

The New Reuse Economy

how the beverage sector's
re-embrace of refill will
transform the industry

The beverage sector is one of the ripest sectors for reuse. Leaving out closed systems like reuse for on-site dining, **more beverage reuse/refill systems operate at scale than all other open systems** (like reuse for take-out and delivery, or reuse for other consumer packaged goods). Virtually all of them use Deposit-Return Systems (DRS) to ensure they get their bottles back.

Refillable containers have been the norm for most of human history

Human societies and businesses have been using Deposit-Return Systems (DRS) for millennia. Before the modern era, if you wanted to buy a consumable product, you would either bring your own container to be filled at the store or market, or the merchant would sell their product in a refillable container that they would loan or rent to you.

When you were done, you would bring it back (or it would get picked up) and the merchant would wash it and refill it again for another customer. To ensure that they got their packaging back, merchants would charge their customers a deposit at initial purchase, which was refunded when the customer brought the container back.

The original mass-market Deposit-Return Systems were created by beer, soda and dairy companies to get their bottles back for washing and refilling. Companies like Coca-Cola and Budweiser popularized these in the late 1800s. Soda, beer and dairy companies had local distribution hubs where they would take back refillable glass bottles for washing and refilling. The infrastructure allowed virtually all commercial beverages sold in the United States to be sold in refillable bottles.

Many of these reuse/refill systems were pooled (shared) packaging and logistics/cleaning services – meaning that a consortium of brands would collectively own standardized refillable bottles that could be interchanged from brand to brand, and leased to them (and potentially other brands outside the consortium or cooperative). *And this is still the case with many refillable beverage systems around the world.*

Back then, materials like glass, ceramics and metals were seen to have value, and businesses and consumers wanted to use them for as long as possible. It's important to note that these were economic, not environmental, initiatives. It costs less – and still does once the infrastructure is built – to make the bottle once and then collect, wash and refill it as many times as possible than to use the same quantity of single-use bottles.



The big disposable idea

Unfortunately, things changed after World World II. During the war, the extraction, mining and manufacturing industries ramped up production levels to serve the war effort. Business was good – but once the war was over, they asked, “What should we do now?”

Their answer: Keep churning all these materials through the economy. One of the big ideas was to sell these materials – like aluminum, paper, and eventually plastic – in the form of disposable products.

The birth of the Throw-Away Economy and the advent of legislative DRS in the US

Extraction companies (like mining, paper, and eventually petrochemical corporations) furthered their partnerships with consumer goods, fast food and beverage companies. Big soda and beer brands shifted their packaging away from refillable glass to disposable aluminum and glass, as well as plastic containers for soft drinks and other non-alcoholic beverages.

Then, they eliminated the deposit on these containers. Not surprisingly, a significant amount of beverage containers ended up in the environment as litter. The explosion of litter provoked the ire of concerned citizens and policymakers. Leading up to the first Earth Day in 1970, environmental demonstrations across the country focused on the issue of throw-away containers.

These protests held the industry – not consumers – responsible for the proliferation of disposable items that depleted natural resources and created massive amounts of litter. Originally billed as a litter prevention tool, legislators developed and introduced what we now call “bottle bills,” which are mandatory Deposit-Return Systems requiring beverage companies to take their bottles back for reuse or recycling – to ensure that they won’t be littered.

Environmental advocates eventually succeeded in passing bottle bills in 10 states. But unfortunately, DRS has not proliferated beyond these states in the US, nor have these systems brought refillable bottles back... yet.

Other countries reject disposability and embrace refill

However, in other countries, beer, wine, soda, dairy and bottled water companies have continued to operate and – in some cases – expand their refillable beverage container lines. In almost every European nation, regardless of the presence or absence of a policy, refillable containers are used to some extent for at least one type of beverage.¹ Refillables have an overall market share of 23% for the largest global non-alcoholic beverage markets. In Latin America, countries like Mexico, Chile, Peru, and Brazil, refillables claim about 30% of market share.² The 94 countries where refillables are used currently comprise 80% of global sales of ready-to-drink water, soda, and other non-alcoholic beverages.³

Some examples of refill rates from 2019:

