncontaminated and of good enough quality for reuse or remanufacture.



Industry Financed

5 PRODUCER FUNDED

Require beverage producers to finance a system capable of achieving a 90% target redemption rate.

6 FAIR PAY FOR SERVICE PROVIDERS

Set a fair handling fee for parties providing services and redemption infrastructure that covers the cost of their receiving and storing beverage containers.

7 FINANCIAL SUPPORT FOR MUNICIPAL RECYCLING PROGRAMS

Ensure an equitable transition to a modern DRS by reinvesting an adequate portion of revenue back into municipal systems and service providers in the initial phase of modernization.

Well Managed & Regulated

8 CLEAR SYSTEM STANDARDS & FUNCTIONS

Establish independent monitoring and safeguards to meet legislative requirements, and standards that producers can follow in the DRS process:

- Product Placement on Market (recycling design, labeling)
- Accessible and equitable service standards
- Administration (mandatory registration and database of barcoded containers)
- Redemption (transparent recording/reporting of money and material flow data)
- Pickup and Recycling (contracts, processing, material ownership)
- Education and outreach (public campaigns)

9 PRODUCER REPORTING ON UNITS SOLD

Require containers to have barcode verification to ensure efficient annual reporting on audited sales and units collected.

10 GOVERNMENT OVERSIGHT AND ENFORCEMENT

Establish specific government audit, oversight, and enforcement responsibilities. Set enforceable reporting requirements for producers with penalties high enough to incentivize compliance and system improvement investments, including government ability to raise deposit value if producers do not meet targets.

What Does a High-performing DRS Look Like?

DRSs — bottle bills — have a long history of success in this country and, when optimized around high-performing principles, are a critical tool in the shift to a more environmentally responsible, circular economy. For the first time, industry players from across the supply chain came together in partnership with Reloop North America to support an independent study of how DRS can be improved and optimized to play an even greater role in the future. Below, we present hard numbers that show how to improve DRS in five Northeastern states, what those improvements will cost, and what their impact will be.



Redemption vs. Recycling rate

These two terms sound the same but have a distinction that makes a difference when it comes to DRSs.

- **Redemption rate** is the number of returned DRS containers divided by the total sales of DRS containers sold.²⁷
- **Recycling rate** for beverage containers is the number of containers collected through DRS plus those collected from curbside services (minus a process loss percentage) divided by the total number of containers lost in processing.

High-performing DRS have a 90% redemption rate or higher, meaning that 90% of beverage containers sold are reclaimed through the system. However, the recycling rate for all materials can be higher because there are other ways of collecting recyclable materials such as curbside recycling.



MODELING STATE-LEVEL MODERNIZATION IMPACTS

Embargoed until 12:01AM March 15

Methodology

The goal of this research is to build high-performing, resilient recycling infrastructure that harmonizes existing deposit systems in Connecticut, Massachusetts, Maine, New York, and Vermont.

Modernizing these existing systems will bring a suite of environmental, social, and economic benefits and create a model that can be replicated in other states across the US.

The numbers presented below are the findings of analysis and modeling performed by Eunomia Research and Consulting Inc. for Reloop North America. The primary task was to **determine the impact of systems that align with Reloop’s high-performance principles** once needed reforms were implemented.

The model compared current DRSs in the Northeast US against a hypothetical high-performance system, while calculating likely impacts if a high-performance system was implemented.

The analysis below is a critical step toward implementation, providing insight into the granular details that will enable the targeted states to modernize their existing DRSs.

Modernized DRSs may — but do not need to — include a “bag drop” option, whereby residents can return containers in bulk, sometimes for a “convenience fee” that recognizes the additional manual labor and transport required to process containers this way.

When a bag drop system is in place, most states would see between 11% and 25% of material return through bag drop. Additionally in this scenario, about 23%-35% of material would be returned through retailer reverse vending machines (RVMs). When bag drop is not included, then the rates for retail RVM return would be higher and they would exceed 50% in some states.

With the bag drop option, total system costs, total jobs, and per-container costs increase slightly; capital costs decline slightly compared to systems without bag drop because of the decreased need for RVMs with a bag drop system. According to the model, the total tonnage of containers recycled is effectively the same in either scenario, and the total greenhouse gas emissions are less than five percent higher. For this reason, the findings presented here only include bag drop scenario impacts where they are most pertinent.

Current / Future Conditions

The five states targeted by this research all have long-standing bottle bills but varied starting conditions from which to implement a modernized DRS. A brief overview of the current conditions and select impacts from the analysis on each of the five states is presented below.

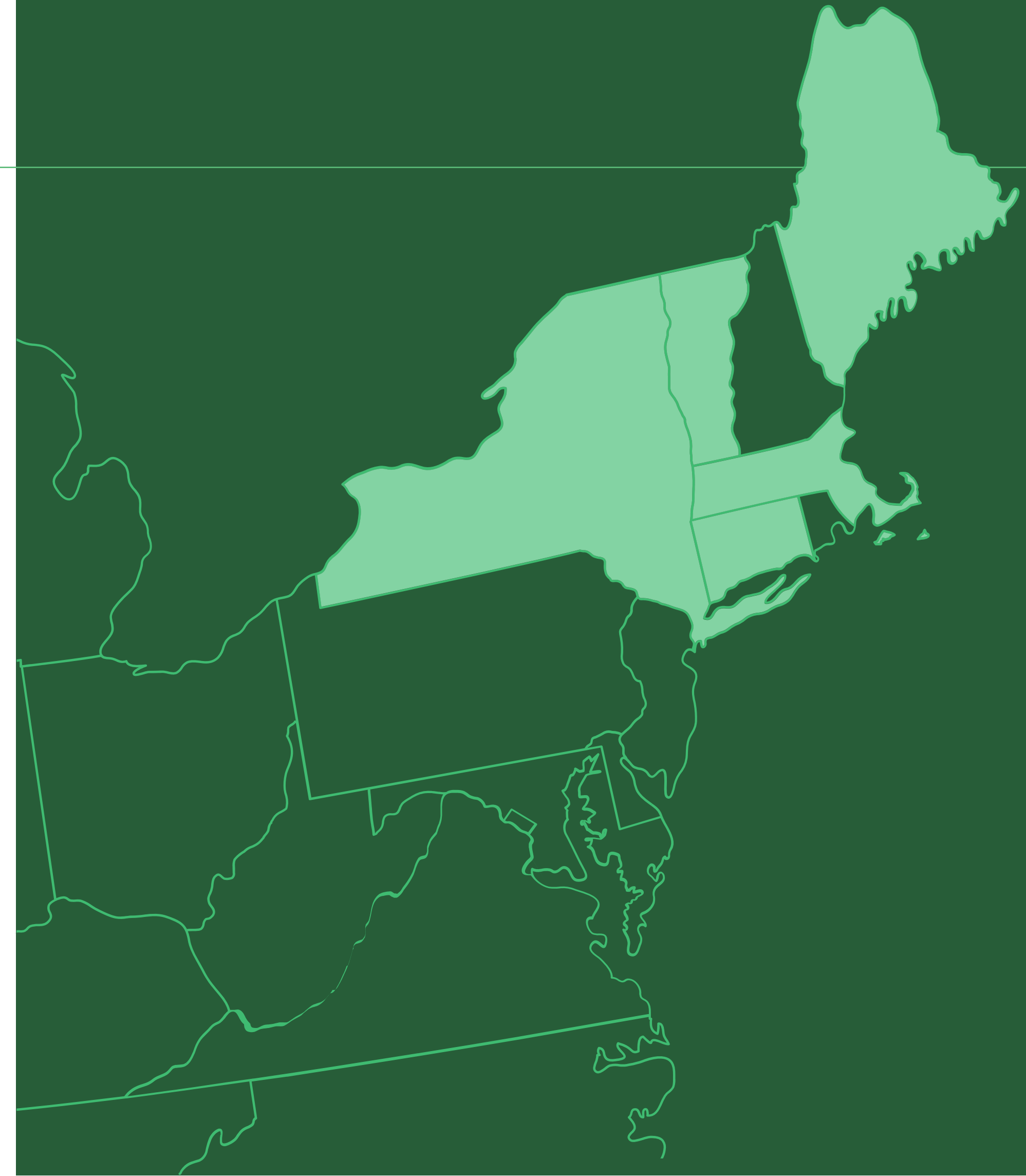
CONNECTICUT

MAINE

MASSACHUSETTS

NEW YORK

VERMONT



CONNECTICUT

Under Connecticut’s current DRS, just 44% of covered beverage containers are returned for recycling. This means that some 1.5 billion containers are wasted annually. In 2021, however, the state adopted Public Act 21-58, which will enact many of the high-performing practices outlined in this report. Namely, the new law will:

- Increase deposit value from five cents to 10 cents by 2023.
- Expand deposit-eligible containers to include non-carbonated beverages (e.g. juices, teas, sports drinks), hard ciders, and hard seltzer beverages (effective January 2023).
- Raise the handling fees paid by beverage distributors to support the improved redemption network.

The law established a Stewardship Organization that lacks specifics on producer control and oversight, raising concerns about standards and accountability.

Beverage Containers included in DRS: Current vs Modernized

ACTUAL DRS



Carbonated Soft Drinks
Beer & Hard Cider
Sparkling Water
Non-Sparkling Water (≤1 gal)

77%

Energy Drinks
Sports Drinks
Fruit & Vegetables Beverages
Ready-to-drink Tea & Coffee
Wellness & Functional Drinks
Wine
Spirits (Liquor)
Milk and Dairy Alternatives

MODERNIZED DRS



Carbonated Soft Drinks
Beer & Hard Cider
Sparkling Water
Non-Sparkling Water (≤1 gal)
Energy Drinks
Sports Drinks

Fruit & Vegetables Beverages
Ready-to-drink Tea & Coffee
Wellness & Functional Drinks
Wine
Spirits (Liquor)






95%

Milk & Dairy Alternatives





■ IN SCOPE ■ OUT OF SCOPE

+18%



Accessible & Accountable

-  **65% to 92%**
INCREASE IN RECYCLING RATE FOR BEVERAGE CONTAINERS
-  **1,297**
RESIDENTS PER REDEMPTION POINT
-  **1.2BN**
ADDITIONAL BEVERAGE CONTAINERS RECYCLED
-  **15,400**
GHG EQUIVALENT CARS OFF THE ROAD
-  UP TO **34%**
LITTER REDUCED OVERALL

Industry Financed

-  **\$93M**
GVA (ADDITIONAL ECONOMIC ACTIVITY GENERATED)
-  **381**
ADDED JOBS (NET)
-  **\$31M - \$64M**
REVENUE AVAILABLE TO STATE FOR REINVESTMENT
-  **1 cent**
SYSTEM COST - PER CONTAINER

Well Managed & Regulated

-  **99%**
RETURN-TO-RETAIL REDEMPTION
-  **\$5.1M**
ALLOCATED TO STATE AGENCY FOR OVERSIGHT

Embargoed until 12:01AM March 15

CONNECTICUT

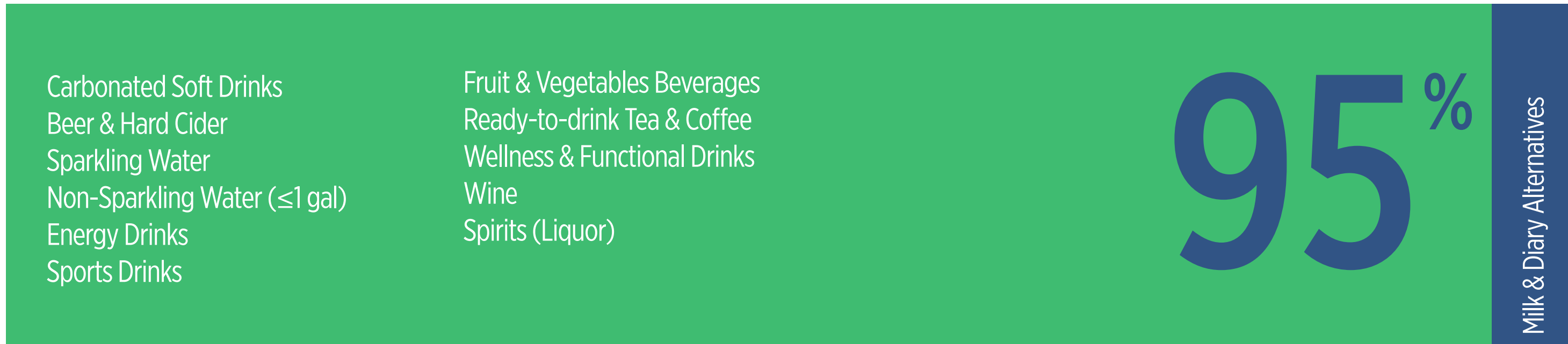
MAINE

Maine’s existing DRS has the most comprehensive range of included beverage containers and a redemption rate of 84%, the highest of the states studied in this new research. Deposit rates are five cents for all beverage containers except spirits and wines, which have a deposit of 15 cents. Maine has adopted Extended Producer Responsibility requirements, and rulemaking around this law will take place in 2023. Minimum recycled content requirements are being considered for adoption in the 2022 legislative session.

