

BRING BACK REFILL

Calling on
Coca-Cola, the
Beverage Industry
and Policymakers
to Bring Reusable
Beverage Bottles
Back to the US



THE STORY OF
STUFF
PROJECT



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THE STORY OF **STUFF** PROJECT

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Glossary of Acronyms

Glossary of Terms

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Executive Summary

In 2022 Coca-Cola pledged to sell 25% of its beverages in reusable packaging by 2030, a nod to widespread public concern about the plastic pollution crisis. But the commitment by the world's largest soft drink manufacturer is a global one, and Coca-Cola did not signal any intent to bring reusable bottles back to the US, its headquarters and flagship market.

Coca-Cola's failure to commit to a refillables target in the United States is both ironic and not terribly surprising. The company introduced reusable bottles (with deposits attached to ensure their return) in the US in the late 19th Century, then in the 1950s and 1960s it dismantled the very system it had created, replacing its trademark refillable glass bottles with throwaway aluminum cans and plastic bottles. It then spent decades avoiding responsibility for the waste this decision generated by fighting bottle deposit legislation on the one hand and blaming consumers for the problem with the other.

Bring Back Refill argues that Coca-Cola and the rest of the beverage industry can and must bring back refillable beverage bottles in the US. The industry already does it in 94 countries worldwide and it is making investments all across Europe and Latin America that will grow its overall market share of reusables, which today stands at 23% by volume globally. US policymakers can ensure that the industry does it – and

In 2022, the 134 billion plastic bottles produced by Coca-Cola were equivalent to 255,000 bottles per minute.

does it effectively – by both enacting legislation establishing and expanding container deposit systems (in order to ensure their return for recycling and reuse) and setting mandatory quotas for reuse.

Coca-Cola's plastic bottles are fueling the climate and plastic pollution crises

Today, the beverage industry plays a significant role in propelling two interrelated environmental crises – climate change and plastic pollution. Globally, more than 580 billion polyethylene terephthalate (PET) plastic beverage bottles are produced each year – nearly 1 million per minute, which accounts for one-quarter of the world's use of PET plastic. The biggest global soft drink brand, The Coca-Cola Company, accounts for 23% of those bottles. In 2022, the 134 billion plastic bottles produced by Coca-Cola were equivalent to 255,000 bottles per minute, 4,250 bottles per second, creating more than 16 million tons of carbon emissions – the equivalent annual emissions from 16 coal-fired power plants.

The marine plastic pollution crisis provides additional visible evidence of the negative impact of the bottled beverage industry's choice of single-use plastic as its primary packaging. Fifteen million metric tons of plastic enter the ocean each year – the equivalent of two garbage trucks per minute. The non-alcoholic beverage industry's contribution is between 21 and 34 billion one-liter PET bottles, or 706,000 to 1.1 million metric tons.

Plastic beverage bottles are consistently ranked at the peak of the top 10 sources of beach and ocean litter. According to brand audits conducted by the Break Free From Plastic (BFFP) movement, Coca-Cola is the top plastic polluter – its plastic bottles were the No. 1 source of plastic pollution every year the audit has been conducted, from 2018 through 2022.

Coca-Cola knew long ago that reusable glass was the best environmental choice

As the first company to ever conduct a Life Cycle Analysis (LCA) of packaging, Coca-Cola knew as far back as the early 1970s that reusable glass bottles were environmentally-preferable to single-use glass, plastic, and metal containers. Although Coke has never publicly released the LCA prepared for it, the authors repeated their analysis for the EPA in 1974, comparing the 10-use glass refillable bottle to single-use glass, steel, aluminum, and plastic. One author of the EPA study summarized the report's conclusions saying that “no single-use container could match the environmental benefits of reusable glass bottles.” Despite the findings of their LCA, Coca-Cola invested instead in single-use packaging.

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Coca-Cola bottles found on Miramar Beach, Tamaulipas, Mexico © Greenpeace

REFILLABLE VS. REUSABLE

Reports in Europe often refer to “refillable” when describing containers that are refilled by the consumer and “reusable” to describe packaging refilled by producers. However, in the US, the two terms are used interchangeably without indication of who is doing the refilling. In this report, “refillable” and “reusable” are used interchangeably, meaning the container is collected after use, washed, and refilled over and over again.

Coca-Cola and the beverage industry have consistently avoided responsibility for take-back of their packaging by opposing Bottle Bills

With no deposits on single-use beverage bottles to incentivize returns and no take-back program in place, the American landscape became littered with cans and bottles. In response, environmental activists tried to enact a US bottle bill in 1974 that would have *outlawed single-use bottles* and required a deposit system for refillables. Despite the Nixon Administration's support for the bill, the beverage industry killed the proposal.

In the ensuing decades, Coca-Cola has led the American Beverage Association and the rest of the beverage industry in stymying one bill after another aimed at incentivizing the return and recycling of disposable beverage containers. Today, with only 10 US state bottle bills in effect, the industry has largely left it to local communities to deal with the litter and waste resulting from single-use beverage packaging, successfully avoiding responsibility for the devastating impacts of its own choices.

DEPOSIT RETURN SYSTEMS (DRS) AND BOTTLE BILLS

DRS is a system where consumers, when purchasing a product, pay an additional amount of money (a deposit) that is reimbursed upon the return of the packaging or product to a collection point. In the case of beverage containers, the system provides an economic incentive for consumers to return empty containers to a collection point to ensure that they will be reused or recycled. In the US, laws that mandate DRS are often called "bottle bills."

Holding the beverage industry accountable with DRS plus mandatory reuse targets

The leading beverage industry companies are associated with decades of failed sustainability commitments with respect to plastic. DRS is a proven system for reducing beverage container waste. Nowhere is that more important than the US which far outpaces any other country in wasted plastic bottles. In the US, 212 PET bottles are burned, buried or lost per person per year, compared to just 5 in Denmark for example.

While government-mandated DRS sprung up to address litter caused by single-use beverage containers, mandatory refillables quotas combined with DRS can ensure high enough reuse rates to make refillable beverage containers a climate and plastic pollution solution – one that can reduce reliance on an extractive economy, easing the burden on frontline communities, reducing the waste and the energy demands of recycling and production, and creating an economic model that centers jobs prioritizing a clean, green materials economy.



© Kristian Buus / Greenpeace

While progress is being made in European and Latin American markets, in the US, only 4% of non-alcoholic beverages are sold in reusable bottles.

Reuse can reduce up to 40% of raw materials inputs and 50% of greenhouse gas emissions associated with beverage packaging. It also achieves lower water and waste impacts. An increase of 10% in the share of refillables in the U.S. market would reduce PET marine pollution by 22%, or 4.6 to 7.6 million bottles a year. The disproportionate impacts on people of color and low-income populations that live near plastics production and disposal facilities would also be reduced.

Reusable beverage containers can be a good economic driver

While the market share percentage of reusable bottled beverages has declined over time, reuse is increasingly recognized as a profitable market. DRS systems are also an economic driver – they create 11 to 38 times more jobs than curbside recycling collection. If reusables were a greater part of the mix, they would add jobs associated with the reverse logistics of collection, cleaning, and refilling.

While progress is being made in European and Latin American markets, in the US, only 4% of non-alcoholic beverages are sold in reusable bottles. Advocacy for producer responsibility and reuse in the beverage industry in the US is years behind the EU. No new bottle bill has been enacted in the US since 2002, in part due to the outsized influence of the beverage industry and grocers associations across state capitals.

