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Mixed DRS: Where reuse meets recycling

Exploring how integrating deposit return systems for reusable and single-use beverage packaging creates operational synergies that lower costs, improve convenience, and deliver better environmental outcomes

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Introduction


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While deposit return systems (DRS) are mostly seen as a policy instrument to increase recycling, the origins of these systems lie firmly in reuse. For over a century, beverage producers have sold their products in reusable containers that they took back to be washed and reused. Unlike the single-use bottles and cans that dominate the market today, these containers were treated as durable, valuable assets, and there was a shared expectation that bottles would be returned to producers, often without any financial incentive.[1] Local bottlers relied on recovering bottles within a limited geographic area, making deposit and return arrangements an operational necessity. These early reuse systems functioned effectively at the local and regional level, sustaining production and distribution within defined markets. As national brands emerged, they increasingly relied on reuse quotas and deposit requirements not only to ensure the return of refillable bottles, but also to protect domestic bottling systems from competition.

As beverage markets expanded, production scaled up and became more centralised, and companies consolidated into larger national and global brands, reusable bottles lost relevance in many jurisdictions. Increasingly, these bottles were replaced with lightweight plastic bottles and aluminium cans, which offered lower upfront costs and easier distribution, while end-of-life management costs were often externalised to municipalities and consumers. Return rates for reusable bottles declined, and producers faced rising financial losses from unrecovered containers. In response, beverage companies (mostly brewers and soft drink companies) established voluntary deposit systems to ensure the return of their reusable bottles for washing and refilling. One of the earliest formalised examples of these producer-led deposit schemes emerged in Sweden in the late 19th century[2,3].

Deposit return systems for single-use containers emerged only decades later with the first introduced in 1970 in the Canadian province of British Columbia. Since then, such systems have expanded rapidly and now operate in 59 jurisdictions worldwide, with several more expected to launch in the next two to three years. Most cover metal cans and plastic (PET) bottles, and many also include single-use glass (49 out of 61 DRS globally, including 11 of 19 in Europe). In some jurisdictions, deposit systems for both single-use and reusable containers operate in parallel, and consumers can return both types to the same collection points. While the ways in which these systems interact and integrate vary across contexts, together they represent what we refer to as a "**mixed DRS**."

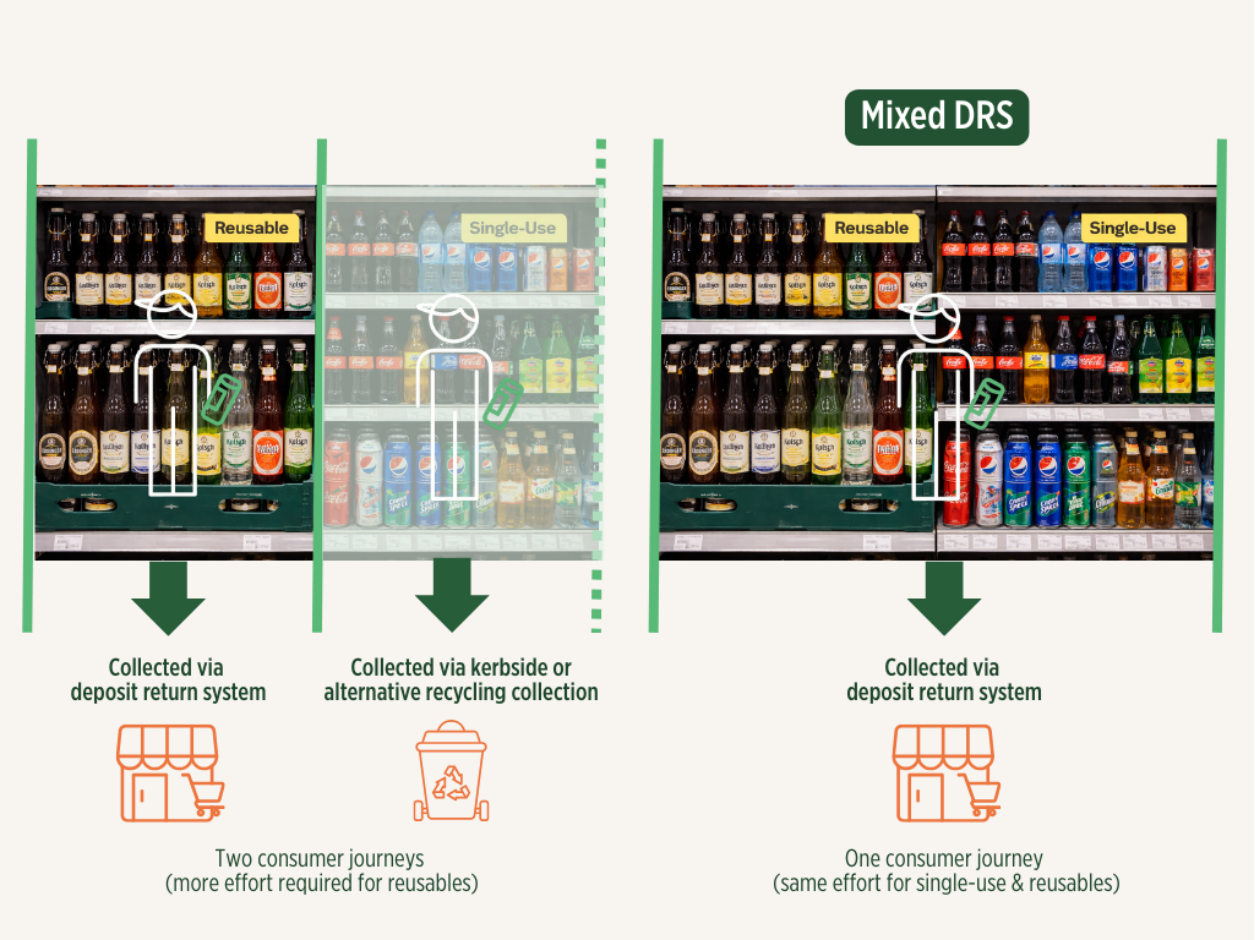

Figure 1 Consumer journeys under separate versus mixed DRS collection models. Left: reusable containers are returned through a DRS while single-use containers are collected via kerbside or other systems, requiring two consumer journeys and greater overall effort for reusables. Right: a mixed DRS captures both reusable and single-use containers within one system, simplifying participation and aligning effort across container types.

While deposit systems for single-use containers are typically well understood (largely because they are underpinned by legislation that requires formal reporting of material flows, financial transactions, and operational performance), much less is known about DRS for reusable beverage packaging, or how these systems can be integrated with single-use DRS to create efficiencies and improve consumer convenience. Most deposit systems for reusable bottles in place today remain voluntary, are decentralised, and managed privately by producers, and are often characterised by limited transparency. As a result, key data such as circulation rates, loss rates, wash-centre throughout, and financial flows are rarely made public. This opacity creates a significant knowledge gap for policymakers, researchers, and other stakeholders seeking to assess system performance or design effective policies that support reuse.

Regulatory drivers shaping mixed DRS

Recent policy developments, such as the European Union's Packaging and Packaging Waste Regulation (PPWR), are set to accelerate the adoption of mixed DRS, including in markets where such systems do not currently exist. Under Articles 26 and 27, for example, economic operators placing reusable packaging on the market must ensure that a system exists for its return, whether through a DRS, a financial incentive, or another reuse-enabling measure. Member States must also ensure that deposit systems for single-use packaging are "equally available for reusable packaging where technically and economically feasible," creating a clear regulatory signal that reuse and recycling infrastructure should be developed in tandem.

At present, several EU Member States already include single-use glass within their DRS, including Croatia, Denmark, Estonia, Finland, Germany, Hungary, Iceland, Latvia, Lithuania, Malta, and Romania. In these countries, the PPWR directly strengthens the case for operational integration between reuse and recycling. In Member States where glass is not currently included in the DRS, the PPWR nonetheless establishes a framework that will shape future decisions on system scope, particularly where reusable glass packaging remains on the market.

The PPWR also introduces binding reuse targets for beverage packaging. By 2030, final distributors, such as retailers, must ensure that 10% of the beverage packaging they sell is reusable. An additional, aspirational 40% target is set for 2040 and applies to all economic operators, including producers. These targets apply to most beverages (both alcoholic and non-alcoholic) excluding dairy, wine and spirits. Importantly, they are designed as 'de minimis' targets, which gives Member States the flexibility to set higher targets if justified to meet their waste prevention goals. Additional reuse requirements apply to the take-away sector (Articles 32 and 33), where businesses with 10 or more employees must establish reuse systems for packaging by February 2028 and aim for at least 10% of their food and beverage products in reusable packaging by 2030.

As Member States begin transposing and operationalising these new requirements, and as other countries explore reuse to meet their own climate and waste prevention objectives, questions are emerging about how deposit systems can be adapted, or newly designed, to support both reuse and recycling. This is a logical evolution, given that DRS for single-use and reusable containers share the same basic structural flows between producers, retailers, and consumers. The practical question is therefore not whether they can coexist, but *how* they can be aligned within a single, cost-efficient and integrated framework.

This fact sheet aims to help address that gap by examining how deposit systems for reusable and single-use containers can be designed and operated as integrated, mutually reinforcing systems that share collection (and sometimes other infrastructure) to create synergies that reduce costs and improve consumer convenience. It explores how governance and financing structures can be organised (whether a single central entity oversees all container types or multiple organisations coordinate) and how deposit values, handling fees, and producer fees can be aligned or differentiated by container type.

The fact sheet also examines practical collection and operational considerations, including how retailers, redemption centres, reverse vending machines (RVMs), and logistics networks can be configured to serve both single-use and reusable containers, how transport, routing, and sorting can be optimised, and how barcodes, markings, and labels distinguish container types. It also considers the performance metrics that should be used to assess the effectiveness of mixed systems, particularly where reuse models are decentralised.

Using real-world case studies, the fact sheet demonstrates how mixed DRS can deliver benefits across the entire value chain, from improved convenience for consumers to operational efficiencies and cost savings for retailers, system operators, and producers.

Global approaches to integrating reuse in a DRS

As noted in the introduction, deposit return systems (DRS) for reusable beverage containers originated as voluntary, producer-managed schemes designed to recover packaging for washing and reuse. This remains the dominant model in many jurisdictions today. In some cases, these voluntary reuse systems operate alongside a mandatory DRS for single-use containers; in others, they exist in regions without any single-use DRS at all. At the same time, a smaller but growing number of jurisdictions now include reusable bottles within a mandatory DRS framework, supported by legislation or other legal provisions, typically alongside mandatory systems for single-use containers.

These different legal and institutional arrangements shape how reusable bottles are incorporated into deposit systems and can be broadly grouped into three models (see Table 1 and Figure 2).

Table 1 Approaches to integrating reuse in a DRS – Global overview

Approach	Description	Examples	Mixed DRS?
No DRS for single-use containers; voluntary (producer-managed) DRS for reusable containers	Reusable containers are managed exclusively through voluntary deposit return schemes operated by producers or industry associations, while single-use containers are collected for recycling through kerbside systems, bring sites, or other channels, or are otherwise disposed of or littered. These schemes typically cover reusable bottles used in HORECA or retail channels.	Belgium, Czech Republic, France, Italy, Slovenia, Manitoba (Canada)	No
Mandatory DRS for single-use containers, voluntary (producer-managed) DRS for reusable containers	Single-use containers are covered by a mandatory DRS, while reusable bottles are collected through private, voluntary schemes managed by producers or industry associations.	Austria, Germany, the Netherlands, Oregon (US), Romania, Slovakia, Sweden	Yes
Mandatory DRS for both single-use and reusable containers	Both single-use and reusable beverage containers are included in a DRS that is mandatory for producers. Participation in the single-use DRS is generally required by legislation, though in some cases (such as Finland) alternative policy instruments, like environmental taxes, effectively compel producers to join. Reusable containers may be included through legislative requirements (e.g. Denmark, Poland) or binding industry agreements, as seen in Austria, Ontario, and Quebec.	Denmark, Finland, Latvia, Lithuania, Estonia, Ontario, Poland (reusables included by 2028), Quebec	Yes

The last two models in Table 1 and Figure 2 represent forms of a **mixed DRS**, as they allow consumers to return both single-use and reusable containers through shared collection infrastructure, such as common return points and/or reverse vending machines, even where legal responsibilities or system operators differ. While single-use containers (e.g., cans, PET bottles, or glass) are directed toward high-quality recycling, reusable containers (typically durable glass or plastic) are returned to producers for cleaning and refilling. Despite these different end destinations, the core mechanism is the same: producers place containers on the market with a deposit that is refunded upon return, creating a strong financial incentive for recovery and supporting high return rates.

*A mixed DRS is an **integrated framework** that enables consumers to return both single-use and reusable beverage containers through the **same collection infrastructure**.*

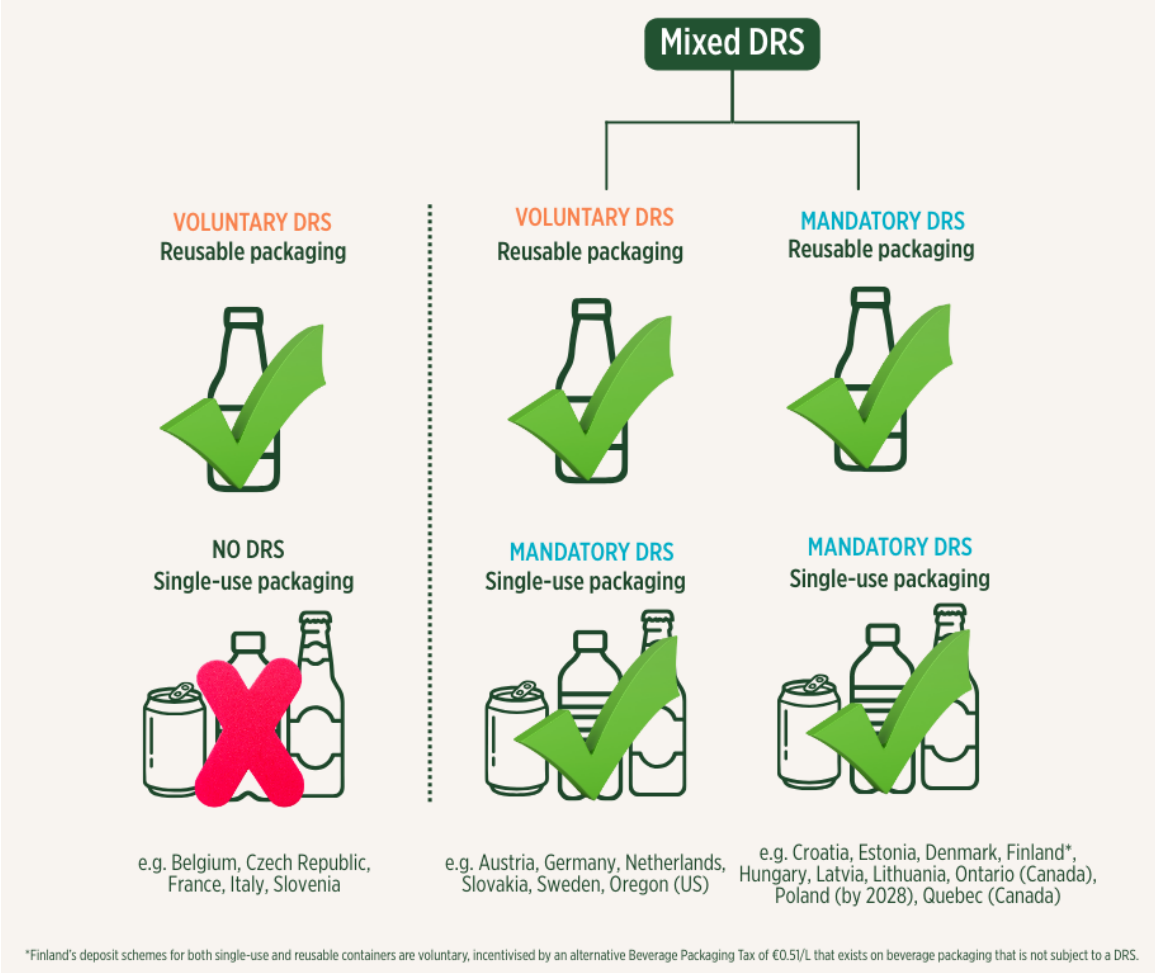

Figure 2 Three broad approaches to integrating reusable containers in a DRS

It's important to emphasise that **a mixed DRS is not a single prescriptive model but a principle of system integration**. It aligns deposit systems for single-use and refillable containers through **shared collection infrastructure**, with or without a common organisational framework such as a central system operator (see Figures 3 and 4). At its core is the recognition that reuse represents the most advanced application of extended producer responsibility (EPR), treating packaging not as waste, but as a managed asset that retains economic and functional value across multiple use cycles.