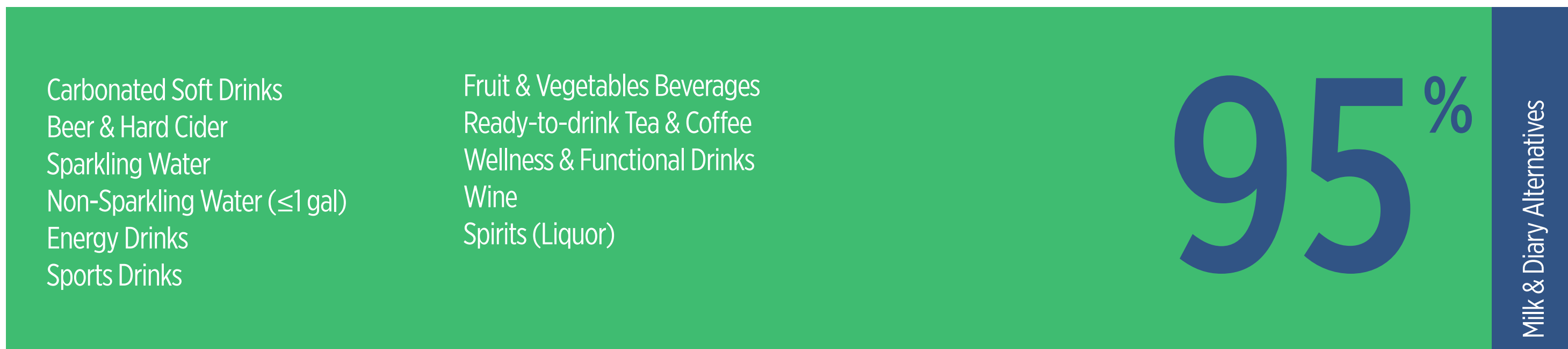
The high-performance principles provide guidance to further enhance Maine’s impressive redemption rate and push it above 90%, including increasing deposit fees, building in automatic triggers to increase deposit value if redemption rates fall, and improving access to redemption sites. Opportunities exist to include modernization measures in the governor’s 2022 budget proposal or in the rules being created as part of Extended Producer Responsibility requirements.

Beverage Containers included in DRS: Current vs Modernized

EXPANDED DRS



MODERNIZED DRS



■ IN SCOPE ■ OUT OF SCOPE

Accessible & Accountable

- 89% to 94%**
INCREASE IN RECYCLING RATE FOR BEVERAGE CONTAINERS
- 1,620**
RESIDENTS PER REDEMPTION POINT
- 128M**
ADDITIONAL BEVERAGE CONTAINERS RECYCLED
- 1,500**
GHG EQUIVALENT CARS OFF THE ROAD
- UP TO **34%**
LITTER REDUCED OVERALL

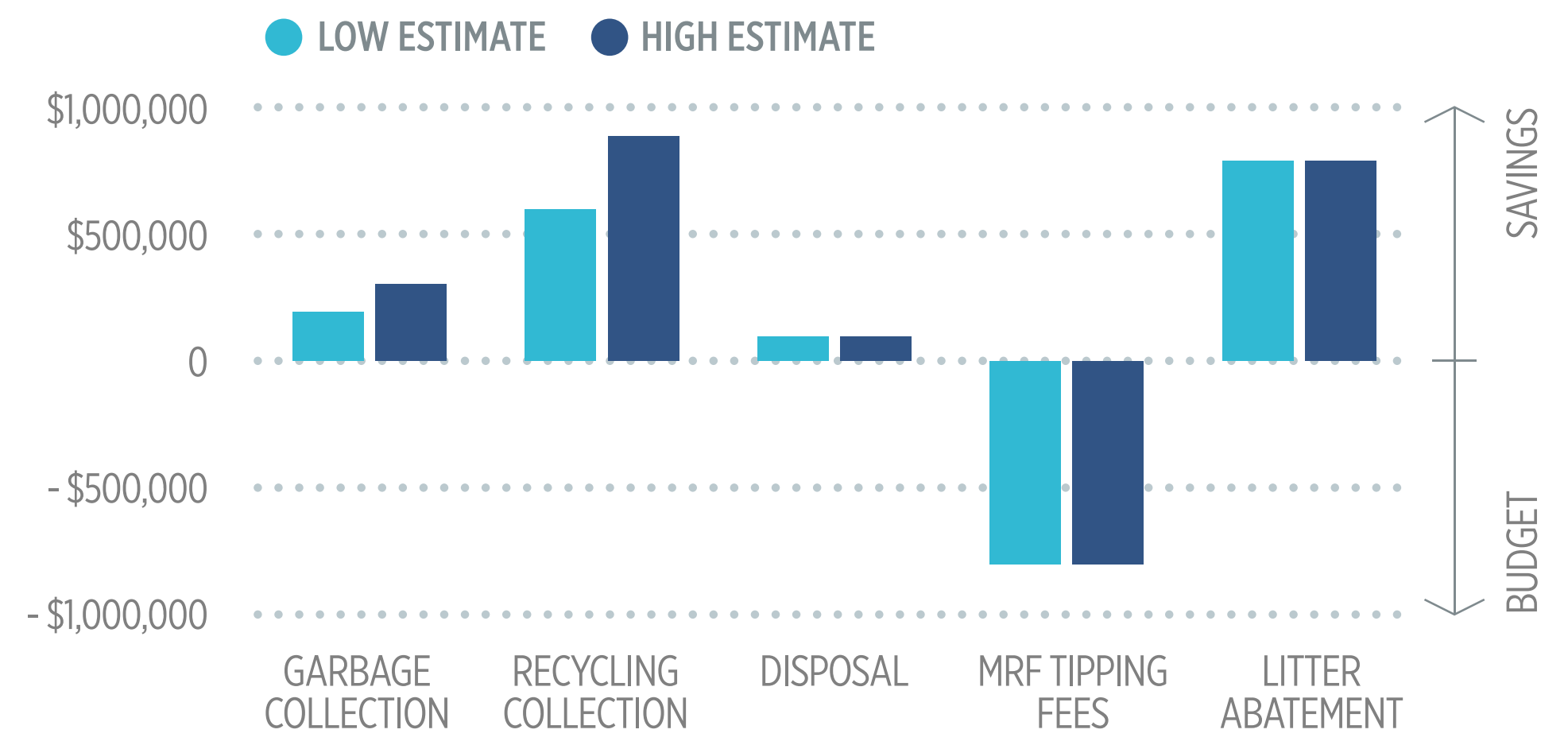
Industry Financed

- \$100M**
GVA (ADDITIONAL ECONOMIC ACTIVITY GENERATED)
- 16**
ADDED JOBS (NET)
- \$13M**
REVENUE AVAILABLE TO STATE FOR REINVESTMENT
- 3.6 cents**
SYSTEM COST - PER CONTAINER

Well Managed & Regulated

- 93%**
RETURN-TO-RETAIL REDEMPTION
- \$3.3M**
ALLOCATED TO STATE AGENCY FOR OVERSIGHT

MODERNIZED DRS IMPACT ON MUNICIPAL BUDGETS

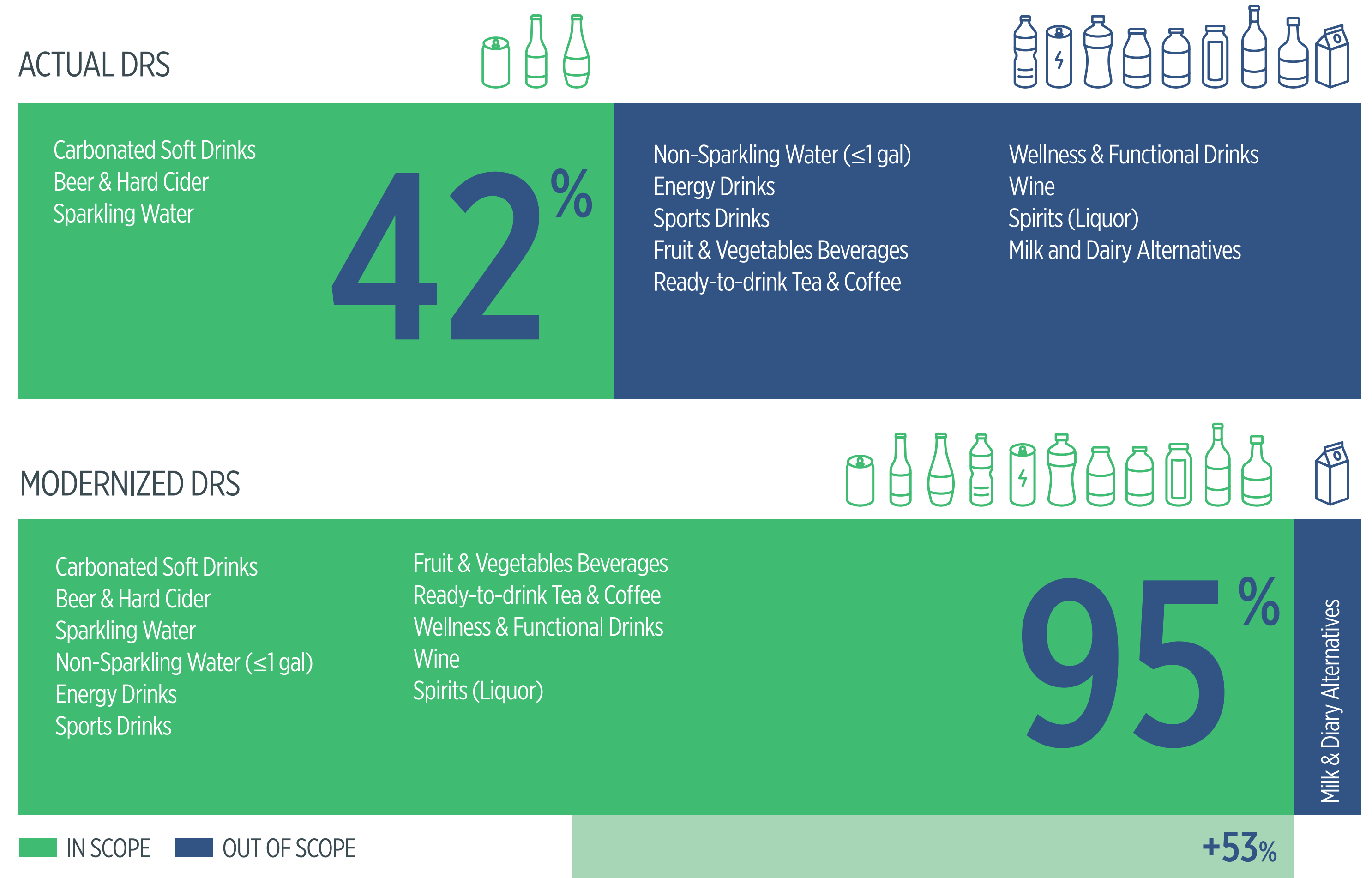


Embargoed until 12:01AM March 15

MASSACHUSETTS

The current return rate for beverage containers in Massachusetts is one of the lowest rates in the Northeast, at just 48%. This results in over three billion plastic, glass, and aluminum beverage containers being wasted every year. The state has made multiple attempts to modernize the current system, including a 2014 public referendum that failed due to a \$9 million campaign financed by beverage companies, waste industry, and retailers.²⁸ Modernization bills have been proposed every year, including a bill in the 2021-2022 legislative session (the Better Bottle Bill) that would expand the covered beverage containers, raise the deposit fee from five cents to 10 cents, and include a “Return-to-Retailer” provision. At the time of writing, the Better Bottle Bill has a better chance of passing than those in recent years but will require strategic support.

