



**A Guide to Modern
Deposit Return Systems:
10 Essential Practices**

reloop



Foreword

The task of shaping a more sustainable world requires collaboration, informed decision-making, and inspired action.

A Guide to Modern DRS: 10 Essential Practices (the Guide) aims to bring these elements together for policymakers, advocates, and producers seeking the best public policy solutions to the massive problem of beverage container waste.

The journey towards sustainable waste management requires not only a desire for change, but also an understanding of the principles that underpin a modern deposit return system (DRS). In *Reloop North America's "Bottle Bill Reimagined"*, we outlined the high-performance *principles* that form the bedrock for reshaping our approach to used beverage container management. But there is no point in having principles if they cannot be applied. That's what the Guide does — harnesses the power of these principles and the experiences of states and countries developing DRSs by laying out clearly and simply how to build, run, and maintain an effective DRS.

The 10 essential practices described in this Guide have proven to be key for successful implementation. The path to transforming these principles and practices into actionable policies is daunting. But the Guide can serve as a compass, informing each step and keeping all parties on track when competing interests intervene. The Guide's purpose is two-fold:

- 1. Equip policymakers with experiential insights, practical advice, and useful language.**
- 2. Empower advocates and researchers with tangible references on where and why DRS is working well.**

Our goal has been to demystify the intricacies of DRS, distilling complex concepts into actions. Some colleagues asked me to create a “DRS for Dummies”. I hope the Guide is more of a “DRS for Doers” who need examples of good DRS policies so they can make a difference in their jurisdiction. Through well-curated case studies from different corners of the world, the Guide offers insights that are universally applicable, transcend geographical boundaries, and create a bridge between theory and action.

We invite you to journey through the foundational principles, discover and embrace the best practices, and take inspiration from those who are pioneers on the path to effective post-consumer material recovery and use. Let this Guide be your companion on this journey – a roadmap, a reference, and an inspiration.

Let's advance the circular economy, one best practice at a time.



Elizabeth Balkan
Director, Reloop North America

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10 Essential Practices for a Modern Deposit Return System

- 1 Meaningful Targets and Penalties
- 2 Point-of-Return Requirements
- 3 Compliance & Official Reporting
- 4 Oversight and Enforcement

Regulations
Lay the foundation to build a strong system.



An orange arrow points downwards from the 'Regulations' section to the 'Standards' section.

- 5 Design, Marking, and Registration for Containers
- 6 Collection Standards


Standards
Serve as a frame to run the system effectively.



A pink arrow points downwards from the 'Standards' section to the 'Operations' section.

- 7 Infrastructure for Large-Volume Returns
- 8 Optimized Logistics
- 9 Material Processing and Service Fees
- 10 Management of Material Flow and Financial Data

Operations
Define the functions to maintain the system over time.



A blue arrow points downwards from the 'Operations' section to the bottom of the page.

Overview

As raging wildfires and powerful storms threaten and devastate community after community, addressing climate change has never been more urgent. Nations are seeking ways to mitigate their carbon footprint and innovative waste reduction strategies have emerged as a pivotal approach.

Modern deposit return systems (DRSs) — as opposed to older, traditional beverage container return systems — have garnered attention as a potent tool for not only waste reduction, but also resource conservation, and carbon emissions reduction — a sustainable solution to waste management and climate change at large. Despite this demonstrable effectiveness, when there's legislation to initiate or modernize a DRS in a state — “*bottle bills*” have been introduced in 12 states along with talks of a federal bill — opinions fly in all directions. Too often, advocates propose, industry opposes, legislation stalls, and progress stops. Meanwhile, every minute worldwide, more than 2.5 million beverage containers are buried, burned, or littered.¹ All of that wasted material is then set to move us further away from zero carbon, as the management or leakage of that waste and production of new containers pollutes our environment and generates additional carbon emissions.

A Guide to Modern Deposit Return Systems: 10 Essential Practices (the Guide) sets out the key requirements for successful implementation of a DRS. The Guide has been developed by the North American arm of Reloop, an international nonprofit organization working with governments, industry, and society to accelerate the global transition to an integrated circular economy that allows precious resources to remain resources, so that people, businesses, and nature can flourish.

Based on Reloop research, data, and policy experience, the Guide interweaves explanatory text with real-world case studies on where DRSs are working, what it takes to make a DRS work, why these practices are essential, and how to build, run, and maintain an effective DRS — tangible lessons from both success and setback stories.

Each of the 10 Essential Practices explored have their basis in a set of 10 high-performance principles (mentioned on Page 8, and explained in Appendix I). Together these principles and practices are two sets of evidence-based guidance that policymakers, industry, and advocates could agree on and which make more modern and effective bottle bills. A synopsis of each of these practices follows.



Modern deposit return systems have garnered attention as a potent tool for waste reduction

¹ Calculations based on Wilcox, Jason and James MacKenzie (2021) What We Waste. reloopplatform.org/resources/what-we-waste

Practice 1**Meaningful Targets and Penalties**

The foundation of a successful DRS lies in achieving meaningful targets which drives proactive participation from all the stakeholders involved. Complementing such targets are enforceable penalties, whose importance and application are detailed in this section.

Practice 2**Point-of-Return**

Recycling success hinges on public participation. This practice underscores the value of informed and engaged consumers, catalyzing their active involvement in the DRS. Centering DRS on equity and access can lead to higher return volumes compared with examples of when these elements aren't included. This section expands on the legislative requirements for high performance and accessibility.

Practice 3**Compliance and Official Reporting**

Transparency and accountability serve as the cornerstones of an effective DRS. This section showcases the importance of well-structured reporting mechanisms, binding legal frameworks, and robust compliance protocols.

Practice 4**Oversight and Enforcement**

Effective DRS implementation demands vigilant oversight and rigorous enforcement. This portion of the Guide navigates through the intricacies of monitoring, addressing fraudulent activities, and ensuring system integrity.

Practice 5**Design, Marking, and Registration for Containers**

This practice delves into the significance of standardized container design, universally recognizable markings, and rigorous registration systems. These measures not only enhance sorting accuracy but also enable consumers to recycle easily.

Regulations

Lay the foundation to build a strong system.

**Standards**

Serve as a frame to run the system effectively.



Practice 6**Collection**

Access to convenient collection points is pivotal in motivating consumer participation. This practice explores the role of retailers and highlights the minimum standards and operating requirements as well as the technological needs of an efficient DRS.

Practice 7**Infrastructure for Large-Volume Returns**

This section focuses on the pivotal role of optimized logistics in orchestrating large-volume returns. By explaining the various methods of collection, this practice highlights the specific operational requirements that ensure successful DRS implementation and financial viability.

Practice 8**Optimized Logistics**

To enable a DRS to recycle efficiently, efficient logistics are paramount. This section delves into optimizing logistical operations, balancing flexibility with performance requirements.

Practice 9**Material Processing and Service Fees**

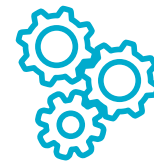
This practice unpacks the intricacies of handling and processing fees, emphasizing transparency and accuracy in financial transactions to show how these mechanisms maintain DRS momentum.

Practice 10**Management of Material Flow and Financial Data**

This practice elaborates on the roles of regulatory agencies, producers, and distributors in maintaining transparent transactions.

Operations

Define the functions to maintain the system over time.



A Call to Action

The DRS practices highlighted in this Guide are not mere suggestions; they are the essentials that give force to a rallying cry for governments, policymakers, advocates, industries, and citizens alike. The transformation of waste management is no longer a choice; it is a collective imperative that transcends borders and ideologies. The legacy of a cleaner, more sustainable future rests on the shoulders of stakeholders at all levels.

- Governments and policymakers must make sure there is sound legislative support for modern DRSs, providing the framework that empowers systemic change.
- Advocates must continue to push for aspirational yet practical solutions and hold those who develop and run DRSs accountable for implementing them year in year out.
- Industry, from beverage producers to retailers to waste management companies, must be prepared to collaborate, embracing technological innovation and transparent financial practices that echo their commitment to environmental stewardship.
- Citizens, too, play an indispensable role by being advocates at the local level and actively participating in DRSs, demonstrating that responsible choices ripple outward, impacting the broader ecosystem.



*Advocates must
continue to push
for aspirational yet
practical solutions*

Using this Guide

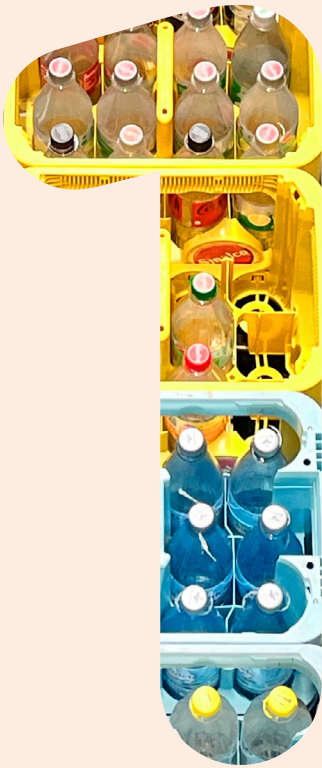
The practices detailed in the Guide underscore that building, running, and maintaining a modern DRS is like weaving an intricate piece of fabric from various strands that gain strength and durability through their interconnection.

Optimal waste management demands legislative commitment to clear mandates, ensuring the systemic adoption of responsible recycling practices. Regulatory oversight guarantees compliance and safeguards against fraudulent activities, reinforcing the credibility of the system. Collaboration between producers, retailers, and consumers is critical.

A modern DRS offers hope for a sustainable tomorrow. Its potential for reducing waste, conserving resources, and curbing emissions has far-reaching implications. The Guide serves as an indispensable roadmap for policymakers and stakeholders navigating the intricacies of DRS implementation.

As the world grapples with extreme weather events and natural calamities attributable to rising emissions, the circular economy for waste and emissions reduction, including a DRS, provides a pragmatic solution. It is our fervent hope that the Guide can help move us all forward on the journey towards a greener, more sustainable future.





Practice 1

Meaningful Targets and Penalties

Meaningful targets and penalties drive performance and outcomes to make a modern DRS work. A minimum deposit of 10 cents and a redemption target of 90% stimulate consumer, producer, and government engagement and investment. Strong penalties and government enforcement are important so that producers view compliance as more cost-effective than non-compliance.

Regulations

Lay the foundation to build a strong system.



→ Setting clear targets through legislation helps define common goals for producers, retailers, and regulators, to encourage cooperation. Ambitious performance targets also counteract practices that may discourage redemption.

Establishing adequate enforcement and meaningful penalties are equally important. Any system not backed by rigorous enforcement risks missing targets and encouraging inappropriate behavior. The right mix incentivizes producers and system operators to avoid penalties by voluntarily maintaining high performance.

Public policy impact can be measured by the yardstick of meaningful targets, without which it is impossible to assess the effectiveness or efficiency of the DRS.

A 90% collection target is ambitious but attainable when the system is designed properly. Setting a 90% collection target ensures the system is designed to maximize waste prevention, litter reduction, and facilitate high levels of closed-loop recycling.



High-performing DRSs operating in countries such as Denmark, Finland, Germany, Norway, and Lithuania achieve 90% or higher collection rate regularly. In addition to a 90% collection rate, DRS legislation should require beverage producers and/or DRS operators to meet targets set in the following areas:

Recycling rate (material-specific and overall)

Legislation should specify the minimum amount of eligible beverage container material that is verifiably recycled into new products, expressed as a percentage of the amount of beverage container material placed on the market. When expressed as weight, this should be net of contamination, labels, glues, and caps.

Beverage packaging material

Setting specific targets based on beverage packaging materials, such as plastic, glass, and metal, allows legislators to tailor goals determined by processing capacity and market conditions.

Public awareness/satisfaction

Widespread awareness and public support is achievable if legislation requires system operators to promote public education, and measure and monitor consumer satisfaction. Targets should require that a minimum percentage of the public are aware of the program, as well as aware of what containers are included, what deposit amounts are, and where containers can be returned. A minimum percentage of the public should also report satisfaction with their experience of returning containers for a refund.

Minimum post-consumer recycled content

Where technically feasible, legislating minimum recycled content targets is another way to ensure performance and help deliver a closed-loop system. Ideally, such targets — which would be imposed on individual producers as opposed to system operators — should be material-specific and be set at the onset of a DRS.

Geographical coverage

A minimum number of collection points should be required throughout the state, with different targets applying in urban vs. rural areas. Legislation must specify maximum distances between collection points and where consumers live, measured by travel time and/or distance to a participating retailer or redemption center. Those sites' minimum operating hours must go beyond traditional working hours, so consumers can access return points easily.



Targets should require that a minimum percentage of the public are aware of the program

DRS and Extended Producer Responsibility: Better Together

For many policymakers, extended producer responsibility for packaging and paper products (which we simply call EPR here) offers the promise of financial relief from years, if not decades, of the budgetary burden that waste management and exposure to commodity market volatility presents. Some may see EPR as an effective salvo, as this intervention typically applies to all packaging types.

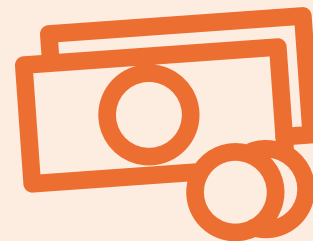
It is important to recognize several things with regard to DRS and EPR. First, DRS is an EPR tool. In fact, it is one of the most effective and crucial ones because it covers a specific, critical part of the packaging stream. Why, one might ask, is it so important to have a specific program for separate collection and recycling of beverage containers?

In summary:

- Energy-intensive production means beverage containers contribute an outsized carbon footprint.
- Typically made from glass, PET, or aluminum, beverage containers are readily mechanically recyclable materials well suited to closed-loop recycling, unlike many other packaging formats.
- 40%-60% of roadside litter (in non-bottle bill states) is beverage containers — and is by far the most littered coastline item.²
- Beverage containers make up 40-50% of the packaging stream by weight.

Modern DRSs can achieve more than a 90% recovery rate, with little or no subsequent production losses. In contrast, even in a best case scenario for beverage container collection via curbside recycling programs, it is virtually impossible to achieve a 60% recovery rate after factoring in participation and loss rates. The current beverage container recycling rate in states without DRS is 27%.

Ontario, Canada, offers a real-world example of this very phenomenon. There, alcoholic beverages are covered by the DRS, which has achieved a 78% rate of return. The remaining beverage containers, covered only by EPR, are returned at only a 46% rate. Internationally, on average, curbside collection systems for PET plastic beverage containers achieve a 47% recycling rate whereas DRS achieves 94%³. Through this, we can see that DRS is far more effective than EPR alone for efficient collection and recycling of beverage containers.

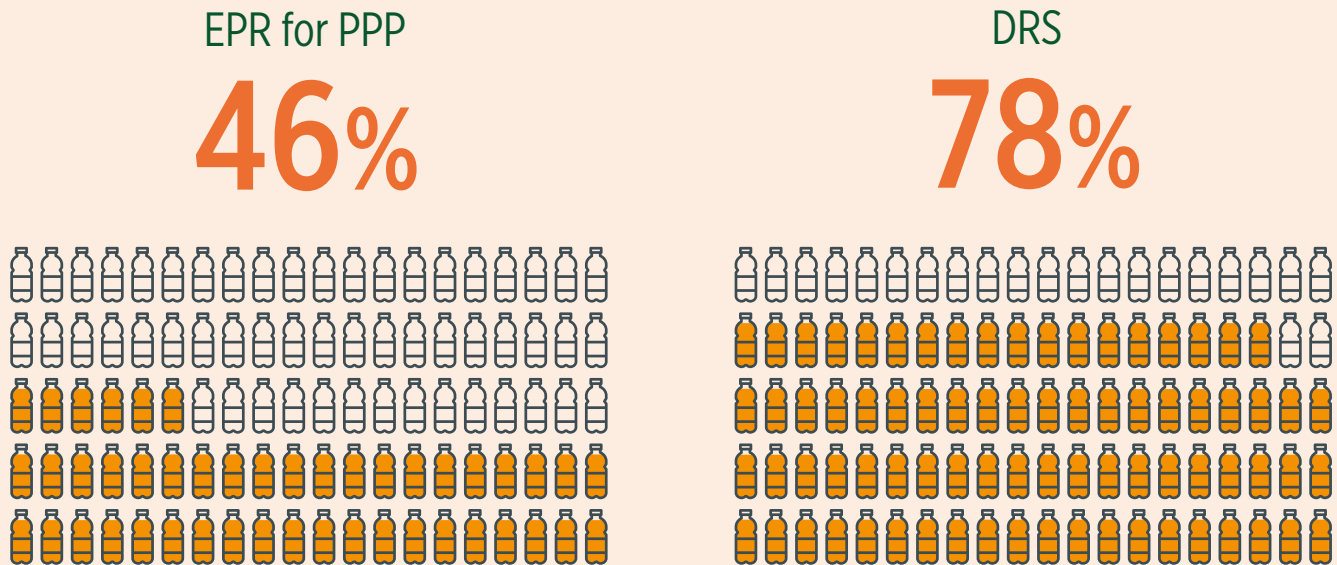


DRS is far more effective than EPR alone for efficient collection and recycling of beverage containers.