- In Germany, 82% of beer is sold in refillable bottles.⁴ 99% of those bottles are returned for refilling. Overall, 54% of beverages sold in Germany are in refillables.⁵
- In Ontario, Canada, 84% of beer is sold in refillable bottles.⁶ 97% of those are returned for refilling.
- In Latin American countries, refillables account for 27% of sales in Mexico, 54% in Columbia, and 24% in Brazil.⁷
- In Asia, Mainland China sells 22% of beverages in refillables, Vietnam sells 31%, Thailand sells 20%, and in India, refillables are at 34%.
- On the African continent, in Nigeria 43% of beverages are sold in refillables.⁸
- The Philippines has the highest national rate: 59% of beverages are sold in refillable bottles.⁹



Throwaway Living

DISPOSABLE ITEMS CUT DOWN HOUSEHOLD CHORES

The objects flying through the air in this picture would take 40 hours to clean—except that no housewife need bother. They are all meant to be thrown away after use. Many are new; others, such as paper plates and towels, have been around a long time but are now being made more attractive.

At the bottom of the picture, to the left of a New York City Department of Sanitation trash can, are some throwaway vases and flowers, popcorn that pops in its own pan. Moving clockwise around the photograph come assorted frozen food containers,

a checkered paper napkin, a disposable diaper (seriously suggested as one reason for a rise in the U.S. birth rate) and, behind it, a baby's bib. At top are throwaway water wings, foil pans, paper tablecloth, guest towels and a sectional plate. At right is an all-purpose bucket and, scattered throughout the picture, paper cups for beer and highballs. In the basket are throwaway draperies, ash trays, garbage bags, hot pads, mats and a feeding dish for dogs. At the base of the basket are two items for hunters to throw away: disposable goose and duck decoys.



Bottle Bills: mandatory Deposit-Return Systems requiring beverage companies to take their bottles back for reuse or recycling – to ensure that they won't be littered.

Top 10 countries with reuse/refill by sales

Country	Market Share Refillable (2019)
Philippines	59%
Colombia	54%
Germany	54%
Nigeria	43%
India	34%
Vietnam	31%
Mexico	27%
Brazil	24%
Mainland China	22%
Thailand	20%
Total Top 10	29%

Data credit: Reloop, ["What We Waste."](#)

Brands still use refillables around the world

Many individual beverage companies, as well – especially mineral water and beer companies – never shifted away from refillable to one-way containers.

The Beer Store, co-owned by Labatt Brewing Company, Molson Coors Canada and Sleeman Breweries, began its refillable beer cooperative and deposit return system in 1927. The company will take back anything it sells at its 447 Ontario locations: bottles, caps, cans, cases, kegs, plastic bags. About 94% of all containers and 99% of all refillable beer bottles are returned. Since its inception, the company has recovered 75 billion beer bottles, and today in Ontario, 84% of beer is sold in refillable bottles.¹⁰

In 40 markets, 25% or more of Coca-Cola's products are sold in refillable bottles.¹¹ Globally, refillables already account for 16% of Coca-Cola's total bottle usage in 2020, and the company recently pledged to sell 25% of their product in refillable packaging by 2030. To do this, Coke is expanding the roll-out of its "universal bottle" – polyethylene terephthalate (PET) refillable – that was first introduced in 2018 by Coca-Cola Brazil and is now used in Argentina, Brazil, Chile, Colombia, Mexico, Guatemala and Panama – and is being rolled out in South Africa.¹²

"Reusable packaging is among the most effective ways to reduce waste, use fewer resources and lower our carbon footprint in support of a circular economy."