Beverage Containers included in DRS: Current vs Modernized



Embargoed until 12:01AM March 15

Accessible & Accountable

- 65% to 92%**
INCREASE IN RECYCLING RATE FOR BEVERAGE CONTAINERS
- 2,020**
RESIDENTS PER REDEMPTION POINT
- 2.4BN**
ADDITIONAL BEVERAGE CONTAINERS RECYCLED
- 30,012**
GHG EQUIVALENT CARS OFF THE ROAD
- UP TO **34%**
LITTER REDUCED OVERALL

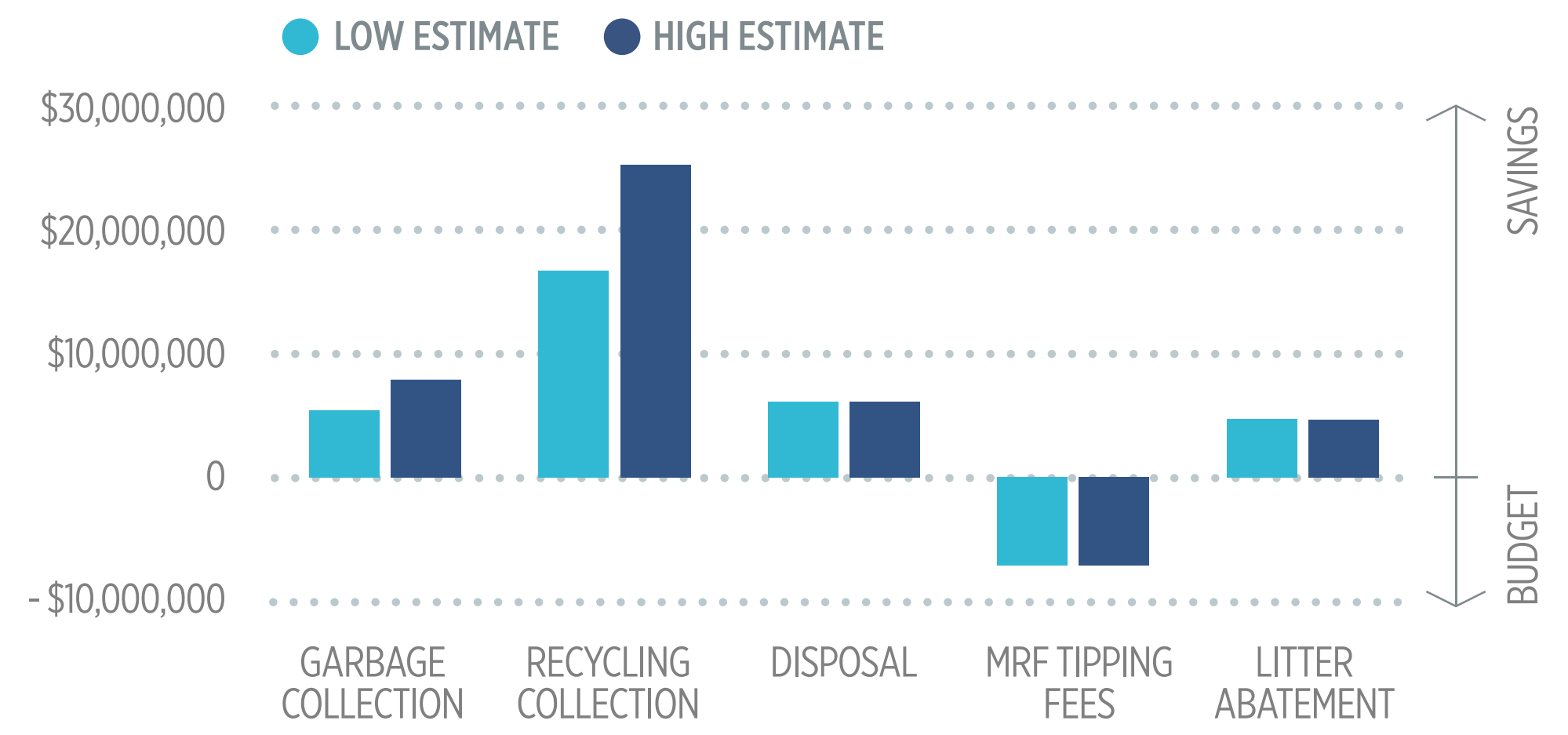
Industry Financed

- \$206M**
GVA (ADDITIONAL ECONOMIC ACTIVITY GENERATED)
- 785**
ADDED JOBS (NET)
- \$62M - \$126M**
REVENUE AVAILABLE TO STATE FOR REINVESTMENT
- 1.1 cents**
SYSTEM COST - PER CONTAINER

Well Managed & Regulated

- 98%**
RETURN-TO-RETAIL REDEMPTION
- \$9.2M**
ALLOCATED TO STATE AGENCY FOR OVERSIGHT

MODERNIZED DRS IMPACT ON MUNICIPAL BUDGETS



Embargoed until 12:01AM March 15

NEW YORK

New York's current redemption rate is 64%. This means that more than 7 billion containers are wasted annually. New York's current recycling infrastructure is characterized by complexities and challenges that obstruct improvement. Each county has its own system of recycling processing laws; fraud is perceived as a serious problem within the existing system; advocates for improved recycling laws have different responses to modernization proposals because of concerns about cost impacts on municipalities, and industry players strongly oppose change. But with the 40th anniversary of the original bottle bill taking place in 2022 and a new governor in office, there is an immediate opportunity to advocate for modernization to revive a troubled system.

Beverage Containers included in DRS: Current vs Modernized

ACTUAL DRS



Carbonated Soft Drinks
 Beer & Hard Cider
 Sparkling Water
 Non-Sparkling Water (≤1 gal)

78%

Energy Drinks
 Sports Drinks
 Fruit & Vegetables Beverages
 Ready-to-drink Tea & Coffee
 Wellness & Functional Drinks
 Wine
 Spirits (Liquor)
 Milk and Dairy Alternatives

MODERNIZED DRS



Carbonated Soft Drinks
 Beer & Hard Cider
 Sparkling Water
 Non-Sparkling Water (≤1 gal)
 Energy Drinks
 Sports Drinks

Fruit & Vegetables Beverages
 Ready-to-drink Tea & Coffee
 Wellness & Functional Drinks
 Wine
 Spirits (Liquor)

95%

Milk & Dairy Alternatives

■ IN SCOPE ■ OUT OF SCOPE

+17%

Accessible & Accountable

- 69% to 92%**
INCREASE IN RECYCLING RATE FOR BEVERAGE CONTAINERS
- 1,325**
RESIDENTS PER REDEMPTION POINT
- 5.4BN**
ADDITIONAL BEVERAGE CONTAINERS RECYCLED
- 72,000**
GHG EQUIVALENT CARS OFF THE ROAD
- UP TO **34%**
LITTER REDUCED OVERALL

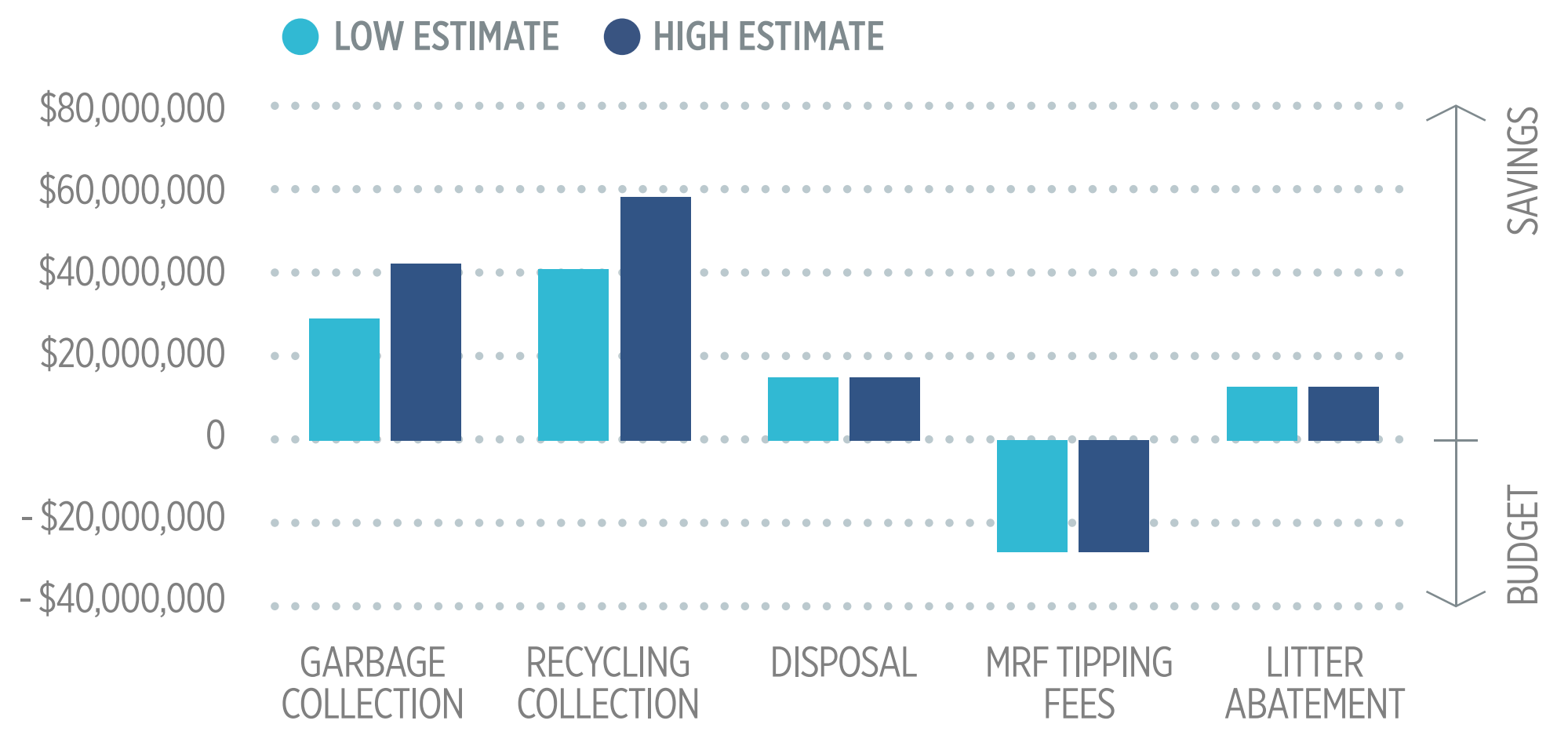
Industry Financed

- \$852M**
GVA (ADDITIONAL ECONOMIC ACTIVITY GENERATED)
- 1,526**
ADDED JOBS (NET)
- \$171M - \$349M**
REVENUE AVAILABLE TO STATE FOR REINVESTMENT
- 2.5 - 3.3 cents**
SYSTEM COST - PER CONTAINER