***Bring Back Refill* calls on Coca-Cola – the No. 1 plastic polluter – to meet its global commitment of 25% reusable packaging by 2030 in the US, with “real reuse.”* Rather than fighting them in the US, Coca-Cola should support bottle bills that include mandatory reuse quotas consistent with its 25% pledge. Furthermore, *Bring Back Refill* calls on policymakers to enact bottle bills that contain the 25% mandatory reuse quota.**

*“Real reuse” eliminates single-use packaging. Reuse systems that require multiple single-use packages to deliver the product in a reusable cup or container are not “real reuse.”



A member of staff at a UK supermarket refilling a bottle of beer © Isabelle Povey / Greenpeace

The Change We Need

1. POLICY MANDATES.

A history of failed sustainability commitments by Coca-Cola indicates that policy mandates (bottle bills with reuse quotas built in) are absolutely necessary to drive significant change. Coca-Cola is already failing to make progress on its reuse commitment.

2. TRANSITION FROM PLASTIC TO GLASS.

The urgent need to end the addiction to single-use plastic bottles cannot be overstated. The beverage industry's insatiable thirst for single-use PET plastic bottles is helping to fuel the US build-out of 157 newly permitted petrochemical facilities that are projected to increase greenhouse gas emissions by 30% by 2025 compared with 2018 – the equivalent emissions of 50 new coal-fired power plants. These facilities threaten the already overburdened communities in Louisiana – a region now dubbed 'Cancer Alley' – the Gulf Coast, and the Ohio River Valley.

3. COMPREHENSIVE DRS MANDATING REFILL.

DRS provides mechanisms and incentives for consumers to return containers at high rates (ensuring environmental benefits) and can enable pooled systems that scale reuse.

With the potential of reusable beverage containers to dramatically cut greenhouse gas emissions, reduce the disproportionate impacts of the plastic industry on frontline communities, and significantly reduce plastic pollution, it's time to bring refill back to the US and require reuse in the beverage industry. The path forward necessitates a commitment to serious action by the beverage industry, policymakers, advocates, and consumers. Since Coke has pledged to do 25% reuse by 2030, we must ensure it achieves this goal in a meaningful, transparent, and measurable way in the US – the country with the biggest plastic beverage container waste rate per capita in the world.

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1. Introduction

In 2022, the Coca-Cola Company (including its many affiliated brands, such as Dasani, Sprite, Minute Maid, Powerade, and Fanta) made a pledge to sell 25% of its products in reusable containers by 2030.¹

While this seems ambitious, in actuality Coke has only committed to bring back reusable bottles outside the US. In its headquarters and flagship country, it plans to focus on fountain service with reusable cups,² which does not address the single-use plastic bottles that drive dependence on fossil carbon sources and contribute to rising ocean plastic pollution.

The commitment is a global one – and not very ambitious, considering that Coca-Cola was at 16% reuse when it made the pledge and two years later dropped to 14%.³ It's an ironic commitment for the company that pioneered reusable bottles, then dismantled the US reusable glass system in the 1950s and 1960s – replacing it with throwaway aluminum cans and plastic bottles – and then spent decades avoiding responsibility to manage the waste by fighting bottle deposit legislation and blaming consumers for the problem.

The need to avert “greenwashing” of reuse in the US beverage industry

Coca-Cola states that in Africa, Europe and Latin America, refillable glass and plastic bottles are its top priority for meeting the 25% reusable pledge, while in the US it plans



For decades, the original Coca-Cola dispensers were designed for reuse © Alamy

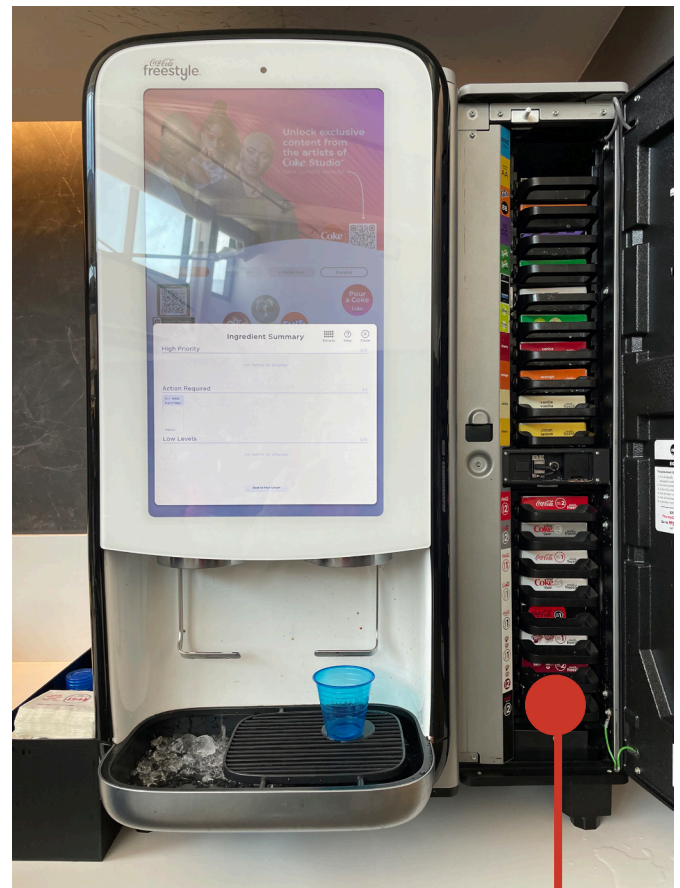
to focus on rollout of the Freestyle™ fountain dispenser with reusable cups programs at restaurants, large entertainment venues and theme parks.⁴

But checking “under the hood” of fountain dispensers, the syrup is delivered in plastic pouches that hold the product syrup and the outer box, plus the one-way shipping boxes. Freestyle™ creates significant quantities of non-recyclable, non-reusable plastic packaging that will be landfilled or incinerated. As such, this system threatens to “greenwash” reuse. As the world’s largest per capita waster of beverage bottles and consumer of PET plastics, the US needs “real reuse” solutions to single-use plastic beverage containers.

This report calls on the Coca-Cola Company – the originator of the reusable bottle and today’s No. 1 plastic polluter – along with the rest of the beverage industry – to phase out single-use, plastic beverage bottles by bringing back returnable, reusable glass beverage containers. It also calls on Coca-Cola and the beverage industry to support comprehensive⁵ DRS, or “bottle bills” that contain “real reuse” quotas of 25% by 2030 for beverage bottles in the US.

CALLING FOR “REAL REUSE”

“Real Reuse” is needed to solve plastic beverage waste, pollution, and litter problems. It is a form of packaging prevention. A reuse system that relies on single-use packaging to deliver the beverage in a reusable format cannot be considered “real reuse” since it may not reduce or prevent packaging waste overall. Real reuse in the beverage sector must prioritize displacing single-use plastic bottles with other delivery methods that prevent waste.



A look inside Coca-Cola’s new Freestyle™ fountain system reveals that the syrup is delivered in single-use, plastic pouches that cannot be recycled

The transition to single-use and the rise of waste

Packaging waste from the beverage sector is a relatively modern construct. It was not until the 1970s in the US that the majority of beverage bottles in the soft drink sector were served in single-use containers. Coca-Cola, the world's largest soft drink manufacturer, first dispensed its beverages through soda fountains, supplied by refillable metal kegs of syrup, and then worked with bottlers to distribute the beverages in refillable glass bottles through the mid-20th century. To get customers to return the valuable glass bottles, bottlers placed a refundable deposit on them that resulted in a near 100% return rate and enabled numerous refills of the bottles.