–Ben R. Jordan, Senior Director, Environmental Policy, Coca-Cola Company

In Oregon, ten of the largest breweries banded together to create a refillable packaging system with the Oregon Beverage Recycling Cooperative (OBRC), which is the primary service organization for Oregon's bottle deposit-return system. The Cooperative owns the refillable bottles and leases them to the brewers at a price less than single-use glass and aluminum cans. Consumers put the refillables in with the rest of their returnable beverage containers – where they're sorted at the store or at OBRC's recycling facilities. They're then washed, refilled with product, and restocked on store shelves.¹³

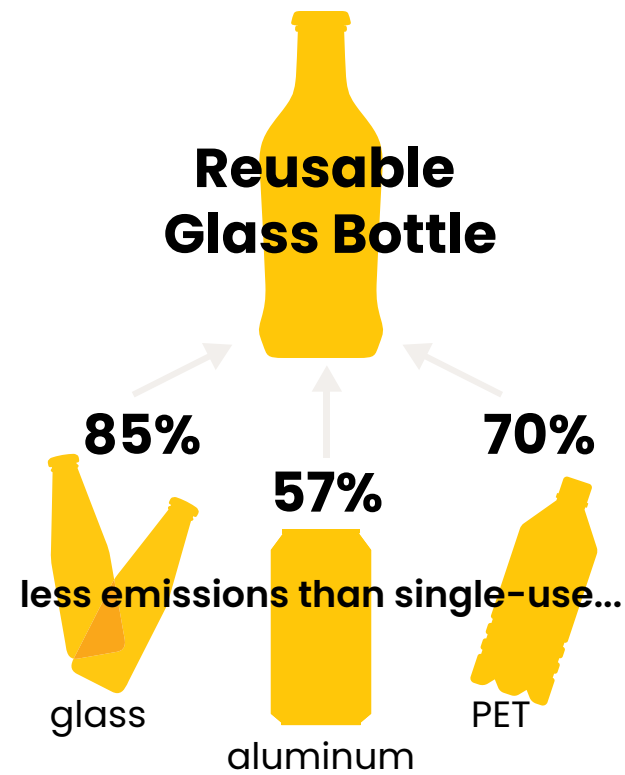
Materials

Refillable bottles are typically either made from glass or PET plastic (#1). Aluminum packaging manufacturers are also beginning to make refillable bottles, although this is a very small share of the market currently. Glass bottles can be reused up to 50 times and PET bottles can be reused up to 20 times before they are retired and recycled.¹⁴

Environmental benefits

Life-cycle analyses or assessments (LCAs) document environmental impacts of a product during different lifecycle phases – from cradle (extraction), through manufacturing and consumption, to grave (disposal). They are widely used to compare the environmental footprint of various materials and products. A number of LCAs for beverage packaging have been developed, analyzing how emissions from disposable packaging made from different materials compares with reusable packaging made from different materials under different use scenarios.

The point at which the impact per use for a reusable product falls below that of a disposable product used for the same purpose is the environmental “break-even point.” After that point, the reusable product performs better for environmental metrics. The break-even point for a reusable product will depend on various considerations, such as the weight and material composition of each product; how it is manufactured; how often the product is washed; sources of energy used, distance and method by which products are transported, and finally how it is disposed of at end of life. The break-even points are usually far below the expected lifetimes of reusable products. **Each additional use beyond the break-even point accrues environmental benefits.**



According to a comprehensive life-cycle analysis of beverage packaging, **the break-even point for reusable glass bottles and single-use glass bottles was reached after 2 cycles** (200km from plant to distributor).¹⁵ After the third use, reusable glass bottles are already less impactful than single-use glass, PET or aluminum cans.

In terms of climate emissions, refillable glass bottles used 25 times and then recycled¹⁶ create:

- 85% less climate emissions than single-use glass.
- 57% less than aluminum cans.
- 70% less than single-use PET.
- And 93% less energy is consumed by a refillable bottle that can be reused 25 times, as opposed to single-use bottles.¹⁷

In comparing refillable PET to single-use PET, refillable PET bottles can:

- Save up to 40% of the raw materials and,
- 50% of the greenhouse gas emissions from the production of single-use plastic bottles.¹⁸