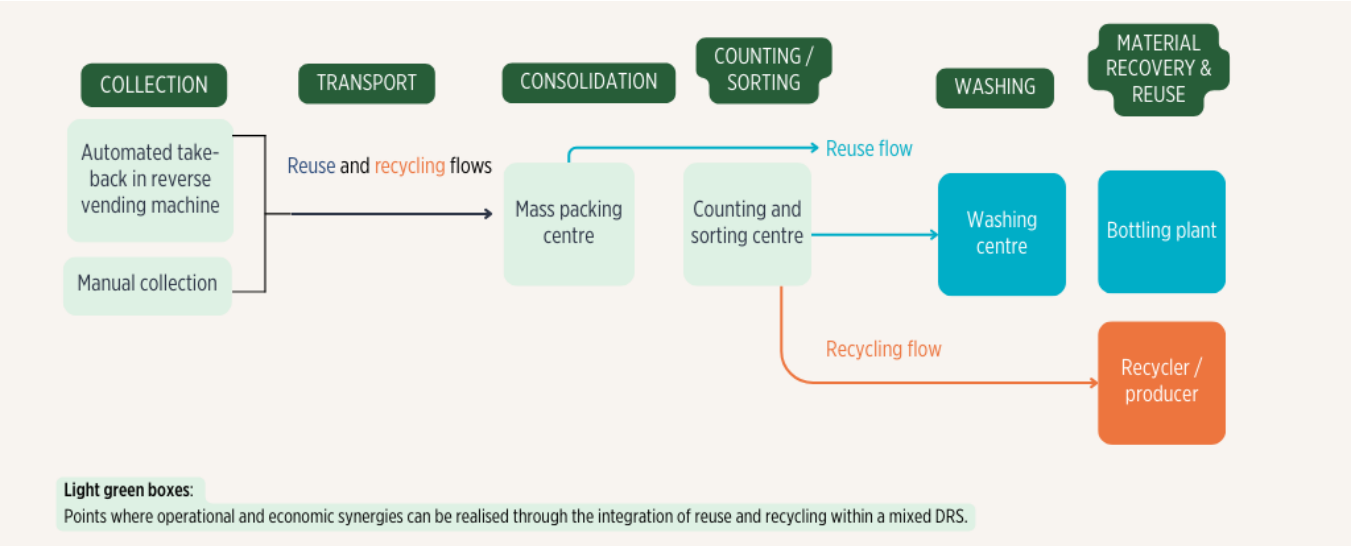

Figure 3 Value chain and potential synergies in a mixed DRS[1]

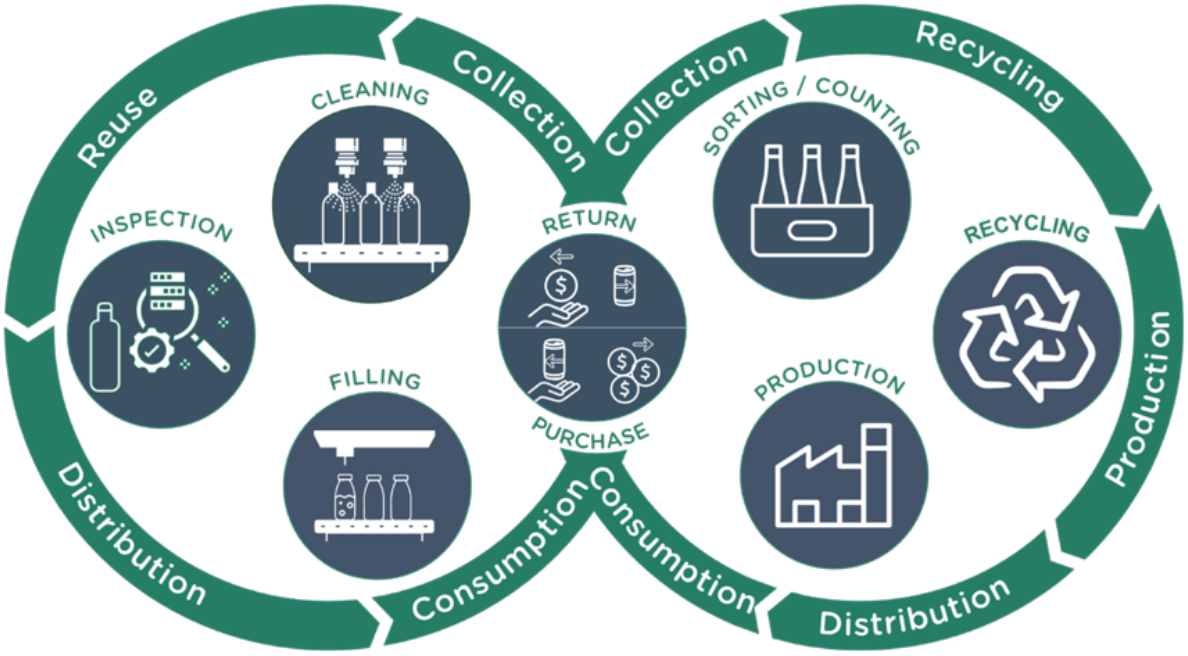

Figure 4 Integration of single-use and refillable deposit containers in a mixed DRS

Understanding differences in mixed DRS: two key operational functions

While mixed DRS are often described using broad labels such as "centralised" or "decentralised," these terms can obscure a more important point: there is no single model of integration.

Instead, the degree to which reuse and single-use containers are integrated within a mixed DRS depends primarily on how two core DRS functions are organised. Each function can operate along a spectrum from decentralised to centralised, and systems often combine elements of both.

The two key operational functions are:

- **Governance, administration, and reporting:** This concerns how the system functions institutionally and in terms of information and financial management. It includes how producers are registered, how containers placed on the market and returned are tracked, how deposits and other fees (e.g. producer fees, handling fees) are cleared, and how system performance and compliance are monitored. In more centralised arrangements, a single system operator manages reporting, financial clearing, and oversight across both single-use and reusable streams. In more decentralised arrangements, these responsibilities may be divided among multiple operators, producer groups, or industry consortia, particularly for reusable containers. The degree of centralisation of this function strongly influences transparency, administrative efficiency, compliance oversight, and the overall coherence of the system.
- **Organisation of transportation and reverse logistics:** The other key operational function in a mixed DRS concerns the physical movement and handling of containers after collection, including transport, sorting, processing, washing (for reusables), and redistribution. For single-use containers, reverse logistics are typically coordinated through a central system operator responsible for contracting transport, counting, sorting, and directing materials to recycling. Notable exceptions are Germany and Poland, where the single-use DRS operates through a more decentralised clearing model with multiple system operators. For reusable containers, responsibility for reverse logistics always ultimately rests with producers, as containers must be returned for washing and refilling. However, the degree of coordination varies. In some systems, especially where standard bottle formats are used, transport, sorting, and washing flows can be organised in a more centralised or shared way, allowing multiple producers to use common infrastructure. In other cases, particularly where bottles are non-standard, logistics remain highly decentralised, with producer-specific sorting and return flows.

Figures 5 and 6 illustrate these two key functions and how different combinations of centralisation and decentralisation shape real-world mixed DRS designs.

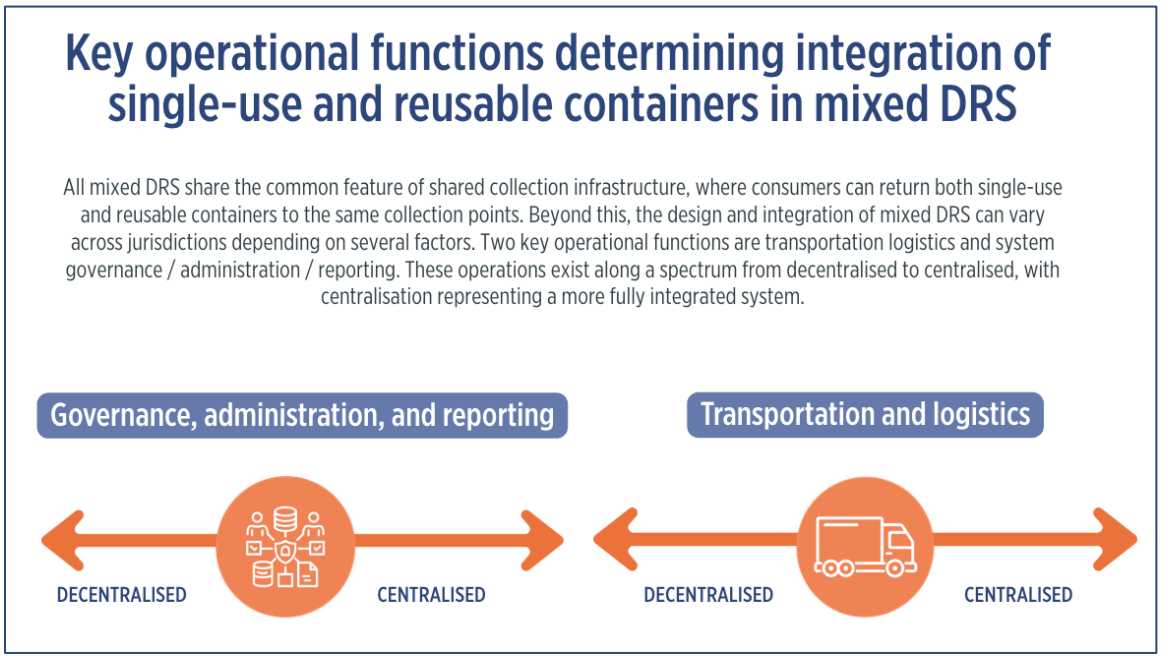

Figure 5 Key operational functions determining level of integration of single-use and reusable containers in mixed DRS

Understanding how mixed DRS can differ depending on how these key operational functions are organised helps explain why systems that appear similar at the point of return can function very differently behind the scenes, and why policy discussions should focus less on labels and more on how mixed DRS operate in practice.

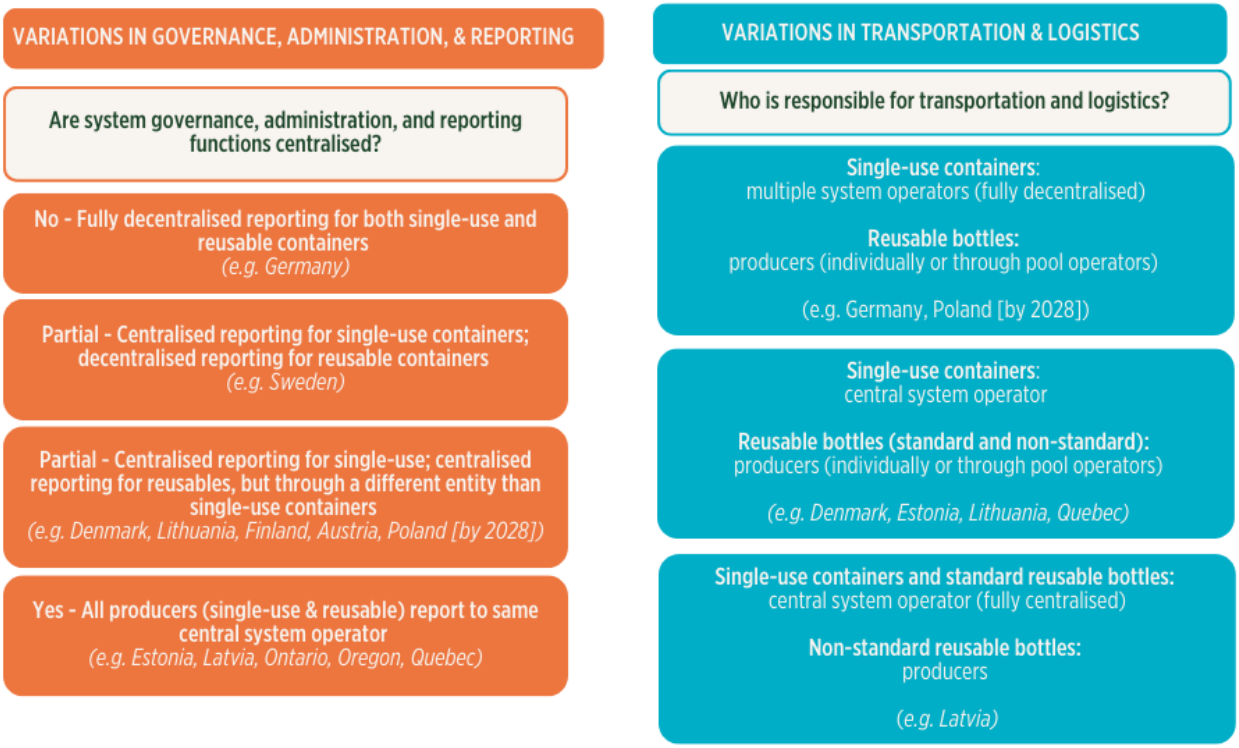

Figure 6 Understanding variations in mixed DRS – two key operational functions

Who is responsible for transportation and logistics?

Fully centralised collection for single-use + standard reusables

In some systems (e.g. Latvia), single-use containers and standard reusable bottles move through the same centrally coordinated logistics network, while non-standard reusable bottles remain producer-managed. This model reflects partial operational integration while recognising that non-standard bottles often circulate in brand-specific loops.

	Single-use containers	Standard reusable bottles	Non-standard reusable bottles
Entity responsible for transport logistics	Central system operator	Central system operator	Producers

Centralised for single-use, producer-managed for all reusables

Other systems (e.g. Denmark, Estonia, Lithuania) centralise logistics only for single-use containers. All reusable bottles (standard and non-standard) are collected and transported by producers, either individually or through pool operators. Here, reuse logistics remain largely separate from the central DRS material flow, even when governance and reporting are integrated.