2 CRI (2006), The 10¢ Incentive to Recycle www.container-recycling.org/assets/pdfs/10Cent4th-web.pdf

3 Tomra (2021), Rewarding Recycling, p.17. www.tomra.com/en/Reverse-vending/Media-Center/News/2021/rewarding-recycling-seminar

Figure 1: Return rate for PPP (Packaging & Paper Products) containers only covered by EPR vs. the return rate for containers covered by a DRS in Ontario



EPR and DRS are complementary programs which, when carefully designed and implemented, contribute to sustainable material management in specific and unique ways. Sacrificing the introduction of DRS and looking to EPR as an all-purpose approach will result in uneven, sub-optimal outcomes. This is why so many European countries, after experiencing EPR for several decades, have now implemented DRS to enhance their system and achieve higher rates of packaging recovery and circular recycling.

Some may think EPR should be implemented in place of DRS, or as a preceding measure before DRS can be considered. Instead, it is important to acknowledge these two programs as not just fully compatible but also better together.

Effective DRS legislation allows performance expectations to increase over time

The mandated collection target could, for example, increase by 5% annually until the maximum target of 90% is reached. When producers and DRS operators know targets will become progressively more ambitious, they can plan and make investments in infrastructure and innovation necessary for continuous improvement.

Without meaningful targets, perverse outcomes can result. For example, a redemption network that is inaccessible or inconvenient is bad for the consumer but does translate into lower system costs and a larger pool of unclaimed deposit funds, which benefits producers and state agencies. To counteract this unintended consequence, setting redemption targets serves as a healthy deterrent.

Case Study — Latvia

Latvia's deposit system for single-use and refillable beverage containers, which launched in February 2022, aims to achieve a collection rate of 90% for eligible glass, ferrous metal, aluminum, and plastic beverage containers by 2030.⁴ When submitting their application to become the system operator in 2020, Depozita Iepakojuma Operators (DIO) committed to reaching the 90% target ahead of the government schedule, to demonstrate their commitment to performance and confidence in their operations. This also exceeds the targets set out in the European Union's Single-Use Plastics Directive, which calls on member states to separately collect 90% of plastic beverage bottles for recycling by 2029. To achieve this, Latvia's legislation includes specific collection and recycling rate targets for each material included in the scheme, as well as overall targets.

Table 1 presents a selection of the official target milestones spanning from 2023 to 2030, along with the ambitious commitments made by the system operator. A unique aspect of Latvia's DRS legislation is the inclusion of minimum reuse targets for glass containers. Starting at 5% in 2023, these targets progressively rise to 15% in 2030.

Table 1: Latvia DRS implementation: material-specific collection and recycling targets and deadlines

Packaging material	By 2023		2024 DIO-set targets		By 2027		2030 onwards	
	Collected	Recycled	Collected	Recycled	Collected	Recycled	Collected	Recycled
Glass	70%	65%	90%	90%	81%	71%	90%	75%
Plastic	70%	50%	90%	90%	80%	57%	90%	60%
Ferrous metal	60%	60%	90%	90%	72%	72%	80%	80%
Aluminum	40%	40%	90%	90%	52%	52%	60%	60%
All materials		60%		90%		66%		70%

4 Reloop Platform. 2022. Global Deposit Book (2022). www.reloopplatform.org/resources/global-deposit-book-2022

Enforceable Penalties

As important as setting meaningful targets is adequate enforcement. When targets are not reached, governments can get the program back on track through strong oversight and enforcement paired with penalties.

Monetary fines and additional reporting requirements are two common penalties. Legislation could also include, for example, a trigger to automatically increase the deposit value, either at a set period, to keep up with inflation, or whenever performance targets are not met.

At a minimum, enforcement procedures and penalties need to be clearly stated in statute and regulations, along with the government agency responsible for enforcing them. Penalties are most effective when developed with a clear connection to the expectations outlined in the targets and a direct line of responsibility back to a specific party. They must also be high enough that the cost of compliance makes better business sense than the cost of non-compliance. If the producer/distributor perceives the penalty as simply the cost of doing business, then the penalties are not strong enough.

Legislation must include a detailed and exhaustive list of potentially fraudulent activities for which a producer, distributor, retailer, or other collection point could be fined or prosecuted.

These may include:

- Selling beverages without a deposit
- Underreporting the number of beverage containers sold to limit deposit refunds and other financial responsibilities
- Failing to display mandatory unique marking on the containers
- Using a barcode that does not meet DRS operator requirements so proper automated collection is not guaranteed
- Failing to meet minimum recycled content requirements, if applicable
- Refusing to accept empty eligible DRS containers that meet stated criteria
- Using non-compliant Reverse Vending Machines (RVMs) to collect eligible containers

Case Study — Quebec

Quebec’s new DRS regulations will begin to be implemented in November 2023. They prescribe the following annual recovery rate targets for 2030:

Table 2: Container Type and Recovery Rates for Quebec

Container type	Recovery target (%)
Single-use metal containers	85%
Single-use plastic containers	80%
Single-use glass containers	80%
Single-use fiber containers, including multi-layer containers	70%
Single-use biobased containers	80%
Reusable glass containers	90%
Reusable containers made of any material other than glass	80%
All containers	85%

To drive continuous improvement, the regulations also stipulate that starting in 2030, and every two years thereafter, the recovery rates will increase by 5% until they reach 90%. Additionally, a minimum of 50% of containers must be recycled in a closed-loop fashion. By 2026, 80% of glass, aluminum, and plastic must be recycled locally. The same is required by 2028 for multi-layered and bio-based containers.

The new regulations also prescribe clear monetary penalties (all Canadian dollars) to be imposed on various stakeholders in the system, should they fail to meet legislated requirements:

- \$2,000 to \$10,000 for producers who fail to mark a barcode on the redeemable containers
- \$4,000 to \$250,000 and \$12,000 to \$1,500,000 if retailers fail to comply with the distances limit
- \$8,000 to \$500,000 and \$24,000 to \$3,000,000 for producers or Producer Responsibility Organizations (PROs) that fail to meet requirements
- \$10,000 to \$1,000,000 and \$30,000 to \$6,000,000 for other infractions by producers or their PRO

Practice **1**
**Meaningful Targets
and Penalties**

Summary

Achieving a high-performing DRS, whether it is being newly introduced from scratch or legislatively reformed, requires careful planning. There are several legislative and implementation requirements to consider in order to lay the foundation for a successful system. While fundamentals like an effective minimum deposit level and convenient access to return points are key, other principles — such as meaningful targets, strong enforcement, and penalties — are also critical to program success.



Practice **2**


Point-of-Return

Point-of-Return requirements ensure that consumers have easy, equitable access for returning containers and redeeming deposits. A retail-focused return approach consistently shows 87% return rates compared with 71% for return to depot or redemption centers. Retail return can also generate increased foot traffic for smaller stores, encouraging their participation.

Regulations

Lay the foundation to build a strong system.





Point-of-return requirements are the key to easy, equitable access for all consumers when they return their beverage containers to redeem their deposit. A consumer-friendly collection network assists the system's logistics providers, too. For these and other reasons, an approach focused on retail-oriented return consistently shows higher redemption rates than depot-based systems.

Centering DRS on Equity and Access

To encourage participation, returning empty containers for a deposit refund should be as easy as a routine grocery shopping trip. The redemption system should also be as accessible as possible, including for those living in rural areas; those without automobiles or modern mobile phones; people with disabilities; those on low incomes; and customers of delivery services. It should prioritize access for historically marginalized communities and other groups that have been denied access and/or suffered past institutional discrimination in the delivery of programs and services.

A strong network of return points that provide easy, convenient redemption options is vital to the high recycling rates seen in the highest-performing DRSs. Prioritizing access and improved customer experience means ensuring a network of redemption points that:

- Are sufficient in number in a set of geographic areas
- Deliver a consistent, easy, clean, and safe customer experience
- Are as easy to access as going shopping
- Cater to both low- and high-volume redeemers
- Guarantee cash refunds alongside other options (such as Electronic Fund Transfers, vouchers)
- Are technology-led

International experience shows that return-to-retail (R2R) systems, where retailers selling beverages become legally responsible for accepting empty containers for recycling, can best achieve all of these. R2R systems allow consumers to return their containers when they do their shopping or, if they are consuming their beverage outside of the home, to the nearest convenient location, which may be a shop or other local hub. In other words, these systems require no extra trips or additional travel time to return containers, which removes the barrier of going out of your way to recycle.

The Role of the Retailer

In addition to maximizing consumer access, R2R systems:

- **Leverage existing retail infrastructure and facilitate reverse logistics.** R2R mitigates the need to construct new recycling centers, which is particularly helpful when systems are being introduced. Avoiding new site construction and additional trips for consumers also prevents extraneous carbon emissions.
- **Reduce system costs.** In general, the cost of redemption at retail locations is only a marginal increase on fixed costs. This makes them a cost-effective option compared with standalone redemption centers or depots.
- **Benefit retailers.** Providing a convenient location where consumers can redeem their empty containers gives them another reason to visit retailers and spend their deposit refund. One study found shoppers returning containers spent up to 50% more money in that store visit than those who did not.⁵

Case Study — Germany

In Germany, retailers and other final distributors of deposit-bearing beverages are required to take back the same type of empty containers that they sell. For example, a retailer that only sells PET bottles must accept all PET bottles regardless of their size or brand but is not obliged to take back aluminum or glass containers.

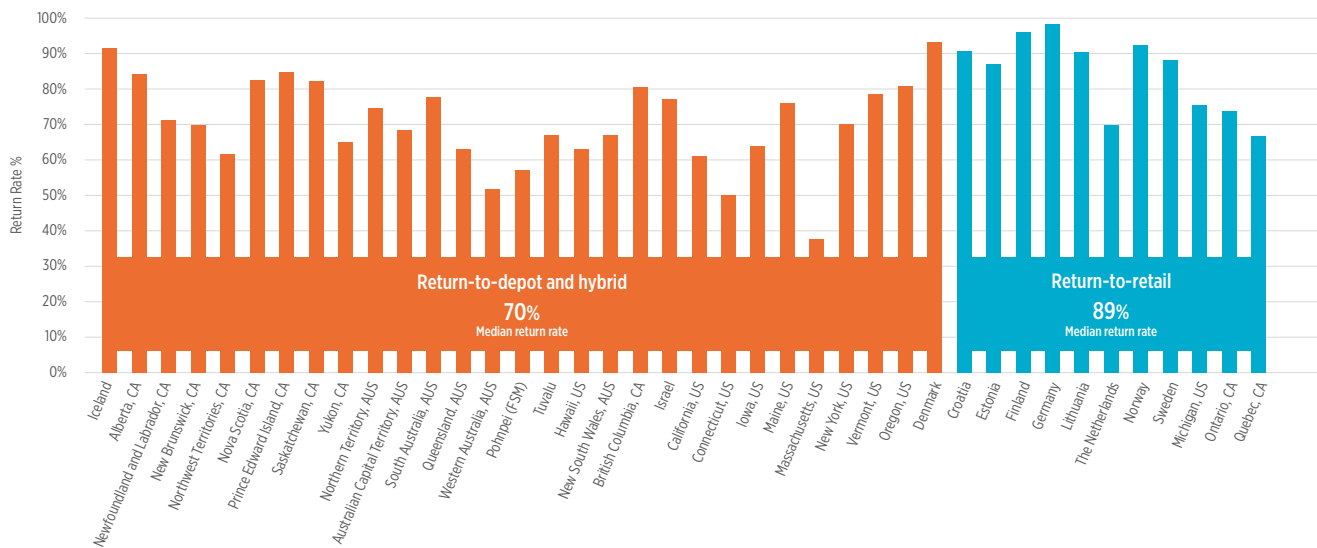
Small retailers (floor area less than 2,150 square feet) only need to take back empty containers of the beverages they sell, with no limit. There are approximately 130,000 redemption locations in Germany, yielding a ratio of one return point for every 640 residents. Germany's return rate in 2021 was 98%, the highest in Europe.

⁵ TOMRA (2021), Rewarding Recycling: Learning from the World's Highest-Performing Deposit Return Systems circular-economy.tomra.com/resources/drs-white-paper

Performance and System Type

Of all DRSs around the world, those that employ a R2R model have the highest redemption rates. According to ReLoop’s latest analysis, R2R systems achieve a median redemption rate of 89%, compared with 70% in systems that either rely only on depots or have a combination of retail and depots (“hybrid”). This is illustrated in Figure 2.

Figure 2: Redemption Rates for Single-Use Beverage Containers in Deposit Return Systems by Type of Collection Model



Case Study — California

California exemplifies how making redemption inconvenient damages system performance. California uses a hybrid redemption model, where redemption centers operate alongside retail stores to accept returns, with no redemption obligation for retailers. Retailers must only accept empties if they are outside a “convenience zone” — a specified distance from a redemption center.

Retailers can also opt out by paying a USD\$100 daily fee to the program. In practice, this is largely unenforced. Consequently, California only has 1,219 redemption points across the state, less than one per 30,000 residents.⁶ An inconvenient redemption network thwarts residents’ ability to easily obtain a refund, which essentially makes the deposit a tax. As more and more redemption centers closed in recent years, the state’s redemption rate saw a steady decline, from 74% in 2013 to just 60% in 2020 (inclusive of containers placed in curbside recycling bins).⁷

6 TOMRA (2021) Key Elements of High Performing Deposit Return Systems #4 - Convenient redemption system for consumers www.tomra.com/en/reverse-vending/media-center/feature-articles/key-elements-of-high-performing-deposit-return-systems-four
 7 CRI analysis of AB 1454, Container Recycling Institute, June 22, 2021 www.bottlebill.org/images/CRI_analysis_of_AB_1454_FINAL_6-22-21.pdf

Legislative Requirements

Setting legislative requirements for return points helps assure a consistent, optimized experience for consumer redemption. Quebec’s granular requirements, set by legislation, are summarized in Table 3.

Table 3: Quebec Legislation - DRS Return Point Requirements

Topic	Requirements
Physical layout	<ul style="list-style-type: none"> The site must be clean, safe and well lit, situated inside a building or in a closed shelter. A recovery bin designated for containers rejected when they are returned as well as for receptacles used to transport redeemable containers must be situated in the customer area and clearly marked. The redeemable containers that have been returned to a return site must be stored in an entirely enclosed space, separate from, and not visible or accessible from, the client area.
Information	<ul style="list-style-type: none"> The site must clearly display its affiliation with the DRS and bear the name or logo of the system prominently. A return site’s hours and days of operation must be posted at a location that is clearly visible from outside the premises.
Accessibility	<ul style="list-style-type: none"> The site must be accessible to persons with reduced mobility, with year-round road access (except in isolated or remote areas).
Operation time	<ul style="list-style-type: none"> When a return site is inside an establishment, it must be open at the same times as the establishment. When a return site is installed by a group of retailers outside their own establishments, the site must operate during the business hours of the establishment that remains open for the longest duration. In other cases (except in isolated or remote areas), a return site must be open every day, for at least 10 hours on Mondays to Saturdays and for at least six hours on Sundays, except on official holidays.

Retailer Allowances

Retailers frequently raise concerns about hosting redemption sites. To minimize the potential impacts on small retailers, almost all modern DRSs with R2R obligations include some allowances.

Two examples of these allowances are limiting the number of containers that can be returned per day and exempting stores below specific size and/or sales revenue criteria from all redemption obligations.