In the 1960s and 1970s, the majority of beverages came in refillable glass. But single-use formats had already begun to replace refillables. Steel beer cans were introduced in 1935, steel soda cans in 1953, aluminum cans in 1959 and PET plastic bottles

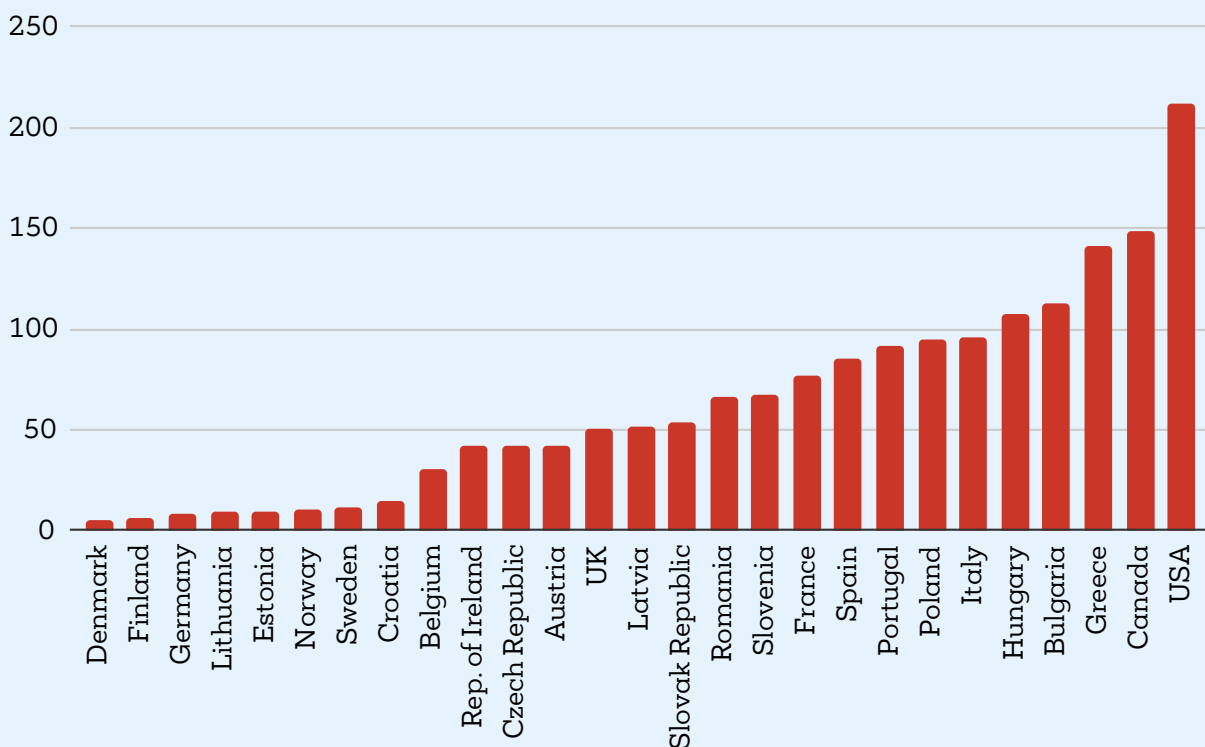
in 1973.⁶ In 1958, only 2% of soft drink containers and 42% of beer containers were sold in single-use, throwaway containers in the US. By 1972, 50% of soft drinks and 77% of beers were sold in throwaway containers.⁷

Overall, reusables as a percent of market share have declined globally and beverage container waste has increased. Among the top 10 countries for reusable bottles, the average market share of reusables was 29% in 2019, down from 60% in 1999.⁸ In the US in 1999, reusables totaled 9.7 bottles per capita. Ten years later, reusable bottles dropped to only 0.1 reusable bottles per capita. In 2019, the US ranked 87th out of 93 countries for per capita sales of beverage bottles in reusables.^{9,10}

While reusable bottles dropped from negligible in the US to practically nonexistent, the amount of PET bottles sold per year increased dramatically. Between 1999 and 2019, PET bottle sales went from \$30 billion to more than \$100 billion, replacing aluminum cans as the most popular container by 2017.¹¹

Wasted units of PET plastic bottles by country for 2022

Graph produced by Reloop with insights from Global Data PLC



COCA-COLA LEADS THE PACK

Coke ranks number one globally in the following ways:



The first major beverage company with a reuse target

The company has pledged to sell at least 25% of all beverages globally in refillable containers.



The leader in global soft drink sales

and the third largest in beverage sales.¹³



The leader in the global production of PET plastic bottles

134 billion in 2022,¹⁴ equivalent to 255,000 bottles per minute, 4,250 per second, and annual emissions from 16 coal-fired power plants.



The highest sales of plastic of any consumer-facing brand

at 2.9 million metric tons per year.¹⁵



The biggest polluter of oceans and beaches

According to Break Free From Plastic audits, it was the biggest plastic polluter in all five years 2018-2022 of data collection.¹⁶

In that same year, the US topped the charts compared with other countries in beverage bottle waste. The per capita PET beverage container waste disposal (landfill and incineration) rate was 212 for PET plastic bottles and 222 for all single-use bottles. In ReLoop's 93-nation dataset representing 81% of the world's population, the US ranks No. 1 in beverage bottles wasted per capita.¹² The average US citizen produces over 42 times more wasted plastic bottles than the average Danish citizen per year.

Coca-Cola: The leader of the pack

The history and development of the beverage container and its associated waste epidemic cannot be understood without recognizing the role of Coca-Cola in 'making and breaking' the refillable beverage container. This report and its associated call to action focus on Coca-Cola because it is the "leader of the pack" as the largest, most influential, profitable, and most polluting beverage producer.

At a net revenue of \$43 billion in 2022,¹⁷ Coca-Cola is notable for the ways in which it avoids responsibility and risk throughout its operations. Historically, the company has operated with an outsourcing strategy that allows it to avoid cost and risk by maintaining an arm's length from commodity development (sugar, caffeine, and – early on – cocaine) and infrastructure (water, bottling, packaging, and distribution), effectively serving as a middle man.¹⁸ Through this model, it left local governments and communities to deal with the burdens of managing beverage container waste and litter, and all of us to deal with the climate impacts.

Historically, the beverage industry's efforts to avoid responsibility have succeeded

The top beverage brands have waged a decades-long campaign of smoke and mirrors, using voluntary initiatives and public relations efforts to project an environmentally friendly brand, to greenwash their image, and to undermine and delay formal efforts to regulate the industry's spiraling pollution problem.

These actions go as far back as the 1950s, when Coca-Cola, PepsiCo, and other fast-moving consumer goods companies helped establish 'Keep America Beautiful' (KAB), a PR vehicle that centered two narratives: that the consumer is at the heart of solving the problem of litter, and that government needed to fund curbside recycling. KAB came up with the now infamous "Crying Indian" ad, the slogan of which was, "People start pollution. People can stop it." Released on the first anniversary of Earth Day in 1971, the ad helped reframe the focus of the environmental movement away from holding producers responsible, and toward individuals and taxpayers solving the problems.¹⁹

Similarly, the American Chemistry Council's "Plastics Make it Possible" campaign branded consumers as "litterbugs." At the same time, the plastics industry began its

Keep America Beautiful reframed the focus of the environmental movement away from holding producers responsible, and toward individuals and taxpayers solving the problems.