	Single-use containers	Standard reusable bottles	Non-standard reusable bottles
Entity responsible for transport logistics	Central system operator	Producers/pool operators	Producers

Fully decentralised single-use + producer-managed reusables

In some jurisdictions (e.g. Germany, Poland), even single-use container logistics are decentralised, handled by multiple system operators or competing entities. Reusables are still managed directly by producers or pool systems. This represents the most decentralised operational structure.

	Single-use containers	Standard reusable bottles	Non-standard reusable bottles
Entity responsible for transport logistics	Multiple system operators	Producers/pool operators	Producers

Are system governance, administration, and reporting functions centralised?

How producers report data, pay fees, and interact with DRS operators is a defining feature of how integrated a mixed DRS is at the governance level. Even where logistics differ, reporting structures often reveal whether a system operates as a single coordinated framework or as parallel schemes.

Fully centralised governance and reporting

In some jurisdictions (e.g. Latvia, Ontario, Oregon, Quebec), all producers placing beverage containers on the market, whether single-use or reusable, report to the same central system operator. Financial flows, data reporting, and administrative oversight are consolidated under one designated entity, even where physical logistics for reusable containers may still involve producer-led reverse logistics.

Under this model, one central body is responsible for:

- Producer registration across all in-scope container type
- Reporting of containers placed on the market (POM) and return volumes
- Collection of producer fees and management of deposit clearing and reimbursements
- System-wide performance monitoring and regulatory reporting

This structure creates a single administrative interface between producers and the DRS, reducing duplication and simplifying compliance, particularly for producers placing both single-use and reusable formats on the market. It also enables consolidated, system-wide data on return rates, material flows, and financial performance, improving transparency and policy oversight.

From an integration perspective, this represents the highest level of governance alignment in a mixed DRS. Reuse and recycling streams may still differ operationally (e.g. who transports and washes reusable bottles), but they function within a shared regulatory, financial, and reporting framework.

Fully decentralised governance and reporting

In this model (e.g. Poland, Germany), neither single-use nor reusable containers are administered through a single, central system operator. Instead, both streams are governed and reported through separate, decentralised structures, often involving multiple operators, clearing entities, or industry-led organisations.

Producers interact with different entities depending on container type and, in some cases, even within the same container category. Reporting on containers placed on the market (POM), return volumes, and financial clearing of deposits and fees may be handled by different organisations, and data flows are not consolidated through one administrative hub. This creates a system architecture that is functionally distributed rather than centrally coordinated.

From a regulatory and oversight perspective, this means system performance is monitored through a combination of actors rather than a single body. While legal obligations (such as take-back requirements) may still be clearly defined, compliance monitoring and financial clearing rely more heavily on coordination between industry actors. As a result, the system can appear cohesive to consumers at the point of return, while remaining institutionally fragmented behind the scenes.

Partial centralisation: single-use centralised, reuse decentralised

In some jurisdictions (e.g. Sweden), governance, administration, and reporting are fully centralised for single-use containers, but reusable containers operate through separate, producer-led systems outside the core DRS administrative structure. A central system operator is responsible for the single-use DRS, including producer registration, data reporting on containers placed on the market (POM), return rate tracking, financial clearing of deposits and fees, and overall system oversight. Reusable containers, however, are managed through independent, producer-run arrangements, often organised by brewers or beverage industry associations. These reuse systems typically handle their own reporting, financial flows, logistics coordination, and performance tracking without being integrated into the central DRS administrator's data or compliance framework. As a result, consumers may still experience a degree of integration at the point of return, however, behind the scenes, the systems function as parallel structures with limited administrative alignment

Partial centralisation: both centralised, but through different entities

In some countries (e.g. Denmark, Lithuania, Finland), single-use and reusable containers are both managed under central governance, but the governance is split between separate organisations. Each type of container has its own dedicated central authority responsible for overseeing operations, setting standards, and ensuring compliance. This means that while governance is highly centralised within each container stream, there is no single entity coordinating across the entire system.

- **Single-use containers**: Managed by one central organisation that handles collection, refunds, processing, and reporting for all single-use beverage containers.
- **Reusable containers:** Managed by a separate central organization responsible for the logistics, washing, and redistribution of refillable containers.

Other factors influencing mixed DRS design

While the organisation of governance/reporting and transportation and logistics explains much of the structural variation observed across mixed DRS, these operational functions do not operate in isolation. A number of additional factors further shape how systems function in practice, and their effects are closely linked to the degree of centralisation within each operational function. These include the types of reusable bottles allowed in the system (standardised versus non-standard formats), whether reusable containers are managed through pooling arrangements or not, and how deposits are structured across single-use and reusable containers (Figure 7). All these variables further define how the system functions in practice and have direct implications for consumer convenience, collection point operations, producer costs and competitiveness, and the overall efficiency of the system.

The sections that follow examine these design variables in more detail and illustrate how different combinations interact with the two core operational functions described above.

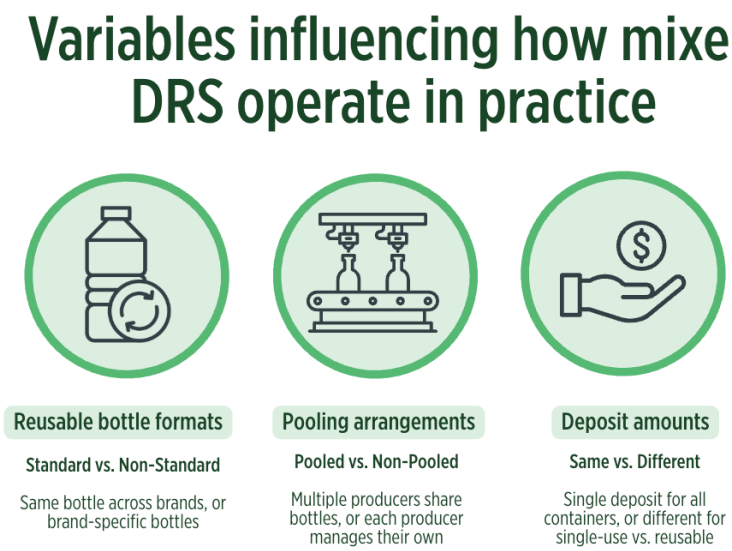

Figure 7 Variables influencing how mixed DRS operate in practice

Reusable bottle formats: Standard vs. non-standard

Reusable bottles may be either standard or non-standard, and this choice has implications for system efficiency, scalability, and how logistics are organised within a mixed DRS.

Standard reusable bottles are uniform in size, shape, colour, and material, and can be used across multiple brands or beverage types within the system (e.g. the same 500ml brown glass used by multiple brewers) (see Figure 8). This uniformity simplifies washing, storage, transport, and handling, reducing operational complexity and costs. Standardisation is a prerequisite for pooling systems (coordinated sharing of packaging), where bottles circulate among participating producers rather than returning to a single brand owner. Because they can be processed together, standard bottles support shared washing infrastructure, economies of scale, and easier system expansion, as new producers can join without modifying equipment or logistics.

Did you know?

Bottle design strongly affects logistical integration. Standard bottles support centralised collection, shared washing infrastructure, and economies of scale. Non-standard (brand-specific) bottles require sorting and producer-specific reverse logistics, increasing decentralisation even within otherwise integrated systems.

Non-standard reusable bottles (also referred to as individually shaped, unique, brand-specific, or iconic bottles) are designed and owned by individual producers or brands, and typically feature distinctive shapes, sizes, or materials that support brand identity and product differentiation (see Figure 9). These bottles can still be fully included in a mixed DRS and returned through the same consumer-facing infrastructure. However, because they must be sorted separately and returned to their originating producer, their downstream logistics differ. Collection may occur through shared return points, but transport, washing, and redistribution are usually managed through producer-specific reverse logistics systems. As a result, these formats tend to be operationally decentralised, even within otherwise centralised systems. Their inclusion in a DRS is

particularly important for large brands, whose high volumes can sustain efficient closed-loop logistics and for whom packaging plays a key role in market differentiation.

Figure 9 Examples of standard reusable glass bottles used in Europe

Figure 8 Examples of non-standard reusable glass bottles

This distinction between bottle formats directly affects how transportation and logistics are organised. Standard bottles are more likely to be physically collected, transported, and processed within central or pooled systems, similar to single-use containers. Non-standard bottles, by contrast, often remain decentralised beyond the point of return.

Because bottle format has such a strong influence on logistics efficiency, some DRS operators allow both standard and non-standard reusable bottles (e.g. Finland, Latvia, Ontario, Quebec, Germany), while others are actively working to limit the proliferation of unique formats. Where too many bottle types circulate, sorting complexity increases, washing lines become less efficient, and transport costs rise, which can undermine the performance advantages of reuse systems. In **Lithuania**, producers wishing to introduce a new reusable bottle design are required to withdraw an existing one, effectively capping the total number of formats in circulation. **Estonia** has taken a more prescriptive approach: non-standard bottles that were already on the market prior to the introduction of the DRS are allowed to remain (effectively grandfathered), but no new non-standard bottle formats may be introduced. Any new reusable bottles must meet strict conditions, including a minimum annual market volume of 2 million units, the absence of brand-specific design features, and a requirement that the producer grant the system operator the right to use and sublicense the bottle design. These measures steer the system toward standardised, poolable formats and help maintain centralised, efficient reuse logistics.

From a system design perspective, bottle format choices also shape who can realistically participate in reuse systems. While standard bottle formats offer simplicity, a mixed DRS that accommodates both standard and non-standard reusable bottles more accurately reflects market realities and enables broader producer participation without materially reducing system efficiency.

Reuse system: Pooled vs. non-pooled

Another important operational choice is whether reusable bottles are shared (pooled) among producers or managed by individual producers.

A pooled reuse system is one in which producers participate in a shared pool of bottles. Bottles can be refilled by any participating producer, regardless of who first placed them on the market. Advantages include:

- Reduces duplication and streamlines handling (shares facilities for washing and redistribution allow all participants to use the same infrastructure, minimising duplication in production, storage, and cleaning while improving operational efficiency)
- Maximises economies of scale
- Supports small producers (who don't need to manage their own logistics)
- Avoids the capital investment needed to purchase a reusable bottle inventory as an individual producer.

The opposite of a pooled reuse system is a fully decentralised reuse system (non-pooled, fragmented, brand-specific), where each producer manages its own reusable bottle stock and logistics, without sharing bottles with others. For smaller producers, this can result in higher per-unit costs (due to lack of economies of scale as well as the front-end capital expenditure) and greater logistical complexity. However, large producers with high sales volumes may be able to manage, wash, and circulate their bottles efficiently within their own facilities.

Pooled Reuse Systems

A pooled reuse system is one in which reusable bottles are shared across multiple producers rather than being owned by a single company. Any participating producer can fill, distribute, and receive returned bottles from the same shared pool.

Key characteristics:

- **Shared ownership**: Bottles are treated as system assets rather than the property of individual producers.
- **Standardised designs**: Bottles often follow common sizes and materials to enable universal handling, washing, and distribution.
- **Central coordination**: A central operator or pool manager tracks rotations, maintains quality standards, and manages incentives for timely returns.
- **Open participation**: Multiple producers, including small brands, can join the pool and use the same infrastructure.

Key benefits:

- **Economies of scale**: Washing, transport, and storage operations are consolidated across multiple producers, which can reduce overall costs per rotation.
- **Simplified logistics for producers**: Producers don't need to maintain their own dedicated bottle stock or return network, lowering capital and operational requirements.
- **Supports small and medium producers**: By sharing infrastructure and bottles, small producers can participate without high upfront investment or complex logistics.
- **Risk and cost sharing**: Pooling spreads the financial risk of lost or damaged bottles across participants, rather than concentrating it on individual brands.

Deposit structure: Same vs. different for single-use and reusables

In jurisdictions operating mixed DRS, deposit levels may either be the same for single-use and reusable containers (as in the Baltic countries) or differ between them. Where deposits are differentiated, reusable containers may carry either a lower or

higher deposit. A higher deposit value typically reflects the greater upfront production cost of reusable packaging and the need to ensure its return for multiple rotations. For example, in Poland, the deposit on reusable bottles is 1 PLN (€0.24), double the 0.5 PLN (€0.12) deposit applied to single-use bottles and cans. This structure is not universal. In Germany, for instance, deposits on reusable bottles typically range between €0.08 and €0.15, much lower than the deposit for single-use containers which is set at €0.25.

Given that the economic viability of refillable systems depends heavily on achieving high return rates, brand owners and system operators should retain the flexibility to adjust - including increase the deposit level on reusable bottles where necessary. Ensuring an adequate financial incentive is critical to protecting return performance, maintaining bottle pools and safeguarding the long-term sustainability of reuse systems.

Each of these design decisions shapes the consumer experience, producer and retailer engagement, and overall efficiency of a mixed DRS. While no single combination is universally superior, understanding these variables helps policymakers and system operators make informed choices that balance convenience, environmental impact, and operational feasibility.

Examples of mixed DRS: High-level overview

As discussed in the previous section, the specific design of mixed deposit return systems (DRS) varies by jurisdiction, reflecting differences in market structure, historical development, legal frameworks, and policy objectives. As a result, key system features can differ across programme, for example, deposit values may be the same for reusable and single-use containers or set at different levels; reporting and clearing may be centralised through a single system operator or managed in a more decentralised way; some DRS may include standard bottles, while others may not; and reusable containers may be managed through pooled reuse systems or producer-specific arrangements. Responsibilities for transportation and logistics can also differ by container type.

Table 2 shows how selected jurisdictions across Europe and North America have implemented mixed DRS across administrative, legal, and operational dimensions. For more detailed information on each system, see the case studies in the Appendix.