Case Study — Michigan

Until COVID-19 forced a system shutdown, Michigan's redemption rate was nearly 90%, the highest in the US. The success of Michigan's container deposit law can be attributed, in part, to the fact that it utilizes a R2R redemption model. All beverage retailers are required to take back empty containers of the same kind, size, and brand that they sell; there are no opt-out provisions. With that said, Michigan retailers have the option to:

- Refuse containers once an individual has been refunded \$25 within a single day
- Establish special or limited hours of operation for bottle return facilities
- Limit the number of available and operating RVMs

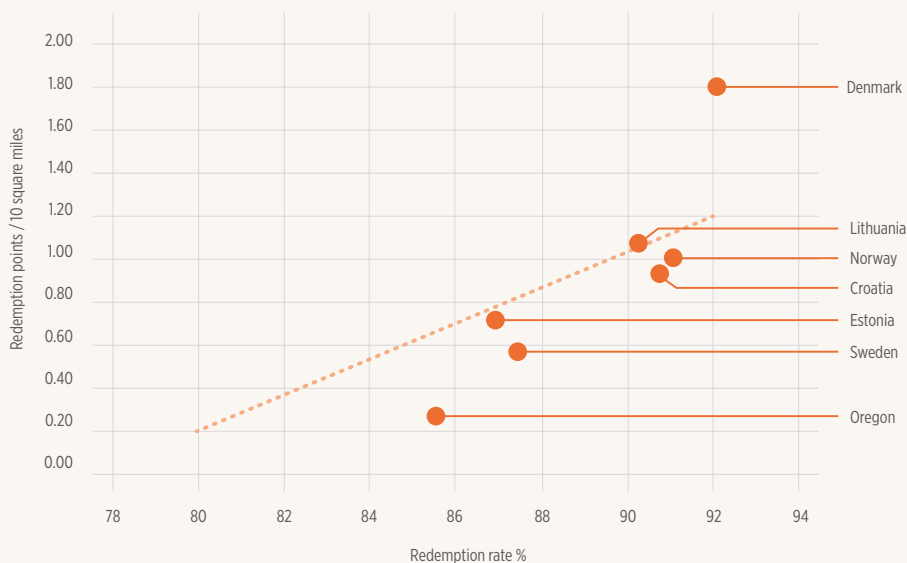
Performance and Access

Equitable access to redemption depends not only on a retail return network, but also on appropriate geographic distribution of redemption sites. In the Reimagining the Bottle Bill impact study,⁸ Reloop found that to achieve system accessibility and equity in Northeast DRS states, the distance from a consumer to a redemption point should not exceed:

- five miles in low population density rural areas;
- two miles in high density urban and suburban areas; and
- a half mile in ultra-dense New York City.

Looking at the world's highest-performing systems, one can find a clear correlation between high redemption rates and the availability of widely distributed return points. The more sites there are for consumers to return their containers at their convenience, the higher the redemption rate tends to be. Highly accessible systems consistently recover and recycle the highest amounts of material.⁹

Figure 3: Redemption rates vs. access in high-performing deposit return systems



Source: Reloop (2023) Internal data analysis.

8 Reloop Platform. Northeast Reimagining the Bottle Bill. Bottle Bill Reimagined. bottlebillreimagined.org/wp-content/uploads/2022/03/Reimagining-the-Bottle-Bill-REPORT.pdf

9 Reloop Platform. Global Deposit Book 2022. www.reloopplatform.org/resources/global-deposit-book-2022

Practice **2**
Point-of-Return

Summary

Successful DRSs depend on high rates of public participation and material recovery. To realize these goals, the number and strategic placement of return sites matter considerably. While certain allowances may be necessary to enable retailer involvement in the system, it is imperative to recognize the importance of point-of-return requirements, and the fact that R2R stands out as the approach with a proven track record of ease of use and accessibility.



Practice **3**


Compliance and Official Reporting

Compliance and official reporting by producers to government regulators guarantees progress can be measured and meaningful targets are met. Publicly communicating the activities and results of the program helps build and maintain consumer support, encouraging participation and driving higher rates of return.

Regulations

Lay the foundation to build a strong system.





Transparent performance reporting by system operators ensures that regulators can measure and enforce progress against meaningful targets accurately. When system results are communicated to the public openly, it not only builds trust but also maintains consumer support for the system. This transparent communication fosters a sense of accountability, encouraging consumer participation and driving higher rates of return.

Performance Requirements

Central system administrators (CSAs) collect performance-related data from a variety of stakeholders — producers and distributors, return point operators, logistics providers, consolidation and counting centers, and recyclers — and report to government regulators.

Regulators use this data to ensure that the DRS is operating soundly, and that the operator is fulfilling its legal obligations. These obligations include meeting statutory performance targets, such as minimum collection and/or recycling rates, number of collection points and appropriate distribution of collection points, and public awareness of the deposit system and locations where containers can be returned.

Case Study — Quebec

Quebec's new deposit return regulations were adopted on July 7, 2022, and are effective as of November 1, 2023. They contain detailed reporting requirements for each distributor, including information on the product type, quantity sold and recovered, quantity recycled into a closed-loop, rejected, or disposed of, as well as the parties involved in reclaiming or disposing of containers. As part of the reforms, traceability and independent third-party auditing are prerequisites in calculating the officially reported recycling rate.

The primary goals of these measures are to ensure the integrity and efficient management of the system. By having comprehensive data on the entire system, regulators can enforce regulations effectively, ensuring that expansion of the redemption network does not leave any communities underserved. The enhanced reporting requirements will allow regulators to monitor the system's performance carefully and, if necessary, intervene to make necessary improvements. The insights gained from these measures will prove invaluable for other jurisdictions seeking to enhance their own DRSs.

Modern DRS legislation requires the following minimum information be reported on an annual basis at the state level.

Table 4: Minimum information requirements

Information	Term	Description
What is out there? Beverage- and material-specific categorization of:	Sales data	Eligible beverage containers sold in the state (#)
	Returns data	Eligible beverage containers returned in the state (#)
Where does it go?	Recycling rate	Beverage containers actually recycled divided by beverage containers sold in the state in a given year, broken down by material and end use (%)
	Circularity rate	Beverage container material recycled in a closed loop divided by beverage container material sold in the state in a given year (%)
Who is using it?	Participation rate	Population that returns eligible containers via the deposit system (%)
	Community access	Population per redemption point, and the average distance to and from a redemption point (#, mi)
	Public communication and education	Population aware of DRS program (i.e., which containers are part of the system, what the deposit level is on various containers, the location of return points) (%)
What does it cost? How is it funded? (independently audited)	System expenses	Cost data, by material type, including but not limited to handling fees, transportation, collection, and processing costs, public communication and education costs (\$)
	System revenues	Revenue data, such as material sales and unredeemed deposits (\$)

Accountability and Fraud

Establishing and maintaining a beverage-container-specific data registry is crucial for building and upholding system integrity. The registry should include information such as supplier name, product name, flavor, container volume/height/diameter dimensions, material type, color, and barcode. A critical function of this registry is to capture new products, thus minimizing the presence of “free riders” – containers entering the market without a deposit which compromise brand owners’ financial responsibility for their proper management.

To ensure system integrity, reporting requirements must encompass all instances where material and money flow through the system. This includes not only points where containers are redeemed, but also consolidation and counting centers, participating recyclers, and third-party logistics providers. This comprehensiveness provides the kind of “checks and balances” that are needed to reconcile and audit system-related data. Because of the potentially sensitive nature of the data shared with system operators and regulators, it is important to prioritize data protection and maintain privacy.

Enforcement Mechanisms

At a minimum, modern DRS legislation should clearly define enforcement procedures and auditing protocols. These include clear penalties for non-compliance, which will be enforced by the responsible government agency.

Any attempts to underreport the number of beverage containers sold with the intention of reducing producer fees or the number of deposits paid out to consumers should result in a significant penalty. To be effective, legislation needs to set fines that are higher than the cost of non-compliance. This way, they will serve as an effective incentive for both producers and DRS operators to comply with the regulations.

Public Communication of Results

Alongside official performance reporting, it is best practice to communicate system results to all stakeholders, especially the public. An annual report serves as an important touchpoint and should be as engaging and accessible as possible.

To build and maintain public awareness and support, annual reports should go beyond mere numbers and ought to showcase the socioeconomic and environmental benefits derived from the system, such as jobs created, reduced littering rates, and avoided carbon emissions. They can also explain the overall intentions of the program, what beverages and container types are included, and shed light on the planned and existing collection point infrastructure.

To ensure the widest possible reach, DRS operators are advised to communicate their results across various channels, both traditional and non-traditional. These include social media platforms.

Case Study — Oregon

Under Oregon's DRS, any producer or distributor of redeemable beverage containers is required to report sales annually and return data to the Oregon Liquor and Cannabis Commission (OLCC) — the entity responsible for overseeing the system — and register each container type with the Oregon Beverage Recycling Cooperative (OBRC). Failure to register accurately is a violation of state law and OLCC has the right to impose civil and criminal penalties on companies who fail to do so. In addition to reporting beverage sales and returns data, the OBRC is required to maintain, and provide to the OLCC, a registry of all types of beverage containers sold and redeemed in the state for all registered entities that describe the containers.

OBRC publishes annual information on the number of beverage containers collected for recycling through the published redemption rate and refunds paid out to consumers. They also detail the system's community impact, through grants awarded via its BottleDrop Fund, as well as data on its returns network via different channels, including bag drop, redemption centers, and processing plants.

In November 2020, the Oregon Audits Division released an assessment of Oregon's DRS performance along with recommendations to modernize the program and increase participation. The recommendations, delivered to OLCC, included expanding the program scope to include wine and liquor and automatically boosting the deposit by \$0.05 whenever redemption rates fail to meet certain targets. The audit also recommended revenue from unredeemed deposits go to the state, instead of exclusively to OBRC, to support environmental programs.

In 2022, a new reform measure was passed to include some wine containers and other beverages, require all distributors selling at least 500,000 eligible containers to financially support a collection scheme in order to improve access and deliver an expanded redemption network.¹⁰ They were also required to strengthen reporting requirements for distributor cooperatives, namely OBRC.

10 Creating Change On A Dime obrc.com/wp-content/uploads/2023/03/About_Reports_2022_Annual.pdf
Accessed Nov. 7, 2023

Practice **3**
**Compliance and
Official Reporting**

Summary

The adage “you cannot manage what you cannot measure” aptly pertains to a modernized DRS.

Progress toward targets and overall system performance are measured by regular and robust reporting. Transparent reporting and communication of program results are also crucial for building and maintaining public support for the system, and flagging a need for recalibration to increase return rates and participation.

In this way, reporting requirements are a building block to greater accountability and overall system integrity.



Practice **4**

Oversight and Enforcement

Oversight and enforcement by state agencies incentivize producers to meet performance targets. When producers fail to meet targets, government can respond with strong enforcement measures, including financial penalties.

Effective legislation may also include a trigger mechanism to increase the minimum deposit value, if/when performance targets are not met. Penalties clearly connect to the expectations outlined in targets and responsibility accrues to a specific party or parties.

Regulations

Lay the foundation to build a strong system.





Scope of Responsibilities

In a high-functioning DRS, producers should have the authority to run the system as they see fit. However, that doesn't diminish the crucial need for robust oversight and enforcement. Establishing guardrails and careful monitoring are key to striking the right balance between the private sector's efficiency and innovation on one hand, while ensuring the best social and environmental outcomes possible on the other.

Sound legislation for DRSs is focused on outcomes. The role of government should include:

- Setting and enforcing performance targets, such as minimum redemption rates
- Adjusting the minimum deposit amount if redemption targets are not achieved during an agreed number of consecutive years
- Ensuring consumers can redeem containers conveniently
- Overseeing stakeholders and enforcing penalties in cases of non-compliance
- Carrying out regular and random audits
- Potential membership in the program's key decision-making body, such as an advisory council

To fulfill these obligations, the regulatory body will need dedicated staff and resources. As with other EPR programs, a DRS should include producer funding for government oversight. The exact funding can be assessed on a case-by-case basis but should be adequate to cover the full range of monitoring, auditing, and enforcement activities, as detailed below.

Sample DRS Implementation Schedule

The necessary steps for government and system operators to take in a DRS implementation plan are outlined in the sample DRS two-year rollout plan outlined in Appendix II.

Monitoring and Auditing

The most direct way that government oversees the DRS is through official reporting. As discussed in “Reporting Requirements,” the DRS system operator should be legally obliged to report the following to the regulator on at least an annual basis.

Table 5: Reporting requirements for System Operators

Term	Description
Sales data	Eligible beverage containers sold in the state (#, by material)
Returns data	Eligible beverage containers returned to a return point for recycling in the state (#, by material)
Recycling rate	Beverage containers actually recycled divided by beverage containers sold in a given year, broken down by material and end-use (%)
Circularity rate	Beverage containers recycled in a closed-loop divided by beverage containers sold in a given year (%)
Participation rate	Population that returns containers via the deposit system (%)
Community access	Population within a certain distance of each redemption point, and the average distance to and from a redemption point (#, mi)
Public communication and education	Population aware of DRS program (such as which containers are part of the system, what the deposit level is on various containers, the location of return points) (%)
System expenses	Cost data by material type, including but not limited to handling fees, transportation, collection, and processing costs, public communication and education costs (\$)
System revenues	Revenue data, such as material sales and unredeemed deposits (\$)

The regulatory body uses this data to ensure that the DRS is operating soundly and that the operator is fulfilling its legal obligations. Well-conceived legislation will include targets for rates of redemption, recycling, circularity, and participation as well as community access and awareness. Statutes may also include a trigger mechanism to increase the minimum deposit value, if/when performance targets are not met.

If, after careful analysis, there is strong reason to doubt the reported information, the governing body should retain the authority to perform a financial or operational audit to determine the veracity of the annual report. Legislation should clearly outline this authority, without any exemptions or prohibitions. As with all government oversight activities, the budget needed to conduct such audits should be fully funded by the relevant producers or distributors.

Penalties and Enforcement

At a minimum, legislation and/or regulations must clearly state the penalties and enforcement measures, as well as the government agency responsible for enforcement. Penalties are developed with a clear connection to the expectations outlined in the targets and draw a direct line of responsibility back to a specific party or parties.

Below are some examples of different penalties or steps that governments can take to encourage compliance with various performance requirements.

Table 6: Non-compliance areas and their potential response measures

Non-compliance area	Potential response measure
Failure to meet overall redemption target	<ul style="list-style-type: none"> • Impose a sufficiently high monetary fine: For example, the value of the avoided handling fee + avoided logistics and processing fees + unredeemed deposits • A “trigger” that automatically increases the deposit value • Require an increased amount of money be spent on consumer education and awareness campaigns • Replace “producer fees” with an ecotax
Failure to meet recycling target	<ul style="list-style-type: none"> • DRS operator forced to forego some of its materials, resulting in lower material revenues and /or higher producer fees • Introduce a recycling tax • Impose a monetary fine if a certain minimum quota is not reached
Failure to meet public education target	<ul style="list-style-type: none"> • Require an increased amount of money be spent on consumer education and awareness campaigns • Require more frequent reporting than originally mandated (e.g. biannual or quarterly)

The system operator is not the only party responsible for compliance. The following penalties are examples of measures used to ensure compliance by multiple parties.

Table 7: Examples of penalties for non-compliance

Non-compliance area	Responsible party	Potential response measure
Selling beverages without a deposit	Producer	Fine
	Retailer	Fine
Underreporting beverage containers sold (to reduce producer fees)	Producer/ Retailer	Fine
Not displaying the mandatory unique marking on containers	Producer	Fine
Using a barcode that does not meet requirements for effective collection	Producer	Product withdrawn from market
Refusal to accept empty eligible DRS containers that meet redemption criteria	Collection point	Prosecution

Case Study — Slovakia

Slovakia was the first Central European country to introduce a DRS in 2022. Manufacturers are responsible for managing and financing the program under the regulations, while the state plays a supervisory role. The system administrator, known as Správca zálohového systému, is a consortium of four associations representing beverage producers and retailers in Slovakia. The Ministry of the Environment oversees and regulates the system, ensuring transparent data and monetary flows and promoting the system to stakeholders and the public.¹¹

The Slovak DRS regulation¹² establishes the authority and responsibilities of government bodies in managing beverage packaging. It includes provisions for state supervision, administrative offenses, and the imposition of fines. Slovakia's legislation stipulates the Ministry's authorities as follows:



Authority and oversight

- Approves and monitors changes in the founding documents of the administrator
- Designates the legal entity or consortium to serve as the administrator
- Regulates and controls the deposit return system
- Determines fines for non-compliance with obligations



Enforcement measures

- Imposes fines for administrative offenses, considering the seriousness, scope, and duration of the offense
- Can impose measures to remedy the consequences of the offense alongside the fine
- May impose additional fines if the obligated entity fails to implement the required measures



State supervision

- Oversees the Slovak Trade Inspection, which performs state supervision
- Empowers inspectors to enter premises, request proof of identity, inspect records, conduct investigations, & enforce corrective measures
- Inspected entities are obligated to cooperate and provide access to premises and documents



Manufacturer registration and waste management

- Removes registered manufacturers from the system in case of non-compliance
- Operates the waste management information system
- Grants access to authorized entities, including government bodies and inspection authorities

The Ministry of Environment plays a crucial role in ensuring compliance with regulations; monitoring the system's implementation and taking action against any violations. Most importantly, these duties and responsibilities are codified in the law.