KAB clean-up volunteers in 2021 © Ben Nelson

opposition to bottle bills, noting that every returnable container removed from the market would mean the sale of 20 single-use containers.²⁰

From the 1970s onward, state legislatures began to introduce mandatory DRS to address the increasingly visible problem of littered beverage containers. These systems proved to be hugely effective almost overnight. Michigan's deposit return system reduced plastic bottle pollution by 84% and all litter by 41%, while Oregon's system reduced plastic bottle pollution by 83% and all litter by 47%.²¹

As the largest beverage company in the US and one of the top three in the world, Coca-Cola's impacts on the environment – from plastic production, waste, litter, chemicals usage, water demand, greenhouse gas emissions, and harm to frontline communities throughout the life cycle of its products – are outsized. However, the entire beverage industry bears responsibility for these problems. Collectively, this is an industry sector that has actively worked to avoid responsibility for both public health and environmental harms and costs associated with the packaging it uses. But these companies are well resourced enough and have the capability and responsibility to do better.²²

Coca-Cola & The Rise and Fall of the Reusable Bottle

1884

John Pemberton begins Coca-Cola as 'French Wine Coca' including traces of cocaine, modeled off the popular drink 'Vin Mariani'.

Prohibition-era alcohol bans see Coke evolve into a soft drink sold in soda fountains in reusable glass bottles at 5¢ per serving.



1955

Coca-Cola experiments with single-use steel containers.²⁴

1929

Coca-Cola bottlers put a 2¢ deposit on a 5¢ beverage to ensure the return of the glass bottles. 96% of those bottles are returned, refilled and reused.²³



1960s

Coke trials 'lopac' plastic bottles but they are deemed unsafe and banned by the FDA in 1977, then Coke switches to the PET bottle.²⁵

Coke begins the widespread sale of its product in single-use aluminum cans.²⁶

Coke CEO Paul Austin warns "this green land of ours will become a graveyard" speaking to the issue of litter with a group of Atlanta bankers, but continues with the company's shift to single-use containers.²⁷



Coca-Cola commissions the world's first lifecycle analysis (LCA) – comparing the environmental impact of various packaging types – which supports the case for reusables over single-use bottles. The company never releases the study but claims their research supports the switch to plastic bottles.²⁸

For photo credits, see references

1970s

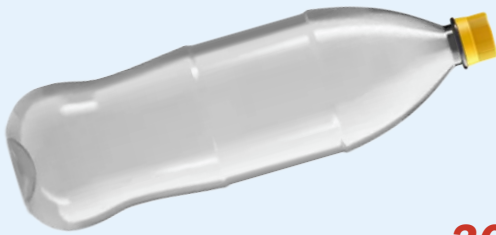
Growing public concern over litter develops momentum for the first US state-level 'bottle bill,' passing in Oregon adding a 5¢ deposit on bottles and cans.

Keep America Beautiful releases the now-infamous "Crying Indian" ad, blaming consumers for litter instead of corporations.



1980s

Coca-Cola works with industry associations to lobby against deposit systems sweeping the US and continues to do so today.



2018

Coca-Cola rolls out its 'universal bottle' in Brazil, providing a reusable bottle for various brands owned by the company, producing 1.8 billion fewer plastic bottles the next year as a result.³²



2020

Bea Perez, Coca-Cola Head of Sustainability claims they will not stop selling plastic bottles because 'people want them.'³⁴

Coca-Cola announces a pledge to sell 25% of its product globally in reusable packaging by 2030.³⁵

The EPA runs another LCA concluding that reusable glass bottles are the best packaging option for the environment.²⁹

The Non-Returnable Beverage Container Prohibition Act proposes banning single-use beverage containers in exchange for refillables with deposits. Coca-Cola and the beverage industry crushes the legislation, despite Coca-Cola bottlers' development of the system decades earlier.³⁰



1990s

Coca-Cola pledges to put 25% recycled plastic into their bottles, a target they still have not come close to achieving thirty years later.³¹

2019

Coca-Cola Southwest Beverages runs a pilot in El Paso, Texas 'to determine whether the returnable glass bottle can work once again in the US.'³³



2022

#BreakFreeFromPlastic's global brand audit declares Coca-Cola the world's biggest plastic polluter for the 5th year in a row.³⁶



2.

Coca-Cola Knew that Reusable Glass Was the Best Packaging Choice for the Planet

From the late 1800s until the 1940s, Coca-Cola delivered its products via soda fountains (supplied with syrup using reusable metal jugs and served to customers in reusable cups) and with returnable, refillable bottles.

Cheap and lightweight beer cans came onto the scene after Prohibition ended in the 1930s and ushered in a new era of throwaway beverage containers. Cans allowed brewers to reach consumers who were far from the few remaining centralized beer distribution centers at the end of Prohibition. They also reduced transportation costs by eliminating the return trip to bottling plants.³⁷

Early in its history, The Coca-Cola Company decided to outsource the bottling of its product by selling its syrup to bottlers. By 1953, there were 1,400 Coca-Cola bottlers in the US, but with the development of throwaway metal cans, Coca-Cola saw an opportunity to cut these middlemen out and keep the profit earned by bottlers within the company. Single-use containers allowed the company to develop its own consolidated one-way distribution networks and diminish the power of the local bottlers.³⁸

INTRODUCTORY OFFER!



Coca-Cola in the new 6-pak of 16-oz. bottles. Only 6/\$1.25

Now there's a great new way to enjoy the delicious, sparkling crisp taste of Coca-Cola. The handy new 6-pak of convenient no-deposit, no-return 16 ounce bottles. It's an easy, economical way for you and your family to enjoy Coke. Special introductory offer good for a limited time only at participating stores in this area. So you'd better hurry and bring home Coca-Cola. It's the real thing. Coke.

A Coca-Cola advert from the Lebanon Daily News, 1974, calling their new 'No Deposit, No Return' plastic bottles an 'easy, economical way for you and your family to enjoy Coke' © newspapers.com



To this day, Coca-Cola and the beverage industry at large generate ad campaigns and PR initiatives that blame consumers for being ‘litterbugs’ and focus on the need for cleanups.

This campaign, launched in Europe in 2019, went so far as to tell consumers to not buy Coca-Cola if they weren't going to recycle the bottle, putting the onus firmly on the public to take responsibility for single-use plastic © Adam Stones

By the 1960s, Coca-Cola was using thousands of cases of aluminum cans that had no deposits and nowhere for consumers to return them, and therefore became litter. For decades and to this day, Coca-Cola and the beverage industry at large generated ad campaigns and PR initiatives that blamed consumers for being “litterbugs” (the term was popularized by the Keep America Beautiful ad campaign) and focused on the need for cleanups.

Early on, the biggest players in the industry formed a trade association – now known as the American Beverage Association (the ABA) – to lobby against federal government efforts to impose mandatory deposits and to ban throwaway containers. The ABA killed bill after bill that would have made its members contribute to the costs of collection and the reuse or recycling of beverage containers. Many reports have documented Coca-Cola and the beverage industry's efforts to avoid cost and responsibility through its PR machine and its history of killing bottle bills, taxes, and bans on single-use containers.³⁹

At a May 7, 1974, Senate Judiciary Committee hearing on the proposed Non-Returnable Beverage Container Prohibition Act (S.2062), the Nixon Administration

expressed its full support for the bill. The proposed national bottle bill would have set a mandatory national deposit on all soft drink and beer containers, and would have outlawed the use of non-returnable containers. The glass and aluminum container associations and the National Soft Drink Association (now the ABA) testified against the bill, saying the country had ‘outgrown’ returnables and promoting “resource recovery” (i.e. recycling) as the best alternative.⁴⁰



President Nixon supported proposed federal legislation to ban single-use beverage containers © Nancy Wong

Coca-Cola knew as far back as 1970 that reusable glass bottles were environmentally-preferable to single-use glass, plastic, and metal containers.