Well Managed & Regulated

- 84%**
RETURN-TO-RETAIL REDEMPTION
- \$24M**
ALLOCATED TO STATE AGENCY FOR OVERSIGHT

MODERNIZED DRS IMPACT ON MUNICIPAL BUDGETS



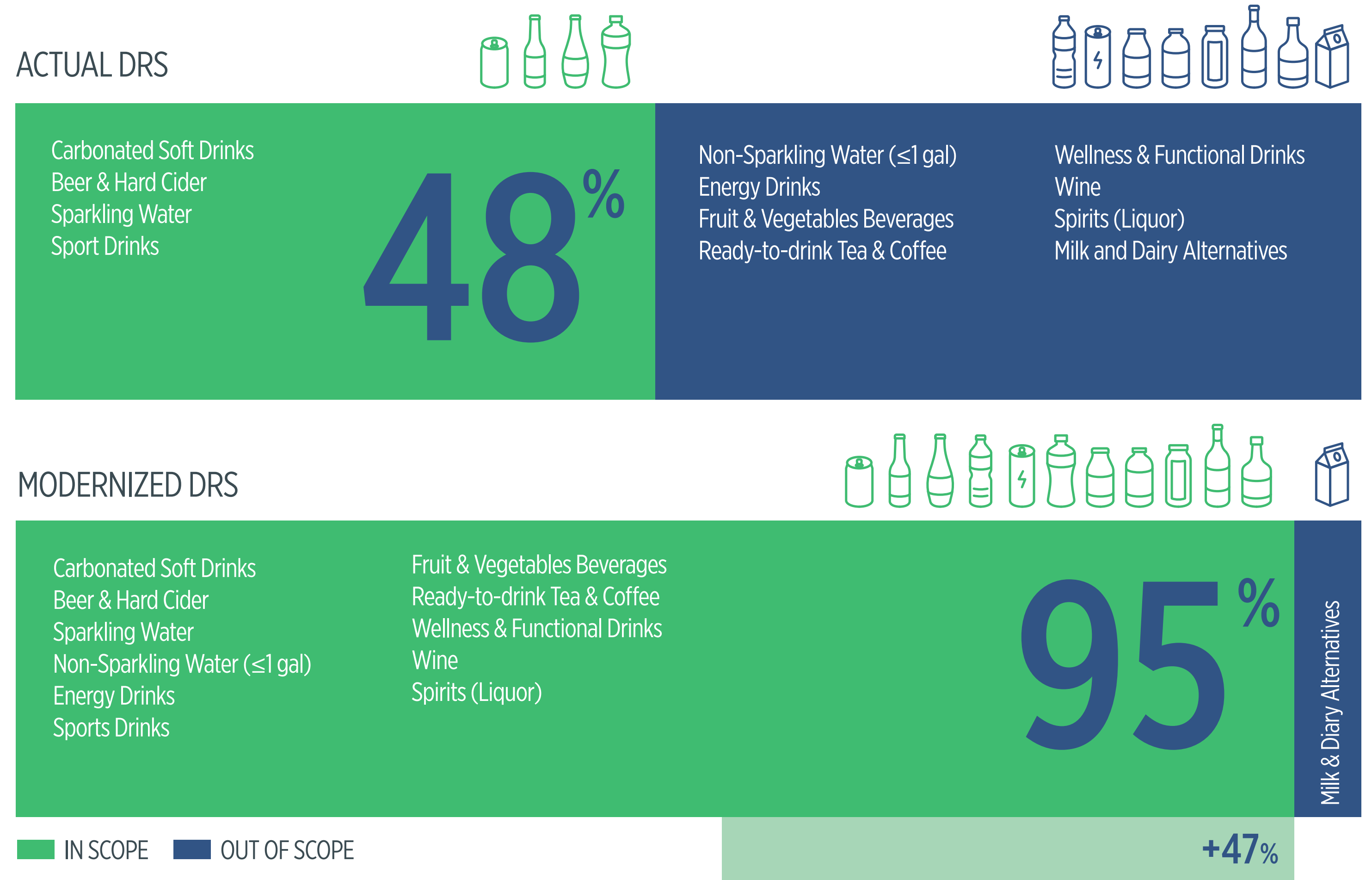
Embargoed until 12:01AM March 15

VERMONT

Vermont is the smallest of the states considered in the current research. Its existing bottle bill already sees high redemption rates at 76%, although this number is outdated and may be an overestimate. Still, the system does not include bottled water and has a low deposit fee of only \$0.05 for most included containers. More than 200 million beverage containers are wasted in the state every year. Concerns of fraud exist, but a lack of supporting data makes it tough to determine the scope.

A bill has been proposed that would expand coverage of the system to include non-carbonated beverages, but advocates indicate a veto-proof majority will be needed to override a likely veto from the governor should the bill pass.

Beverage Containers included in DRS: Current vs Modernized



Embargoed until 12:01AM March 15

Accessible & Accountable

- 76% to 93%**
INCREASE IN RECYCLING RATE FOR BEVERAGE CONTAINERS
- 870**
RESIDENTS PER REDEMPTION POINT
- 176M**
ADDITIONAL BEVERAGE CONTAINERS RECYCLED
- 1,805**
GHG EQUIVALENT CARS OFF THE ROAD
- UP TO **34%**
LITTER REDUCED OVERALL

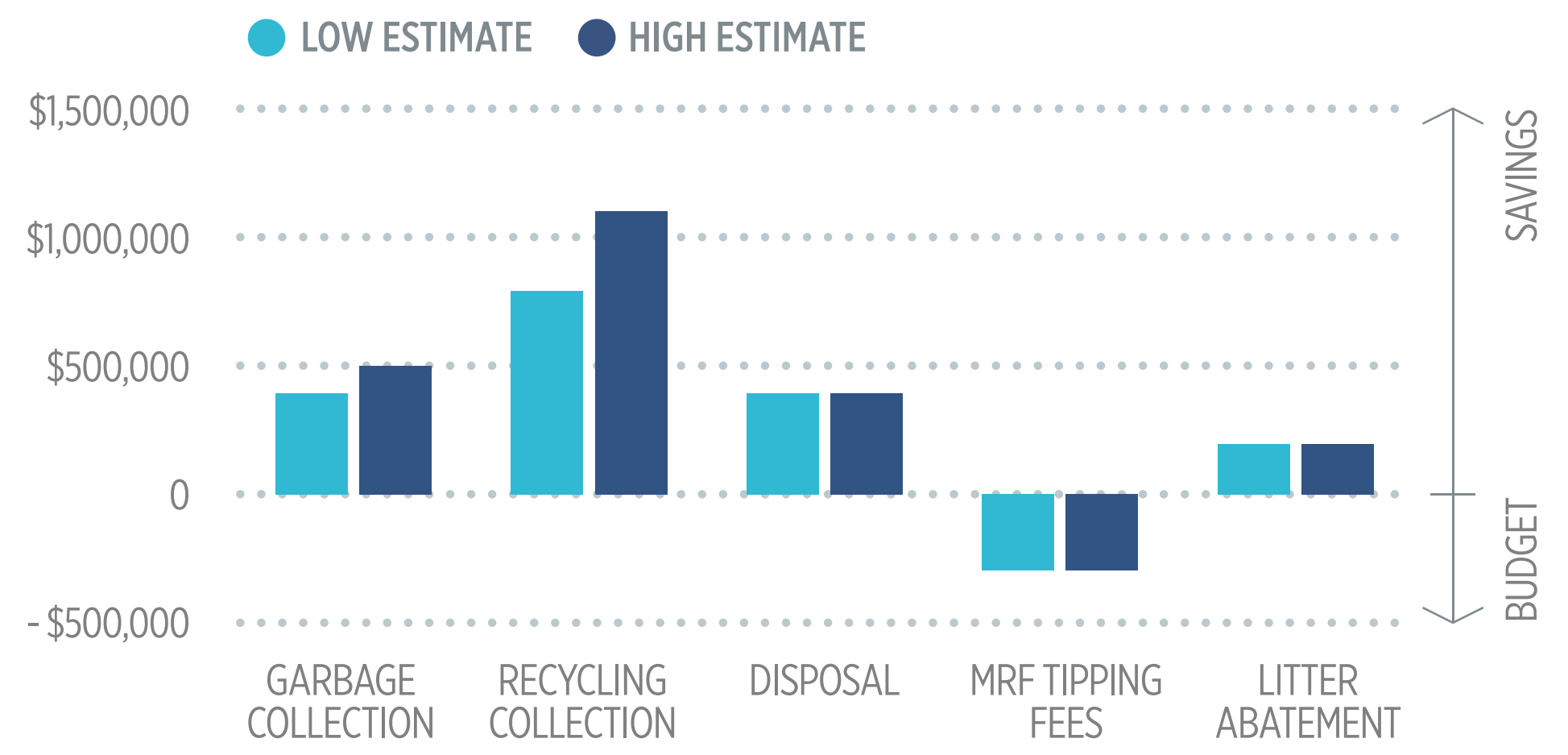
Industry Financed

- \$41M**
GVA (ADDITIONAL ECONOMIC ACTIVITY GENERATED)
- 43**
ADDED JOBS (NET)
- \$6M - \$13M**
REVENUE AVAILABLE TO STATE FOR REINVESTMENT
- 2.9 cents**
SYSTEM COST - PER CONTAINER

Well Managed & Regulated

- 96%**
RETURN-TO-RETAIL REDEMPTION
- \$2.6M**
ALLOCATED TO STATE AGENCY FOR OVERSIGHT

MODERNIZED DRS IMPACT ON MUNICIPAL BUDGETS



Embargoed until 12:01AM March 15



REGIONAL IMPACTS OF DRS MODERNIZATION

Embargoed until 12:01AM March 15

Regional (Northeast DRS States)

Transitioning to the upgraded DRS will take time, money, and planning, but will have a range of positive environmental, economic and social impacts.

Below, we present an overview of those impacts, both on the system and communities impacted as a whole; and spotlight stakeholder groups most impacted by DRS modernization: municipalities and the state agencies overseeing these systems, and the producers who will bear the cost.

Shown here are the potential regional-level impacts if DRS modernization were realized across all five Northeast bottle bill states.