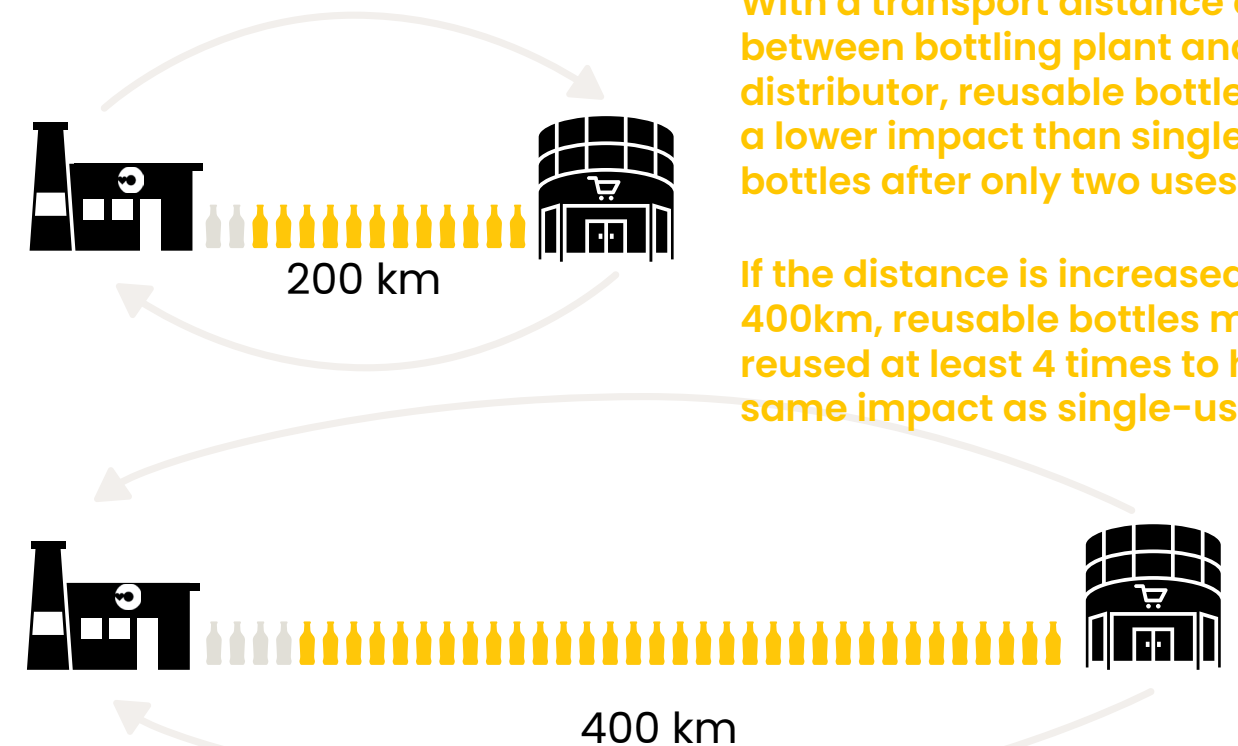
Standardization and pooling (shared packaging leasing platforms) can help reduce emissions by optimizing logistics and reducing unnecessary transport. The implementation of a pooling system can further decrease the need for extra transport and travel distances, increasing overall efficiency and reducing costs.

Lastly, when more beverages are sold in refillable bottles, the benefit to the ocean is amplified. Oceana estimates that just a 10% increase in the share of beverages sold in refillable bottles could result in a 22% decrease in marine plastic pollution. This would keep 4.5 to 7.6 billion plastic bottles out of the ocean each year.¹⁹

What about transport loops?

With LCAs, one of the parameters that affected the results the most was found to be the distances traveled in transport loops:

- One study found that when a transport distance of 200km between the bottling plant and the local distributor was applied, the reusable bottles had a lower impact than single-use bottles after only two uses.²⁰
- However, if this distance is increased to 400km, reusable bottles must be reused at least 4 times in order to have the same impact as single-use bottles.²¹
- In some cases, transport distances were not so relevant. One study performed a sensitivity analysis to examine the impact of different transport distances between manufacturer and retailer. The results showed that increasing the distance from 10km to 200km only increased global warming potential by 2.3%.²²



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How refill systems work (and can work) for beverage containers

Beverage companies either own their refillable bottles (like Coca-Cola) or they lease them from a service provider (like the Oregon Brewers example). Once the consumer has finished their beverage, they can take advantage of different options to return the refillable bottle back to the brand.