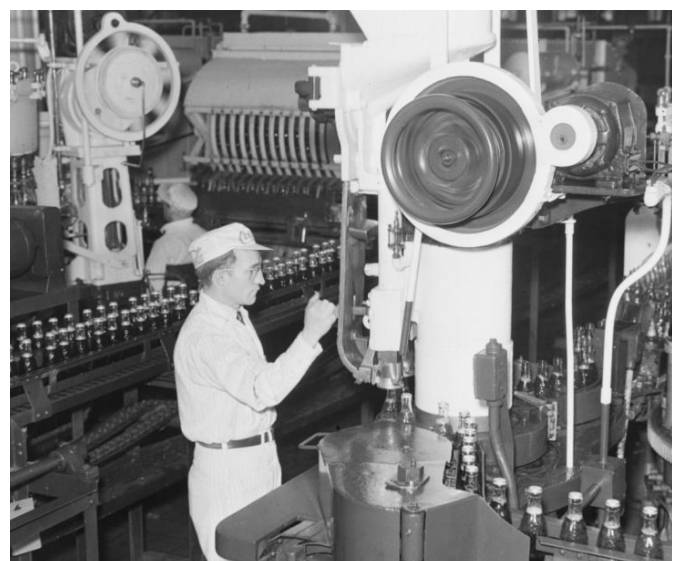
But the truth, as one owner of a small bottling company explained, was that the throwaway container “provided the medium through which the monopolization of the soft drink industry could be achieved... Discard the returnable/refillable deposit bottle system and the thousands of small and intermediate bottlers will no longer be needed.”⁴¹ The industry succeeded in killing the bill. By 1976, the federal government enacted the Resource Conservation and Recovery Act, which enshrined the resource recovery approach into US law and made it the responsibility of local governments and taxpayers to deal with waste.

By that time, Coca-Cola had already begun to investigate and subsequently invest in plastic bottles. In researching alternative packaging materials, Coca-Cola commissioned what some have called the first-ever Life Cycle Analysis (LCA) to investigate the environmental footprint of various containers used by the industry. With rising public anger about beverage container litter, Coke’s president at the time, Paul Austin, wanted to know the environmental footprint of various packaging options, including plastic bottles Coke began trialing around the same time. The results of that LCA were never made publicly available.⁴²

However, the same consultant from the Coke study, Robert Hunt, was commissioned by the United States Environmental Protection Agency (EPA) in 1974 to conduct a similar LCA. According to that report, a 10-trip returnable, refillable bottle had lower

impacts on the environment than single-use aluminum, bi-metal, steel, plastic and glass bottles.⁴³ Hunt later said that his 1974 LCA arrived at the same conclusion as the previous one, produced for Coca-Cola, in 1970.⁴⁴ This analysis was also supported by report co-author Arsen Darnay.⁴⁵

When interviewed by Bart Elmore, Hunt offered that the energy savings associated with plastic bottles were very attractive to Coke officials. It’s likely that discovery took on an even greater significance by 1973, with OPEC’s oil embargo and the rise in fuel costs and accelerated the company’s decision to transition to single-use containers – despite the fact that the plastic bottle is derived from oil. Over time, with major federal subsidies to the energy and petrochemicals industries, plastic has indeed become a cheaper material for Coca-Cola, which cemented the switch, and reinforced the company’s decision, despite the negative impacts on the environment, public health, and litter and disposal costs. That Coca-Cola decided to ‘see what it wanted to see’ in the findings of its own unpublished LCA, which reached the same conclusion as the subsequent 1974 LCA conducted by the EPA, is evidenced in an interview with Hunt, who confirmed that the research showed “that refillable bottles are far and away the best” environmental choice.⁴⁶ In doing so, Coca-Cola disregarded the bottom-line findings of the reports.



A Coca-Cola glass bottling plant in Canada, 1941

3.

The Scourge of Single-Use Plastic Beverage Bottles

We have a crisis of plastic – there’s too much of it to manage effectively, too much of it is unnecessary, and the environmental and health burdens associated with its production, consumption, and disposal disproportionately burden low-income communities and people of color.

Single-use beverage bottles are a large, unnecessary component of the plastic pollution crisis. Recycling and waste disposal options aren’t going to solve the problem – that’s where returnable reusable bottles come in.

Single-use plastic beverage bottles are a major source of plastic pollution and waste

Coca-Cola began developing prototype plastic bottles in partnership with Monsanto using a lopac bottle made of acrylonitrile-based plastic in the late 1960s and distributed 3 million containers in Rhode Island and Massachusetts by 1970.⁴⁷ The successor PET beverage bottle was developed in 1973 by Dupont as a cheaper alternative to glass. Today, the beverage industry buys and sells more than 580 billion PET plastic bottles per year – nearly 1 million per minute. Plastic bottles alone provide 25% of the global demand for PET plastic.⁴⁸



A single-use plastic Coca-Cola bottle floating down the Anacostia River, Maryland © Tim Aubry / Greenpeace

Today, the beverage industry sells more than 580 billion PET plastic bottles per year – nearly 1 million per minute.

In the US, 27% of all plastic produced is used for packaging. More PET packaging is used in the US than in any other country.⁵² Globally, plastic bottles account for 25% of PET plastic.⁵³ The worldwide generation of waste from single-use plastic has more than doubled in the past two decades, from 156 Mt in 2000 to 353 Mt in 2019.⁵⁴

Strategies for managing plastic waste (recycling, landfill, and incineration) are failing to prevent single-use plastic waste from entering the environment. In 2019, an estimated 22 Mt of plastics leaked into the environment⁵⁵ – 6% of the waste generated. Estimates of the magnitude of the “leakage” to the ocean vary, as do the methods and models used to generate them. In one recent peer-reviewed analysis, 15 million metric tons per year – or 33 billion pounds of plastic – are estimated to enter the ocean each year,⁵⁶ equivalent to two garbage trucks per minute.⁵⁷

In 2018, the equivalent of 21 to 34 billion one-liter PET bottles generated by the non-alcoholic beverages industry reached the ocean, representing 706,000 to 1.1 million metric tons (MT) of plastic bottle waste.⁵⁸ If 1 million MTs of the 15 MT of plastic that enter the ocean each year are single-use plastic bottles, they represent as much as 7% of the marine plastic pollution problem.