Beverage Containers included in DRS: Current vs Modernized

ACTUAL DRS



Carbonated Soft Drinks
Beer & Hard Cider
Sparkling Water
Non-Sparkling Water (≤1 gal)

69%

Energy Drinks
Sports Drinks
Fruit & Vegetables Beverages
Ready-to-drink Tea & Coffee
Wellness & Functional Drinks
Wine
Spirits (Liquor)
Milk and Dairy Alternatives

MODERNIZED DRS



Carbonated Soft Drinks
Beer & Hard Cider
Sparkling Water
Non-Sparkling Water (≤1 gal)
Energy Drinks
Sports Drinks

Fruit & Vegetables Beverages
Ready-to-drink Tea & Coffee
Wellness & Functional Drinks
Wine
Spirits (Liquor)

95%

Milk & Dairy Alternatives

■ IN SCOPE ■ OUT OF SCOPE

+26%

Accessible & Accountable

69% to 92%
INCREASE IN RECYCLING RATE FOR BEVERAGE CONTAINERS

1,400
RESIDENTS PER REDEMPTION POINT

9.3BN
ADDITIONAL BEVERAGE CONTAINERS RECYCLED

121,000
GHG EQUIVALENT CARS OFF THE ROAD

UP TO **34%**
LITTER REDUCED OVERALL

Industry Financed

\$1.3M - \$1.4M
GVA (ADDITIONAL ECONOMIC ACTIVITY GENERATED)

2,751
ADDED JOBS (NET)

\$283M - \$564M
REVENUE AVAILABLE TO STATE FOR REINVESTMENT

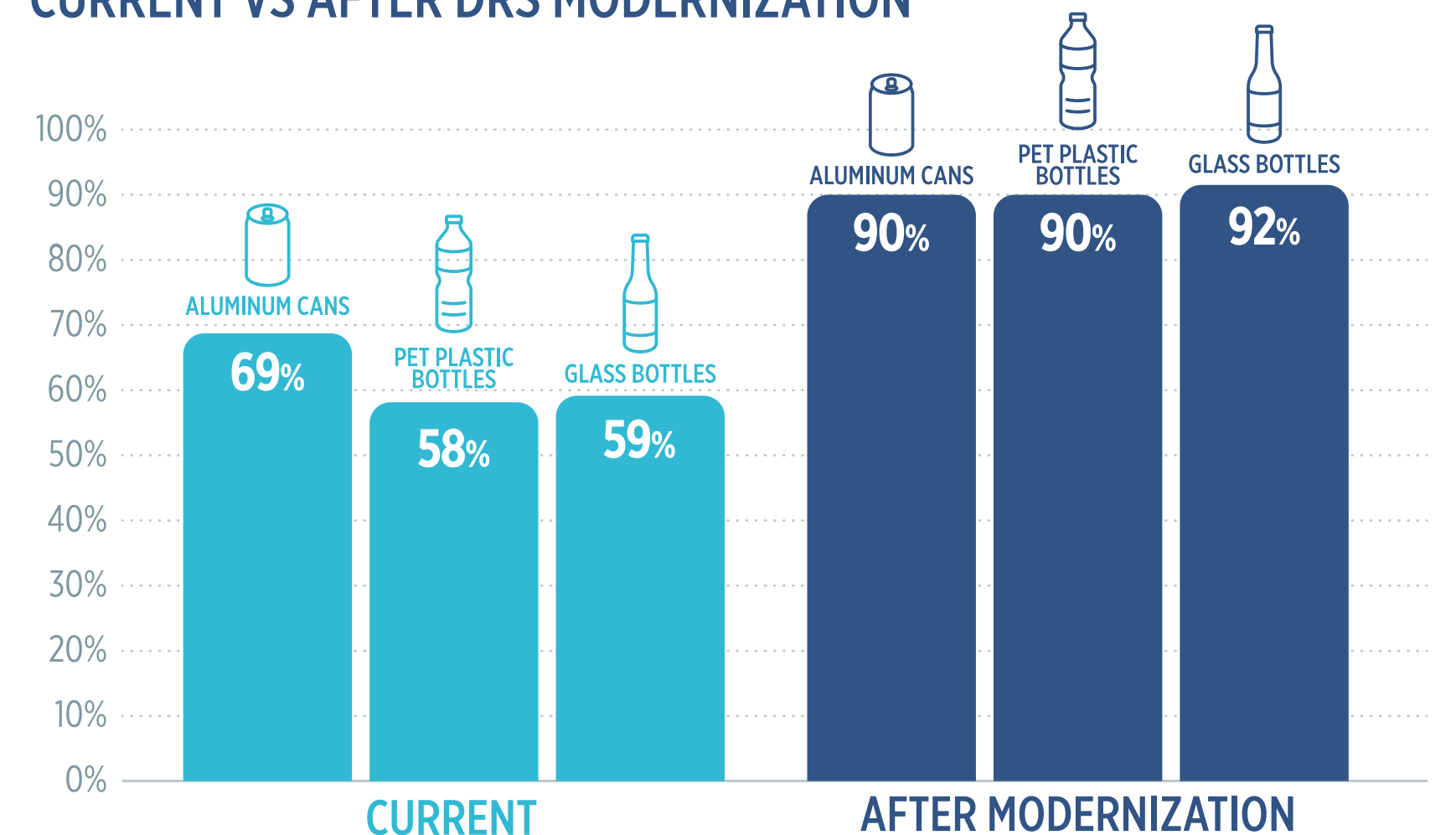
1 - 3.6 cents
SYSTEM COST - PER CONTAINER

Well Managed & Regulated

89%
RETURN-TO-RETAIL REDEMPTION

\$44M
ALLOCATED TO STATE AGENCY FOR OVERSIGHT

CONTAINER RECYCLING RATES, BY MATERIAL: CURRENT VS AFTER DRS MODERNIZATION



Embargoed until 12:01AM March 15

Environment / Climate

DRS modernization positively impacts the environment in two primary ways: by diverting usable materials from final disposal and by reducing the greenhouse gas emissions of the beverage industry.



INCREASED DIVERSION OF RECYCLABLE MATERIALS

Based on Reloop's extensive research of deposit return systems worldwide, the 10 high-performance principles, and the analytical model that were developed based on that research, every targeted state would see an increase in the return rate for beverage containers under a modernized DRS. Massachusetts and Connecticut would see the most significant increases, from a baseline redemption rate in the 40% range to 90%.

Of all container types, plastic cartons and nips (small, single-serving liquor bottles) would see the greatest increases, including a jump from 0% recycled to 89% for nips — equivalent to more than 70 million individual nips, which are not currently included in the region's DRSs and are one of the most commonly littered items. In terms of increased beverage container recycling, plastic is estimated to see the largest increase, with an additional 5.9 billion units being recycled; aluminum and glass follow with an additional 1.9 billion and 1.4 billion containers. By weight, about 463,000 tons of additional material will be diverted from landfill and recycled across the Northeast region each year.

Nips



Small, single-serving liquor bottles often referred to as "nips" are one of the hardest beverage containers to recycle. As one of the most littered beverage containers, nips are a crucial addition to the deposit return system scope. However, often, the current infrastructure is not equipped to handle the small containers. Placing a deposit value on nips not only incentivizes individuals to return their containers but also encourages infrastructure to adapt to a now valuable container.



REDUCED GREENHOUSE GAS EMISSIONS

Manufacturing beverage containers from raw materials is an energy-intensive process. To the extent that raw materials can be replaced with quality recycled materials, environmental impact and financial burden decreases.

Reloop’s new research shows that modernizing the DRS in each state will result in the reduction of 556,800 metric tons of greenhouse gas emissions across the region. While the state’s GHG inventory parameters might not enable them to count these against their climate goals, the largest carbon reductions were associated with the most populated states: Massachusetts (with 138,000 metric tons reduced per year) and New York City (with 224,000 metric tons reduced per year). The increase in transportation emissions associated with increased redemptions (highest in Massachusetts at 18 metric tons) will be many times offset by the reduced emissions from using recycled rather than virgin materials. The total carbon savings across the five Northeast states would be as high as 557,000 metric tons of CO₂ annually. This is the equivalent of over 121,000 cars being taken off the road each year.²⁹

Healthy and Just Communities

The health impacts from environmental impacts associated with the supply chain for single-use packaging — in particular from the production, disposal, and littering of plastic — are disproportionately borne by low-income communities and communities of color and are therefore a major environmental justice issue³⁰. High-performing DRSs must not only avoid negative impacts but also deliver improved economic, social, and public health conditions.

As described further in the “Equitable Transitioning” section below, revenues from unclaimed deposits create an opportunity for targeted, neighborhood-driven programs and improvements that can be used to deliver meaningful improvements in quality of life for everyone and some vulnerable populations in particular.

In addition to the impacts outlined below, reducing the volume of containers produced from virgin materials may also have an impact on the toxic emissions from manufacturing facilities, which disproportionately affect lower-income communities. However, assessing this impact is beyond the scope of the current research and will require further study.



LITTER REDUCTION

Low-income areas and neighborhoods of color are disproportionately affected by litter and receive less litter cleanup than wealthier neighborhoods³¹. Improving DRSs will primarily impact lower-income and vulnerable populations by reducing beverage container litter by 85% and total litter up to 34% overall, helping make communities more livable.



EQUITABLE AND EASY ACCESS TO RECYCLING SERVICES

Returning bottles and cans should not require any additional trips and should be as easy as doing regular grocery shopping inclusive of all transportation modalities and physical abilities. In many areas of the states covered in this study, this is not yet the case.

Achieving the targeted 90% reduction goal for beverage containers will necessarily require an expansion of return sites throughout the Northeast region. Our analysis found that a high-performing, cost-efficient DRS means that all but the most rural residents in Connecticut, New York, and Massachusetts are within five miles of a redemption point in rural areas and within two miles of a redemption point in urban areas.

In Vermont and Maine, almost all residents are within five miles of a redemption point, except the most rural residents. Across the five states, a redemption point is guaranteed for every 1,400 residents, with a state-by-state range of 870 and 2,020 persons per redemption point.

The data in this research also supports the hypothesis that return-to-retail correlates with the highest rates of redemption. The expanded types and numbers of return sites built into the model are intended to serve a diverse range of households and communities and to maximize both access and impact. Across the Northeast states analyzed, return to retail comprised an 89% share of the redemption network, with Massachusetts moving toward a 99% return-to-retail scenario.



IMPACTS ON THE INFORMAL RECYCLING SECTOR

The existing beverage container recycling and waste management system supports a significant informal sector of canners, particularly in large urban areas. Increasing diversion of beverage containers in the targeted states to the DRS will affect these typically marginalized and vulnerable individuals, but opportunities exist to anticipate and mitigate these effects, as outlined further below.

Economic Impacts

Research shows that deposit return systems create at least five times more jobs in beverage container collection, sorting, and transport than in garbage collecting, hauling, and landfilling, and can also drive more jobs than a curbside recycling system for beverage containers³². These jobs are associated with the collection of containers at retailers and in redemption centers; transporting, counting, and sorting of containers; maintenance of technology; auditing and monitoring; and administration of the system. Roughly 9,000 would be directly employed with DRS in the five states. While there is the potential for modernization to result in 608 disposal-related jobs losses (e.g. collections and operations associated with landfill or incineration), 3,359 jobs would be gained through collecting and sorting the materials in a DRS. This results in **a net gain of 2,751 jobs in the entire region.**

That said, the transition to a modernized DRS will require thoughtful implementation and support within the existing recycling infrastructure.

MRFs will see fewer beverage containers flow through their facilities, lowering revenue from tipping fees. This will also result in the revenue loss associated with higher-value materials such as aluminum cans and PET bottles. However, MRFs will also see reduced volumes of materials such as glass and cartons that are costly to process and have limited markets.

Reduced volumes of problematic materials and overall cost savings to towns and cities will help to offset the negative impacts of DRS modernization. In addition, unclaimed deposits from the early phases of transition can be used to upgrade and modernize MRFs and other key infrastructure to better adapt to new systems and manage hard-to-recycle materials. More about facilitating an equitable transition is explained below.

Generally, the changes to regional DRSs will also have a wider benefit to Gross Domestic Product. **The gross value added (GVA)³³ of the improved system will amount to between \$1.3 and \$1.4 billion each year** due to increased tax revenues to the states from increased employment and other factors.

Impacts on Municipalities and State Agencies

Municipal recycling programs are struggling. Volatile or disappearing markets for materials and rising labor costs have compromised their ability to meet their fundamental purpose: to divert usable materials from final disposal. Municipalities are adapting by removing problematic materials like glass or plastic from their collection streams, temporarily halting recycling collection, or other measures — in other words, in the interest of cost savings, these programs have had to make changes that compromise the reason they were established in the first place. Ultimately, cities need longer-term solutions.

Modernized DRSs are one of the tools that can guarantee that materials are reused — achieving the ultimate goal of city recycling programs for a significant subset of recyclable materials — and enable cities to reorient their recycling programs for long-term success. Reloop’s research has shown that, in addition to supporting city and state-level waste diversion goals, modernized DRSs will save municipalities money.

As part of the current study, Reloop conducted a state-by-state and city and town-specific full cost accounting of the impact of modernized DRS on municipalities in the Northeast and calculated cost or savings impacts in the following areas:

- Garbage collection costs

- Recycling collection costs

- Disposal fees

- MRF processing fees, with anticipated MRF revenue losses factored in

- Litter cleanup costs

Net cost impacts were calculated using two methods.