Table 2 High-level comparison of mixed DRS by jurisdiction: Administrative, legal, and operational integration of reusable and single-use containers

	Single-use glass included?	Integration of reusables: mandatory (through legislation or other binding agreement) or voluntary)?	Centralised reporting through a single operator for both single-use and reusable containers?	Entity responsible for transport logistics (e.g. pick-up from collection points, redistribution of reusable containers to producers)?	Deposit values for single-use vs. reusable containers: same or different?	Reusable pooling system?	Reusable bottle formats	Reusable market share (2026)
Austria	No	**Voluntary:** deposits on	No (producers of single-use	**Single-use containers:**	**Different**	No	Non-standard only	25%

	Single-use glass included?	Integration of reusables: mandatory (through legislation or other binding agreement) or voluntary)?	Centralised reporting through a single operator for both single-use and reusable containers?	Entity responsible for transport logistics (e.g. pick-up from collection points, redistribution of reusable containers to producers)?	Deposit values for single-use vs. reusable containers: same or different?	Reusable pooling system?	Reusable bottle formats	Reusable market share (2026)
		reusable glass bottles are not mandated by law but are instead governed through industry agreements, coordinated with the Austrian Chamber of Commerce	containers report to Recycling Pfand Österreich; producers of reusable containers report to the government portal)	central system operator (Recycling Pfand Österreich) **Reusable containers (non-standard):** producers	*Single-use containers:* €0.25 *Reusable containers:* €0.20			
Denmark	Yes	**Legislated requirement:** DRS legislation requires reusable containers to be subject to a deposit	Yes (producers of both single-use and reusable containers report to the same system operator Dansk Retursystem)	**Single-use containers:** central system operator (Dansk Retursystem) **Reusable containers (non-standard):** producers	**Different*** *Deposit values for reusable containers broadly mirror those for single-use containers, with slight differences in size thresholds for glass.* Plastic (single-use and reusable): • <1 L: 1.5 DKK (€0.20) • ≥1 L: 3 DKK (€0.40) Aluminium: • <1 L: 1 DKK (€0.13) • ≥1 L: 3 DKK (€0.40) Single-use glass: • <1L: 1 DKK (€0.13) • ≥1: 3 DKK (€0.40) Reusable glass: • <500ml: 1 DKK (€0.13) • >500 ml: 3 DKK (€0.40)	No	Non-standard only	10%

	Single-use glass included?	Integration of reusables: mandatory (through legislation or other binding agreement) or voluntary)?	Centralised reporting through a single operator for both single-use and reusable containers?	Entity responsible for transport logistics (e.g. pick-up from collection points, redistribution of reusable containers to producers)?	Deposit values for single-use vs. reusable containers: same or different?	Reusable pooling system?	Reusable bottle formats	Reusable market share (2026)
Estonia	Yes	**Legislated requirement:** DRS legislation requires reusable containers to be subject to a deposit	Yes (producers of both single-use and reusable containers report to Eesti Pandipakend [EEP])	**Single-use containers:** central system operator (Eesti Pandipakend) **Reusable containers (non-standard):** producers **Reusable containers (standard):** producers	**Same** €0.10	No	Standard and non-standard *(see footnote)*[1]	13%
Finland	Yes	**Voluntary, but with tax-based obligation**: There is no legal requirement for reusable bottles to be included in a DRS, however, producers of beverages in reusable bottles who do not join a DRS (such as that managed by EkoPullo) must pay the beverage	No (producers of single-use containers report to Suomen Palautuspakkaus Oy [Palpa]; producers of reusable containers report to EkoPullo)	**Single-use containers:** central system operator (Palpa) **Reusable containers (non-standard):** producers **Reusable containers (standard):** producers	**Same** *Single-use containers:* • Metal, PET up to 1L, glass: €0.10 • PET >1L: €0.20 *Reusable containers:* €0.10	Yes	Standard and non-standard	2%

[1] Non-standard bottles that were already on the market prior to the introduction of the DRS may continue to be sold. These existing bottle shapes are effectively grandfathered in and may remain in use until the producer voluntarily decides to phase them out. However, no new non-standard bottle formats may be introduced to the market. Any new reusable bottles placed on the market must comply with the following requirements:

- The annual volume placed on the market must be at least 2 million units
- Bottles must not include brand-specific features; so-called "branded" bottles are prohibited.
- The producer introducing a new bottle must grant EPP (system operator) the right to use the bottle, including the right to sublicense it. This allows the DRS to authorise other producers to use the same bottle design)

	Single-use glass included?	Integration of reusables: mandatory (through legislation or other binding agreement) or voluntary)?	Centralised reporting through a single operator for both single-use and reusable containers?	Entity responsible for transport logistics (e.g. pick-up from collection points, redistribution of reusable containers to producers)?	Deposit values for single-use vs. reusable containers: same or different?	Reusable pooling system?	Reusable bottle formats	Reusable market share (2026)
		packaging tax, making DRS for reuse the de facto norm)						
Germany	Yes	**Voluntary, producer-managed**: The DRS for reusable bottles is 100% voluntary and producer-managed	No (there is no central body responsible for gathering audited data from producers, whether that be for single-use or reusable containers)	**Single-use containers:** various system operators (decentralised) **Reusable containers (non-standard):** producers **Reusable containers (standard):** various pooling systems managed by private entities (e.g. GDB)	**Different** *Single-use containers:* €0.25 *Reusable containers:* €0.08 to €0.15	Yes	Standard and non-standard	49%
Latvia	Yes	**Legislated requirement:** DRS legislation requires reusable containers to be subject to a deposit	Yes (producers of both single-use and reusable containers [standard and non-standard] report to the same system operator DIO)	**Single-use containers:** central system operator (DIO) **Reusable containers (non-standard):** producers **Reusable bottles (standard):** system operator (DIO)	**Same** €0.10	Yes	Standard and non-standard	14%

	Single-use glass included?	Integration of reusables: mandatory (through legislation or other binding agreement) or voluntary)?	Centralised reporting through a single operator for both single-use and reusable containers?	Entity responsible for transport logistics (e.g. pick-up from collection points, redistribution of reusable containers to producers)?	Deposit values for single-use vs. reusable containers: same or different?	Reusable pooling system?	Reusable bottle formats	Reusable market share (2026)
Lithuania	Yes	**Legislated requirement:** DRS legislation requires reusable containers to be subject to a deposit	Partial (producers of single-use containers report to USAD; producers of reusable containers report POM to Depozito Sistemos Administratorius [DESA])	**Single-use containers:** central system operator (USAD) **Reusable containers (non-standard):** producers (In some cases, USAD is contracted by individual producers regarding logistics' services for reusable bottles[4])	**Same** €0.10	No	Non-standard only (*see note)*[2]	20%
Sweden	No	**Voluntary, producer-managed**: The DRS for reusable bottles is 100% voluntary and producer-managed	No (producers of single-use containers report to Returpack; producers of reusable containers report to Swedish Environment Agency)	**Single-use containers:** central system operator (Returpack) **Reusable containers (non-standard):** producers	**Different** *Single-use containers:* • Aluminium and small PET bottles: SEK 2 (€0.19) • Large PET bottles: SEK 3 (€0.28) *Reusable containers (330ml and 500ml):* 3 SEK (€0.28)	No	Non-standard only	3%
Poland	No	**Legislated requirement:** DRS	Partial (*note:* Under legislation	**Single-use containers:**	**Different**	No	Non-standard only (individual	13%

[2]Initially, there were 7 breweries participating in the system and there was only one standardised bottle format. Over time, however, the number of non-standard reusable bottle types in circulation increased significantly, from 6 types in 2007 to 30 in 2018 to about 35 today. To prevent uncontrolled proliferation of new non-standard bottle formats, any producer wishing to introduce a new bottle design is now required to remove an existing one.

	Single-use glass included?	Integration of reusables: mandatory (through legislation or other binding agreement) or voluntary)?	Centralised reporting through a single operator for both single-use and reusable containers?	Entity responsible for transport logistics (e.g. pick-up from collection points, redistribution of reusable containers to producers)?	Deposit values for single-use vs. reusable containers: same or different?	Reusable pooling system?	Reusable bottle formats	Reusable market share (2026)
		legislation requires reusable containers to be subject to a deposit* (*Based on the novelisation of the Act of Law from 13 July 2023 which took place in Q4 2025, reusable glass bottles up to 1.5L should have been subject to the new DRS as of 1 January 2026. However, as of the time of writing (Q1 2026), proceedings are ongoing in the Polish Parliament to address a proposed delay in the implementation of the deposit for reusable glass bottles until the end of 2028)	adopted in 2023 introducing a DRS for single-use plastic and aluminium containers, producers are required to fulfil reporting obligations through a licensed system operator. However, Polish law allows for multiple system operators to be licensed in parallel, meaning there is no single, centralised reporting body. As a result, while producers placing both single-use and reusable containers on the market may choose to report to the same system operator, reporting data are not consolidated through a single central entity. This reflects Poland's long-standing tradition of decentralised, producer-managed systems	multiple system operators (decentralised) **Reusable containers (non-standard):** producers	*Single-use containers:* 0.50 PLN (€0.12) *Reusable containers*: 1 PLN (€0.24)		shapes per producer/product line)	

	Single-use glass included?	Integration of reusables: mandatory (through legislation or other binding agreement) or voluntary)?	Centralised reporting through a single operator for both single-use and reusable containers?	Entity responsible for transport logistics (e.g. pick-up from collection points, redistribution of reusable containers to producers)?	Deposit values for single-use vs. reusable containers: same or different?	Reusable pooling system?	Reusable bottle formats	Reusable market share (2026)
			for reusable containers. In addition, legislative proceedings are ongoing to delay the mandatory inclusion of reusable glass bottles in the DRS until the end of 2028; until then, the inclusion of reusable containers remains at the discretion of individual system operators' licences)					
Oregon, US	Yes	**Voluntary, producer-managed**: The DRS for reusable bottles is 100% voluntary and producer-managed	Yes		**Same** USD$0.10	Yes	Standard	Unknown
Ontario, Canada	Yes (*alcohol only*)	**Voluntary, producer-managed**: The DRS for reusable bottles is 100% voluntary and producer-managed	Yes (The Beer Store submits an annual report to the provincial government detailing total sales and returns for all deposit beverage containers, including both single-use and reusable formats. However,	**Single-use containers:** central system operator (The Beer Store) **Reusable containers (standard and non-standard):** The Beer Store collects and sorts both industry-standard and non-standard	**Same** (deposit differs by container size, but not by container type) Single-use and reusable containers less than or equal to 630ml: CAD $0.10 (€0.06) Single-use and reusable containers greater	Yes	Standard and non-standard	12%

	Single-use glass included?	Integration of reusables: mandatory (through legislation or other binding agreement) or voluntary)?	Centralised reporting through a single operator for both single-use and reusable containers?	Entity responsible for transport logistics (e.g. pick-up from collection points, redistribution of reusable containers to producers)?	Deposit values for single-use vs. reusable containers: same or different?	Reusable pooling system?	Reusable bottle formats	Reusable market share (2026)
			brewers and wine and spirits producers themselves are not required to report their sales, since The Beer Store and the LCBO are the primary distributors of alcohol in Ontario).	refillable bottles on behalf of producers. Bottles are returned to breweries either directly via backhaul during deliveries or from The Beer Store's distribution centre for return transport. Additionally, brewers conduct direct backhauls, retrieving empty containers and crates from HORECA during regular product deliveries.	than 630ml: CAD $0.20 (€0.12)			
Quebec, Canada	Yes	**Voluntary, producer-managed**: The DRS for reusable bottles is 100% voluntary and managed by producers	Yes (producers of both single-use and reusable containers report to the Quebec Beverage Container Recovery Association [QBCRA])	**Single-use containers:** central system operator (Quebec Beverage Container Recovery Association [QBCRA]) **Reusable containers (standard and non-standard):** producers	**Same** (deposit differs by container size, but not by container type) *Single-use and reusable containers 100 ml–499 ml:* CAD $0.10 (€0.06) *Single-use and reusable containers* 500 ml–2 L: CAD $0.25 (€0.15)	Yes	Standard and non-standard	6-8%[5]

What are the benefits of a mixed DRS?

Despite differences in design, mixed deposit systems share a defining characteristic: a single, integrated return experience for consumers and, in many cases, consolidated infrastructure for system operators. This integration is what unlocks many of the core benefits of mixed DRS that no stand-alone reuse or recycling system can achieve, benefits that extend across the entire value chain, from consumers and retailers to producers and system operators (see Table 3).

Key benefits include:

- **Increased convenience and simplicity for consumers drives higher collection rates:** Mixed deposit systems simplify the return process by allowing consumers to follow a single, consistent journey regardless of container type (Figure 10). This equal effort ensures reusable containers are not disadvantaged compared with single-use options, supporting broader participation and helping to normalise reuse. When containers do not need to be segregated into different machines or locations, return rates improve for both streams. Research shows that easy, convenient, and clearly identifiable return points are the most important driver of consumer behaviour. Evidence from early mixed systems demonstrates this effect: In Latvia, the collection rate for single-use containers rose from 45% to 83%, while the return rate for reusable bottles increased from 50% to 90% after the mixed DRS was launched.[6]

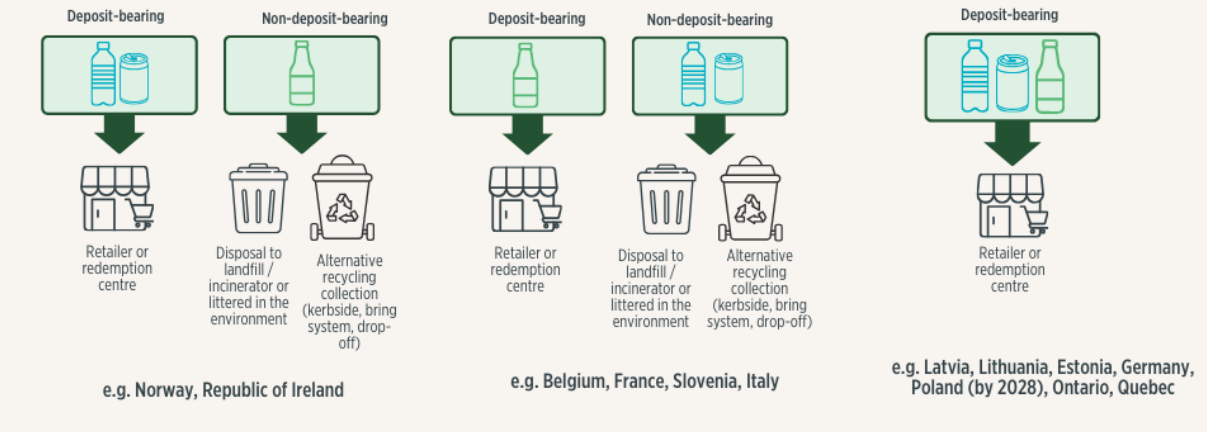

Figure 10 A mixed DRS simplifies the system for consumers, since all containers can be returned to the same collection points

- **Uptake of reusables:** When the return experience is the same regardless of format, purchasing decisions are less likely to be influenced by convenience. Reusables begin to compete on equal footing (the same effort, behaviour, and return journey), making them more attractive to consumers, where feasible. Evidence from multiple countries shows that introducing a deposit for single-use containers can strengthen reuse rather than undermine it. In Lithuania, after years of decline, the market share of reusable bottles began to rise following the launch of the deposit for recycling in 2016.[7] In Germany, the introduction of the DRS for single-use containers in 2003 helped stabilise a long-term decline in reuse and enabled sectors like juice to reintroduce competitive reusable offerings.[8]

- **Cost savings for collection points:** Shared infrastructure across the value chain reduces duplication and lowers system-wide costs, particularly at the collection point. A dual-function RVM, with one front unit (screen, optical barcode reader, IT system) and two backend modules (a compaction module for single-use containers and a soft-drop module for reusables) is far more cost-effective than installing two separate machines, each requiring its own front-end hardware, maintenance schedule, and power supply. Mixed RMVs can reduce acquisition/rental, installation, servicing, and electricity costs, as well as the physical footprint at the collection point.[9] One study found that a mixed RVM with three storage bins (one each for PET, cans, and glass) can lower rental costs by 14–18%[10] compared with operating two separate machines (one for reusables, one for single-use PET and cans). Ongoing operating costs are also lower. Technician travel, often the most expensive part of maintenance, is reduced when only one machine needs servicing. Cleaning and routine upkeep can likewise be consolidated.