These numbers explain why plastic beverage bottles are consistently one of the top 10 sources of marine plastic pollution reported from International Coastal Cleanup. In 2021, plastic beverage bottles were the No. 2 of the top 10 littered items collected during International Coastal Cleanup Day.⁵⁹

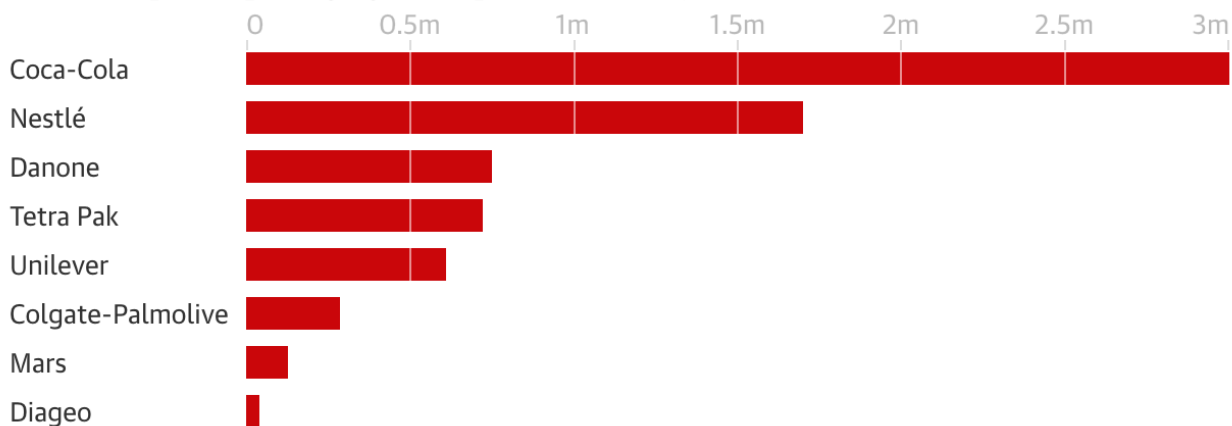
Coca-Cola’s plastic bottles are a significant part of the problem. Data collected in 44 countries by 14,760 volunteers organized by the #breakfreefromplastic movement










The Coca-Cola Company accounts for 23% of the worldwide demand for PET plastic beverage bottles. It buys more than 134 billion PET bottles per year globally⁴⁹ – the equivalent of 255,00 bottles per minute and 4,250 per second, and equal to the annual emissions of 16 coal-fired power plants.⁵⁰ It produces 3 million tons of plastic packaging waste annually.⁵¹

ADAPTED FROM Ellen MacArthur Foundation (2022). [The Global Commitment Report](#).

Producing plastic waste: how some of the biggest household names compare

Tonnes of plastic packaging waste produced each year



Year	Brand Audits	Volunteers	Countries and Territories	Total Count	Top 3 Polluters
2018	240	8,802	43	255,429	①  ②  ③ 
2019	721	157,415	52	763,004	①  ②  ③ 
2020	575	14,734	55	346,494	①  ②  ③ 
2021	440	11,184	45	330,493	①  ②  ③ 
2022	397	14,760	44	429,994	①  ②  ③ 
Total	2,373	206,895	87	2,125,414	①  ②  ③ 

Brand Audit 2018-2022 by #BreakFreeFromPlastic

between 2018 and 2022 shows that plastic bottles were the most common plastic item found on beaches worldwide and Coca-Cola was consistently the number one brand associated with plastic pollution. PepsiCo held second place and Nestlé held third in four of the five years.⁶⁰

The human health threats of plastic

Since plastic in the environment continually breaks down into ever smaller particles, plastic is now enmeshed in our ecosystems and our bodies. Plastic has been found at the top of Mount Everest and in the deep ocean Mariana Trench. From pelagic birds, to ocean life at all levels, to camels, elephants, hyenas, tigers and cattle, more than 1,550

wildlife species have been found to be eating plastic, and many are dying of starvation with stomachs full of plastic.⁶¹

An emerging scientific consensus indicates plastic as a food or beverage contact threatens human health due to the leaching of toxic chemicals and endocrine disrupters – a phenomenon that may be worsened when plastic is recycled.⁶² Humans eat, drink and inhale microplastics.⁶³ Microplastics have been detected in bottled water, beer, and soft drinks, linking the presence of microplastics to the water sources used, the production processes and capping of the bottles, contamination from the air, and the plastic bottles themselves.⁶⁴



A dead albatross chick with a stomach full of plastic found in the Midway Atoll National Wildlife Refuge © U.S. Fish and Wildlife Service Headquarters / Chris Jordan / CC BY 2.0

Lab animal studies show that exposure to microplastics can disrupt the gut microbiome, lead to inflammation, lower sperm quality and testosterone levels, and negatively affect learning and memory.⁶⁵ Nanoplastics (less than 1 micrometer in length) are small enough to migrate through human tissue, circulate in the bloodstream, and find their way to the major organs as well as the human placenta.⁶⁶ Animal studies also show the ability of nanoplastics to cross the blood-brain barrier, raising fears of neurotoxicity.⁶⁷

Throughout its life cycle – from the extraction and production of hydrocarbons to make plastic bottles and during the consumption and disposal phases- the plastic bottle pollutes. In *Hidden Hazards: The Chemical Footprint of a Plastic Bottle*, Defend Our Health (DoH) investigated the different chemicals that go into the production of a PET plastic bottle used by The Coca-Cola Company and traces the supply chain back to the companies that produce these ingredients. It includes a facility-by-facility review of the type and quantity of toxic chemicals released in 2021 to air and water, the CO₂ equivalent emissions, and the disproportionate impacts on the people of color and low-income residents in the communities surrounding each facility.

DoH reports that the use of PET plastic resin for bottling beverages pollutes surrounding communities, which are disproportionately low-income and people of color, and has a significant role in changing climate at every step in the life cycle of a bottle – production, use, and disposal. All along its chemical supply chain, PET plastic pollutes air, water, and food with cancer-causing chemicals.

Each year, 211.5 million pounds of toxic chemicals are released into air, water, and land across the PET plastics supply chain in North America. Antimony, 1,4-Dioxane, Cobalt, and Monoethylene Glycol (used to make EtO), Benzene, and Ethylene are the top chemicals of concern in this pollution mix.⁶⁸ Each of these chemicals is associated with varying, high degrees of cancer risk and other human health hazards.⁶⁹

There are 300 chemicals found in PET plastic. At least half of them migrate from the packaging into food and beverages, and are not authorized to be used in food contact materials such as beverage bottles. One of these migrating chemicals, antimony, is used as a catalyst to make PET plastic. It can cause cancer and is toxic to the liver, thyroid and heart.⁷⁰

Disproportionate impacts on people of color and low-income populations

People of color and low-income populations are disproportionately impacted by pollution throughout the life cycle of PET. Extraction facilities poison the air and water resources of surrounding communities. Horizontal drilling, hydraulic fracturing, and other forms of extraction to reach previously unattainable oil and gas deposits have greatly expanded the exposure of communities on the fenceline of oil and gas production to a toxic brew of chemicals.

More than 1,000 chemicals are used in fracking injection fluids, resulting in toxic wastewater. Many are associated with cancer and other health risks.⁷¹ Hundreds of hazardous air pollutants and adverse impacts to drinking water are associated with releases from unconventional drilling sites, with disproportionate impacts on fenceline communities.⁷²

During the production of ethylene to make PET, 57% of the production plants in the US are in communities where people of color exceed the national average of 41%. Meanwhile, 83% of PET supply-chain chemical plants in the US are located in communities where the proportion of residents who are low-income exceeds the national average of 27.5%.