¹¹ Jarossová & Gubíniová (2022) Beverage Container Deposit Return System in Slovakia: Insights after One Year of Its Introduction https://dbc.wroc.pl/Content/120602/Jarossova_Gubiniowa_Baverage_Container_Deposit.pdf

¹² Latvia Regulation Draft (2019, 2020)

Practice **4**
**Oversight and
Enforcement**

Summary

Governments play a critical role in ensuring that DRSs achieve high performance, deliver a convenient and equitable user experience, and continually improve.

In an optimized DRS, the regulatory agency actively maintains compliance, utilizes auditing and enforcement mechanisms when necessary, and is generally an empowered owner of the program's success.



Practice 5

Design, Marking, and Registration for Containers

Standardized and uniform **design, marking, and registration for containers** leads to optimized recovery, enhanced recyclability, and accurate accounting.

Universal marking of every container with a barcode allows tracking by brand, beverage type, and deposit amount. This minimizes fraudulent redemption, reduces system costs, and facilitates transparency in the DRS. Every brand owner in a given deposit state registers their barcode(s) with the appropriate party or parties so all retailers and reverse vending machine (RVM) operators can get the codes to program their redemption machines.

Standards

Serve as a frame to run the system effectively.



Requirements for the design, marking, and registration of containers are critical to an effective DRS.

- **Eco-design requirements, including standards for container materials**, boost the potential for eligible containers to be designed for recyclability, remaining in the circular economy for as long as possible.
- **Unique markings** on each container help consumers and collection point staff and equipment identify containers eligible for a deposit refund.
- **Universal registration** levels the playing field for all participating producers, ensures deposits are applied at the point of sale, and enhances transparent flow of containers.

Container Design Requirements

Design for recycling standards help ensure that beverage containers recovered via DRS can be recycled in a closed-loop manner. Some materials are not readily recyclable in current recycling processes because their design significantly degrades the quality of recycling streams. For example, polylactic acid (PLA) and polyvinyl chloride (PVC) are contaminants in polyethylene terephthalate (PET) recycling processes and reduce the quality of PET. Players across the value chain need to communicate and adhere to design standards that work at all points of production, consumption, and post-use recovery and remanufacturing. Elements to consider when designing packaging for recycling are detailed in Table 8.

Table 8: Elements to consider when designing beverage containers for recycling

Material composition	Material form	Toxicity
Separability of components	Shape, size and thickness	Material toxicity
Use of additives, fillers, and colorants	Product residues (how easy it is to empty the container completely)	Labeling and adhesive toxicity
Sleeves and labels	Barriers and coatings	Printing ink toxicity

Legislation that specifies the use of modulated producer fees can incentivize eco-design. This means that fees paid by producers vary according to aspects of their product's design, with more "*economically recyclable*" materials charged at a lower rate than those that are more difficult to recycle.

Case Study — Norway

Beverage containers in Norway's DRS, which is run by Infinitum, must adhere to detailed specifications that regulate the type of materials used, as well as the thickness, physical shape, and dimensions of containers that enter the system.¹³ Before launching on the market, each product and related beverage container requires registration with Infinitum.¹⁴ During the registration process, the container's deposit marking and barcode are checked to ensure that they can be identified using automated collection or counting equipment. The registration process includes marking containers with a standardized deposit logo and submitting the barcode to Infinitum to ensure they can be correctly scanned by RVMs. Eco-design standards inform the fees for materials in the DRS. For instance, considering that colored plastics are economically more challenging to recycle than clear ones, the clear PET bottles are charged lower fees than colored PET bottles, as shown in Table 9.

Table 9: Eco-modulated producer fee structure, converted from NOK to USD (2021)

	Aluminum can	Steel can	PET bottle	HDPE bottle
Basic fee	-0.5 cents	2 cents	1 cent	1 cent
Surcharge for universal barcode (also sold outside Norway)	0.5 cents	0.5 cents	0.5 cents	0.5 cents
Surcharge for light blue container			0.7 cents	
Surcharge for colored container or a sleeve that covers 75% or more of the container	0.3 cents	0.3 cents	1 cent	1 cent

In Norway, manufacturers can choose between a universal barcode, which allows beverages to be sold in both Norway and Sweden, or a barcode unique to Norway. Unique barcodes carry lower fees since they minimize the risk of fraud; these items are only sold in the Norwegian market and a deposit fee for them is paid in Norway. While universal barcodes may save producers other operational costs, they carry higher fees to cover the cost of increased fraud, as a consumer can redeem a container bearing the same barcode but sold in a place where they have not been charged a deposit.

13 TOMRA (2022) Deposit Return Schemes System Spotlight - Norway's deposit return scheme is world's recycling role model tomra.com/en/reverse-vending/media-center/feature-articles/norway-deposit-return-scheme Last accessed Nov. 7, 2023.

14 TOMRA (2022) Key Elements of High-Performing Deposit Return Systems: #6 - Container deposit markings for consumers and manual returns, barcodes for accurate accounting tomra.com/en/reverse-vending/media-center/feature-articles/key-elements-of-high-performing-deposit-return-systems-six Last accessed Nov. 7, 2023.

Container Marking

Best practice dictates the use of standard text, such as “Return for Refund”, and/or printing a logo, as well as a barcode, on each container for easy identification. Barcodes enable RVMs to recognize and count each deposit container, in order to track which containers are returned. Barcodes also help to ensure that containers not eligible for redemption are not accidentally accepted. This provides a baseline level of system accountability. The decision on what level of marking and labelling to legislate is determined by a number of factors, including:

- Level of deposit
- Proximity of population centers in bordering markets
- Impacts on distribution of beverages
- Costs of additional labels (including redesign)
- Likely cost to system of fraudulent activity

Table 10 details three categories of marking and their corresponding levels of security.

Table 10: Categories of marking in relation to security level

Highest security	Standard security	Lowest security
Deposit amount	Deposit amount	Deposit amount
Deposit system demarcation (e.g. logo)	Deposit system demarcation (e.g. logo)	Only state abbreviation included
Market-specific barcode	Market-specific barcode	None
Invisible security ink to prevent barcode replication	Universal barcodes may be used, but the producer might be charged a higher fee	None



Case Study — New South Wales, Australia

Before the deposit system was launched in New South Wales, multipacks (4- or 6-packs) of beverages were not required to have individual barcodes for each container. This would have created a situation where one container sold individually would be accepted by a RVM but those sold in multipacks would be rejected in many cases. However, the government updated labelling requirements to add individualized barcodes to all containers before the system was implemented. This helped to avoid consumer confusion and ensure fairness.

Container Registration

Consumers must be able to return all eligible containers to any collection point (barring specific exemptions), in order to create a convenient and effective system. Requiring brand owners to register their products with the system operator, who then provides that information to return point operators, is a direct way to help reach this goal.

High-performing DRSs around the world require beverage producers to provide the following information as part of the registration process:

- Company name and contact information
- Beverage container information, such as: brand/product name/flavor; number of sales per unit; volume, material type
- Barcode

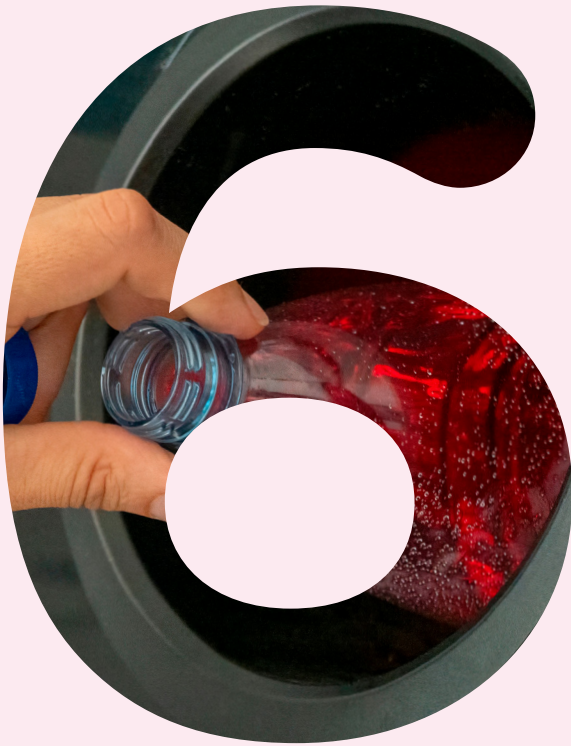
Practice **5**
**Design, Marking,
and Registration for
Containers**

Summary

Setting a DRS up for success begins with the design, marking, and registration of the containers within the system. DRS legislation that specifies eco-design criteria helps minimize contamination and maximize recycling. Such requirements are the cornerstone of a truly circular system, enabling producers to access the material they need to meet their recycled content commitments while preserving resources in their most recyclable state. Without such requirements, there will be no deterrent to the continued production of beverage packaging with minimal consideration for optimized recovery and recyclability.

Likewise, clearly marked and readable containers make it easier for consumers to decipher redeemability, and for service providers to accurately track material and refund deposits to consumers. Finally, high-performing systems tend to be those that mandate registration of all eligible containers and monitor and enforce this requirement. These measures, when pursued in combination, drive a fairer, more transparent, and fraud-proof system.¹⁵

¹⁵ Digital Deposit Return Systems: What You Need to Know, Reloop Factsheet, January 2022
reloopplatform.org/resources/digital-deposit-return-systems




Practice **6** Collection

Collection standards specify minimum operating requirements for deposit return points. This makes them easy and equitable for consumer use and efficient for retailers to run and get timely reimbursements. Standards should include having trained staff available during business hours to assist consumers when they need help, as well as onsite cash refunds, with an option for a secure electronic refund within two business days of the transaction.

Standards

Serve as a frame to run the system effectively.





Convenience and user experience are two essential factors to consider when planning and implementing a successful DRS. Legislated minimum collection standards not only ensure ease and accessibility for consumers, but also reduce fraud and build system accountability.

The same is true for specific operational requirements for manual and automated redemption points with RVMs. Without these requirements, some consumers will be unable to redeem their containers easily, undermining system equity, and businesses are more likely to ignore their legal responsibility to participate in the system.

User experience and access are optimized in high-performing systems. To do this, legislation should ensure, as noted in Practice 2, redemption networks that:

- Are numerous and distributed across geographic areas
- Deliver a consistent, easy, clean, and safe user experience
- Are part of routine shopping or other activities
- Cater to both low- and high-volume redeemers
- Benefit from technological and other innovations

The Role of the Retailer

Experience from DRSs around the world shows that R2R systems can best meet access and user experience criteria. One critical piece of evidence is the median 89% return rate in retail-based systems versus a 70% median return rate for return-to-redemption center systems.

Retail-based systems allow consumers to take back their containers when they do their shopping or, if they are consuming beverages outside of the home, to the nearest convenient location. These systems remove barriers to recycling as they do not require extra trips or additional travel time to return containers. A retailer-focused system also leverages existing business infrastructure and logistics networks. Utilizing assets both for distribution to and collection from a retailer, commonly referred to as reverse logistics, can drive greater efficiencies, especially in rural and remote areas.

Achieving a strong retail-based redemption network begins with legislated mandates that require retailers selling beverages to accept empty containers for recycling and provide consumers with a refund of their deposit.

Minimum Standards for Collection Points

In order to ensure equitable, easy, and timely access to return points, some of the conditions that retailers should provide include:

- Offering a clean, safe, and well-lit site
- Making sure the return point is inside a building or in a closed shelter
- Providing a non-trash receptacle for rejected containers
- Ensuring storage capacity for returned containers, separate from the shopping area, and not visible or accessible from it
- Clearly marking the container return area as part of the DRS
- Ensuring site accessibility for persons with reduced mobility and year-round road access
- Aligning operating hours with those of the establishment if the return point is inside the building, with business days displayed clearly

Case Study — Quebec

Quebec's new DRS regulations, which will begin to be implemented in 2023, include distinct collection requirements for the different types of return points: return points designed to take small quantities of containers; return centers designed to accept both small and large quantities of containers; and bulk return points. The regulations require that producers establish a network of 1,500 return sites, with quotas based on density of residents per redemption site. For example, in more urban areas, such as Montreal, the minimum requirement is one return point per 15,000 residents; whereas in isolated regions it is one per 4,000 residents. Producers must also ensure that there are at least two return sites in each regional municipality where an unlimited number of containers can be redeemed. More bulk sites may be introduced, but they will not count towards the 1,500-site requirement, to avoid the potential for some areas or populations to be underserved.

The new system focuses on consumer experience, aiming to make container return as straightforward as using a household recycling bin. Retailers are given flexibility in how to meet their obligation, with emphasis placed on overall system performance. For example, they can decide where and how to offer RVMs, grouping them with other businesses if they wish, so long as the system operator approves the proposal. They are then required to deliver consistent service and marketing, and site redemption points, according to distance provisions set in the legislation. Quebec's approach matches robust and harmonized collection requirements with a flexible approach towards retailers.

Quebec's new DRS regulations also lay out specific producer requirements to ease food service establishments' interaction with the system, including but not limited to: capacity-based minimum collection requirements; provision of equipment needed to facilitate collection; and a maximum one week period for refunding the deposit.

Minimum Operating Requirements

Standards for manual collection / bag drop / containers originating with food service establishments

In a manual system, customers return their empties to retailers, who then reimburse the deposit and store the containers in a dedicated storage area within the store. Minimum standards are critical to ensure that both manual collection and bag drop collection, where residents can return containers in bulk, are done accurately and are not subject to fraud.¹⁶ This also applies to the collection of containers from the commercial sector — such as from bars, cafes, and restaurants. Counting containers using barcodes helps mitigate fraud.

In order to protect consumers, routine audits should be performed to ensure that all of the collection options are executed accurately and fraud is made as difficult as possible. Note that when implementing an account-based collection mechanism, the amount of personal information collected from consumers should be limited to essentials, such as name, phone number, and email address.

Mandatory requirements for manual take back and bag drop should encompass the following key elements:

- Recognizability of the returned container to provide the corresponding refund to the consumer
- Sorting and counting the containers for recycling
- Destroying returned containers (glass crushing and compaction of plastic, metal, and cartons) to prevent double redemption
- Accurate reporting with mass balance
- Displaying easy-to-understand signage that clearly communicates which containers are eligible for redemption and the penalties for attempted fraud



Routine audits should be performed to ensure that all of the collection options are executed accurately and fraud is made as difficult as possible.

¹⁶ Preventing Fraud in Deposit Return Systems, Bottle Bill Reimagined, Reloop bottlebillreimagined.org/wp-content/uploads/2022/03/Factsheet-PREVENTING-FRAUD.pdf Accessed Nov. 7, 2023.

Criteria for RVM Technology

Despite the fact that there are no known examples of existing deposit legislation that explicitly mandates automated take-back of eligible beverage containers (via RVMs), numerous jurisdictions — especially those with high-performing R2R systems — already rely on their use. Although they require a higher initial capital investment compared to manual systems, modern RVMs offer numerous advantages. For consumers and return point operators, RVMs provide enhanced convenience and smoother operations. They streamline the return process while optimizing efficiency for the entire system. Additionally, RVMs are particularly beneficial for producers and distributors as they help prevent or minimize fraud.