LOW END

The low-end scenario calculates the total volume of materials shifted out of both the garbage and recycling stream and derives a total cost savings through avoided collection costs (primarily vehicle fleet costs), based on data from a similar, previous study.³⁴

HIGH END

The high-end scenario assumes that a lower volume of collected material will result in collection and support cost reductions of a similar magnitude, based on municipal budget data. This estimate assumes that some fleet, support staff, and many other sanitation costs can be reduced when material is shifted out of curbside collection and into the DRS.

In calculating these numbers, Reloop has made every effort to avoid overstating possible benefits. However, the cost savings described here are not all automatic and some — particularly garbage and recycling collection cost savings — require changes at the municipality level.

Ultimately, much will depend on the choices the municipality makes to optimize services. As collected tonnage stabilizes at a lower level and contracts come up for renegotiation, municipalities will be able to realize potential savings in assorted ways. These include, for example, reducing collection frequency, modifying routes, reducing vehicle turnover and fleet size, leveraging existing fleet vehicles and staff for other services, or investing in dual-purpose vehicles that enable (for example) both recycling and organics collection.

FINDINGS

Based on our estimates**, municipalities in each state will realize the following savings:

Estimated Cost Savings from Modernized DRS

| | Maine | | Massachusetts | | New York | | Vermont | |
|-----------------------------|---------------|---------------|----------------|----------------|----------------|-----------------|---------------|-------------|
| | LOW | HIGH | LOW | HIGH | LOW | HIGH | LOW | HIGH |
| GARBAGE COLLECTION | \$200K | \$300K | \$5.8M | \$8.2M | \$29.2M | \$41.8M | \$400K | \$500K |
| RECYCLING COLLECTION | \$600K | \$900K | \$16.9M | \$24.1M | \$40.8M | \$58.3M | \$800K | \$1.1M |
| DISPOSAL* | \$100K | \$100K | \$6.5M | \$6.5M | \$15.1M | \$15.1M | \$400K | \$400K |
| MRF TIPPING FEES* | \$-800K | \$-800K | \$-7.5M | \$-7.5M | \$-26.9M | \$-26.9M | \$-300K | \$-300K |
| LITTER ABATEMENT* | \$800K | \$800K | \$5.1M | \$5.1M | \$12.7M | \$12.7M | \$200K | \$200K |
| TOTAL | \$900K | \$1.2M | \$26.7M | \$36.5M | \$70.9M | \$100.9M | \$1.5M | \$2M |

*Disposal, tipping fees, and litter are determined by the tonnage diverted to the DRS, which is consistent across all three scenarios. As such, the cost savings from each are static in each scenario.

**Connecticut is not included in these calculations since the state has already enacted a modernized DRS bill.

While the bulk of the savings accrues to the states with larger populations, even municipalities in smaller states with higher redemption rates like Vermont and Maine will realize significant overall savings.

In total, municipalities across the region can expect to see savings of between \$112 million and \$160 million due to reduced processing fees at MRFs, reduced final disposal costs, and savings on collection costs. Curbside programs would lose high-value aluminum and PET but also no longer have to deal with costly glass containers.

While the municipal cost findings already reflect anticipated MRF revenue losses and the potential for tip fees to increase as a result, to additionally ease the economic shock of transitioning to an optimized DRS, our analysis provides for specific funding to be made available for MRFs to make needed upgrades and operate competitively given a new mix of recyclables they will be recycling. This is detailed in the section below.

Additionally, proper oversight of DRSs requires that state agencies be equipped with appropriate resources. In our model, state agencies across the Northeast would receive \$44 million per year from unclaimed deposits, with \$24 million per year going to New York, as the largest state.

Impacts on Producers

Under a modernized DRS, producers are expected to finance the system: this is a key part of ensuring that the industry takes responsibility for the products it creates and that municipalities and taxpayers do not incur the costs of managing these materials instead. Across all five states, producer cost for the transition to a modernized system is estimated at just 1 and 3.6 cents per container. Though the overall cost is around \$625 million per year across the five states, the system also allows producers to retain a portion of unclaimed deposits — estimated at \$264 million per year — even before the 90% return rate is reached, to invest in system improvements. Equally important, producers will have access to more than 1.9 million additional tons of aluminum, glass, and plastic beverage containers, at a value of roughly \$93 million. Ownership of this material will enable beverage brands to meet the voluntary recycled commitments they have made to consumers and shareholders, as well as comply with regulatory mandates, which are expected to multiply in the years to come and have already been passed regionally in Maine and New Jersey.

Reloop North America’s findings demonstrate that high performing DRSs across the Northeast would result in dramatically increased material tonnage: for glass, aluminum, PET and HDPE. Using public recycling rates, proprietary data, and the calculation methodology used in a previous Reloop report, *What We Waste*, as well as statements on recycling goals and a white paper on recycled content from the material trade associations, we were able to calculate how much of the

total needed material would be satisfied strictly by realizing high-performing DRSs in the five existing Northeast DRS states. The results of these findings are staggering: between 10% and 47% of brand and material manufacturer needs for post-consumer recycled content would be met just by modernizing the existing systems in Connecticut, Maine, Massachusetts, New York, and Vermont.

Material Demand and Modernized DRS

| Material | Industry Source | Recycling target/ supply analysis | Tonnage needed | Tonnage available across the five NE DRS states, once modernized | Available tonnage would satisfy how much of the stated national goal/supply need? |
|-------------------------|-----------------------------|--|-------------------|--|---|
| ALUMINUM | Can Manufacturers Institute | 70% by 2030 | 1.3 million tons | 125,100 tons | 10% |
| GLASS | Glass Packaging Institute | 50% by 2030 | 2.75 million tons | 1.34 million tons | 47% |
| PET AND HDPE (COMBINED) | Ameripen | Gap in supply to meet consumer packaged goods recycled content commitments | 1.25 million tons | 336,100 tons | 27% ³⁵ |

Embargoed until 12:01AM March 15

Producers will also be required to report the number of each product that is sold into the state, and its associated barcode.

This ensures that all containers returned are counted and verified using barcode verification and has the following benefits for the system:

- Prevents containers from being fraudulently returned multiple times; it aims to limit manual returns and all manual returns are counted and verified at redemption centers
- Enables close monitoring of return volumes through return locations to help identify irregularity in return
- Allows for transparency on return rates through retailers and redemption centers such that the 90% return rate can be accurately verified
- Can be used to accurately pay handling fees to return locations
- Can be used to charge producers an accurate producer fee

Because DRSs already exist in the targeted states, producers will be adapting and expanding existing systems rather than starting from scratch.

CT-NY: 5¢  Cap & Bottle Please replace the cap on bottle prior to recycling.

ITM. / ART. 4165934



NV10064 NYSHD CERT#553

The background is a solid green color. It features several white line-art elements: two large, overlapping circles and two stylized leaves. One leaf is positioned in the upper right quadrant, and the other is in the lower left quadrant. The text is centered in the middle of the page.

THE TRANSITION TO A MODERNIZED DRS

Embargoed until 12:01AM March 15



Equitable Transitioning

Modernizing existing DRSs in the Northeast and beyond is an important step toward realizing waste reduction, pollution reduction, and climate action goals. We cannot ignore the fact, however, that individuals and organizations across the region are invested in the system as it stands now and that these stakeholders will be affected, both negatively and positively, as states adopt the system upgrades recommended here.

With planning, outreach, and collaboration, transitioning to a modern DRS can be done equitably and strategically, enabling system stakeholders to adapt or even benefit from changing conditions.

Funding for equitable transitional support for MRFs will come out of the unclaimed deposits. The value of unclaimed deposits during the early stages of implementation (an estimated \$822 million across the five states over the first two years) provides significant resources to aid in this transition.

\$822M UNCLAIMED DEPOSITS VALUE
ACROSS THE FIVE STATES
OVER THE FIRST TWO YEARS

Framework Conditions to Encourage Long-Term Materials Recovery Facility Competitiveness

Under a modernized deposit return system, a significant volume of materials would shift from being collected through a curbside recycling system to being returned through a DRS.

This system would alter both the volume and composition of material in the curbside programs to be processed by MRFs as there would be fewer beverage containers and more flexible and rigid plastic containers and paper as a percent of total waste. To better manage this change in composition, MRFs may require investment in new technology.

To understand the technology investment needs of MRFs and the relative cost of these investments, Reloop conducted a survey of 21 MRFs throughout the Northeast. The responses show that optical and other enhanced sorting equipment were the most common investment needs³⁶. According to an interview with industry experts, modernizing a plastic line would cost \$1 million — \$1.5 million per MRF and modernizing a paper line would cost \$500,000 — \$1.5 million per MRF.

If all states (except for Maine, which already has a very high redemption rate) achieve a 70% redemption rate in the first year, there would be \$551 million available to invest in DRS and recycling infrastructure. If in the second year the redemption rate is 80%, there would be an additional \$270 million. In every state, the sum of unclaimed deposits is significant enough to make substantial investments in every existing MRF if needed.



Embargoed until 12:01AM March 15

With advanced technology in place, MRFs will be well-positioned to intercept deposit-eligible materials coming through their facilities and to improve and expand their ability to process additional materials.

Preparing to provide this temporary transitional support to MRFs will require:

- Delineating eligibility for MRFs interested in receiving transitional support
- Defining the terms and conditions for funding
- Identifying options for both capital grant funding and debt financing
- Determining an appropriate, diminishing, and sunseting formula for transitional funding
- Using a verification mechanism to link transitional funding to actual projected loss

With these planning steps as a framework, Reloop will work to establish principles for equitable transition, formulate specific policy recommendations, and advance proposals through additional MRF survey research and stakeholder dialogue. To do this work, Reloop will partner with the Alliance of Mission-Based Recyclers (AMBR), a coalition of community-based recycling industry nonprofits working to provide model policies, tools, and other resources to rebuild a credible, transparent, and just recycling system.

Addressing the Informal Sector

DRS systems benefit and rely heavily on canners despite the lack of data to demonstrate this. This group will be affected when the deposit rate increases, the types of deposit-eligible containers expands, and the number of littered beverage containers declines.

High-performing DRSs are those designed with the redeemer in mind, be it a consumer or a canner. In recognition of the role canners play, and of the impact DRS reforms will have on their livelihoods, Reloop is committed to working with partners such as Sure We Can, a Brooklyn-based non-profit recycling center and community space supporting area canners, and Women in Informal Employment: Globalizing and Organizing (WIEGO), a global network focused on empowering the working low-income in the informal economy. Doing so will enable us to engage this sector and to identify and pursue the research and other work needed to both better understand the needs of canners and develop and facilitate the implementation of a robust standard for place-specific, inclusive DRS.

Needed steps include:

- Perform a canner census in New York City to better understand, for example:
 - Total population and demographic profile of canners
 - How canner activity is organized (individually, cooperatively, an organized business)
 - From what sources and how much material canners collect
- Identify fair and equitable conditions for canners, like access to canner-friendly redemption sites
- Promote needed interventions such as government-supported siting of canner-oriented redemption centers and other incentives



Modernized DRSs Enable the Transition to Refillables

Refillables are an important part of the solution to our waste crisis. Refillable beverage containers can be reused multiple times before being recycled or discarded, reducing both waste and greenhouse gas emissions in the beverage industry. In Germany, the beer industry reports reuse rates for glass bottles of up to 50 times³⁷. Each time a bottle is reused, environmental impacts associated with production and end-of-life management are avoided. Refillable systems also offer tremendous economic benefits in terms of material cost savings and job creation, which are multiplied with each refill. Reloop's research shows that implementing a deposit return system for one-way containers is a proven way to accelerate the transition to a refill economy.³⁸

EACH BOTTLE IS REUSED



IN GERMANY'S BEER INDUSTRY

Modernized DRSs solve a host of the challenges faced by the recycling sector and also can act as a critical stepping stone away from single-use containers.