What is a soft drop module?
A soft drop module in a reverse vending machine (RVM) is a specialised mechanism for safely collecting refillable glass bottles, preventing breakage by gently lowering them into a separate bin, crucial for deposit systems to maintain bottle integrity for reuse, unlike basic RVMs that might crush or damage glass. Major RVM manufacturers offer these modules as optional add-ons for their RVMs, enabling retailers to handle both single-use (crushable) and reusable glass, optimising space and efficiency in various store sizes.

- **Streamlined logistics and shared downstream infrastructure:** Under a mixed DRS, there is the potential to consolidate key logistics functions, reducing duplication and lowering operating costs. Unifying logistics and sorting/counting operations avoids non-optimal parallel systems that duplicate journeys and resources; for example, rather than multiple independent sorting centres serving the same region, a single coordinated network can localise operations, cutting transport distances and emissions. Latvia illustrates this approach: reusable and single-use containers move through the same reverse-logistics network, using the same collection points and transport routes.[11] A substantial share of reverse-logistics transport (around 50% of total volume) is provided by distributors, which further reduces transport costs. Downstream, Latvia operates a single counting and sorting centre for both streams. This shared infrastructure eliminates the need for parallel facilities, staff, and transport flows, and also helps maintain the cost competitiveness of reusable containers, particularly in smaller markets.
- **Lower carbon footprint:** In rural or lower-density areas, collecting all container types through a single system can reduce transportation needs, improving logistics and potentially decreasing emissions.
- **Retailer-friendly design:** A harmonised system reduces complexity at the point of return, easing the operational burden on retailers who serve as key collection points.
- **Simple market entry:** With capital and operating costs shared across all producers (single-use and reusable), allowing new participants to join easily with a one-time admin fee and producer fees based on container type and size. This offers small producers and bulk importers a cost-effective way to reduce their packaging impact and lower annual EPR fees.

- **Support for HORECA:** Shared infrastructure allows restaurants and bars to plug into collective operations, logistics and routing. Small businesses with limited storage gain efficiency through economies of scale and more frequent pickups.

Spotlight on France: Why a mixed DRS is the best approach

In 2024, Reloop commissioned EY to study *Opportunity and Feasibility Analysis of the Deployment of the Mixed Deposit System in France*, exploring whether France should implement a mixed DRS or a DRS for reusable beverage containers only. The study considered France's AGEC law and the EU's SUPD and PPWR, which aim to reduce packaging impacts, increase recycling, and promote reuse.

The study concluded that a mixed DRS is the most effective option for France because it:

- Increases the likelihood of achieving the regulatory objectives of the AGEC, SUPD, and PPWR
- Accelerates the rollout of refillable beverage containers by 2026
- Is more economically efficient, with estimated savings of €179-198 million per year (€10–12 million per year in system management savings, plus €169–186 million per year from infrastructure and automated collection efficiencies, for a total potential savings of €179–198 million annually if France implements a mixed DRS from the outset rather than starting with a DRS for reusables only and adding a single-use DRS later)
- Is easier for consumers to understand and accept
- Limits any unfair market advantage of single-use packaging over reusable containers

Source: EY. (14 May 2024). *Opportunity and feasibility analysis of the deployment of the Mixed Deposit System in France (reuse and recycling of beverage packaging) – Final report.* https://www.reloopplatform.org/resources/feasibility-analysis-of-mixed-deposit-system/

Table 3 Benefits of a mixed DRS by stakeholder group

Stakeholder	Key Benefits
Consumers	• Single, simple return process for all container types • Equal effort for reusable and single-use options • Reduced confusion and better return convenience
Retailers	• One return system to manage instead of two • Reduced staff burden at manual return points • Less back-of-store sorting complexity • Lower equipment footprint • More predictable logistics and pickups
Producers / Fillers	• Shared infrastructure lowers costs • Easier onboarding into the system, especially for SMEs • Access to efficient pooled logistics • Faster turnaround for reusable formats
System Operators / PROs	• Consolidated logistics improve efficiency and reduce costs • Simplified data management and clearing • Economies of scale across collection, counting, and transport

HORECA (hotels, restaurants, cafés)	• Easier participation through shared pickups and routing • Reduced storage needs compared with operating separate return streams • Less staff training/administration
Municipalities	• Reduced litter and lower cleanup costs in public spaces such as streets, parks, roadsides, and beaches • Reduced pressure on public collection infrastructure, particularly in tourist areas and around restaurants • Lower out-of-home bin collection frequency and costs, as beverages under 1L (largely consumed away-from-home) represent a significant share of public bin volume
Environment / Climate	• Fewer transport kilometres through integrated routing • Reduced duplication of infrastructure • Higher reuse uptake and improved recycling quality • Lower overall emissions and resource use

Conclusion

From their origins in reuse to their widespread adoption for single-use containers, deposit return systems have evolved into one of the most effective tools for recovering beverage packaging and advancing circular economy goals. As regulatory momentum builds, particularly with measures such as the EU's Packaging and Packaging Waste Regulation (PPWR), there is growing recognition that DRS can play a pivotal role not only in high-quality recycling, but also in enabling scalable, economically viable reuse systems.

The emergence of mixed DRS reflects this shift. Although still relatively limited in number, jurisdictions that have integrated single-use and reusable containers within shared return systems provide valuable real-world insight into how such models function. Their experiences demonstrate both the opportunities and complexities inherent in aligning reuse and recycling within a common infrastructure. Mixed systems can deliver significant benefits, from increased convenience and higher return rates to operational efficiencies made possible through shared logistics, equipment, and data flows. At the same time, they highlight that integration is not uniform; mixed DRS vary widely depending on market conditions, governance choices, container formats, and logistical arrangements.

As interest in reuse accelerates, understanding how existing systems work, and the factors that shape their performance, will be essential for policymakers, industry stakeholders, and system operators exploring options for modernising or expanding their deposit systems. This fact sheet provides a high-level overview of those dynamics, offering a clearer picture of how mixed DRS operate today and what can be learned from jurisdictions that have already begun this transition.

Figure 11 Where mixed DRS create synergies

Appendix: Mixed DRS case studies

Europe

Austria

On 1 January 2025, Austria became the 17th European country to launch a national DRS for single-use beverage containers. The system covers PET bottles and aluminium cans ranging from 0.1L to 3L. The system is administered by EWP Recycling Pfand Österreich, which oversees operations, collects returned containers, and resells the material to producers for closed-loop recycling.

Consumers pay a €0.25 deposit, which is refunded upon return of the empty container to any retail outlet selling deposit-eligible beverages. All containers in the system are clearly marked with a deposit logo (see Figure 12), and the infrastructure allows for returns through both RVMs and manual collection points.

Figure 12 Deposit logo used in Austria on single-use containers

System performance has been strong from the outset. Austria's DRS legislation set a collection target of 80% in the first year of operation, rising to 90% by 2027. In 2025, the system achieved an 81.5% collection rate, exceeding the first-year legal requirement.[12] Convenient access to returns has been a key driver of these results. The DRS includes around 16,300 return points nationwide. Austria has one of the highest supermarket densities in Europe and correspondingly a very high density of RVMs: consumers have access to more than 6,400 reverse vending machines, enabling fast and convenient returns. As a result, 98% of containers are returned via automated machines, while only about 2% are returned through manual collection points.

Austria's single-use DRS operates alongside a long-established, industry-led deposit system for refillable containers. Reusable glass bottles have been widely used in Austria since at least the 1960s and 1970s, and refillable PET bottles were also prominent in the market in earlier decades, supported by major beverage producers, including soft drink and bottled water brands. While refillable systems remained strong through the 1980s, their market share began to decline in the 1990s with the rapid expansion of single-use PET containers. By the 2000s, refillable PET had largely exited the market, and refillable glass increasingly shifted toward a premium product segment.

Unlike the single-use DRS, deposits on reusable glass bottles are not mandated by law but are instead governed through industry agreements, coordinated with the Austrian Chamber of Commerce, to ensure alignment across producers and retailers. These arrangements have historically supported high levels of reuse but have not prevented a gradual erosion of refillable market share over time.

To help stabilise and rebuild reuse, Austria has introduced mandatory refillable market share quotas of 25% by 2025 and 30% by 2030, with certain exemptions (e.g. non-alcoholic drinks in containers under 0.5L). As of 2024, refillable bottles held a 27% market share across all beverage categories.

In February 2025, the deposit on reusable glass bottles increased for the first time in more than 40 years. The deposit rose from €0.09 to €0.20 per bottle.[13] According to the Austrian Brewery Association, this change primarily affects 0.5L and 0.33L

beer bottles, as well as certain white glass bottles with screw caps, together representing around 90% of all reusable glass bottles in the market.[14] The Association has noted that the long-standing low deposit value reduced the incentive for consumers to return bottles, leading to higher losses and increasing replacement costs for producers. The higher deposit is expected to improve return rates and reduce the number of reusable bottles incorrectly placed in glass recycling streams. Each reusable glass bottle can typically be refilled up to 40 times, delivering substantial energy and material savings compared with single-use glass.

Retailers are required to clearly label containers as either "ONE WAY" (single-use) or "REUSABLE" and may limit manual returns to the types and quantities of containers they sell. However, most (but not all) RVMs are designed to accept both single-use and refillable containers, enabling a mixed return infrastructure that supports consumer convenience and system efficiency.

Figure 13 Optional logo for refillable bottles in Austria

Denmark

Denmark has a long history with DRS, dating back to the early 20th century. The country's culture of 'flaskepant,' or bottle deposit, began when dairies and breweries first introduced deposits on their glass bottles to ensure they were returned for cleaning and refill. By 1890, Holmegaard Glassworks began producing standardised bottles for beer and carbonated soft drinks (typically 330 ml for beer and 250 ml for soft drinks), which breweries were required to use.[15] This standardisation created a unified bottle pool that allowed any producer to refill bottles collected from the market.

Throughout the 1920s and 1930s, the deposit system expanded as refillable bottles became the dominant beverage packaging format in Denmark. Standardised bottles and crates enabled an efficient, highly effective reuse system, with near-perfect return rates.[16] Reuse was deeply embedded across production, retail, and logistics networks: breweries collected, washed, and refilled bottles, while retailers served as the main return points. Bottles were reused up to 30 times before being recycled, making Denmark an early example of a closed-loop, circular packaging system driven initially by practical resource conservation rather than formal environmental policy.[17]

From the 1970s onwards, environmental policy became an explicit driver of packaging management. The Danish government introduced a ban on single-use beverage packaging for beer and carbonated soft drinks in 1977 under the Environmental Protection Act[18], followed by a ban on aluminium cans in 1982. This made it mandatory for domestic producers to use reusable packaging whilst the policy allowed for single-use packaging (glass and plastic) for imported beer and other drinks on the condition they were covered by a DRS and with a limit of 3,000 hectolitres.[19]

Actors outside Denmark, mostly notably in Germany, argued that establishing a collection system would be administratively difficult and costly, prohibiting foreign producers from entering the market. Similarly, the Association of European Producers of Steel for Packaging argued that the standards were discriminatory and subjectively prioritised one environmental impact factor over another. The 'can ban' was also criticised by retailers, the packaging industry, importers, and even producers themselves who became keen on removing the ban on single-use packaging for domestic production.[20] Furthermore, the growing variety of bottle designs led to a growing complexity in sorting and returning bottles to beverage manufacturers, with retailers calling for a handling fee to be applied to compensate for this.[21] Meanwhile, the European Commission challenged Denmark's aluminium can ban as a potential trade barrier, raising legal concerns under EU packaging directives.[22] These combined pressures highlighted the need to move beyond a purely reuse-based system to one that could include both single-use and reusable containers

In response, the Danish government together with industry stakeholders collaborated to create a national, mandatory DRS. Dansk Retursystem was established in 2000 as a non-profit operator jointly owned by producers, importers, and retailers, under the oversight of the Danish Environmental Protection Agency to operate the system.[23] In 2002, the aluminium can ban was repealed, allowing a free choice of packaging as long as all containers were covered by a DRS. The DRS was formally launched nationwide that year, integrating single-use PET, glass, and aluminium containers with the existing model for reuse.

While single-use containers carry a deposit mark (either printed directly on the bottle or can, or applied as a small sticker) (see Figure 14) reusable bottles do not. The current deposit values by container type are as follows[24]:

- Single-use containers:
    - Glass and aluminium <1L: 1 DKK (approximately €0.13)
    - Plastic <1L: 1.5 DKK (approximately €0.20)
    - Glass, plastic, aluminium 1-20L: 3 DKK (approximately €0.40)
- Reusable containers:
    - Glass <500ml: 1 DKK (approximately €0.13)
    - Glass >500ml: 3 DKK (approximately €0.40)
    - Plastic <1L: 1.5 DKK (approximately €0.20)
    - Plastic >1L: 3 DKK (approximately €0.40)

Reusable transport crates used for beer, soft drinks, and other beverages are not regulated under the Statutory Order. As a result, retailers are free to set the deposit amount for these crates.

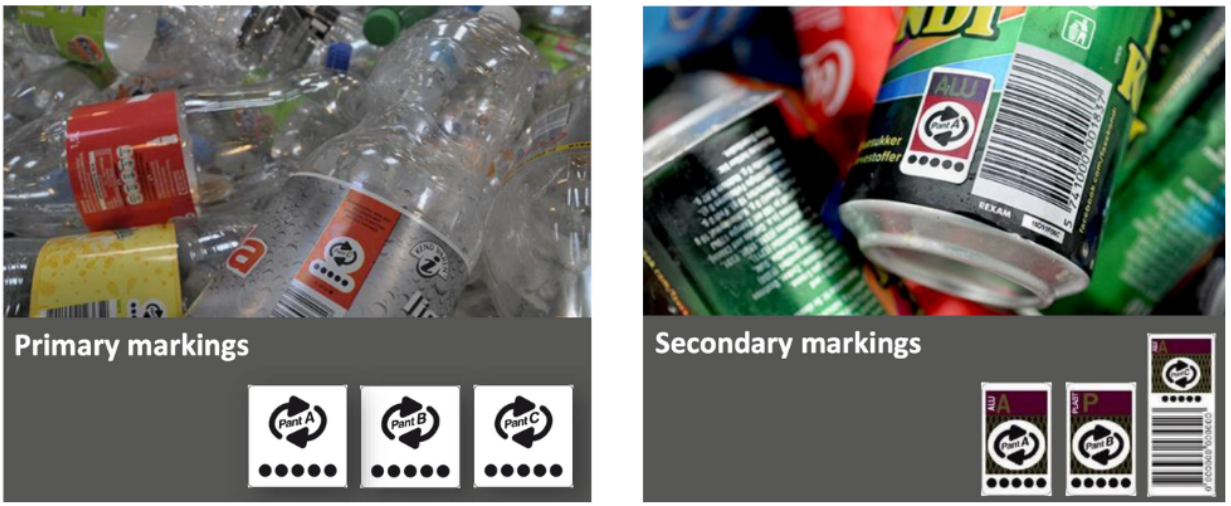

Figure 14 Deposit markings required on single-use containers in Denmark's DRS[25]

As of 2025, nearly 3,000 stores throughout Denmark are equipped with RVMs that accept single-use bottles and cans for recycling.[26] Reusable bottles can be returned to locations that sell the same shape bottle. While Dansk Retursystem manages deposit clearing and handling fees for both container types, the practical operations of collecting and washing reusable bottles remain the responsibility of individual producers (see Figure 15).