Given their importance to the success and integrity of DRSS, jurisdictions should specify RVM operational requirements in their system rules wherever RVMs are deployed. Doing so can ensure that all retailers offer the same standard of service and have the capacity to meet the system requirements effectively. Some examples of RVM requirements include:

- Connection to power supply
- Reliable Internet connectivity
- Installation by authorized RVM suppliers
- Front screen display providing clear instructions for customers
- Ability to issue a deposit slip that includes information on the packaging returned by the consumer, corresponding deposit amounts, and the contact details of the retailer or collection point issuing the slip (for accountability)

Case Study — Norway

All RVMs used in Norway's system, operated by Infinitum, must adhere to specific requirements to meet the system operator's performance target of achieving a 99.5% RVM container acceptance rate. These requirements include several key features, including: barcode reading capabilities, shape recognition technology, metal detection, weight detection, and programmable order of operations should one capability encounter an error. The requirements also include fraud detection capabilities, to prevent any kind of container that has been tampered with from entering the system. Additionally, RVMs must be designed with some tolerance for partially deformed or non-found containers. At the same time, all RVMs need to be able to compact containers effectively. The compactor standards mandate at least 70% volume reduction and a flatness of one-fifth the original container's size. The standards also require that, to reduce contamination, containers must remain with similar types and not be shredded. RVMs in Norway are also required to have sophisticated material flow and financial data recording capabilities for Infinitum's reporting needs. All RVMs must undergo a test audit before installation and are subject to random audits in the field.

DRS and Beverage Reuse Systems: What's the Link?

For many, DRS may seem a solution that perpetuates the single-use economy, albeit in a far less polluting manner. Why spend all the effort and cost to collect and recycle beverage containers in a closed-loop manner when we know that the waste hierarchy dictates reduction over reuse, and reuse over recycling? Quite simply, because separate collection vis-à-vis deposit return is an indispensable system for transitioning to reusable beverage containers.

Reloop's 2021 report — What We Waste — found that Americans consume and waste substantially more beverage containers per capita than any other country. Furthermore, findings reveal a direct correlation between waste minimization, reusable beverage container deployment, and deposit return systems. In other words, the countries with the lowest carbon footprint and packaging pollution use DRS and reuse in tandem to achieve optimized outcomes.¹⁷

A reusable glass beverage container's carbon advantage varies with the single-use container with which it is compared; but after as few as three repeated uses, reusable glass bottles are environmentally preferable to single-use plastic bottles.¹⁸ In markets with mature collection systems and logistics in place, glass bottles are reused 20 or more times, generating 57-85% fewer greenhouse gas (GHG) emissions compared with other packaging.¹⁹ With each additional reusable container use cycle comes significant additional environmental benefits of avoided production and end-of-life management.

Two factors above all others distinguish successful reuse from unsuccessful reuse. The first is the recovery rate — if a reusable unit is held onto or disposed with refuse or recycling, rather than re-entering the production process, system efficiency cannot be achieved. Producers need to get as many containers back as possible for the system to work cost-effectively and to optimize environmental outcomes.

Second is the user experience. In many places, like parts of Canada, single-use and reusable beer containers are sold side-by-side and are virtually indistinguishable. So, we can assume no discernible consumer preference for single-use packaging, despite claims to the contrary. However, the consumer's role in returning the container is fundamental. It must be as easy for the consumer to return the unit as it is to throw it away or recycle it.

17 Reloop (2021) What We Waste Dashboard. reloopplatform.org/what-we-waste/what-we-waste-dashboard

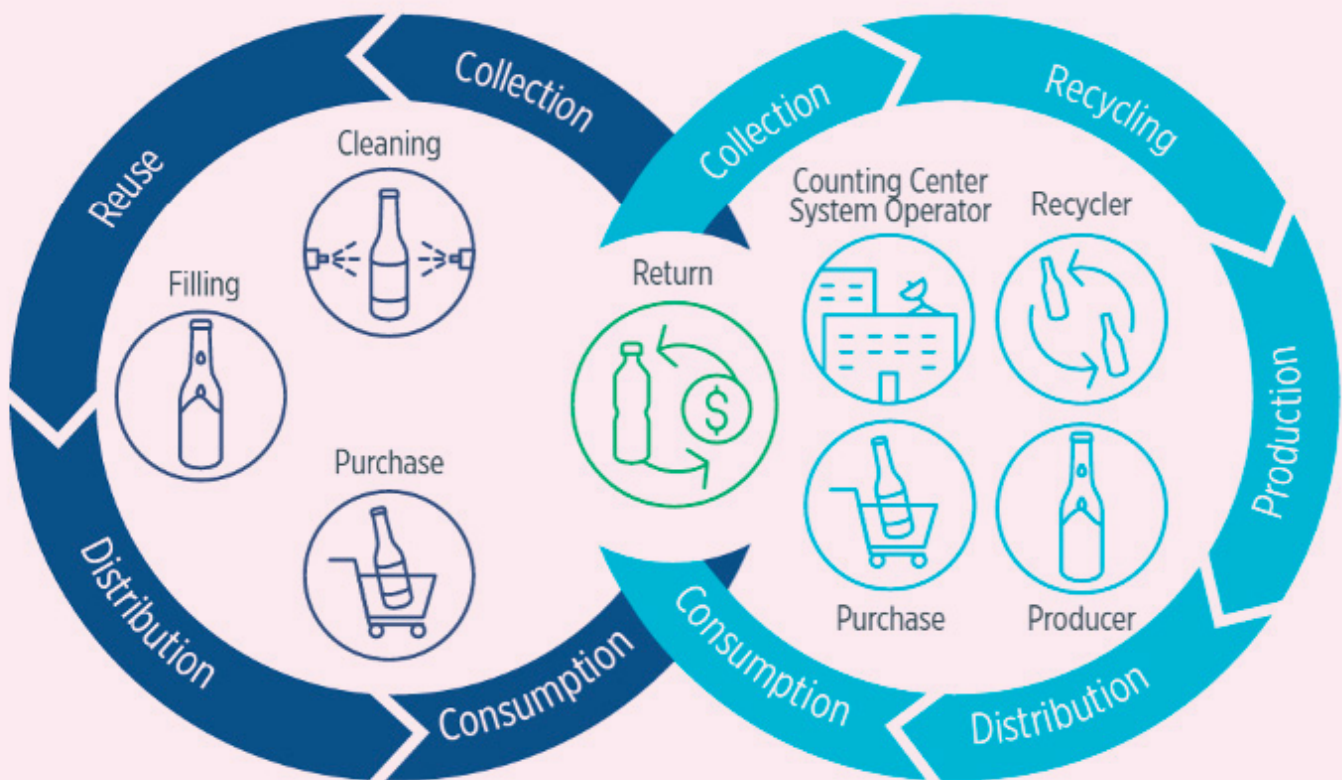
18 ZWE/Reloop (2020) Reusable vs. single-use packaging – A review of environmental impacts , p.7 Exec Summary- zerowasteurope.eu/wp-content/uploads/2020/12/zwe_reloop_executive-summary_reusable-vs-single-use-packaging_-_a-review-of-environmental-impact_en.pdf; see also foodpackagingforum.org/news/zwe-report-identifies-climate-benefits-of-reusable-packaging

19 Wilcox, Jason and James MacKenzie (2021) What We Waste. reloopplatform.org/resources/what-we-waste

In this manner, we can see the need for and value of a high-performing DRS, which not only incentivizes return through the use of a deposit, but also establishes an equitable, accessible network of collection points to make return easy. With modern DRSs, the consumer does not have to distinguish between returning a container for recycling or reuse; that distinction is made instead by the back-end handling systems.

Reintroducing reusable beverage containers is an important policy objective, and one which depends critically on the presence of an optimized DRS. It may therefore be concluded that a robust refillable beverage market without DRS is not possible. At the same time, adding reuse targets to DRS will incentivize industry to make upfront and ongoing investments into both reuse and DRS systems.

Figure 4: The relationship between DRS and beverage reuse systems



Practice **6**
Collection

Summary

A strong network of convenient return points where consumers can easily take back their empty containers is vital to achieving the high redemption rates seen in high-performing DRSs.

Building collection standards into legislation is essential to deliver a redemption network that supports an equitable deposit system.



Practice **7**

Infrastructure for Large-Volume Returns

Infrastructure for large-volume returns makes each collection point more efficient, user-friendly, and cleaner for both consumers and retailers. A modern system offers return points specifically geared to bulk returns so it eliminates long lines for consumers and lessens the burden on businesses. Any technologies used for bulk counting adhere to container identification requirements and ensure accountability in the counting and verifying of containers collected.

Operations

Define the functions to maintain the system over time.





When it comes to designing and running a DRS, there is no “one size fits all.” It’s crucial to consider the diverse range of users and their specific redemption patterns, as well as the volume of containers they redeem:

- *Consumers* return a relatively small number of containers to retailers (low-volume)
- *Canners* often collect containers from multiple places but return containers to one spot (often high-volume)
- *Food service businesses* typically generate a significant volume of beverage containers consumed on their premises, and routinely return large quantities of containers (very-high volume)
- *Bag drop systems* which allow users to collect their containers in bags and deposit them into designated machines or drop-off points (relatively high-volume)

In each of these scenarios, user needs can vary significantly. To maintain ease of use, not to mention system effectiveness, integrity, and transparent tracking of materials and funds, a modern DRS must include specific requirements for high-volume redemption.

Commercial Food Service Establishments (On-site Consumption)

Just as customers purchasing beverages from a supermarket pay a deposit, businesses pay beverage distributors or wholesalers a deposit on every eligible beverage they buy. However, in the case of beverages consumed on their premises, such as in bars, full-service restaurants, and hotels, the deposit is not passed on to the customer since the business retains the actual containers. Convenient refundability should be guaranteed to businesses, just like individual consumers.

In practice, a business' ability to get the deposit refunded may vary greatly. Some businesses manage to get the wholesaler/distributor to collect the empty containers and refund the deposit despite the absence of clear legal requirements. However, unless the producers' obligation to manage this material is explicitly stated in legislation, businesses often cannot make this arrangement. A few may take it upon themselves to organize the return to a redemption center, but do so at considerable operational and financial cost.

Because of the inherent operational challenges in redeeming high volumes of beverage containers, many businesses opt to forfeit the deposit altogether. In addition to the financial implications for businesses, this forfeiture also results in the loss of containers from the deposit system, and the risk of them going to landfill or incineration.

One solution is legislative clarity around mandatory distributor take-back requirements. In this scenario, the law makes explicit that beverage companies or distributors are obliged to collect empty containers from businesses, ensuring that those businesses are not burdened with the sole responsibility of managing the returned containers.

Ontario, Quebec, Finland, Norway, Estonia, and Lithuania are examples of DRSs with at least some take-back requirements. To ease the additional cost of sorting and preparing for collection that businesses will face, some DRSs, such as those found in Denmark, Norway, and Scotland,²⁰ have established a food service business-specific material handling fee.

²⁰ Scotland has passed enabling legislation for DRS, but has not yet implemented a system.

Case Study — Finland

Finland's DRS operator, Palpa, regards commercial sites in the similar way it does retail redemption sites. To ensure ease of separation and preparation for collection, businesses are only required to separate containers by material; plastic bottles and cans are each placed into specific bags, while glass containers are placed in durable plastic bins. Each bag or bin is tagged so that once the material is taken to a counting center, the number of collected containers can be calculated and recorded, and the account holder can be refunded the deposit. Refillable bottles are stored in crates and handled by another service provider, but are just as much a part of the DRS. All the materials required for collection, preparation, storage, and marking are provided and paid for by the beverage distributor.

Finland's system pays close attention to climate-friendly operations with the use of reverse logistics. The beverage supplier picks up the transportation units in connection with a beverage delivery, thereby avoiding emissions-intensive one-way pickups.²¹

Figure 5: Finland's Deposit Return System

How Finland Does It

Businesses separate containers by material. Plastic bottles and cans go in special bags. Glass bottles go in durable crates.



Everything is tagged. When it arrives at the counting center, the business is credited for the containers returned.



All the materials required for collection, preparation, storage, and marking are **provided and paid for by the beverage distributor.**

21 Ekopullo (2022) Uudelleentätettävien lasipullojen palautusohje palpa.fi/retail-and-horeca/returns-without-reverse-vending-machine/, palpa.fi/static/studio/pub/Materiaalipankki/Palautuspisteet/Lasipullojen+ja+korien+palautusohje+2022-02-14.pdf
Last accessed Nov. 7, 2023.

Bag Drop and Other Instances of Manual Collection

Minimum standards for high-volume returns are also critical to ensure the accuracy of bag drop and manual collection processes. Requiring containers to be counted using barcodes at some stage of the processing is one way to overcome fraud (see Practice 5: Design, Marking, and Registration for Containers). And conducting routine system audits as a regulatory measure goes a long way in protecting system integrity.

Operational standards help ensure a positive redemption experience for users returning large volumes of beverage containers. A common challenge that canners face, for example, is long queues, which hinder efficient refunds. The use of electronic accounts can greatly assist with streamlining operations. These measures also enable transparent recording of money and material flows. Such practices, however, should not overstep privacy or undermine consumer rights. Users should not have to provide a driver's license or disclose other private information to set up an account, and their refunds should be paid out promptly in cash. Finally, it is important that high-volume return spots do not limit the number of containers which can be redeemed per visit.

Case Study — Quebec

Quebec offers a good example of specific operational requirements for high-volume return points. First, a bulk return point is defined separately from other return points and return centers, and the three are not treated the same as retail return points in terms of fulfilling accessibility and convenience criteria. A bulk return point must meet the following requirements:

- The manager of a bulk return point may not limit the number of redeemable containers that may be returned at each visit; and
- If using an electronic process to refund the deposit, it must be secure and completed within a maximum of seven days of the return of the containers at the site.

Enforceable legal requirements and efficient operational arrangements for manual collection are further explained in Practice 9: Material Processing and Service Fees.

Practice **7**
**Infrastructure for
Large-Volume
Returns**

Summary

Minimum standards are critical both to ensure accuracy and thwart fraudulent activity in high-volume container return settings. Setting requirements for high-volume returns sets a DRS on a fair path for all.

Protecting the interests of a diverse set of system users, from canners to businesses, is an important component of a high-performing, modern DRS.



Practice **8** **Optimized Logistics**


Optimized logistics ensure uniform and fair procedures for those who handle beverage containers. Wherever possible, containers would be compacted to reduce the number of trucks on the road and their travel time. Fuel-efficient or alternative fuel vehicles are encouraged for added environmental benefit.

Producers would conduct regular auditing of service operators and vendor procurement procedures as a matter of good business.

Operations

Define the functions to maintain the system over time.





Running a successful DRS comes with a multitude of responsibilities spanning various aspects including financial management, operational compliance, and effectiveness parameters. When those responsibilities and their related parameters are clearly defined, the DRS works well.

However, if left undefined or ill-defined, the logistics of the system are compromised, leading to potential issues. System operators need to have the flexibility to manage DRS operations as they see fit, but this flexibility should always be balanced with the need to meet system performance and legal operational requirements.

When it comes to managing the logistical operations of the program, the system operator may choose to handle them directly or use contracted third-party service providers. It is in producers' and public interest to prioritize logistical approaches that balance cost-effectiveness and climate-friendly operations. Strategies for optimizing logistics based on these parameters follow here.

Case Study — Quebec

Quebec's newly-legislated DRS reforms, whose implementation will begin in late 2023, include specific provisions regarding the selection of service providers. Namely, they require producers to consider the following aspects when choosing one:

- Ability to meet transportation, sorting, and recycling requirements for containers
- Transparent business model with detailed impact on the community
- Reduction in greenhouse gas emissions in the collection and recycling processes, as well as their transportation routes and modes for transporting containers once collected

Responsibilities of the DRS Operator

Optimizing the logistics of a DRS starts with a review of typical system operator responsibilities. These responsibilities fall into four distinct categories: system operations; data management and reporting; marketing of collected material; and public communications. The specific activities for each of these are presented in the table below.

Typically, a DRS operator decides which of the services to contract out, based on an assessment of expertise, quality and cost-effectiveness of managing activities internally versus through an external vendor.