At the waste disposal end, 79% of municipal waste incinerators that burn plastics in the US are located in communities where at least 25% of the population are people of color or at least 25% live below the federal poverty line.⁷³

Greenhouse gas emissions and the climate footprint of PET bottles

The PET plastic supply chain emits nearly 9 million metric tons of greenhouse gasses in North America every year, about the same amount as the annual emissions of 2



Daria C. Guerra Leverage, of Longmont, near hydraulic fracturing infrastructure in Windsor – one of the most intensively fracked areas in the United States © Les Stone / Greenpeace



Children playing near a hydraulic fracturing drilling rig on the shore of Lake Windsor, Colorado © Les Stone / Greenpeace

million cars. With PET production projected to double in the next decade, so too will its climate impacts.⁷⁴ One to two tons of CO₂ is produced for every ton of ethylene produced. Producing ethylene is the second most climate-intensive chemical production process known, topped only by ammonia production.⁷⁵ In 2022, the 134 billion plastic bottles the Coca-Cola Company used⁷⁶ amounted to approximately 16 million tons of carbon emissions,⁷⁷ the equivalent annual emissions of 16 coal-fired power plants.⁷⁸

Significant expansion in plastics production is underway in the US. For the 157 largest new or expanded oil, gas and chemical production facilities that have been permitted in the US, the greenhouse gas pollution emissions could increase by 30% by 2025 compared with 2018. The estimated emissions increase is equal to the GHG pollution of 50 new coal-fired power plants.⁷⁹

The end-of-life emissions related to plastics disposal are frequently overlooked. A recent study showed that PET and other common types of plastic release methane and ethylene – powerful greenhouse gasses – once exposed to sunlight. After sunlight exposure, the release of these gasses continues with or without ongoing exposure.⁸⁰ Methane is 25 times more potent than CO₂ at trapping heat in the atmosphere.⁸¹

Recycling alone won't solve the problems with plastic

Plastic recycling has been a dismal failure. Only 9% of plastics produced globally have been recycled,⁸² the majority of which was “downcycled”, meaning the material was not used circularly for “like-for-like” products but used for alternate products, just one stop on the way to their eventual disposal. As of 2021, a paltry 5-6% of plastics are being recycled in the US.⁸³ PET bottles are considered one of the few recyclable plastics, but in 2021 the US PET bottle recycling rate was only 28.6%.⁸⁴ From 2019-2021, single-use plastic made from virgin polymer grew 15 times that made from recycled feedstock.⁸⁵

Historically, the US and many other Western countries have been heavily dependent on China for recycling their plastic packaging, despite little visibility over the final destination for that material – mostly not recycling. In 2018, Beijing enacted its



Since China's 'National Sword' policy, countries in Southeast Asia have accepted an increased amount of plastic waste from developed nations, seen here at a dumpsite in Malaysia © Nandakumar S. Haridas / Greenpeace

“National Sword” policy, effectively banning the export (or dumping) of plastic waste into China and sending recycling markets into chaos. China's outsized role in importing plastic waste since the 1980s enabled a fiction of plastics recycling resulting in an explosion of plastic packaging.⁸⁶ The Basel Convention effectively made the ban on plastic waste exports global.

While recycling is better than disposal (landfill and incineration) or allowing plastics to escape into the environment, it comes with many downsides. From the chemical and water intensity of the processes, to the carbon and chemical emissions, to the microplastics generated by mechanical recycling and the concentration of toxic chemicals in recycled content,⁸⁷ recycling more plastic should not be the end goal. The solid waste management hierarchy of the 1970s got it right when it placed Reduce and Reuse as higher priorities than Recycle in the 3Rs.

4.

The Environmental Benefits of Reusable Beverages

Reducing plastic pollution and litter

Reusable beverage bottles can dramatically reduce waste and eliminate litter.⁸⁸ Oceana reports that 76 coastal countries collectively contribute 20 to 34 million plastic bottles to oceans each year. Increasing the reusable containers by 10% in all coastal countries could reduce marine plastic pollution by 22%, keeping 4.6 to 7.6 million PET bottles per year out of the oceans. A 20% increase in reusables could reduce marine plastic pollution by 39%, and 50% reuse could lead to an 83% decrease in marine plastic pollution.⁸⁹

Oceana also estimates that if Coca-Cola meets its commitment to reach 25% reusable packaging by 2030, the company could avoid producing the cumulative equivalent of more than 100 billion 500ml single-use plastic bottles and cups. In addition, approximately 8.5 to 14.7 billion plastic bottles and cups could be prevented from reaching our waterways and seas.⁹⁰

LCAs demonstrate the environmental benefits of reusable beverage bottles

LCA is the most commonly used method for assessing the impacts of products across their life cycle, from cradle (extraction) through manufacturing and consumption, to grave (disposal). While LCAs can be fairly comprehensive in scope, considering up to



A long-beaked common dolphin off the Southern California coast © David McNew / Greenpeace

HOW MUCH PLASTIC BOTTLE POLLUTION CAN BE PREVENTED BY REUSE IN THE US?

In the US, the equivalent of 300 million one-liter PET bottles per year end up in the ocean. A 10% increase of reusable bottles in the US market would reduce PET marine plastic bottle pollution by 22% (4.6 to 7.6 million bottles per year).⁹¹

15 types of environmental impact,⁹² most usually consider just one or two, commonly energy consumption and/or the carbon emissions. LCAs are far from perfect.⁹³

Assumptions, such as sources of energy, transportation distances and methods, production processes and waste disposal methods, are often used to skew the results. Industry-funded LCAs must be viewed carefully as industry consultants cherry-pick data and comparisons to present desired outcomes.⁹⁴ Plastic pollution, litter, and human health impacts of exposure to toxic chemicals in products are not currently included among the impacts considered by standard LCAs.

Despite their faults, LCAs are the standard technical tool for assessing and comparing the environmental impacts of products. Compellingly, despite the exclusion of plastic pollution, litter, toxic chemical exposure and health impacts, past reviews of single-use versus reusable packaging have still determined that reusable packaging wins when it comes to environmental impact.⁹⁵

Various LCAs have investigated the environmental benefits of reusable beverage containers versus single-use containers. In general, reusables can reduce up to 40% of raw materials inputs and 50% of greenhouse gas emissions of beverage containers.⁹⁶

Looking at the specific case of reusable glass bottles as compared to single-use bottles, a few conclusions can be made.

Reusable glass is preferable to single-use glass, aluminum, and PET containers

Although glass is generally heavier than plastic and aluminum, and therefore requires more energy to produce, transport and recycle, reusable glass bottles have a lower environmental impact overall than single-use glass, PET bottles, and aluminum cans.

- ▶ Reusable glass vs. single-use glass, PET and aluminum. Compared to single-use glass, PET, and aluminum, reusable glass bottles were found to be the clear winner, with 85% lower emissions compared to single-use glass bottles, 75% fewer emissions than single-use PET bottles, and 57% lower emissions than aluminum cans.⁹⁷
- ▶ Reusable glass vs single-use glass. Considering carbon emissions alone, for single-use bottles, glass is generally the least preferred material due to the energy consumption and emissions related to production and disposal. But when glass is reused two to three times, it results in a 40% reduction of CO2 emissions compared to single-use glass.⁹⁸ Where glass bottles were reused only five times, emissions associated with reusable bottles were a third of the single-use glass bottle emissions.⁹⁹



© Anh Tuan To

Reusable PET is preferable to single-use PET

An evaluation of Coca-Cola's Universal PET bottle compared to a single-use bottle found the reusable could reduce carbon emissions up to 47% and the water footprint could be reduced by 45% with reuse.¹⁰⁰

Both provide benefits over single-use. PET achieves greenhouse gas reductions compared to single-use in fewer use cycles than glass, but the difference isn't always that significant. In one study, it took one cycle for reusable PET to achieve lower emissions than single-use PET, whereas it took two for glass.¹⁰¹

However, the LCA doesn't consider other factors that might make glass a better choice. There are better recycling outcomes with glass – it can be recycled more times, recycling can be closed loop, and it's more readily used for food grade products – offers higher potential to decrease the impacts of glass. It's challenging to pick a "winner" using LCA because of the variables and assumptions that go into it.¹⁰² Looking beyond LCAs, food safety, recyclability, and the disproportionate burdens of plastic on communities that are low-income or people of color are reasons to prefer refillable glass.