Behind the scenes of Denmark's mixed DRS:
Shared (and separate) processes for single-use and reusable containers

Step in the DRS value chain	Single-use containers	Reusable containers
Registration and reporting	Dansk Retursystem	
Handling fees	Dansk Retursystem	
Deposit validation	Dansk Retursystem	
Logistics from retailers	Dansk Retursystem	Producers
Deposit collection and payment	Dansk Retursystem	Producers
Reuse or recycling	Dansk Retursystem (recycling)	Producers (washing for reuse)

Figure 15 Division of responsibilities for single-use and reusable deposit containers in Denmark[27]

With regards to financing, the Danish DRS is funded by fees that producers and importers must pay for each deposit-bearing beverage container they sell, supply, or otherwise transfer on the Danish market. The amount of these fees depends on the material of the container (e.g., glass, plastic), the volume of the container, and whether it is refillable or single-use (with materials that are more difficult to recycle [e.g. PVC bottle] subject to an additional surcharge). With reusable bottles, the fee covers handling compensation paid by Dansk Retursystem to stores for accepting and processing returns. Table 4 compares the fees by container type.

Table 4 Producer (operating) fees in Denmark's DRS (2026) [28]

Container type		Operating fee/unit
Single-use containers	Plastic	5 øre to 145 øre (approximately €0.01-€0.13)
	Aluminium	None
	Steel	0-4 øre (approximately €0.00-€0.01)
	Single-use glass	22 øre to 554 øre (approximately €0.03-€0.78)
Reusable containers	Plastic and glass	7 øre (approximately €0.01)

With return rates of 92% for single-use containers and 100% for reusable glass bottles (2025), Denmark's DRS remains a leading example of how a system can evolve from a reuse-only model to a mixed deposit framework. As of 2026, refillable bottles account for 10% of all beverage containers sold in Denmark.[29]

Table 5 Return rates for beverage containers in Denmark's DRS (2025)[30]

Container type	Return rate
Plastic (PET)	92%
Metal	92%
Single-use glass	92%
Total single-use	**92%**
Reusable glass	**100%**

Estonia

Since 2005, Estonia has had a mandatory DRS covering both single-use and reusable beverage packaging. The DRS is administered by Eesti Pandipakend (EPP), a producer responsibility organisation (PRO) established by beverage producers, importers, and retailers. EPP operates the DRS for single-use containers and performs an administrative role for reusable packaging within the same regulatory framework.

When the system was first introduced, deposit values varied by container size. In 2015, the Minister of Environment, acting on EPP's recommendation, implemented a uniform €0.10 deposit for all beverage containers, regardless of size, material, or whether they are single-use or refillable.[3]

From the consumer perspective, returns are fully integrated: both single-use and reusable containers are returned at retail outlets, where deposits are refunded. Behind the scenes, however, physical and financial flows differ by container type. To support this operational separation, reusable and single-use glass containers are clearly differentiated through distinct markings and labels (see Figure 16). Single-use containers move through the DRS, with EPP responsible for transport, counting, sorting, and directing materials to recycling. Refillable bottles, on the other hand, circulate directly between producers and retailers under contractual agreements. EPP's role in relation to reusable packaging is limited to system coordination and data management, including maintaining the national packaging register and updating RVM databases to ensure reusable containers are recognised at the point of return. For this service, producers pay EPP a nominal administrative

[3]For single-use and reusable packaging for which a deposit amount has not been established by the Minister of the Environment, the producer may independently establish the amount of the deposit if the producer has a DRS in place, based on which the quantities of packaging placed on the market and taken back can be monitored.

fee of €0.0001 per reusable bottle. Producers retain full responsibility for the logistics of reusable packaging, including collection, washing[4], refilling, and redistribution, and pay retail handling fees directly to stores.

While historically, a wide range of bottle shapes existed in the market (17 different bottle types used by five to six producers[31]), today the number of producers using refillable glass has declined and the range of bottle types has narrowed (only two producers and seven bottle types remain in circulation).[32] New reusable bottles introduced to the Estonian market are subject to strict eligibility criteria designed to limit fragmentation and support efficient system operation.[33] Producers may continue to use historically existing reusable bottle designs that pre-date the current framework, but any new reusable bottle format must meet three core requirements. First, the bottle must reach a minimum annual market volume of at least 2 million units, ensuring that only high-volume formats are introduced and that reuse systems benefit from economies of scale. Second, non-standard bottle designs are prohibited for new formats; bottles must be generic in shape and appearance, preventing proprietary designs that would require separate handling or return loops. Third, producers introducing a new reusable bottle must grant EPP the right to use the bottle design, including the right to sublicense it to other producers. This provision effectively enables bottle pooling by allowing multiple producers to use the same bottle format over time, even if it was initially introduced by a single company.

With respect to handling fees, fees differ between single-use and reusable containers. For reusable packaging, producers pay handling fees directly to retail outlets, rather than through the DRS operator. In 2025, the retail handling fee for reusable bottles was set at €0.057 per unit. By contrast, handling fees for single-use containers are paid to retailers through the system operator. Fees are lower for manual collection, with €0.0157 per unit for glass and €0.0140 per unit for plastic and metal. Automated collection via RVMs commands higher fees: €0.0502 per unit for glass, €0.0386 for plastic, and €0.0337 for metal.

The system has achieved consistently high performance. Return rates for single-use containers in 2024 were 89% for PET, 85% for metal, and 91% for single-use glass, with an overall single-use return rate of 90%. For refillable glass bottles, the estimated return rate is nearly 100%, with each bottle completing about 20 refill cycles before recycling.

Table 6 Return Rates for Beverage Containers in Estonia's Deposit Return System (2024)[34]

	Return rate
Plastic (PET)	89%
Metal	85%
Single-use glass	91%
Total single-use	**90%**
Reusable glass	**~100% (estimated)**

[4]There is no centralised washing facility, and each producer retrieves, washes, and refills their own bottles.

Figure 16 Mandatory container label for single-use glass packaging (left) and reusable glass packaging (right)

Finland

A DRS for glass refillable bottles has existed in Finland since 1952, when Coca-Cola introduced a local return system for its refillable glass bottles during the Helsinki Summer Olympics.[35] As single-use packaging began to emerge in later decades, waste volumes increased rapidly, prompting government intervention. In 1983, Finland introduced legislation establishing a beverage packaging tax (€0.51/L) on soft and alcoholic drink containers; this tax was explicitly designed to encourage the use of deposit systems as packaging included within an approved DRS was exempt from the tax, a system that remains in place today.[36]

At the time, the deposit system for alcoholic beverages was operated by Alko Oy, the state-owned alcohol monopoly, which also dictated packaging requirements. However, Finland's accession to the EU in 1995 brought an end to Alko's regulatory authority, creating space for alternative packaging formats and a broader, industry-led approach to deposit systems.[37] In response, the private sector mobilised quickly, united by a shared interest in avoiding packaging taxes while maintaining efficient recovery systems.

In 1996, three retailers (Alko Oy, Inex Partners Oy, and Kesko Oyj) and three breweries (Hartwall Ab, Olvi Oyj, and Sinebrychoff Supply Company Oy) collaborated to establishe Suomen Palautuspakkaus Oy (Palpa) as a non-profit operator to manage a DRS for aluminium cans.[38] Over time, this system was expanded to include PET bottles (2008) and single-use glass bottles (2012), creating a comprehensive single-use DRS covering cans, plastic, and glass.

In parallel, the same breweries and retailers operate Ekopulloyhdistys ry (Ekopullo), a non-profit association established in 2004 (and approved as the official return system by the Pirkanmaa Centre for Economic Development, Transport, and the Environment) to manage reusable beverage packaging (primarily covering drinks such as beer, mineral water, and milk).[39] Ekopullo administers a shared (pooled) reuse system for standard brown glass bottles, along with associated transport packaging such as crates, trays, pallets, and dollies.

While the refillable and single-use systems are managed by separate organisations, they are closely integrated operationally. Ekopullo acquires human resources and services from Palpa and operates within Palpa's premises. Ekopullo's transport units are also primarily used to deliver packaging associated with Palpa's single-use DRS, creating shared logistics, infrastructure efficiencies, and reduced transport emissions. From a consumers' point of view, the system is simple as all containers (single-use and reusable) can be returned to the same retail outlets, where RVMs sort the containers on-site and issue a refund to the

consumer. Palpa contracts companies to pickup the sorted bottles and cans and transport them to a centralised processing facility. After processing, the materials are sent to either recyclers or packed in crates and transported directly back to breweries (see Figure 17[40]) where they are washed and refilled approximately 33 times before being recycled as glass material.[41]

With regards to deposits, deposit values are set by government decree and vary by material and size. The deposit on reusable and single-use glass bottles is the same (€0.10). A €0.10 deposit also applies to cans and small PET bottles (up to 1L), whereas larger PET bottles (over 1L) carry a €0.20 deposit.

Figure 17 Reusable standard bottles in crate, Finland

Together, Finland's deposit systems consistently achieve some of the highest return rates in Europe. In 2025, 94% of all single-use deposit containers were collected for recycling, including 95% of aluminium cans, 93% of PET bottles, and 90% of single-use glass.[42] Refillable bottles also perform strongly, with consumers returning approximately 97% of refillable glass bottles placed on the market. Despite this strong performance, reusable bottles accounted for only around 2% of Finland's total beverage market in 2025.

Latvia

In 2019, in response to the EU Single-Use Plastic Directive, the Latvian parliament passed an amendment to the Packaging Law to introduce a mandatory, nationwide DRS for all beverage containers. The DRS launched on 1 February 2022 and covers plastic bottles, aluminium cans, and both single-use and reusable glass bottles 100ml to 3L. Since its launch, the collection rate for PET containers has increased from 45%[43] to 82% in less than 3 years. The system has also had a positive impact on reuse, with the collection rate for refillable bottles increasing from 50% before implementation to 90% within two years. [44]

Table 7 Return Rates for Beverage Containers in Latvia's Deposit Return System (2024)[45]

Container type	Material	Return rate
Single-use	Plastic	86%
	Metal	76%
	Glass	81%
	Total	82%
Reusable	Standard glass bottle	90%
	Non-standard glass bottle	88%
Total		83%

Under Latvia's DRS, all containers, regardless of whether they are single-use or refillable, are subject to a €0.10 refundable deposit. Deposit containers must display a mandatory mark, with distinct labels for single-use and reusable packaging, as shown in Figure 18.

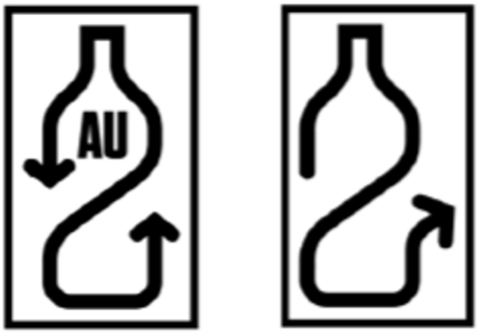

Figure 18 Container Markings Required in Latvia's DRS (logo for reusable containers on the left; logo for single-use containers on the right)[1]

The entire system is managed by a single non-profit entity, SIA Depozīta Iepakojuma Operators (DIO), a private company bringing together local and Baltic beverage manufacturers and retailers, along with AS PET Baltija, the Baltics' largest PET recycler. From the consumer perspective, the system is fully integrated: retailers are required to accept both single-use and reusable bottles, and all containers are returned through the same infrastructure, including shared RVMs, which are equipped with soft-drop modules for reusable glass. Even the counting centre is shared; it handles sorting and preparation of single-use containers for recycling, as well as the inventory and storage of refillable glass bottles.[46]

When it comes to reusable glass bottles, producers have a choice between standard bottles and non-standard bottles. As of 2024, reusable glass represented approximately 15% of all deposit containers placed on the market, with industry-standard bottles accounting for around 12% and individual design bottles for 3%.[47]

Figure 19 Reusable and single-use containers at a shared DIO counting centre in Latvia

Producers using standard bottles benefit from full integration into DIO's centralised logistics and accounting system. More than 28 producers[48] currently use industry-standard bottle formats. After return, bottles are placed in durable plastic crates (the same crates used to transport full bottles) and moved through the shared reverse-logistics network to the central counting centre (see Figure 19). There, bottles are inventoried, stored, and counted to verify producer reporting before being redistributed to breweries based on market share and return rates. Breweries then wash and refill the bottles in-house. Producers without washing facilities are required to sell returned bottles to breweries that do have washing capacity, ensuring access to refillable packaging for smaller producers.[49] This approach has helped reduce the number of refillable glass bottle shapes on the market from roughly 30 to 14, improving system efficiency and compatibility.

Producers that opt for non-standard reusable bottles (created for specific brands) operate under a more decentralised model. These producers enter into agreements with both DIO and collection points, while DIO ensures that their bottles are compatible with the system, including recognition by RVMs. Although these bottles are returned through the same RVMs (and benefit from the same identification technology), the logistics diverge once collection occurs. Producers are responsible for transporting bottles from collection points to their own washing and refilling facilities, bypassing DIO's central counting centre. Nonetheless, these producers must meet the same reporting obligations as users of standardised bottles, submitting monthly data on reuse volumes, with DIO responsible for verifying accuracy through bottle counts conducted at the collection stage.

Figure 20 Refillable bottles at the counting centre in Latvia

The system as a whole is supported by multiple revenue streams that cover each system costs separately, avoiding cross-subsidisation between container types. For single-use containers, revenues are broadly balanced across industry fees (approximately 30%), material sales (30%), and unredeemed deposits (40%). [50] In contrast, standardised reusable glass bottles are financed primarily through producer fees (around 89%), with the remaining 11% coming from unredeemed deposits, [51] reflecting the high return rates achieved for refillable packaging.[52]

When it comes to producer fees, the fees vary by container type (Table 5). For single-use containers, fees are differentiated by material and, in some cases, offset by material value. For reusable glass bottles, fees are structured to reflect two distinct models:

- **Standard reusable bottles** carry a higher producer fee, as this includes full system services provided by DIO, including automated collection, sorting at retail, centralised logistics, counting, and redistribution.
- **Non-standard reusable bottles** have a lower producer fee, as producers retain responsibility for transport, washing, and refilling, with DIO covering only automated collection and shared administrative costs.

Table 5 Producer fees charged in Latvia's DRS (effective 1 January 2026)[53]

Container type		Producer fee
Single-use containers	Clear PET plastic	€0.0199
	Coloured PET plastic	€0.0271
	Aluminium	-€0.0095
	Steel	€0
	Single-use glass	€0.0491
Reusable containers	Standard glass bottle	€0.0722 (full service to producers included - collection in RVMs, sorting at retail, logistics)
	Non-standard glass bottle	€0.0138 (only collection in RVMs and share of administration costs included)

Like producer fees, handling fees paid to retailers also vary by container type and are slightly higher for reusable bottles, particularly when bottles are returned via automated collection (Table 6).