Table 11: DRS Operator Responsibilities

Topic	System operations	Data management and reporting	Marketing of collected material	Public communications
Compliance	Fulfill performance targets	Maintain central database with all barcodes	Monitor and potentially require closed-loop recycling	Develop guidelines for effective public communication
	Register new products/producers	Make periodic performance report to regulatory authorities		Brand the program
Financial	Develop and maintain a budget for the operational expenses of the DRS, including collection, transportation, and processing costs	Conduct deposit clearing	Negotiate price of material for sale	Generate reports that provide an overview of the financial aspects of the DRS, including revenue and expenses
		Administer handling and processing fees	Support development of end markets	
Operations	Plan and specify adequate return infrastructure	Aggregate data from all collection points	Provide quality assurance	Equip every collection point with standardized marketing assets
	Collect, transport, count, and sort containers			
Effectiveness	Mitigate fraud	Review and refine internal IT systems as needed/periodically	Negotiate other conditions of material for sale	Develop and implement public awareness campaign

Optimizing Logistics – Factors to Consider

Selecting service providers will depend greatly on local circumstances. However, the following performance criteria serve as a rule-of-thumb to help ensure consistent and fair operations:

- A minimum collection schedule (e.g. once per week for establishments with a capacity of 50 or more people at a time)
- The service provider should load all the containers it is collecting
- The producer should supply all necessary equipment to facilitate collection, and possibly emptying and sorting of redeemable containers
- The contracting agent should provide the establishment with a document outlining the operation of the collection service, the scope of redeemable containers, and the rules required to receive the service
- Preference for service vendors that have implemented emissions-reducing operational procedures in place e.g. reverse logistics and the use of alternative fuel vehicles

A primary responsibility is the transportation of containers from collection points to the next stage in their processing. To optimize this process, a system operator can use routing technologies to assess whether it is more cost-effective and climate-friendly to establish dedicated routes for picking up containers, or if reverse logistics, also known as backhauling, is a more suitable approach.

Efficient container transportation is essential for a well-performing DRS. Uncompacted containers are difficult to transport efficiently because of all the wasted space, so it is best practice to require compaction wherever possible. Compaction enables a greater number of containers to be transported in a single trip, reducing logistical complexities and expenses. DRSs that achieve high rates of compaction, such as Norway, are among the highest performing and lowest cost systems. Where compaction is not possible, an effective alternative is backhauling containers to distribution centers where they are consolidated for further transportation to a counting center. This option is utilized by many retail outlets in Germany, which have access to existing infrastructure, and therefore realize considerable cost savings.

While it is vitally important to set up a strong performance-based contract with service providers, it is equally critical for DRS operators and/or producers to regularly audit their service operators. This will not only ensure smooth and effective operations but may potentially spare the operator or producers from reputational liabilities that could arise from inadequate service.

Material Recovery Facility (MRF) in DRSs

As legislative DRS proposals have increased, so too have concerns about how these systems could work alongside existing curbside recycling programs, particularly with regards to the impact on material recovery facilities (MRFs) and other waste industry stakeholders. In reality, DRS can be designed with consideration for MRFs, both operationally and financially, provided some key factors are kept in mind.

While MRFs will see fewer beverage containers flow through their facilities, resulting in revenue loss associated with higher-value materials, they will also see reduced volumes of materials such as glass that are costly to process and have limited markets. ReLoop previously found that municipalities across five Northeastern states could expect to see net savings of between \$112 million and \$160 million due to reduced processing fees at MRFs, reduced final disposal costs, and savings on collection costs.²² (It's worth noting that these cost savings already factor in anticipated MRF revenue losses and the potential for tip fees to increase as a result.)

With that said, to better manage changes in both the volume and composition of material MRFs receive under DRS, the transition to a well-designed DRS should enable MRFs to intercept deposit-eligible materials coming through their facilities and improve and expand their ability to process additional materials. To do so effectively requires careful consideration and an understanding of potential dilution of the wider DRS impact.

First, policymakers can require that a portion of unclaimed deposit revenue be used to reimburse MRFs or municipalities for lost revenue or to cover the cost of handling the beverage containers that residents place in their curbside bins. Previous ReLoop research showed an estimated \$822 million in unredeemed deposits would be available across the Northeast region in the initial years of program reform which could be used, in part, to upgrade MRFs.²³ To do so responsibly, a verification mechanism must be used to link transitional funding to actual projected loss inclusive of material sales, revenue losses and financial savings from reduced collection, transportation, sorting, processing, and landfilling of beverage containers. This will help maintain transparency and avoid duplicate revenue streams for MRFs.

22 ReLoop Platform (2022) Northeast Reimagining the Bottle Bill. Bottle Bill Reimagined. bottlebillreimagined.org/wp-content/uploads/2022/03/Reimagining-the-Bottle-Bill-REPORT.pdf

23 Ibid.

Second, a participation role for MRFs could be part of the DRS. MRFs should have to follow standards around the material collection, namely avoiding contamination and assuring unit-specific counting as RVM-based DRS does. A MRF might need to change its sorting equipment and storage capabilities, and install new technologies or utilize offsite counting facilities — but this is essential to maintain system integrity and quality control. The role of the MRF in the system should follow clearly stated guidelines, and include monitoring and auditing processes are in place to ensure accountability. MRF participation should be limited to ensure that the majority of eligible material flows through the DRS, not MRFs. Because of the additional oversight and operational considerations, collecting containers via MRFs will add costs to the system as a whole, and could degrade the system performance over time.

By including clear system rules that allow for MRF participation, DRS programs can ensure that MRFs are compensated for their costs and losses and that they remain viable while the recycling system adapts to the introduction of DRS. However, this participation should be limited and carefully implemented in order to ensure efficient and effective beverage container collection and closed-loop recycling.

Practice **8**
Optimized Logistics

Summary

Managing a DRS is no small feat. No one can deny how complex it is for a system operator and their contracted service providers to carry out all the operations required. However, to achieve and maintain a high-performing DRS, corners must not be cut.

Applying uniform and fair procedures, as well as clear performance requirements, will help deliver optimized contract logistics and quality assurances at every step of DRS operations.



Practice 9 Material Processing and Service Fees

Material processing and service fees for collected containers would be set and paid to the collectors and processing/counting entities based on the number of counted and verified containers. Services related to the processing and recycling of beverage containers would benefit from economies of scale. The deployment of processing capacity should be optimized to reduce costs and environmental footprint.

Operations

Define the functions to maintain the system over time.



→ Effective DRSs work with return point operators to ensure the efficient collection of large quantities of beverage containers from consumers.

Typically, retailers and redemption centers are paid what is called a “handling fee” as compensation for their participation in the collection network. This is calculated to offset the costs incurred in hosting and operating a return point.

The entities involved in preparing containers for shipment to final recycling markets by sorting, counting, crushing, and/or baling the various materials are also typically paid a fee for each eligible container they process. This payment is often referred to as a “processing fee”.

Handling Fees

Handling fees are per unit fees paid to return point operators as compensation for the labor and equipment needed to collect, handle, and store redeemed beverage containers before collection. On a long-term basis, handling fees also help to offset overhead costs.

Appropriate handling fees encourage investments by the redemption location. In determining the rates, some of the key factors to consider are: first, how the containers are recovered — using manual labor or automatically via RVMs; secondly, the condition of the containers picked up, compacted or uncompact; and, third, the container material. Typically, handling fee calculations also take into consideration costs of space, labor, equipment purchase and maintenance, site setup and maintenance, and utilities. Table 12 presents best practice recommendations for setting handling fees.

Table 12: Regulatory best practice for handling fees

Handling fee topic	Best practice recommendation
Establishment	Based on an assessment of actual retailer and redemption center costs, not fixed in legislation.
Adjustment	Reviewed at set periods (annually or biannually) by the system operator or state agency, in consultation with return point operator.
Differentiation	Careful consideration of opportunities for more efficient operations, with handling fees differentiated based on: <ul style="list-style-type: none"> • Technology use: manual and automated services • Consumer access: retailer or redemption center/depot return
	Consider storage costs, which vary by container type and whether compaction is required, as well as the cost of real estate.

Processing Fees

Processing fees are paid to operators that collect containers from redemption points and prepare the material for shipment to end markets. These fees are typically negotiated in a service contract and set on a per container or tonnage basis. They tend to be most influenced by material and size of container, sales volume, who owns the scrap material, and the level of automation involved in processing.

Case Study — Norway

In Norway’s DRS, the handling fee incorporates the costs of staff time, retail space utilized, and any RVM capital costs, with a premium placed on efficient operations. Consequently, manual collection receives a lower handling fee, to reflect the fact that a compacting RVM enables efficiencies in transportation since a truck can fit more containers. Compacted containers are also more fraud-proof.

Table 13: Variable handling fee in Norway (2022) (USD)

	 Aluminum	 Plastic
RVM with compaction	2 cents	3 cents
Manual collection	1 cent	1 cent

Data from Reloop Platform (2021), Fact Sheet: Handling Fees in Deposit Return Systems www.reloopplatform.org/resources/handling-fees-in-deposit-return-systems

Infinitem is the system operator. Its board, which includes equal representation from the beverage and retail industries, sets the handling fees. This encourages transparency and fair decision-making.

Since Infinitem works as a single material owner, the material can be collected and processed together and does not need to be separated by brand, which further increases the efficiency of the system. All revenues from the sale of material are reinvested back into the system.

Manual Collection

Following the initial collection and sorting at redemption locations, containers are picked up by collection agents and delivered to counting, sorting, and processing centers. The main role of these centers is to count, verify, and sort manually returned containers and to sort the containers collected out of RVMs. Tagged bags allow the system operator to track the material as it is taken to the counting centers.

At the processing center, containers are emptied from their bulk bags/boxes, further sorted as needed, and baled by commodity type before being shipped to market. Consolidation centers can help reduce logistics costs for transport by grouping material together and combining material that has been taken back manually and been through a counting center, along with material from RVMs, for onward processing.

Automated Collection

In many deposit systems, compaction of material is standard and usually takes place in the RVM itself. This process allows the system to record data on the specific beverage collected, thus adding transparency to the system.

Processing Requirements and Commingling Agreements

Effective legislation also sets out processing requirements for deposit initiators, such as producers or distributors, to ensure they take back their containers from retailers they deliver to or from authorized redemption centers serving those retailers. Best practice requires:

- Minimum pickup frequency: mandating deposit initiators conduct container pickups regularly e.g. once every two weeks, to prevent accumulation and ensure a consistent flow of containers through the system
- Volume-based pickup requirement: requiring deposit initiators to perform pickups once a pre-determined number of beverage containers e.g. 10,000 are amassed, facilitating efficient transportation and processing
- Minimum operating hours: legislating minimum operating hours for return points ensures convenient access for consumers and reduces bottlenecks

Legislation and, at times, brand owners themselves, establish requirements for validating, counting, and reducing fraud where containers are redeemed manually. Ideally, these requirements will consider consumer convenience and fair fee-for-service conditions for redemption centers and the high-volume customers they serve.

To make the process of consolidating and moving containers more efficient, provisions for commingling agreements can be incorporated into legislation. These agreements involve two or more deposit initiators, allowing dealers and redemption centers to sort containers by material and size rather than by brand. Commingling agreements are appropriate only in instances where automated collection and counting/compaction is not cost-effective.

By implementing commingling agreements, return point operators can achieve substantial savings in terms of space, staff time, and money. Beyond efficiency gains, these agreements facilitate greater compaction, potentially leading to reduced transportation costs and emissions. For system integrity to be maintained, however, it is crucial that regulatory standards are not relaxed or excessively dependent on incentivizing commingling agreements.

Striking the right balance is essential to maintain fairness and the overall effectiveness of the DRS. For commingling agreements to be fair, they should aim to include as many distributors as possible. This inclusivity ensures a level playing field for all stakeholders, supporting the system's integrity and fostering collaboration among deposit initiators.

Case Study — Maine

Maine's DRS legislation provides special allowances for producers to participate in commingling agreements.²⁴ Two or more brand owners may enter into a commingling agreement, which allows redemption centers to group containers of participating producers together. A commingling group must include 50% or more of the beverage containers of a like-product group, material, and size for which deposits are being initiated in the state.²⁵

Participating parties receive a half cent reduction in the handling fee paid to redemption centers for containers covered under the agreement, and an exemption from reporting and remitting unredeemed beverage container deposits to the state via Maine Revenue Services.²⁶ However, only 76% of brands are covered under these agreements, resulting in the remaining and smaller brands having to pay a higher handling fee and being required to forfeit their unredeemed deposits.

24 Maine Legislature (2019) legislature.maine.gov/legis/statutes/38/title38sec3107.html Last accessed Nov. 7, 2023

25 An Act To Increase the Handling Fee for Beverage Containers Reimbursed to Redemption Centers, Maine Legislature legislature.maine.gov/legis/bills/bills_129th/billtexts/SP006001.asp Last accessed Nov. 7, 2023

26 Maine's Beverage Container Redemption Program—Lack of Data Hinders Evaluation of Program and Alternatives; Program Design Not Fully Aligned with Intended Goals; Compliance, Program Administration, and Commingling Issues Noted legislature.maine.gov/doc/2316 Last accessed Nov.7, 2023

Understanding and Mitigating Fraud

Implementing robust quality assurance processes for reconciling depot and/or processing center counts is crucial for minimizing the potential for overcounting and other fraudulent activity within a DRS. In instances where the use of automated counting and sorting equipment for containers is minimal, ensuring effective quality control measures becomes paramount. Incidents of counting centers inflating the reported number of containers for their own financial benefit have been observed in some Canadian and US programs.

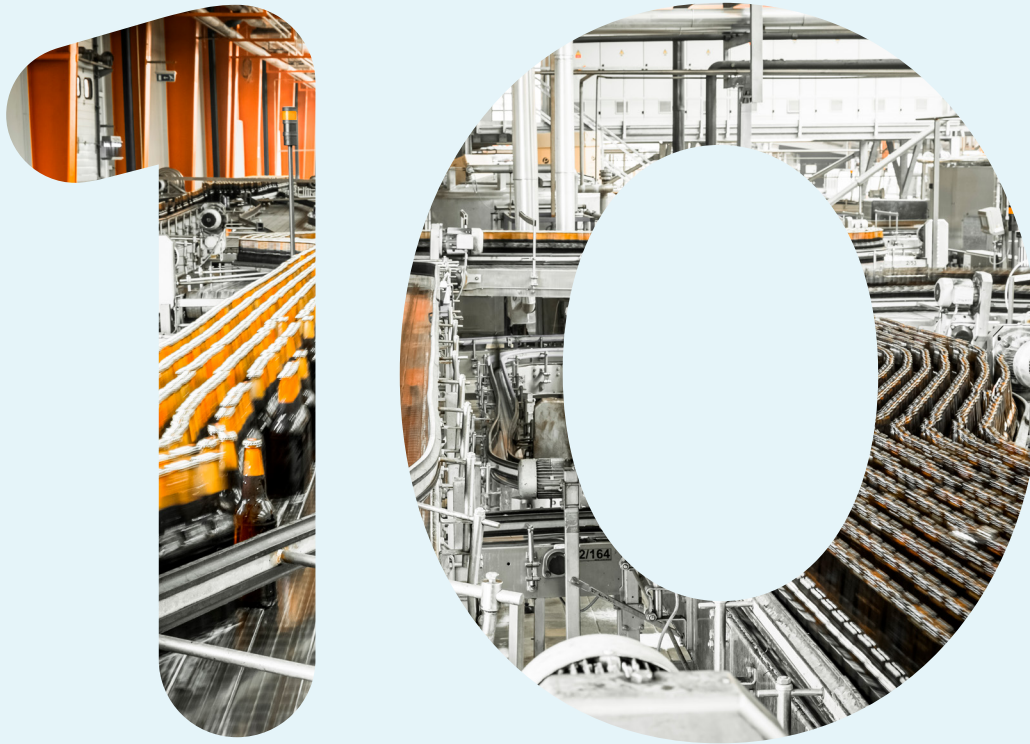
While auditing procedures have been implemented to address and curb such fraudulent actions, legislators must continue to prioritize mitigation strategies to safeguard the integrity of the system.

Practice **9**
**Material Processing
and Service Fees**

Summary

Just as meaningful deposit levels are essential for achieving high redemption rates, handling fees are a critical part of what makes DRSs work well. This is especially true in jurisdictions where there is no legal obligation on retailers to provide take back services. Handling fees should be determined based on the actual cost of service.

Similarly, careful determination of processing fees and requirements greatly impacts system outcomes. Experience shows considerable benefits of automation in reducing fraud. And the use of spot audits to verify the number of declared containers against the number received at processing centers serves as a valuable tool in mitigating potential fraud within the system.



Practice **10**

Management of Material Flow and Financial Data

Management of material flow and financial data facilitates “clearing” — a computer-based exercise where deposit containers registered at the point where they enter the market are “matched” with the units returned. Once this calculation is complete, the container has been “cleared.” Clearing is essential not only for operations, but also for data management and reporting compliance.

Typically, information technology providers use software developed for the specific system. The information collected is linked to a central database management system to ensure timely tracking and accountability for each container.

Operations
Define the functions to maintain the system over time.