The two most important components of a refillables system for consumers are that it be convenient and financially rewarding. For producers, getting as many refillable containers returned as possible is key. DRSs establish a common infrastructure for containers to be returned for either recycling or refilling without any additional effort from consumers or cost from producers.

In February 2022, Coca-Cola announced a global goal to reach 25% reusable packaging by volume by 2030. Commitments such as this from producers are welcome, yet designing for refill is only the first step in the journey. Making sure refillables go out into the world and then come back for cleaning and refilling over and over requires investment, planning, and, most critically, an easy and effective refillables collection system, which DRS is uniquely suited to deliver. With modern DRSs, the consumer does not have to distinguish between returning a container for recycling or refill; that distinction is made instead by the back-end handling systems. This makes return simple for the user, who is motivated to get their cash back. Producers, meanwhile, benefit from a collection system uniquely equipped to deliver high volumes of quality material. Both behind the scenes and from a user perspective, high-performing DRS enable a robust refillable container marketplace and guarantee that valuable resources are reused, not discarded.



DRS

THE MOST EFFECTIVE
REFILLABLES
COLLECTION SYSTEM.

CONCLUSION

Bottle bills are difficult to reform (and to establish), largely owing to:



A DEARTH OF USEFUL DATA



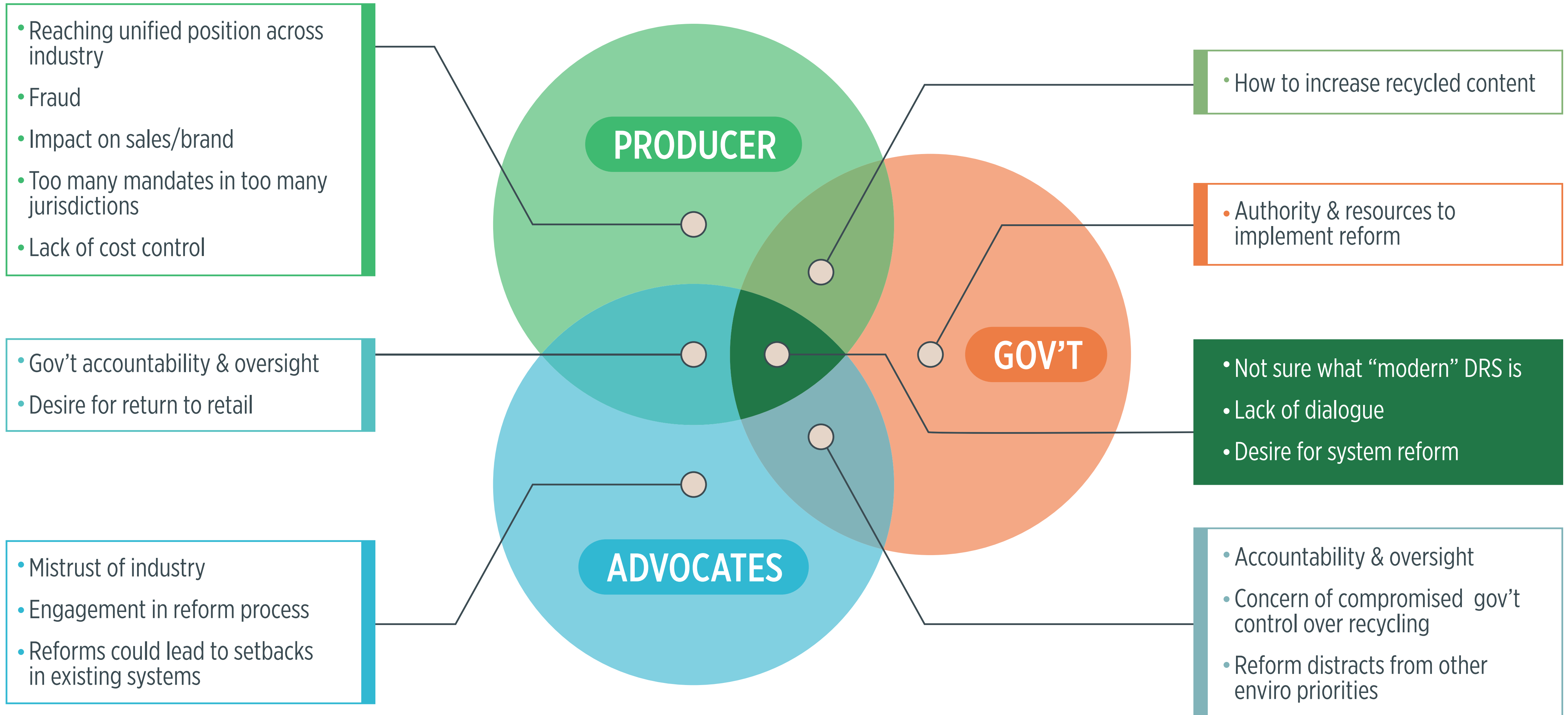
MISALIGNED DEFINITIONS (E.G. WHAT QUALIFIES AS “RECYCLING”)



MISALIGNED GOALS AMONG STAKEHOLDERS

Further, the diverse stakeholders involved have a varied set of interests, sometimes aligned, sometimes competing, that must be considered in any reform effort. Producers struggle to meet uncoordinated and inconsistent mandates across jurisdictions, to address fraud (triggered by differential deposits across state lines, for example), and to respond to consumer and advocate pressure and negative media coverage. Governments struggle to obtain the resources and authority they need to adequately oversee DRS infrastructure. Advocates — often rightfully — mistrust industry goals for and role in DRS reform, including the fear that “reform” could instead lead to bottle bill repeal, and face challenges in facilitating equitable and inclusive public engagement.

Key Stakeholder Considerations



Embargoed until 12:01AM March 15


All stakeholders face challenges with understanding what DRS “modernization” really looks like, with creating constructive and collaborative dialogue, and with the desire to tackle even more comprehensive system reform.

Does reforming DRS create a distraction from “more meaningful” reforms like Extended Producer Responsibility? Can government truly be accountable and effective in its oversight role? Even if the industry does take increased responsibility for their products, can we supply enough high-quality recycled content to meet their commitments? The list of barriers is long but addressable.

Our three-year campaign with partners, Reimagining the Bottle Bill, has four overarching goals to address these barriers:

- 1 Increase targeted audience knowledge of the positive impact of modernized deposit return systems
- 2 Educate key stakeholders and implementers on the value and impact of following Reloop North America’s high-performing principles
- 3 Assist the five northeast states (Connecticut, Massachusetts, Maine, New York, and Vermont) and New York City as they modernize their state-wide deposit return system.
- 4 Use work in the Northeast to encourage harmonization of bottle bill policy and terms at the federal level and in greenfield states with emerging bottle bills.

As the first step in this campaign, Reloop has spearheaded this groundbreaking research into best practices in DRSs all over the world and identified the 10 high-performance principles to guide the modernization of current practices across the Northeast and beyond. We will continue to strategically convene and support others' convening of government, industry, and nonprofit entities to inform and inspire more coordinated action within states and across the region.



Accessible & Accountable

- 1 EASY & EQUITABLE
- 2 90% COLLECTION RATE
- 3 \$0.10 MINIMUM DEPOSIT
- 4 INCLUSIVE CIRCULAR SYSTEM



Industry Financed

- 5 PRODUCER FUNDED
- 6 FAIR PAY FOR SERVICE PROVIDERS
- 7 FINANCIAL SUPPORT FOR MUNICIPAL RECYCLING PROGRAMS



Well Managed & Regulated

- 8 CLEAR SYSTEM STANDARDS & FUNCTIONS
- 9 PRODUCER REPORTING ON UNITS SOLD
- 10 GOVERNMENT OVERSIGHT AND ENFORCEMENT

Implementation of these principles in the five targeted states will result in:



ENVIRONMENTAL / CLIMATE

- Over 24.5 billion beverage containers — roughly 1.9 million tons of material — recycled each year across the five states.
- A decrease in per capita wasted beverage containers from 403 to 91 per person per year
- More than 460,000 tons of valuable material diverted from landfill or removed from land and waterways
- A total reduction in emissions of up to 557,00 metric tons of CO₂, the equivalent of taking as many as 121,000 cars off the road annually



ECONOMIC

- A 33% increase in material available to replace the use of primary material in new beverage containers and to help meet recycled content commitments and requirements
- Over nine billion additional beverage containers recycled each year, including 1.5 billion glass beverage containers and 5.9 billion plastic beverage containers
- 2,751 net added jobs
- Annual municipal cost savings of between \$111.5 million and \$158.3 million, as well as \$44 million per year to support state agency oversight
- An estimated \$822 million in unredeemed deposits available across the region over the first two years to aid with adaptation and transition to modernized DRS in municipalities, MRFs, neighborhoods, and more
- A system cost to producers of just 1 to 3.6 cents per container by state



SOCIAL

- A jump from 0% recycled to 89% for nips — equivalent to more than 70 million individual nips
- Up to 34% overall reduction in litter
- A more accessible, inclusive, and equitable DRS

Ensuring an equitable transition is critically important and will require localized planning and further research.

Reloop is committed to designing new research, data, and analysis to meet state's needs and translate it into timely, accessible, and compelling forms for their easy use. We aim to offer evidence-based support for regional and state-specific policy advocacy as stakeholders draft bills, push for passage, and work on implementation and transition in 2022 and beyond.

In recent years, a huge variety of publications have covered the so-called "material shortage" for beverage production, including for all three primary beverage material types: aluminum, plastic, and now glass.

This contrasts with the reality on the ground of:



Huge amounts of **glass** being illegally dumped and landfilled



A global **plastics** leakage crisis along our coasts and in our waterways, now significantly impacting human and embryo development (recent research confirms that plastic can cross the blood/brain barrier)



More than half of all **aluminum** being sent to final disposal, despite its high market value and ease in handling and sorting aluminum at MRFs³⁹

The problem is not with material shortages but with one of logistics: the current, predominant system is ill-equipped to collect, sort, and remanufacture the quality and quantity of material so desperately needed.

We have a solution that works: modern, effective DRS.

The time for urgent, comprehensive waste policy is now. Not only must we stop burying, burning, and littering over \$5 billion in resources per year, but we must also seize the promise of investment in infrastructure and technology, build supply chain resiliency by using and reusing resources locally; and maximize opportunities for local economic development centered on jobs that cannot be outsourced.

None of this will happen without regulatory interventions to change the economic incentives for recycling and reuse. We should base those interventions on well-researched and well-documented evidence on what works. We need sensible policy, not politically-driven policy. ReLoop is here to deliver the science-based, quantitative guidance, based on lessons learned and hard analysis, needed to ensure that government intervention will be effective.