- 1. Return on the go.** In most states that have mandatory deposit-return systems (bottle bills), the “return-to-store” method is the most popular. Consumers take their beverage containers to either a retailer or a redemption center, where they can use reverse-vending machines, or have their bottles hand-counted for a refund, or use bag-drop technology.
- 2. Return from home.** It’s also possible (although not as widely used) to have reusable packaging picked up from home by a service (e.g. a logistics company or through a curbside collection provider).

For this model, modifying existing infrastructure will be important – either through incorporating reusable packaging into curbside collection for recycling, or by adding “milk-man-type” bins outside homes and apartments, where logistics companies can pick up reusable packaging as they drop off new products.

Once the bottles are collected from the consumer and sorted at recycling facilities, they are returned to the bottling plant, where they are put on a washing line. After the bottles are washed, sanitized and dried, the clean bottles are refilled on production lines whose speeds match those of one-way bottles.

Bag-drop Systems

For retailers that don’t want empty bottles in their stores, but want to support sustainable packaging while increasing foot traffic, bag-drop systems can be very effective. With bag-drop, consumers put all their returnables into a bag with a sticker that has a bar or QR code tied to the consumer’s account. They then “drop” the bag into a kiosk in the parking lot which is picked up by the service provider. Consumers generally get their refunds through an electronic kiosk at the store where there’s an incentive for them to use it on new purchases.



Policy tools: deposit–return systems and refill targets are critical

The foundation for refillable beverage containers are deposit–return systems (DRS).

In every successful refillable beverage initiative around the world, deposit–return systems are either mandated by law or established voluntarily by the beverage industry. The infrastructure that is built to serve consumers and businesses through deposit–return can easily incorporate refillable bottles, and in many parts of the world, it already does.

The second critical policy lever is refill targets (or mandates). These are laws that establish “rates and dates” reuse/refill targets, requiring individual companies to sell a certain percentage of their products in reusable packaging by a certain date – starting smaller and adjusting higher over time. These can be incorporated into Extended Producer Responsibility (EPR) laws – which make brands responsible for post-consumer management of their packaging – and deposit–return systems, alongside recycling targets.

Over time, the goal would be to have high recycling rates to give way to high reuse/refill rates. Many countries – especially in Europe – have refill targets on the books, and there is a renewed interest in strengthening them and passing more legislation. For example:

- Austria has mandated a beverage reuse quota of 25% by 2025.
- France requires 10% of packaging placed on the market to be reusable by 2027.
- Portugal requires 30% of all packaging put on the market to be reusable by 2030.
- Romania requires a 5% annual reusable packaging increase until 2025 (reaching a minimum of 25% by 2025).

- Chile requires that at least 30% of bottles for sale in supermarkets be returnable for reuse.
- Environmental advocates across Europe are calling for a 75% refill target for beverage packaging by 2030.²³

The third policy lever is funding for the infrastructure necessary for reuse and refill to scale. Both EPR and DRS policies can be tools for funding the buildout of reuse/refill infrastructure. With EPR, a portion of producer fees could be earmarked for reuse. Deposit–return systems can dedicate a high percentage of unclaimed deposits toward developing reuse/refill infrastructure. In addition, fees on one-way containers could also fund reusable alternatives.



Environmental advocates across Europe are calling for a 75% refill target for beverage packaging by 2030.

Which comes first? Extended Producer Responsibility or Deposit–Return?

Upstream’s position has been and continues to be that **EPR and DRS policies should fundamentally be about creating a circular economy for packaging – that prioritizes source reduction and reuse above recycling.** Indeed, that’s where these ideas began:

- The original DRS systems for beverages were created by beer, soda and dairy companies to get their bottles back for washing and refilling.
- The EU Packaging Directive passed in 1994 – that resulted in the creation of packaging EPR laws across Europe and began a global movement – states in the first lines of its governing manifesto, “...the best means of preventing the creation of packaging waste is to reduce the overall volume of packaging.”²⁴

But the central problems are that the brands have invested in one-way packaging and supply chains for the last 60–70 years, and cities have invested in waste management and recycling systems to clean up after them. **To shift to a reuse economy – where packaging is a service and not a product – will require re-imagining and remaking supply chains while also investing and building the infrastructure to support it.**

EPR and DRS can help, but in order for these policies to truly be transformative, they have to be about more than just recycling.