A defining feature of modernized DRSs is the use of technological platforms to reconcile the number of empty containers returned with those sold, as well as the refund of deposits against those collected.

This not only establishes a high bar for transparency and accountability but also achieves something few waste or material management systems can: unit-specific tracking.

Why Does this Matter?

The ability of DRSs to track each beverage container moving through the system:

- Establishes a required standard for transparency and accountability
- Enables efficient clearing — deposit containers registered at the point of sale get matched with those returned
- Maximizes visibility for producers, distributors, and system operators into the flow of money and materials within the system
- Creates a valuable database of information to inform future policymaking
- Supports government reporting on progress towards zero waste and climate goals

How Does this Work?

First, there should be a direct online connection (e.g., via RVMs) between return points or counting centers and the system operator. Besides reducing any potential data leakages with the system, this direct connection ensures accurate and reliable data can be captured during the return process.

Second, the information collected should be seamlessly and automatically uploaded to a central database that is easily accessible to the regulatory body. This enables efficient data management and facilitates monitoring and oversight of the system's operations.

Third, unit tracking enables a high level of transparency in financial transactions. It ensures that every deposit collected is properly accounted for and can be traced back to the specific container it originated from. Effective legislation requires that the following activities be followed:

- Maintaining a central database with barcode and registration information for all products in the system (see Practice 3: Official Reporting and Compliance)
- Aggregating material and financial flow data from both automated and manual collection points
- Clearing deposits in a transparent, timely, and unit-specific manner
- Paying handling fees and other compensation, as required, to the appropriate parties
- Invoicing deposit initiators, such as producers or importers, for the costs associated with the DRS, including handling fees, processing fees, and other related expenses

Role of the Regulatory Agency

Setting parameters for data management and reporting is one of the responsibilities that falls to a state regulatory agency in a DRS. (See Practice 4: Oversight and Enforcement.) With regard to oversight on producer-managed reconciliation and reporting, the regulator's role is to make sure producers/distributors or the system operator accomplish each of the five actions outlined in the previous paragraph. As these activities comprise the key financial transactions associated with DRS material flows, they should be both reported to and monitored by the appropriate regulatory agency.

Role of the Producer

In a DRS, it is the responsibility of the producer or distributor to reimburse the entity that has refunded the deposit for redeemable containers. This reimbursement should be completed no more than seven business days after collection. However, in cases where containers are collected manually, the counting processes involved can sometimes cause delays in reconciliation. Software-based accounting processes to reconcile the flow of material and money is a more efficient clearing process.

These systems should be connected to either RVMs or counting centers to reduce any data “leakage” in the system. Wherever digital applications are used, the producer or distributor is responsible for providing the entity awaiting reimbursement the software and equipment needed to allow it to easily claim money owed.

When building its administrative data management capacity, producers or the system operator may decide to contract with a third-party service provider. This external vendor can offer specialized recordkeeping software and services tailored to the program’s requirements. Usually, the same firm that provides data management services also offers the necessary software and technological tools. This information should be automatically uploaded to a central database, which the regulatory body can access to facilitate oversight and monitoring of the DRS.

Case Study — Denmark

Established in 2002, Denmark’s deposit system — operated by Dansk Retursystem²⁷ — is one of the highest performing DRSs worldwide, achieving a redemption rate of 92% in 2022. The Danish legislation includes the following provisions to ensure material flow and financial data is well recorded:

Processing Empty Containers:

- Empty containers can be counted and registered at return points using RVMs equipped with a compactor or sealed container system. Alternatively, counting machines at Dansk Retursystem can be used.
- When counting is done electronically in RVMs, the central control unit registers various data about the packaging, such as packaging type, product type (GTIN), deposit group, sales group, recipient of returns, provider, and deposit code.
- If the compactor or sealed container system is non-operational at return points, Dansk Retursystem assumes responsibility for counting, registration, and data forwarding.
- In cases where containers cannot be scanned by a counting machine, manual control procedures are employed to identify the deposit mark.

²⁷ Dansk Retursystem. Årsrapport (2021). danskretursystem.dk/en/about-us Last accessed Nov. 7, 2023

Data Registration and Forwarding:

- Dansk Retursystem electronically transmits the registered data and estimates (if the exact number of packaging items collected is uncertain) to a central server maintained by the operator with whom they have a contractual agreement. Subsequently, the data is deleted, and Dansk Retursystem is prohibited from copying, storing, or accessing the information.
- Dansk Retursystem is obligated to enter into an agreement with an independent operator for the registration and forwarding of data regarding returned and collected empty single-use packaging. The operator is required to transmit the registered data to the auditing company and Dansk Retursystem.
- The agreement between Dansk Retursystem and the operator should solely include the data specified in the law. If the operator submits any other data, Dansk Retursystem will terminate the system operator agreement.
- A copy of the agreement between Dansk Retursystem and the operator is filed with the Danish Environmental Protection Agency (EPA).

Data Forwarding by the Operator:

- The operator is responsible for forwarding data received from the central control units of RVMs and from Dansk Retursystem to the auditing company.
- Additionally, the operator supplies data to Dansk Retursystem, specifying the number of returned and collected containers categorized by deposit groups and sales groups.

Overall, the Danish legislation ensures an accurate and controlled process for counting, registering, and managing empty beverage containers.²⁸ Whether handled by return point operators or Dansk Retursystem, the system establishes secure and traceable financial data flow, facilitating proper auditing and monitoring by relevant entities.

²⁸ Early warning assessment related to the 2025 targets for municipal waste and packaging waste, Denmark (2022), European Environment Agency; danskretursystem.dk/for-virksomhed/udgifter Last accessed Nov. 7, 2023.

Practice **10**
**Management of
Material Flow and
Financial Data**

Summary

The management of material flow and financial data through the “clearing” exercise is an essential operational function of DRS. All stakeholders stand to benefit from this practice.

Conclusion

The 10 Essential Practices outlined in this Guide are signposts on the path to sustainable management of beverage packaging. They directly address the challenges posed by beverage container waste through a circular economy approach with an equitable, modern DRS at the center. They call for, and rely on, legislative mandates, technological integration, logistical efficiency, financial transparency, and collaborative stakeholder engagement.

Making sure you apply these principles to take account of all stakeholders' needs will produce optimal logistics, leading to efficient collection, transportation, and processing mechanisms that reduce environmental impact and ensure a fair and accessible system. Technological integration will allow for the accurate tracking of material and financial flows, upholding transparency and financial accountability. The synergy of these practices, as demonstrated by global leaders in waste management, drives the circular economy.

Do use the case studies in the Guide as a starting point for exploration of different practices. They offer access to proven methodologies, roadmaps for implementation, and insights to bolster new efforts in the US. Success radiates from regions where modern DRSs have thrived, offering hope to communities striving to balance environmental preservation with economic growth.

The time to embrace the proven success of modern DRS is now. The fusion of legislative mandates, technological innovation, efficient logistics, financial accountability, and collaborative engagement is the foundation of modern DRSs. The success stories in the Guide's case studies are blueprints for transformation. Through the adoption of modern DRS practices, governments, industries, and individuals contribute to a collective effort. The journey may be challenging, but the destination — a world where resources remain resources — is well worth the endeavor.



*The time to embrace
the proven success of
modern DRS is now*

Appendix I

The 10 High-Performance Principles, Explained

Deposit Return Systems (DRSs) have operated successfully in the US and globally for decades. Reloop determined a set of principles for high-performing DRSs through extensive research from all over the world, including in countries such as Norway and Germany, which routinely achieve return rates for beverage containers above 90%. The findings are clear. High-performing DRSs share a set of 10 principles that can be organized into three main categories: Accessible and Accountable; Industry Financed; Well Managed and Regulated.

These 10 high-performance principles, summarized below, along with the 10 essential practices detailed in this Guide, are intimately connected, with each practice serving as a tangible means to achieve the overarching goals set forth by the guiding principles. The following categorization aligns each practice with one or more relevant principles to highlight their connections in promoting effective DRS.

10 High-Performance Principles to Modernize Deposit Return Systems

Accessible & Accountable

Principle 1

Easy & Equitable

Principle 2

90% Collection Rate

Principle 3

\$0.10 Minimum Deposit

Principle 4

Inclusive Circular System

Industry Financed

Principle 5

Producer Funded

Principle 6

Fair Pay for Service Providers

Principle 7

Financial Support for Municipal Recycling Programs

Well Managed & Regulated

Principle 8

Clear System Standards & Functions

Principle 9

Producer Reporting on Units Sold

Principle 10

Government Oversight & Enforcement

Practices relevant to each of the 10 Principles of Modern DRS

Principle 1**Easy & Equitable**

Practice 2: Point-of-Return
 Practice 6: Collection
 Practice 7: Infrastructure for Large-Volume Returns

Principle 2**90% Collection Rate**

Practice 1: Meaningful Targets and Penalties
 Practice 6: Collection
 Practice 7: Infrastructure for Large-Volume Returns

Principle 3**\$0.10 Minimum Deposit**

Practice 1: Meaningful Targets and Penalties
 Practice 6: Collection

Principle 4**Inclusive Circular System**

Practice 2: Point-of-Return
 Practice 5: Design, Marking, and Registration for Containers
 Practice 6: Collection
 Practice 7: Infrastructure for Large-Volume Returns
 Practice 10: Management of Material Flow and Financial Data

Principle 5**Producer Funded**

Practice 1: Meaningful Targets and Penalties
 Practice 3: Compliance and Official Reporting
 Practice 4: Oversight & Enforcement
 Practice 9: Material Processing and Service Fees

Principle 6**Fair Pay for Service Providers**

Practice 7: Infrastructure for Large-Volume Returns
 Practice 9: Material Processing and Service Fees

Principle 7**Financial Support for Municipal Recycling Programs**

Practice 4: Oversight & Enforcement
 Practice 8: Optimized Logistics

Principle 8**Clear System Standards & Functions**

Practice 2: Point-of-Return
 Practice 3: Compliance and Official Reporting
 Practice 5: Design, Marking, and Registration for Containers
 Practice 6: Collection
 Practice 7: Infrastructure for Large-Volume Returns
 Practice 8: Optimized Logistics
 Practice 9: Material Processing and Service Fees
 Practice 10: Management of Material Flow and Financial Data

Principle 9**Producer Reporting on Units Sold**

Practice 3: Compliance and Official Reporting
 Practice 5: Design, Marking, and Registration for Containers
 Practice 10: Management of Material Flow and Financial Data

Principle 10**Government Oversight & Enforcement**

Practice 3: Compliance and Official Reporting
 Practice 4: Oversight & Enforcement
 Practice 8: Optimized Logistics
 Practice 10: Management of Material Flow and Financial Data

Each of these 10 principles for a modern DRS are briefly explained in the next section.

Principle 1**Easy & Equitable**

Make deposit return systems (DRSs) 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.

The success of a DRS for recycling containers depends first and foremost upon people's willingness and motivation to participate. Any effective DRS must be human-centered and provide practical incentives, such as making sure participants get immediate cash refunds.

ReLoop research shows:

- High-performing DRSs are designed with the redeemer in mind, be it a consumer or a canner.
- Return-to-retail (R2R) systems have the highest return rates — a median of 89%, compared with 70% in systems that either rely only on depots or have a combination of retail and depots.
- For DRS to be both easy and equitable, redemption points must be located within five miles of all rural residents, and within two miles of all urban residents.

Principle 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.

Establishing an ambitious collection rate target through legislation is critical to a high-performing DRS. From the outset, it defines a common goal for producers, retailers, and regulators, encouraging cooperation.

Most importantly, setting a 90% collection target ensures the DRS is designed to maximize waste prevention, litter reduction, and facilitates high levels of closed-loop recycling. While a 90% target is ambitious, it is also clearly attainable — countries such as Denmark, Finland, Germany, Norway, and Lithuania routinely exceed 90% collection rates.

Perverse outcomes can result when collection targets are set below the threshold of 90%. An inaccessible or inconvenient redemption network that is bad for the consumer experience results in lower system costs and greater unclaimed deposit funds. Ironically, because of this, producers financing the systems and state agencies may benefit from those unclaimed deposits. High redemption targets incentivize producers to prioritize optimizing the user experience and ensure easy access to return points.

Principle 3

\$0.10 Minimum Deposit

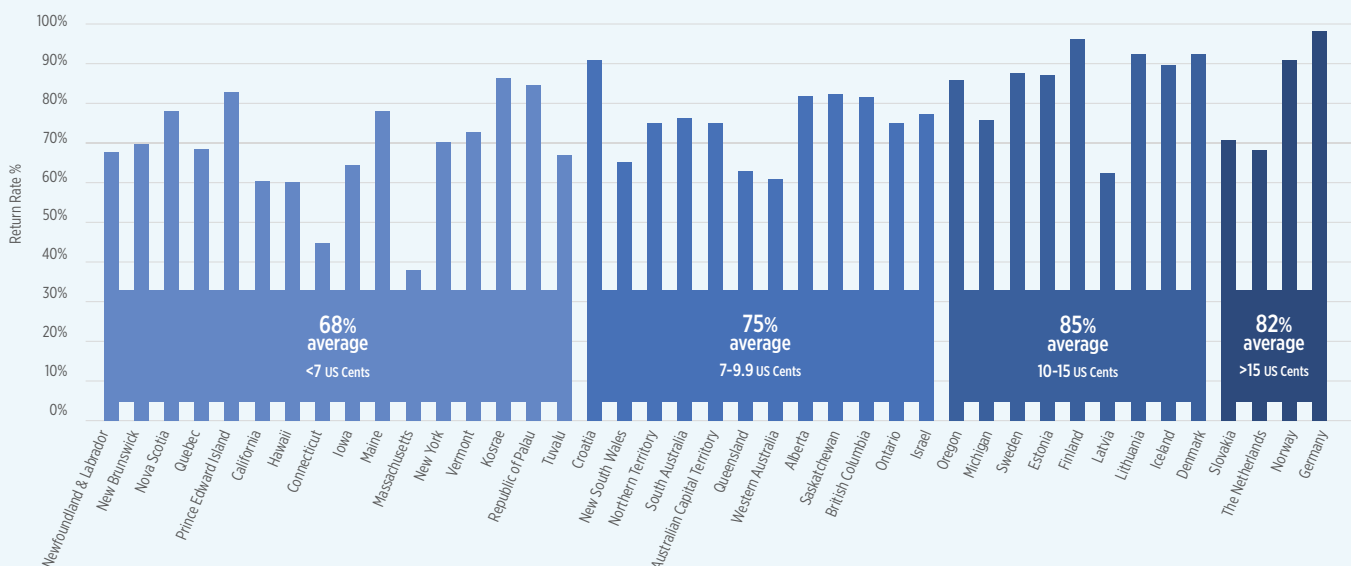
Motivate consumers to return containers by having a high-enough deposit, paired with easy access, to ensure higher levels of redemption.

A high enough deposit gives the consumer an economic incentive to recycle. This is why DRSs result in beverage container recycling rates two to three times higher than the rates achieved by states or jurisdictions that rely only on curbside recycling programs, particularly when the deposit is set at an effective level.

If the deposit is too low, consumers experience “return fatigue”. Why spend time and energy returning a container when the financial reward for the effort is so low? In this day and age, a nickel no longer means that much. A dime deposit, however, tells a different story. All research on DRS in action shows that beverage container deposits should be set at no lower than \$0.10.

The chart below shows redemption rates in DRS jurisdictions by minimum deposit amount (USD). One can see clearly that far lower rates of redemption in Canada and US states are linked to lower deposit rates. When the deposit rate is higher — at 10-25 US cents — then states (e.g. Oregon and Michigan again) have return rates around 80%, while some countries (e.g. Germany and Norway) have return rates consistently above 90%. Experience in these jurisdictions has also shown that it is critical to build a mechanism within bottle bill legislation to adjust the value of the deposit if redemption rates fall, even when minimum redemption point requirements are met.

Figure 6: Return Rates in various DRS Juristictions grouped by minimum deposit amount (USD)



Source: Reloop (2023) Internal data analysis.

Principle 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.

The driving force behind DRSs is the concept of a circular economy — which eliminates waste and pollution; circulates products and materials through reuse, repair, or remanufacture; and regenerates and enhances nature. That's not what happens now with most beverage containers in the US. Beverage containers are the number-one item littering our roads and coastal areas, with billions more of valuable material lost to landfill and incineration.