The 10 principles presented here, derived from nearly a half-century of experience with DRS, offer an immediate opportunity to build on a familiar policy in use for decades. Adhering to them will establish a modernized, replicable model within the US for other states to follow and create a springboard for successful reforms that will operationalize a true circular economy.



| PRINCIPLE | MODEL CONDITIONS | MODEL OUTPUTS | CONNECTICUT | MAINE | MASSACHUSETTS | NEW YORK | VERMONT | REGIONAL |
|--|--|--|--|--|--|--|--|---|
| Accessible & Accountable | | | | | | | | |
| 1. Easy and Equitable | Guaranteed access to a redemption point within 5 miles for rural residents, 2 miles for urban residents (½ mile for New York City) | # redemption spots / person | 1,297 | 1,620 | 2,020 | 1,325 | 870 | 1,400 |
| 2. 90% Collection Rate | 90% enforced collection rate target, 85% reduction in beverage container litter ¹ | % change in recycled tonnage of beverage containers | 65% to 92% | 89% to 94% | 65% to 92% | 57% to 90% | 76% to 93% | 63% to 90% |
| | | Increased landfill diversion (tonnage) | 63,301 | 3,893 | 130,102 | 258,132 | 7,412 | 462,740 |
| | | Avoided greenhouse gas emissions (no bag drop scenario) | 71,700 MTCO ₂ e | 6,900 MTCO ₂ e | 138,000 MTCO ₂ e | 331,900 MTCO ₂ e | 8,300 MTCO ₂ e | 556,800 MTCO ₂ e |
| | | % overall reduction in litter | Up to 34% | Up to 34% | Up to 34% | Up to 34% | Up to 34% | Up to 34% |
| 3. \$0.10 Minimum Deposit | \$0.10 minimum deposit unless pre-existing deposit is higher; \$0.05 deposit for nipsz | # nips diverted from disposal or litter | 9 million | 3.5 million | 17 million | 44 million | 900,000 | 74.4 million |
| 4. Inclusive, Circular System | 95% of beverage container types included | # additional beverage containers recycled | 1.2 billion | 128 million | 2.4 billion | 5.4 billion | 176 million | 9.3 billion |
| | | Material available to meet recycled content goals (before / after) | 153k tons / 218k tons | 77k tons / 81k tons | 308k tons / 438k tons | 810k tons / 1.1 m tons | 33k tons / 41k tons | 1.4 m tons / 1.9 m tons |
| Industry Financed | | | | | | | | |
| 5. Producer Funded | Proprietary bottom-up activity-based costing calculation for each step in the DRS process including: space, retail labor, RVM purchase and maintenance, redemption center overhead, receptacle collection costs, redemption center labor, collection costs, counting costs, sorting costs, centralized administration and oversight; offset by material revenue costs and partial possession of unclaimed deposits | Total estimated cost of the system, net of material revenue and partial unclaimed deposits: • Without bag drop • With bag drop | \$27.4 million / \$33 million | \$43 million / \$44 million | \$69 million / \$82 million | \$454 million / \$475 million | \$16.7 million / \$17 million | \$610 million / \$651 million |
| | | Per container cost (without bag drop) | 1 cent | 3.6 cents | 1.1 cents | 2.5-3.3 cents* | 2.9 cents | 2.9 cents |
| 6. Fair Pay for Service Providers | On average, collecting and sorting for recycling 1,000 tons of material through a DRS creates 7.9 jobs while the collection, transfer, and landfill operations of the same amount material being disposed creates 1.4 jobs ² | Total additional jobs created by modernized DRS | 381 | 16 | 785 | 1,526 | 43 | 2,751 |
| 7. Financial Support for Municipal Recycling Programs | Analysis reflects: • Decrease in material collected • Decrease in material processed at a MRF or disposed • Decrease MRF revenue / tip fee increase • Decrease MRF marketability on remaining material • Decrease litter costs | Total cost savings in municipal budgets | \$11.5 million – \$17.7 million | \$900,000 – \$1.2 million | \$26.7 million – \$36.5 million | \$70.9 million – \$100.9 million | \$1.5 million – \$2 million | \$111.5 million – \$158.3 million |
| Well Managed & Regulated | | | | | | | | |
| 8. Clear System Standards and Functions | Producers retain unredeemed deposits up to 10% of total containers. At a 70% redemption rate, the state would retain 2/3 unredeemed deposits, at 80% redemption rate the state would retain ½ unredeemed deposits | Value of unredeemed deposits available to state during phase in (\$m / per year) | \$31.4 million – \$63.9 million | \$12.9 million | \$62.1 million - \$126.3 million | \$170.9 million - \$348.8 million | \$6.1 million – \$12.5 million | \$283.4 million - \$564.4 million |
| 9. Producer Reporting on Units Sold | All containers counted and verified through technology to ensure accurate reporting and mitigate fraud | Retailer percent of modeled redemption points | Retail: 69% Redemption centers: 31% | Retailers: 94% Redemption centers: 6% | Retailers: 99% Redemption centers: 1% | Retailers: 84% Redemption centers: 2% Building RVMs: 14% | Retailers: 96% Redemption centers: 4% | Retailers: 89% Redemption centers: 2% Building RVMs: 9% |
| 10. Government Oversight and Enforcement | State agency’s role could include reviewing producer submitted data and plans and carrying out audits | Allocation to state agencies for oversight (\$M) | \$5.1 million | \$3.3 million | \$9.2 million | \$24 million | \$2.6 million | \$44 million |

* cost per container is 2.5 for New York City and 3.3 cents for the rest of New York state

1 - “National Litter Study”, Keep America Beautiful. 2021 <https://kab.org/litter-study/>.

2 - Morris, Jeffrey and Clarissa Morawski. “Returning to Work.” Container Recycling Institute. December 2011. <http://productstewardship.net/sites/default/files/PDFs/libraryContainers-Jobs-CRI-Morawski-Morris-Dec2011.pdf>

- 1 “By the Numbers: A National Beverage Container Program.” Reloop Platform. <https://www.reloopplatform.org/by-the-numbers-a-national-beverage-container-program/>
- 2 Calculated using methodology from: “What We Waste.” Reloop Platform. April 2021. <https://www.reloopplatform.org/what-we-waste>
- 3 Prüst, Minne. “The plastic brain: neurotoxicity of micro and nano-plastics.” Particle and Fibre Toxicology. 08 June 2020. <https://particleandfibretoxicology.biomedcentral.com/articles/10.1186/s12989-020-00358-y>
- 4 “By the Numbers: A National Beverage Container Program.” Reloop Platform. <https://www.reloopplatform.org/by-the-numbers-a-national-beverage-container-program/>
- 5 Calculated using methodology from: “What We Waste.” Reloop Platform. April 2021. <https://www.reloopplatform.org/what-we-waste/>
- 6 “Municipal Solid Waste in the United States: 2011 Facts and Figures.” Environmental Protection Agency. pp. 134.
- 7 Municipal Solid Waste in the United States: 2011 Facts and Figures.” Environmental Protection Agency. pp. 134.
- 8 “What Is a Circular Economy?” Ellen MacArthur Foundation, <https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview>.
- 9 “Introducing a More Circular Economy Will Meet with Resistance.” The Economist, 27 Sept. 2018 <https://www.economist.com/special-report/2018/09/27/introducing-a-more-circular-economy-will-meet-with-resistance>.
- 10 “The New Plastics Economy: Rethinking the Future of Plastic.” Ellen MacArthur Foundation pp.27. <https://emf.thirdlight.com/link/faarmdpz93ds-5vmvdf/@/preview/1?o>
- 11 Balkan, Elizabeth et a. “Beyond Recycling: Policy to Achieve Circular Waste Management.” November 2021. <https://www.nlc.org/resource/beyond-recycling-policy-to-achieve-circular-waste-management/>
- 12 50 States of Recycling. Ball. March 2021. <https://www.ball.com/getattachment/37f5f87f-d462-44c5-913f-d3075754741a/50-States-of-Recycling-Eunomia-Report-Final-Published-March-30-2021-UPDATED-v2.pdf>
- 13 2020 National Litter Study: Summary Report. Keep America Beautiful. May 2021. https://kab.org/wp-content/uploads/2021/05/Litter-Study-Summary-Report-May-2021_final_05172021.pdf
- 14 “U.S. Recycling Rates by Deposit Status, 2015. Container Recycling Institute. https://www.container-recycling.org/index.php?option=com_content&view=article&id=199&Itemid=1155
- 15 “Bottle Bill Resource Guide: Litter Studies in Bottle Bill States.” Container Recycling Institute. <https://www.bottlebill.org/index.php/benefits-of-bottle-bills/litter-studies-in-bottle-bill-states>
- 16 “Public Opinion Surrounding Plastic Consumption and Waste Management of Consumer Packaging.” World Wildlife Fund. 2020. c402277.ssl.cf1.rackcdn.com/publications/1457/files/original/CI_Public_Opinion_Research_to_WWF_2021_01_26.pdf?1616455951
- 17 Abel, David. “New England Is Warming Faster than the Rest of the Planet, New Study Finds - The Boston Globe.” BostonGlobe.com, The Boston Globe, 31 Dec. 2021 <https://www.bostonglobe.com/2021/12/30/science/new-england-is-warming-faster-than-rest-planet-new-study-finds/>.
- 18 Global Commitments: Signatory Reports.” Ellen MacArthur Foundation. <https://ellenmacarthurfoundation.org/global-commitment/signatory-reports>
- 19 “Facts and Figures about Materials, Waste, and Recycling.” Environmental Protection Agency, <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling>.
- 20 Mouw S. “The Recycling Partnership. 2020 State of Curbside Recycling.” The Recycling Partnership. https://recyclingpartnership.org/wp-content/uploads/dlm_uploads/2020/02/2020-State-of-Curbside-Recycling.pdf
- 21 “Glass: Material-Specific Data.” Environmental Protection Agency. Agency. <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/glass-material-specific-data>.
- 22 Fernandez, Lauren. “Recycling Prices Continue to Rise – But at What Cost?” Conservation Law Foundation, 4 Nov. 2021, <https://www.clf.org/blog/recycling-prices-rise-at-what-cost/>.
- 23 Dixon, Ken. “CT’s Recycling Market Collapses.” Connecticut Post, Connecticut Post, 8 Mar. 2019, <https://www.ctpost.com/politics/article/CT-s-recycling-market-collapse-13661573.php>.
- 24 Ryan, Carol. “Empty Plastic Bottles Go from Trash to Hot Commodity.” The Wall Street Journal, Dow Jones & Company, 9 Nov. 2021, <https://www.wsj.com/articles/empty-plastic-bottles-go-from-trash-to-hot-commodity-11636455644>.
- 25 U.S. Recycling Rates by Deposit Status.” Container Recycling Institute. 2015. https://www.container-recycling.org/index.php?option=com_content&view=article&id=199&Itemid=1155
- 26 “Deposit Return Systems: System Performance.” Reloop Platform. May 3, 2021. <https://www.reloopplatform.org/wp-content/uploads/2021/05/Fact-Sheet-Performance-3May2021.pdf>
- 27 “System Performance.” Reloop Platform. May 3, 2021. <https://www.reloopplatform.org/wp-content/uploads/2021/05/Fact-Sheet-Performance-3May2021.pdf>
- 28 Goodison, Donna. “Bottle bill foes pour cash into campaign.” Boston Herald. 14, September 2014. <https://www.bostonherald.com/2014/09/14/bottle-bill-foes-pour-cash-into-campaign/>
- 29 Calculated using the Environmental Protection Agency Greenhouse Gas Equivalencies Calculator. <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>
- 30 “The New Coal: Plastics and Climate Change.” Beyond Plastics <https://www.beyondplastics.org/plastics-and-climate>
- 31 “Trashing New York’s Neighborhoods.” Transform Don’t Trash NYC. <https://www.nylpi.org/wp-content/uploads/2019/10/trashing-new-yorks-neighborhoods.pdf>
- 32 “Deposit Return Systems Create More Jobs.” Reloop Platform. <https://www.reloopplatform.org/wp-content/uploads/2021/02/DRS-Factsheet-Jobs-5FEB2021-1.pdf>
- 33 Gross value added (GVA) is an economic productivity metric that measures the contribution of the DRS to the state.
- 34 DSM Environmental, 2009. “2009 Impacts of MA EBB on Municipal Recycling”. Obtained via email correspondence with Michael Noel, 12/7/21.
- 35 Ameripen’s analysis does not state beverage containers only, so it is believed this number applies to all PET and HDPE packaging
- 36 Additional capital upgrades cited included: AI robotics, star screens, foam densifiers, glass processing equipment, pelletizing equipment, extruding systems
- 37 Saphire, David. “Case Reopened: Reassessing Refillable Bottles.” Book News Inc. 1994.
- 38 “Deposit Return Motivates Voluntary Switch to Refillables.” Reloop Platform. 8 February 2017. <https://www.reloopplatform.org/deposit-return-motivates-voluntary-switch-to-refillables/>
- 39 “Aluminum: Material-Specific Data.” Environmental Protection Agency. <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/aluminum-material-specific-data>

reloop

NORTHEAST

Reimagining the Bottle Bill

Embargoed until 12:01AM March 15