Table 6 Retail handling fees for single-use and reusable containers in Latvia's DRS (effective 1 January 2026)[54]

	Plastic (PET)	Metal	Single-use glass	Reusable glass
Automated collection (RVM)	€0.0159 to €0.0383	€0.0130 to €0.0366	€0.0364 to €0.0724	€0.0404 to €0.0759
Manual collection	€0.0263	€0.0253	€0.0466	€0.0494

It's worth noting that before the introduction of its national DRS, Latvia had a long tradition of reusable glass bottle circulation dating back to the post-Soviet period (after 1991). However, this was not a formal deposit system. Instead, a decentralised network of small businesses and some retailers bought back used reusable glass bottles from consumers for a small amount (typically 3-5 cents per bottle, depending on the season) and resold them to breweries. The largest breweries, equipped with bottle washing lines, purchased these used bottles directly or through intermediaries. At its peak, there were an estimated 200 such buy-back points across the country, though no official figures exist. On average, around 50% of refillable bottles were returned through this informal system. The main reason reusables maintained a relatively high market share in Latvia was economic: for breweries, reusable glass packaging was considerably more cost-effective than single-use glass. As of 2025, the market share for refillables was 15%.[55]

Lithuania

Lithuania has a long history with refillable beverage packaging. For many years, the country had a voluntary buy-back system for refillable glass beer bottles, with nearly all retailers participating and all collections conducted manually.[56] At the time, brewers largely relied on standardised reusable bottles, and there were only five types of reusable glass bottles in circulation.

A mandatory DRS for reusable beverage containers was passed into law in 2004, covering beer and other alcoholic beverages, soft drinks, mineral water, and juice. Administered by Depozito Sistemos Administratorius (DESA), a non-profit founded by five breweries, the system became operational in 2006 and achieved strong return rates of 85-90%.[57,58] Initially, there were 7 breweries participating in the system and there was only one standardised bottle format. Over time, however, marketing considerations increased the number of distinct reusable bottle types: by 2007, there were 6 types of reusable bottles, by 2018 there were 30[59], and today 35 different formats are in circulation.[60] To prevent uncontrolled proliferation of new formats, any producer wishing to introduce a new bottle design is now required to remove an existing one.[61] Until 2016, collection of reusable glass bottles was 100% manual.

Ten years after the reusable DRS was introduced, on 1 February 2016, Lithuania launched a mandatory DRS for single-use beverage containers and appointed Užstato Sistemos Administratorius (USAD) as the system operator. From the outset, USAD and DESA collaborated to integrate the collection of reusable and single-use containers through a unified return network, both at manual return points and automated reverse vending machines (RVMs). Despite having separate regulatory and administrative frameworks, the two systems are fully integrated from the consumer perspective: both single-use and reusable containers carry a fixed deposit of €0.10 and can be returned at the same collection locations. Individuals do not need to sort or distinguish between container types, and most are unaware that two separate DRSs are in place. The only visible distinction is the container marking, which varies by container type (see Figure 21).

Figure 21 Container markings on single-use containers (left) and reusable containers (right) in Lithuania's DRS

Figure 22 Mandatory deposit markings on single-use (left) and refillable (right) containers

Behind the scenes, after acceptance at the retailers, the two streams diverge. While single-use containers (both compacted and non-compacted) are sorted into special bags provided by USAD and transported for counting (if collected manually) and processing (with transport being provided by USAD), reusable containers are placed into dedicated crates and returned to producers for washing and refilling, with transportation arranged by the producers. In some cases, USAD is contracted by producers to manage the reverse logistics and sorting on their behalf.[62] USAD then separates them and ships them back to the beverage companies so that they can be reused.

Handling fees for beverage containers differ depending on whether the container is single-use or reusable, as well as by material and collection method. For single-use bottles and cans, retailers are reimbursed by USAD based on counted returns. The fees vary depending on the container material (PET, metal, glass) and the method of return (manual collection vs. RVMs, with or without compaction). For reusable glass bottles, producers are responsible for paying handling fees directly to retailers. DESA negotiates these fees on behalf of all producers of reusable glass bottles, ensuring consistently across the system. It's worth noting that these fees do not include the cost of purchasing or renting RVMs. Producers of reusable containers pay a separate RVM usage fee of €0.0147 per container (as of 1 January 2026), calculated by USAD. The table below summarises the handling fees for single-use and reusable beverage packaging, broken down by material and collection method.

Table 7 Retail handling fees for single-use and reusable containers in Lithuania's DRS (effective 1 January 2026)[63,64]

	Plastic (PET)	Metal	Single-use glass	Reusable glass
RVM with compaction/crushing	€0.0323	€0.0227	€0.0524	€0.0830
Manual or non-compacting/crushing RVM	€0.0294	€0.0243	€0.0325	€0.0428

The seamless user experience provided by Lithuania's mixed DRS has helped drive strong return rates: prior to the introduction of deposit on single-use containers, the collection rate for PET was just 35%; by the end of the first year, this rose to 74%.[65] As of 2024, PET bottle collection rates reached 89%, with an overall single-use container collection rate of 92%. Although their overall market share is estimated at only 20%[66] in 2026, reusable containers continue to be returned at high rates (92%) (see Table 8).

Table 8 Return rates for beverage containers in Lithuania's DRS (2024)[67,68]

	Return rate
Plastic (PET)	89%
Aluminium	91%
Steel	98%
Single-use glass	86%
Total single-use	**90%**
Total reusable	**92%**

Germany

Germany is widely recognised as a global leader in beverage container reuse and recycling, with one of the world's highest return rates for single-use packaging.[5] The country also maintains the largest market share for reusable bottles: in 2025, roughly 50% of beverages sold were in reusable containers.[69] Figure 23 shows sales of reusable (glass and plastic) versus single-use beverage containers in billions of units from 1999 to 2024. While the share of reusables has declined over time, Germany remains the global leader in reusable bottle market share, with half of all beverage sales still packaged in refillable containers in 2025.

[5]Although DPG reports an overall return rate of 98%, Germany's decentralised DRS does not provide the transparency needed to verify how this figure is calculated. In October 2023, DPG confirmed to the Container Recycling Institute that return rates are not calculated in Germany because the necessary underlying data on beverage container sales and returns are not collected. A true return rate would require a central body to gather audited sales and return data from all operators.

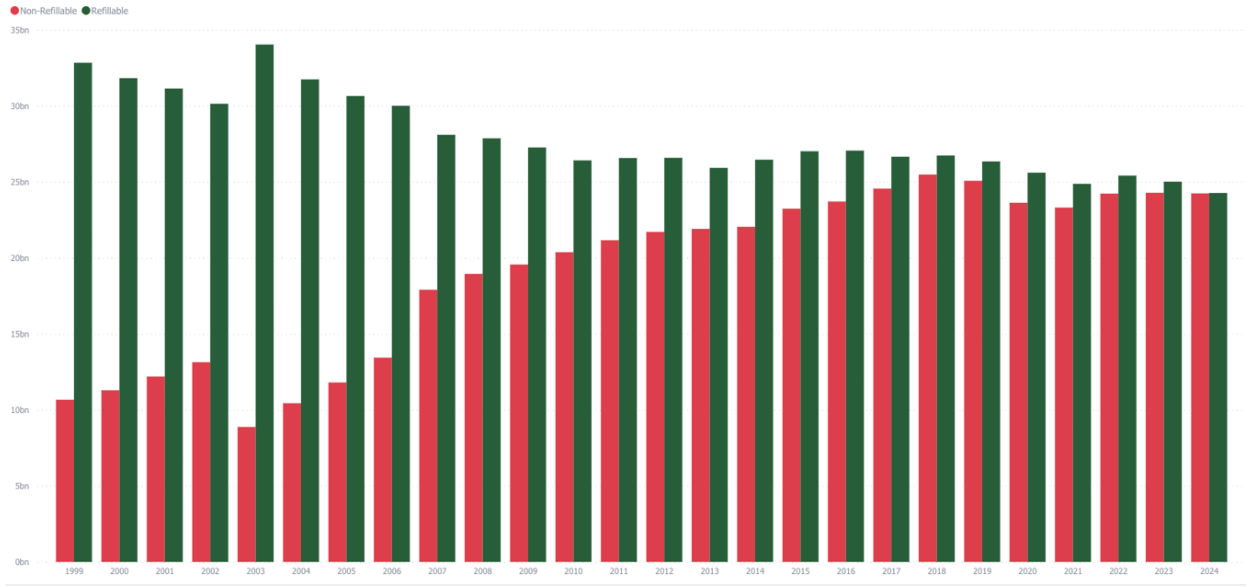

Figure 23 Unit sales (billions) of single-use (red bars) vs. reusable (green bars) beverage containers in Germany, 1999 to 2024

Germany's system for reusable beverage packaging traces its roots back to the 1920s, when the first deposit systems for reusable containers were introduced. The system became more structured in 1969 with the launch of a standardised glass reuse scheme for clear mineral water bottles, followed by the introduction of the green glass bottle in the 1970s for sparkling water. PET refillables entered the market in the 1990s (first for non-alcoholic beverages and later for water), and in 2019, a new line of standardised reusable glass and PET bottles for water and soft drinks was introduced to make bottles lighter and easier to handle. While older models continue to circulate, the 2019 update has helped to slightly increase the market share of reusable bottles, especially as consumers increasingly favour glass over plastic.

The reusable DRS is decentralised, with distributors and producers operating without statutory obligations. Instead, it is coordinated through industry associations. The German Beverage Association (GDB) manages deposits for water and soft drinks, while the German Fruit Juice Federation oversees the deposit system for fruit juices. Although the system has existed for decades, it remains somewhat opaque, with private contracts governing many logistical and financial arrangements.

For water and soft drinks, GDB administers deposits for both glass and PET bottles. The deposit is set at €0.15 per bottle, covering ten standardised formats ranging from 0.5L to 1L for glass and 0.5L to 1.5L for PET. Bottles are typically sold in crates of either 8 or 12 glass bottles, or 6 or 12 PET bottles (see Figure 24).[70] These standardised formats represent about 72% of the reusable mineral water market and 41% of the total bottled water market, with the remainder made up of proprietary bottles from individual producers.[71]

Figure 24 Single-use containers sold alongside reusable containers on store shelves in Germany

For fruit juices, the deposit system is managed by the German Fruit Juice Federation, which defines the rules for deposits (i.e. how many bottles must be replaced each year, and how crates should be). A €1.50 deposit applies per crate, complemented by bottle-specific deposits: €0.15 for 1 L bottles, €0.08 for 0.7L bottles, and €0.08 for 0.2L bottles, the latter mainly used in hotels, restaurants, and cafés. Two crate formats (six bottles each) and three standardized bottle sizes (1L, 0.7L, and 0.2L) are used, and the containers are marked by a distinctive green colour code for identification. On average, glass bottles can be reused around 50 times, while PET bottles are reused about 20 times before being recycled.

Figure 25 Range of GDB refillable pool bottles[1]

Germany's modern reuse and recycling framework was significantly shaped by the 1991 Packaging Act (VerpackV), which introduced a deposit for recycling aimed at protecting the well-established and financially stable reuse market. The law stipulated that if the market share of reuse fell below 72%, a mandatory deposit would apply to single-use beverage packaging within the same product categories. When reuse rates dropped below this threshold, the mandatory single-use DRS was introduced in 2003, followed by the creation of Deutsche Pfandsystem GmbH (DPG) in 2005 to manage it.[72] Under the Packaging Ordinance, the single-use DRS applies a flat €0.25 deposit for PET, glass, and metal beverage containers between 0.1L and 3L.

While there is no mandatory labelling scheme for refillables, containers are typically marked with the word *Mehrweg* or feature symbols such as the Blue Angel logo (see Figure 26).[xlvi]

Figure 26 Labels Used to Identify Refillable Containers in Germany's DRS

Germany's refillable system includes more than 800 unique bottle shapes and over 3,000 crate designs. In practice, most retailers accept only the refillable containers of brands they stock, though some opt to accept a broader range as a customer service. Beverage deliveries, and container returns, are primarily handled through a well-established network of wholesalers. These wholesalers deliver full crates to retailers and simultaneously collect empty ones, reimbursing retailers for returned deposits. After sorting empty bottles by brand and size, the wholesalers send them back to the appropriate beverage producers, where containers are washed, inspected, refilled, or recycled if damaged. Bottles and crates under the GDB system are embossed with the GDB logo for traceability, even though logo use is not legally required. Fruit juice producers wash and refill bottles at their own facilities and can join a "Closed Pool System," which allows access to standardised bottles and crates in exchange for a per-unit contribution.[73]

Although administratively distinct from the industry-led reusable DRS, Germany's national DRS for single-use containers relies heavily on the same return infrastructure that supports reusables. Retailers that sell both reusable and single-use beverages typically accept returns of both types (either manually or via reverse vending machines [RVMs]) (note: retailers are obligated to take back single-use containers of the same material they sell, although smaller shops (under 200m^2) are only required to accept the brands they carry). RVMs are programmed to distinguish between the two types of packaging: single-use containers are crushed immediately, while reusable containers are set aside intact. Reusables are sent back to the appropriate wholesalers, while single-use containers are shipped to central warehouses for processing. For fruit juices in reusable bottles, transport from the collection point is managed by the producers or the reverse logistics company.[74] For water and soft drinks,

service providers (wholesalers) are involved in supermarket logistics by delivering full bottles (from producers) and collecting empty bottles in crates; transporting them to their warehouses where most of the sorting operations are carried out, the logistics company receives €1 per crate of bottles; at the warehouse, the crates are sorted by sector and then delivered to the various producers.[75] Large distributors have their own sorting centres.

Due to the decentralised nature of Germany's DRS for single-use containers, comprehensive performance data is unavailable and there is no transparency on how the return rate is calculated. However, based on data from the German Federal Environmental Agency, the overall return rate is estimated to be between 98% and 99%.[76] The return rate for refillable packaging is also high at 99.4% (2020).[77]

Poland

Poland launched its national DRS for single-use beverage containers on 1 October 2025. At launch, the system covered single-use plastic PET bottles up to 3L and metal cans up to 1L.

Under amendments to the Act of Law of 13 July 2023, adopted in Q4 2025, the scope of the DRS was expanded to include reusable glass beverage containers up to 1.5 litres. These reusable containers were scheduled to become subject to the deposit system as of 1 January 2026. However, as of the time of writing of this fact sheet (Q1 2026), legislative proceedings are ongoing in the Polish Parliament to delay the mandatory inclusion of reusable glass bottles until the end of 2028. Until these proceedings are concluded, the integration of reusable glass into the national DRS remains pending.

Once implemented, the inclusion of reusable glass bottles would place Poland among a small but growing group of jurisdictions integrating reuse within deposit return systems that already cover single-use containers. Single-use glass bottles, beverage cartons, and containers used for dairy products are currently excluded from the system.

The legislated deposit value is set at 0.50 PLN (€0.12) for single-use containers and 1 PLN (€0.24) for reusable glass bottles. The DRS operates under a decentralised model, allowing multiple system operators to function within the country. Poland's DRS operates under a decentralised model, allowing multiple licensed system operators to operate in parallel. These operators are responsible for organising selective collection to meet statutory targets, collecting containers from retail and other designated return points, managing transport to producers and processing facilities, and settling deposits with retailers and other collection points.