Although beverage containers are readily recyclable, the prevalent single-stream recycling system adopted by many US municipalities falls short in this regard. In this system, plastic beverage containers are considered contaminated due to their mixing with other product packaging, rendering them unsuitable for food-grade purposes. In contrast, a DRS enables a circular system, in which bottles and cans are recycled to return as new bottles and cans.

In order to make a state's DRS truly comprehensive, its bottle bill legislation needs to include all beverages and common material types, as well as a full range of container sizes. An inclusive circular DRS is important because it:

- Makes the system easier to understand for consumers
- Levels the playing field for competing beverage companies
- Delivers economies of scale for the system operators
- Brings dramatic reduction in overall litter for local communities

Our current recycling system doesn't work



140 billion beverage containers — glass, metal, and plastic — are lost to litter, incinerators, and landfills each year.



That's at least **\$5.1 billion** in valuable and reclaimable material, wasted.

Principle 5

Producer Funded

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

Well-designed DRSs embody the core principle of Extended Producer Responsibility (EPR). Under a modernized DRS, producers are expected to finance the system: this is key to ensuring that industry takes responsibility for the products and packaging it introduces to the market, and that municipalities and taxpayers are not left to pay the costs of managing these materials.

A producer-funded DRS not only shifts the financial responsibility to those who have created the beverage packaging and put it out into the world, but also obliges them to manage that product throughout its life cycle. That gives them a reason to design and manage their containers in a way that enables cost-effective recycling.

Surprisingly, perhaps, the more that is at stake for the producers, the greater the benefit for them. In fact, many of the DRS jurisdictions with the highest recovery rates also have the lowest producer fees, as illustrated in this chart, owing to careful system design and investment.

Ownership of this material will enable beverage brands to meet the voluntary recycling commitments they have made to consumers and shareholders. It also helps in compliance with environmental regulatory mandates, which are expected to multiply in the years to come and have already been passed regionally in Maine and New Jersey.

Table 14: Material recovery rates and producer fees for different DRS countries

Country	Material recovery rate	Producer fees (cents)		
		Aluminum	Plastic	Glass
Finland	96%	0.15	1.2	6.4
Denmark	92%	0	1.1	1.4
Norway	91%	-0.7	1.6	N/A
Croatia	91%	1.4	1.4	1.4
Lithuania	92%	0.6	2.9	5.4
Sweden	87%	0	2	N/A
Estonia	87%	0	0.9	1.8

Source: Reloop (2023) Internal data analysis.

Principle 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.

A key stop on a beverage container's journey through a DRS is the retailer or redemption center. This is where the container is collected from the consumer, undergoes sorting, and is then stored before it is picked up for recycling. The work of collecting, sorting, and storing these beverage containers does not, and should not, come free. The businesses that provide these services should be fairly compensated and receive a handling fee that reflects the costs incurred in hosting and operating a return point.

Handling fees are best set to enable flexibility based on the cost of the actual service provided. Setting them in legislation only politicizes the process and subjects legislators to lobbying from retailers eager for a fee increase and from producers generally opposed to any change that increases their costs.

Reviewing handling fees at set periods, either annually or biannually, by the system operator or the state agency, in consultation with return point operators, helps guarantee they remain responsive to changing conditions.

Principle 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.

Successfully transitioning to a modernized DRS takes thoughtful implementation and support within the existing recycling infrastructure. Material Recovery Facilities (MRFs) will see fewer containers flow through their facilities, so their revenue from sales of higher value materials such as aluminum and PET drops. They also lose tipping fees — the amount paid by municipalities or private haulers for the management of materials. On the other hand, MRFs will see lower volumes of materials that are both costly to process and have limited markets, such as glass and cartons, so they will have lower operational costs.

With an efficient DRS, bottle bill states can save millions of dollars through cost reductions on garbage/recycling collection, garbage disposal, and litter cleanup.

In addition to budget savings, funds that accumulate from unredeemed beverage containers can support a smooth transition to a modern DRS by either reimbursing MRFs or municipalities for lost revenue or covering MRF upgrades and municipal recycling program improvements, benefiting the entire community.

To ensure the fair distribution of these funds, it is imperative to establish clear rules that strike a balance between compensating MRFs fairly while also benefiting municipalities and prioritizing meaningful system investments so a state's DRS operates efficiently and cost-effectively for all stakeholders.

Principle 8

Clear System Standards & Functions

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

- 1. Product placement on market** (recycling design, labeling)
- 2. Accessible and equitable service standards**
- 3. Administration** (mandatory registration and database of barcoded containers)
- 4. Redemption** (transparent recording/reporting of money and material flow data)
- 5. Pickup and recycling** (contracts, processing, material ownership)
- 6. Education and outreach** (public campaigns)

Setting clear system standards and functions upfront allows each stakeholder to understand their roles and responsibilities. Principle 8 lays out six key areas where such standards and functions are most needed. This principle sets the stage for the 10 essential practices that comprise the core of the Guide. For that reason, they are covered here in minimal detail.

Setting a DRS up for success starts with the design, marking, and registration of containers in the system. Defining and mandating these requirements increases the chance that eligible containers will remain in the circular economy for as long as possible. Clearly marked and readable containers make it far easier for consumers to decipher their “redeemability” and for system operators to register and accurately track material and refund deposits to customers.

Establishing and maintaining a beverage container-specific data registry builds system integrity. Registration should include information such as supplier name, product name, flavor, container dimensions (i.e. volume/height/diameter), material type and color, and barcode. Collecting performance-related data helps keep the DRS operating soundly and ensures that the operator is fulfilling its legal obligations. Use of technology enables a more efficient system and helps prevent or minimize fraud. By specifying technology use and RVM requirements in their system rules, jurisdictions ensure that all redemption point operators offer the same standard of service and have the capacity to meet the system requirements.

Effective DRS operations rely on strong performance-based contracts with services providers. Finally, keeping the public engaged and informed, through public-facing annual reports and marketing campaigns, is essential to program success.

Principle 9

Producer Reporting on Units Sold

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

One powerful tool of a modernized DRS is its capacity to track every single beverage container as it makes its way through the system. While tracking data alone is important, its true value becomes evident when that data is analyzed and translated into reports. By doing so, the system operator can not only accurately measure waste but also reduce fraud, demonstrate transparency, share results with the public, and enable higher beverage container redemption rates.

Once barcodes are affixed to each container, the producer should register them with the system operator. This process involves marking the container with a standardized deposit logo and submitting their respective barcodes to the system operator for recording. That information then enters a central database, and the unique markings are checked to ensure they can be identified by automated collection or counting equipment in subsequent stages.

This rigorous registration and reporting process:

- Ensures that all containers returned are counted and verified
- Prevents containers from being fraudulently returned multiple times
- Enables monitoring of return volumes through redemption locations to help identify any irregularities
- Allows for transparency on units returned so that the collection rate can be verified accurately
- Can be used to ensure producers are charged accurate fees
- Can be used to ensure return point operators are paid the appropriate handling fees

This principle drives a fairer, more transparent and fraud-proof system, working in favor of all DRS stakeholders:

- For participating producers, product registration levels the playing field and enhances a transparent flow of containers.
- For consumers, and retailers, the unique markings help identify containers eligible for a deposit refund.
- For government agencies overseeing the DRS, the data-registry captures new products, thereby minimizing “free riders” — system containers sold onto the market without a deposit, allowing brand owners to avoid financial responsibility for their management.

Principle 10**Government Oversight & 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.

A modern DRS can only succeed if enforceable requirements are in place, with government actively involved in oversight and enforcement.

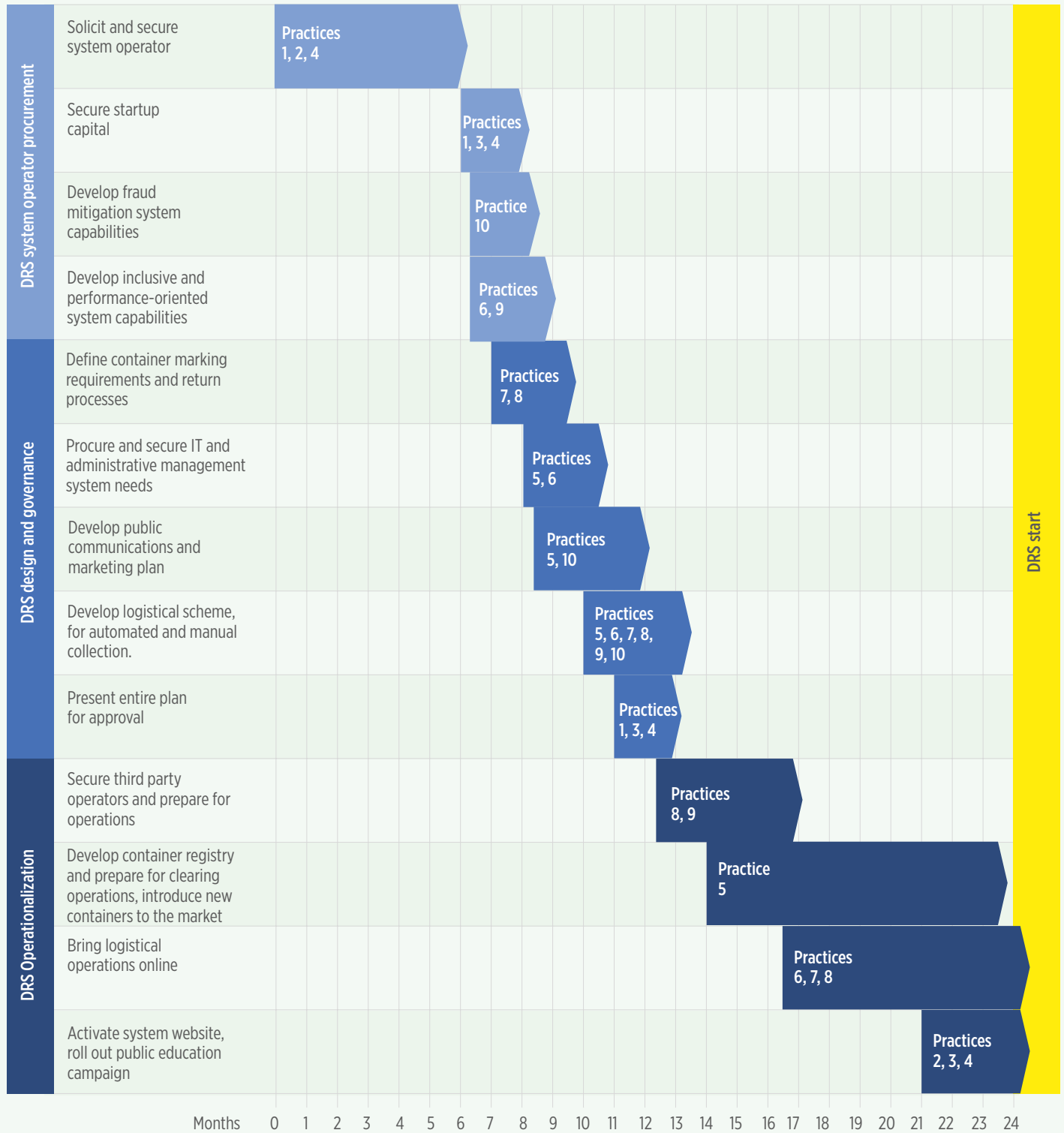
What is the right role for the government in a DRS? First and foremost, it is to craft clear and specific legislation that is outcome oriented. If you get it right in legislation, using the 10 high-performance principles serving as a guide, the need for excessive oversight is minimized.

Equally important to the government setting regulations with meaningful targets is the adequate enforcement of those regulations. When targets are not reached, government can get the program back on track through strong oversight and enforcement measures, including the imposition of penalties. Monetary fines and additional reporting requirements are two common penalties.

Government, however, can only be effective in its oversight and enforcement role if it has adequate resources to play that role well. State agencies can be overwhelmed by trying to manage complex waste management systems with too little staffing or funding.

Appendix II

Sample DRS Rollout Plan



Appendix III

Glossary

Barcode-based system	A system that employs barcode scanning technology to identify and verify eligible beverage containers for the purposes of providing refunds, collecting accurate data for reporting and financial auditing.
Central System Administrator	The Central System Administrator is generally a not-for-profit entity responsible for the operation of a DRS, including (but not limited to): meeting performance targets, managing finances, designing and funding the return infrastructure, registering producers and new products into the system, establishing contracts for service providers, auditing, etc. This entity is often referred to as a System Operator.
Deposit	A sum of money that is charged on applicable beverage containers at the point of purchase, which retailers are required to collect from consumers. This sum is returned to the consumer whenever they return the used containers at specified connection points in a Deposit Return System.
DRS	Deposit Return System
EPR	Extended Producer Responsibility is an environmental protection strategy placing responsibility for the sustainable and safe collection, recycling, and ultimate disposal of products and packaging at the end of their useful life with the manufacturers, importers, and retailers of these materials.
EU	The European Union
Handling fee	A fee that is paid, often by bottlers/distributors (or in some cases, the state [e.g. California]) to retailers and/or redemption centers/depots as compensation for receiving, sorting, and storing redeemed drinks containers.
Collection method	In the context of this report, refers to the way in which empty drinks containers are returned for recycling, sorted, and/or counted: either manually, through bulk return (e.g. bag drop), or using automation like a reverse vending machine (RVM).

Depot	A dedicated establishment for the collection of empty drinks containers in exchange for a deposit refund. Alternatively referred to as a Redemption Center.
Material owner	The owner of the recyclable commodity (empty containers) that can sell the material to the market or keep the material to have it converted into raw material for new bottles or cans.
MRFs	Material Recovery Facilities. These are waste facilities that receive commingled recyclable materials from residential and commercial recycling programmes for the purpose of sorting, processing, and marketing them for sale to recyclers.
PET	Polyethylene terephthalate. A type of plastic resin that is widely used for packaging drinks, especially soft drinks, juices, and water.
PVC	Polyvinyl Chloride. A synthetic polymer of plastic.
Processing fee	A per unit fee paid by system operators to material processors in some North American deposit return systems.
Producers	For the purposes of this Guide, a producer is the entity first selling the eligible drinks container in the market, which technically could be a brand owner, manufacturer, an importer, or a distributor.
Producer fee	Also known as a producer administration fee, extended producer responsibility (EPR) fee, or processing fee, this is a fee paid by beverage producers/importers/distributors to the system operator to cover the proportion of system costs not covered by material revenues and/or unredeemed deposits. Although different terms may be used in different jurisdictions, they all represent the same thing.
Producer Responsibility Organization	A “producer responsibility organization” or PRO is usually a not-for-profit organization or an industry association. It is the entity designated by a producer or producers to act on their behalf to administer an extended producer responsibility or product stewardship program.

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- Redemption Center** A dedicated establishment for the collection of empty beverage containers in exchange for a deposit refund. Alternatively referred to as a depot.
- Retailer** Party that buys drinks from producers and sells them to consumers through a retail establishment. In best practice deposit return systems, they are also responsible for accepting empty drinks containers from consumers and paying out deposit refunds.
- Return rate** The amount of beverage container material that is collected (by unit) expressed as a percentage of the amount of beverage container material placed on the market, excluding exports. While some system operators may report a “collection rate”, others report a “recycling rate” or “redemption rate”. For the sake of consistency, this Guide uses “return rate” with these terms interchangeably.
- Return-to-retail (R2R)** Redemption model that relies on beverage retailers to accept — and refund the deposit on — empty deposit-bearing drinks containers from consumers for the purpose of recycling.
- RVM** Reverse Vending Machine; an automated mechanical device that accepts one or more types of empty drinks containers and issues a deposit refund. In some cases, they may also have a compaction function. Used by consumers at redemption locations.
- System operator** Entity responsible for the operation of a DRS, including (but not limited to): meeting performance targets; managing the system’s finances; designing and funding the return infrastructure; registering producers and new products into the system; establishing contracts with service providers; auditing activities; and quality assurance. DRSs are usually operated by beverage producers, but can also be operated by government, a not-for-profit agency, or multiple parties, each with a specific assigned responsibility.
- Unredeemed deposits** The value of paid deposits on containers that have not been redeemed by a consumer. Sometimes referred to as unclaimed deposits. This can be referred to as an “unclaimed deposit”.

Acknowledgments

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ReLoop (www.reloopplatform.org) is an international nonprofit organization, whose vision is a world free of waste, where natural resources remain resources. Leading the global transition to a circular economy, ReLoop provides evidence-based research and analysis to governments, industry, and NGOs.



www.reloopplatform.org

www.bottlebillreimagined.org