1. **New bills should state that the aim is to build a circular economy for packaging that follows the waste reduction hierarchy in their governing framework.**
2. **And they should include provisions that prioritize building out reuse systems and infrastructure.** Just like it took decades of policies and investment to build out today’s recycling systems, we’re going to need similar (if not greater) commitments and investment to build out the new reuse systems and services.
3. **Finally, Deposit–Return Systems should come before Extended Producer Responsibility (or at the same time).** This is where the rubber meets the road. There is still some division among industry on this point, but history has shown that it’s much easier to add EPR to DRS systems for beverages than the reverse. The biggest reason is that they require different types of infrastructure.

Why DRS first?

To date, **EPR has focused on establishing or expanding and improving curbside recycling systems** that focus on at-home collection. They don't establish mechanisms to prevent or mitigate litter (although they could fund it).

DRS systems are often built around return-to-store or redemption center (e.g. depot) collection methods, although innovative systems like [bag drop approaches](#) could also be applied to curbside collection (to ensure individual customers get their deposits back). By assigning economic value to containers, DRS helps prevent litter, which EPR doesn't do. And DRS systems also keep the different materials source-separated – so materials like glass don't contaminate other materials like paper – which is often the result of EPR-funded single-stream recycling systems (although EPR could fund different collection methods that better preserve valuable materials).

Lastly, for reuse and refill to work at scale, we are likely going to need deposits or some other financial incentive to ensure that consumers put reusable packaging into the right collection systems and not the garbage.

In this way, DRS systems and the consumer practices they help institute – e.g. ensuring returnable containers get returned for a refund – are helpful and should be established first.

In the end, we're going to need all three, and the best systems that exist in the world today have both deposits for beverage containers (and depot/drop-off collection for them as well as materials like non-deposit glass containers) and EPR for everything else (often with curbside recycling). And they are working to bring reuse/refill into the mix. So in short, we need:

1. **First: DRS systems that help establish reuse/refill infrastructure** in addition to better recycling and litter prevention.
2. **Then: EPR systems that layer on top of DRS**, and help establish reuse/refill infrastructure in addition to more and better recycling.
3. **To scale, reuse/refill systems can be funded and developed with and as a part of DRS and EPR systems.**

Recommendations for the Beverage Industry

The beverage industries (soft drinks, alcoholic drinks, dairy, mineral water, etc) – and their value chains – should embrace refillable packaging as the future, and should:

- **Set “rates and dates” targets to transition from single-use to reuse**, similar to what Coca-Cola has done with their pledge to serve 25% of their beverages in refillable formats by 2030.
- **Work to pass mandatory deposit-return systems** for beverage containers with reuse/refill targets to spur the development of reuse service infrastructure.
- **Begin developing reuse/refill infrastructure** and systems either a) individually, or b) in pooled services like the Oregon brewers and Ontario Beer Store models.

Conclusion

Every time a consumable product is sold in a reusable package, the extraction and waste cycles stop. Forests remain forests. Plastic pollution ceases. Landfills and recycling supply chains are not needed. And with the increased attention on Scope 3 Climate Emissions from brands (the emissions from a value chain not directly owned or controlled by the company) – plus the potential for cost savings once the infrastructure is built – **refillable packaging is making a comeback.**

Just four companies account for over 40% of sales (in terms of revenue) for the enormous non-alcoholic ready-to-drink market.²⁵ These companies have the ability to change the overall beverage market, which means that increasing refillables is achievable in the near-term.



Endnotes

- 1 [Western Europe's Experience With Refillable Beverage Containers](#)
- 2 Oceana, [Just One Word, Refillables](#)
- 3 *ibid.*
- 4 [German Environmental Protection Agency](#).
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- 11 Ben Jordan, Senior Director for Climate and Packaging at Coca Cola
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Author: Matt Prindiville, CEO
Contributor: Miriam Gordon, Policy Director
Design & Editing: Erin Covey-Smith, Communications Assistant



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