Container returns follow a return-to-retail (R2R) model. Retailers with a sales area exceeding 200m^2 are required to accept all deposit-marked containers and refund the deposit. Smaller retailers are required to charge the deposit but may opt out of accepting plastic bottles and metal cans; however, they remain obliged to accept reusable glass bottles that they sell (once the obligation for reusable glass is implemented, subject to the outcome of the ongoing legislative process).

Sweden

Sweden has one of the longest histories with DRS in the world. Its DRS for reusable glass bottles was introduced in 1886, a full century before the launch of the country's single-use DRS. The system emerged from a practical need: glass bottles were hand-blown and therefore expensive, so brewers needed a reliable way to recover them.[78] Reverse logistics became the

solution; customers paid a deposit when purchasing beverages and received it back upon returning the bottles. Brewers inspected, washed, and refilled the bottles for resale.

This early reuse system required cooperation within the brewing industry and led to the creation in 1885 of Sveriges Bryggerier (the Swedish Brewers' Association; today, its members represent approximately 88% of all beer, cider, water, and soft drinks producers in the country).[79] To make reuse possible at scale, the Association created the world's first standardised refillable bottle, the 330 ml "Stockholm bottle."[80] Over time, standard reusable bottles expanded to cover virtually all beverage types in Sweden, including beer, soft drinks, and carbonated water. A 500ml refillable bottle was added in 1994.[81]

The transition to single-use packaging and away from reusables began in 1955 with the introduction of steel cans to the Swedish market. When the production of cans shifted material from steel to aluminium in 1981, the government formed an agreement with a multi-national beverage producer which required the producer to introduce a DRS as a condition of scaling up can production. This led to the introduction of a deposit system for aluminium cans in 1984. The scope was later expanded to include single-use PET bottles in 1994.

Today, Sweden's voluntary reusable glass bottle system continues to operate alongside the national DRS for single-use containers operated by Returpack. From the consumer perspective, the system is seamless: the same return points and RVMs are used for single-use and reusable containers. But behind the scenes, the systems diverge, and reusable bottles are separated from single-use plastic and cans. Whereas the logistics of the single-use DRS are managed by Returpack, the logistics of reusable glass bottles are handled by individual beverage producers. The smaller 330ml bottles are returned to producers in blue crates (20 per crate) and 500ml bottles in red crates (15 per crate). Because bottles are standardised, producers redistribute crates among themselves when too many accumulate at a single location. Brewers handle the washing of bottles at their own facilities; Sweden does not operate a centralised cleaning plant.

Deposit values also differ by container type. As of September 2025, deposit values for single-use containers are SEK 2 (approximately €0.19) for aluminium cans and small PET bottles, and SEK 3 (approximately €0.28) for large PET bottles. These rates are set by Returpack. In contrast, the deposit values for reusables are set by beverage producers and retailers. As of 1 June 2025, the deposit on both 330ml and 500ml reusable bottles is 3 SEK (€0.28) from 1 June 2025.[82] Deposits also apply to the reusable crates used to transport the bottles: 22.40 SEK (approximately €2.90) for red crates and 28 SEK (approximately €2.61) for blue crates.[83]

Handling fees for retailers apply to both reusable and single-use returns. For single-use containers, these are set by Returpack and are published on its website, whereas for reusable bottles they are negotiated and confidential.

One of the reasons for Sweden's relatively smooth transition to a single-use DRS was the early timing of its implementation, before single-use packaging had become dominant. This allowed for cost savings by leveraging the return infrastructure that was already in place for reusable containers (see Figure 27).[xlv] Moreover, consumer habits around returning empty containers, regardless of whether they were reusable or disposable, remained intact, supporting a high level of participation as the system evolved.

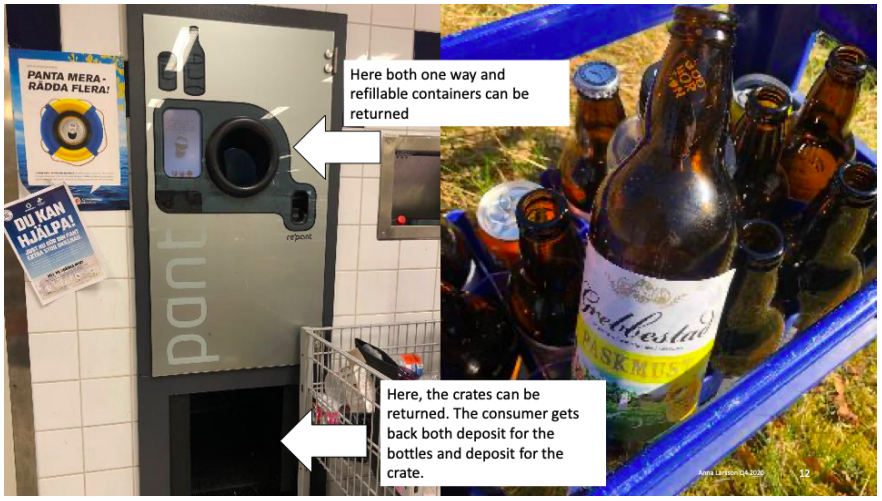

Figure 27 Consumer-facing Return Point for Both Refillable and Single-Use Containers in Sweden

According to the Swedish Brewers Association, reusable bottles account for only 2% of Sweden's beverage container market, a significant decline from earlier decades.[84] With that said, return rates remain high: 330 ml bottles achieve a 98% return rate and are reused an average of 40[85] times, while 500 ml bottles reach a 90% return rate and are reused around 8 times before being crushed and used to make new bottles. The difference is because the small bottle is more common in restaurants, which purchase and return full crates. The large bottle, on the other hand, is more common among consumers who tend to buy single bottles. These bottles are often mistakenly sent for recycling rather than returned to a store for reuse.[86] Return rates for single-use cans and plastic bottles are also high at 89% and 88% (2025), respectively.

Table 9 Return rates for beverage containers in Sweden's DRS (2025) [87,88]

	Return rate
Plastic (PET)	88%
Metal	89%
Single-use glass	Not included in DRS
Total single-use	88%
Reusable glass	98% for 330ml bottles 90% for 500ml bottles

Figure 28 Deposit symbol on reusable bottles

North America

Oregon, US

In 1971, the Oregon Legislature passed the United States' first DRS to prevent litter caused by single-use beverage containers, which was becoming a growing litter problem along Oregon beaches, highways, and other public areas. Over its 40-year history, this landmark legislation has undergone several significant updates and changes, including several scope expansions, and most recently, an increase to the deposit value in 2017. Under the current law, consumers pay a USD$0.10 deposit on eligible beverage containers, which is refunded in full when they return the empty cans and bottles to stores and designated redemption centres. The system is run by beverage distributors through a not-for-profit distributor cooperative, the Oregon Beverage Recycling Cooperative (OBRC). Unless a distributor is part of the cooperative, it is each individual distributor's responsibility to manage the flow of deposits and refunds, collect the empties that are returned for recycling, and ensure that they are sorted, processed and recycled.[89]

In 2018, the Oregon Beverage Recycling Cooperative (OBRC) decided to launch the nation's first statewide refillable programme (the 'BottleDrop' program), alongside the existing system for single-use containers. Together with Owens-Illinois (O-I), a major glass bottle manufacturer, the OBRC created two custom bottles (12-ounce and 500ml) for breweries across the state. The reusable bottles, which are embossed with the words "Bottle Drop" and debossed with the words "Refillable" and "Please return," do not require any extra time or hassle for consumers as they can be returned through the same return infrastructure as other deposit containers, including through the Green and Blue Bag programmes. These distinct bottles are sorted and separated during OBRC's processing, then washed and inspected before being delivered back to Oregon's craft beverage producers for reuse.[90]

Table 10 Return Rates for Beverage Containers in Oregon's Deposit Return System (2024)[91]

	Return rate
Plastic	86%
Metal	90%
Single-use glass	75%
Total single-use	87%
Reusable glass	Unknown

Ontario, Canada

Ontario offers a compelling example of how reusable and single-use beverage container systems can operate together within an integrated deposit-return framework. The system is built around two complementary deposit programmes: The Beer Store's (TBS) longstanding deposit system and the Ontario Deposit Return Program (ODRP).

TBS has operated since 1927 as a brewer cooperative, warehousing, distributing, and selling beer and malt-based beverages on behalf of its member brewers. From the outset, the system was designed to encourage the reuse of refillable containers, including both the Industry Standard Bottle (ISB), which can be reused an average of 15 times, and steel kegs. Brewers may

share standard bottles or use proprietary (non-standard) bottles to differentiate their brands while still benefiting from the economic and environmental efficiencies of reuse. Each year, around 210 million refillable bottles are returned washed, and refilled by brewers. This collection is alongside the collection of approximately 1.8 billion recyclable single use cans and glass bottles. After approximately 15 cycles, these bottles are recycled into new glass bottles or other products, completing the reuse loop.

In 2007, when the Ontario government launched the ODRP, TBS was contracted to manage the collection and recycling of containers not covered by its own system. The ODRP applies to all packaged alcohol not sold through TBS (like wine, coolers & spirits) while containers sold by TBS, even those also sold through other authorised channels such as LCBO or grocery stores, are treated as part of the TBS deposit system. Deposit values are determined by container size rather than whether a container is reusable or single-use: a CAD$0.10 deposit for plastic and glass bottles that are 630 ml or less and cans that are 1L, and a CAD$0.20 deposit for containers larger than these sizes. For kegs, a CAD$20 deposit is applied to those between 12L and 30L, and a $50 deposit for those 30L or more.

Both single-use and refillable containers flow through TBS' shared return infrastructure, which includes 1,291 redemption locations across the province (as of December 2024). These locations comprise TBS retail stores, on-site brewery retail stores, LCBO convenience outlets, contracted empty bottle dealers, and grocery stores. Once collected, containers follow separate pathways depending on type. Both Standard and non-standard reusable bottles are sorted and returned to brewers for washing and refilling, while single-use glass is sorted into clear and coloured streams and sent to recycling facilities where it is made into new bottles, fibreglass insulation, and other glass products. Aluminium cans are densified into bales and recycled into new aluminium cans, while associated packaging such as corrugated cardboard and boxboard is also collected and sent for recycling.

As of December 2024, return rates for single-use containers were 82% for glass, 73% for cans, and 41% for PET, while reusable glass bottles achieved an 89% return rate (see Table 11).[92] In total, the programme collected 104,502 tonnes of material in 2024, of which 51,234 tonnes of glass were reused by brewers. [93]

Looking ahead, return rates are expected to decline as beverage alcohol sales expand to additional retail channels, while the number of dedicated return locations, primarily TBS outlets, continues to decline. At the same time, the share of refillable bottles in the system is decreasing, reflecting a shift toward single-use containers and the absence of policy or financial incentives to maintain refillable packaging.

Table 11 Performance of Ontario's deposit return system, 2024 [94]

	Ontario Deposit Return Program (ODRP) Containers - Return Rate	The Beer Store (TBS) Containers - Return Rate	Combined Return Rate
Single-use glass	82.6%	81.4%	82.2%
PET	41.1%	N/A	41.1%
Tetra/Bag-in-box	26.7%	N/A	26.7%
Aluminium	72.9%	72.9%	72.9%
Total single-use	73.8%	73.6%	73.7%

Reusable glass		88.8%	88.8%
Total single-use + reusable containers combined		76.0%	75.4%

Quebec, Canada

Beer producers have operated a DRS in Quebec since 1808[95]. Under this voluntary system, glass beer bottles are collected from retailers and licensed establishments, washed, and reused up to 15 times before being sent for recycling. This system was fully funded and managed by the province's major brewers, and because it operated as a private, producer-led initiative, reporting and transparency has historically been limited.

Figure 29 Storage of single-use and reusable deposit containers in Quebec, Canada

Quebec's mandatory DRS for single-use containers was established much later, in 1984, under the *Environment Quality Act*. For decades, the system applied only to soft drinks and beer containers. Soft drinks (regardless of material) were subject to a flat deposit of CAD$0.05 (€0.03), while the deposit on beer cans and bottles varied depending on size and material. Although both single-use and reusable containers were returned at the same locations (retailers), the two systems operated largely independently, with limited administrative integration.

A major modernisation of Quebec's DRS began on 1 November 2023, creating a more integrated framework for both single-use and reusable containers and significantly expanding the scope of the system. The expansion is being implemented in phases:

- **Phase 1 (November 2023):** Inclusion of all aluminium beverage containers between 100 ml and 2 L.
- **Phase 2 (March 2025):** Expansion to all plastic beverage containers in the same size range, including water.
- **Phase 3 (March 2027):** Extension of deposits to wine and spirits in glass bottles, as well as multilayer cartons.

Quebec's new DRS regulations also simplified and harmonised deposit values. Deposits no longer vary by beverage type but are determined by container material and size, and are now aligned across single-use and reusable containers of the same size (see Table 12). Importantly, the regulations require that deposits on reusable containers be equal to or higher than those applied to comparable single-use containers.

Table 12 Deposit values for single-use and reusable containers in Quebec (as of 1 March 2026)[96]

Container type	Material	Size	Deposit
Single-use	Metal (all beverages)	100 ml–2L	$0.10 (€0.06)
	Plastic (all beverages)	100 ml–2L	$0.10 (€0.06)
	Glass (soft drink & beer)	100–499 ml	$0.10 (€0.06)
	Glass (soft drink & beer)	500 ml–2L	$0.25 (€0.15)
Reusable	Glass (soft drink & beer)	100–499 ml	$0.10 (€0.06)
	Glass (soft drink & beer)	500 ml–2L	$0.25 (€0.15)

The reform also brought reusable and single-use containers under a single administrative framework. The Quebec Beverage Container Recycling Association (QBCRA), designated as the province's producer responsibility organisation in 2022, is now responsible for overseeing collection, reuse, and recycling on behalf of all producers, with all reporting consolidated through QBCRA.

Transport logistics differ by container type. QBCRA manages the logistics of single-use containers from both retailers and depots. For reusable bottles, brewers continue to collect containers directly from retailers through established reverse logistics arrangements. However, reusable bottles returned to stand-alone bottle depots, introduced as part of the expanded collection network in November 2023, are collected by QBCRA and returned to producers, creating greater operational alignment between the two systems.

Producer fees, collected by QBCRA, vary by container material and type. Fees in effect as of March 2026 are shown in Table 13.[97]

Table 13 Producer fees charged in Quebec for single-use and reusable beverage contains (as of 1 March 2026)[98]

Material	Size	Producer Fee
Metal (all beverages)	100 ml–2L	$0.02 (€0.013)
Plastic (all beverages)	100 ml–2L	$0.02 (€0.013)
Single-use glass (soft drinks & beer)	100ml–2L	$0.04 (€0.025)
Reusable glass (soft drinks &beer)	100ml-2L	$0.02 (€0.013)

Quebec's integrated approach has delivered strong performance. In 2023–24, single-use containers achieved an overall return rate of 63%, with 64% of metal cans, 58% of plastic bottles, and 53% of single-use glass returned[99] Reusable bottles achieved a return rate of 106.9%, reflecting multiple recirculation cycles within the reuse system.

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