An evaluation of Coca-Cola's Universal PET bottle compared to a single-use bottle found the reusable could reduce carbon emissions up to 47% and the water footprint could be reduced by 45% with reuse.

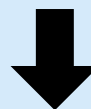
THE NUMBER OF USES FOR REUSABLES TO BREAK EVEN IS LOW

It doesn't take many uses of a reusable glass bottle to break even with the single-use alternative. Reusable glass bottles would have to be reused only three times for its emissions to break-even with those of aluminum cans and 0.5L PET bottles. The authors concluded that since emissions reductions level off at about eight reuses, a case can be made for reuse between one and five uses.¹⁰⁵ Another found that refillable PET should be used at least 15 times and refillable glass should be used at least 25 times.¹⁰⁶

REUSABLE GLASS BOTTLES GENERATE:



85%
lower emissions
than single-use
glass bottles



75%
lower emissions
than single-use
plastic bottles



57%
lower emissions
than aluminum
cans

Credit: Coelho, P., Corona, B., Worell, E. (2020). Reusable vs. single-use packaging: a review of environmental impacts, ReLoop and Zero Waste Europe

Specific factors affect the environmental outcomes of reusable beverage containers

Materials used, number of use cycles, transportation distances, production processes, and recyclability must be considered.¹⁰³

- ▶ **A small number of use cycles are needed to make reusables better than single-use.**

Due to its heavier weight and use of more materials, the refillable container must be used repeatedly in order to achieve environmental benefits over the single-use option. At some number of uses, the reusable breaks even in impact with the single-use container and thereafter environmental benefits begin. Generally, GHG emissions benefits of glass bottle reuse are significant in the first few uses but begin to level off after about eight uses.¹⁰⁴

Typical reuse rates

The average reuse rate for reusable glass is 25 - 30 cycles.¹⁰⁷ Beverage companies report that the average number of uses for reusable glass bottles is up to 50 times, and for PET bottles up to 20 times, before they are retired and recycled.¹⁰⁸

- ▶ **Transportation distances should be kept low.**

For single-use packaging, it is typically the production phase that causes the greatest GHG emissions, but for reusable packaging, the use phase generates higher emissions, mainly due to transportation. This is because there are additional transportation miles associated with the return logistics for reusables, while single-use requires only one-way transport.¹⁰⁹ Generally, reusable beverage bottles are superior to single-use as long as they are not distributed over long transport distances.¹¹⁰

- ▶ **The mode of transport is important.**
GHG emissions vary depending on the mode of transport. One trip across the US by a truckload of reusable bottles can wipe out their climate benefits, while transport from the US to Europe by ship may result in a positive outcome, based on the type of fuel.¹¹¹ To meet their carbon emissions reduction commitments, beverage companies should choose lower emission transport methods.

- ▶ **Weight and volume of packaging are factors during transport.**

Packaging optimized for space will be associated with lower transport emissions. The bigger the volume of packaged product, the lower the impact.¹¹² Smaller packaging formats have higher emissions since they require more material per volume of beverage.¹¹³

- ▶ **Production impacts lessen with reuse and recycling.**

A reusable packaging system with high recycled content and recyclability will lead to further emissions reductions over the entire life cycle.¹¹⁴ Glass can be recycled in a closed-loop and has high reusability, which allows it to be reused many times.¹¹⁵ But recycling has a limited impact on the use of virgin plastics. In Germany, which has a 90%+ rate of recovering plastic packaging waste, the high level of recycling has a limited impact on reducing plastic production. The country's high recovery rate leads to a reduction of 18.2% in the use of virgin plastic. This serves to highlight the need for circular reuse systems, the more resource-efficient and climate-friendly packaging option.¹¹⁶

5. The Economic Case for Reusable Bottled Beverages and DRS

Mandatory reuse targets make good economic sense

Reusable beverage packaging can save beverage manufacturers money. Significant upfront investments in washing facilities, reusable bottles and logistics structures are required for returnable reusable beverage systems. However, once established, the system avoids the need to purchase bottles for each filling. Beverage manufacturers with regional production and distribution structures can take advantage of operational cost savings potential.¹¹⁷

A recent analysis of the return on investment (ROI) for a regional refillable PET beverage bottle pooled system in Germany with maximum of 300 km transport routes found that to establish a 6 million bottle per year system, the ROI would start in year five and by year 10 the system operator would have a 16.4% ROI.¹¹⁸ In other words, the company would recoup its investment by year five, and realize significant savings each year by year 10.

Reusable beverage systems also have the potential to save local governments money related to costs of waste management, recycling,¹¹⁹ and litter cleanup. DRS systems also provide cost savings for litter. In pre

DRS creates 11 to 38 times more jobs than curbside collection because DRS systems collect more beverage container materials (three times more).

and post bottle bill surveys, the percent of litter reduction in states where studies were conducted have been between 70% and 84%.¹²⁰

DRS creates more jobs than one-way disposal systems

Beverage packaging in a deposit system brings higher numbers of jobs than non-returnable single-use packaging.¹²¹ The Container Recycling Institute (CRI) found that DRS creates 11 to 38 times more jobs than curbside collection because DRS systems collect more beverage container materials (three times more). DRS also creates five times more jobs in container collection, sorting and transport than in garbage collection, hauling, and landfilling. More workers are needed for DRS programs (1.5 - 4 times as many) to collect and sort the containers and transport them to materials recovery facilities (MRFs) or secondary processors.¹²²



Reusables represent an overall market share of 23% by volume globally.

A customer using a refillable cup at a market in Böblingen, Germany © Martin Storz / Greenpeace

Reloop's evaluation of 13 studies and reports examined the job metrics of implementing or extending DRS for beverage containers. Every study showed that DRS not only have a positive impact on the environment, but on jobs as well.¹²³

In 2020, the California redemption program provided more than 8,000 full-time equivalent jobs statewide. Changing Markets estimated that including wine and liquor containers and achieving a 96% redemption rate in California's system would nearly double the redeemed tonnage of materials and almost double the number of jobs to 13,000.¹²⁴ The number of direct and indirect jobs created by New York's DRS was over 5,700 in 2017.¹²⁵

Reusable beverage bottles create more jobs

Even more workers are required in a reuse system. Single-use container management is more automated than reuse and involves only one trip– the logistics are simpler. In a 1998 study, the European Commission found that increased use of reusable beverage containers could create 27,000 new jobs in Germany.¹²⁶

Reusable bottle systems are part of modern consumption in many parts of the world

Today, reusable bottles – both glass and PET plastic – are used in 94 countries worldwide.¹²⁷ Reusables represent an overall market share of 23% by volume globally. Most of the top 10 global non-alcoholic beverage markets, including China, Mexico, Indonesia, India, Brazil, Germany, and Turkey have reusable market shares ranging from 26% - 61%.¹²⁸

The major markets that have low reuse rates for beverage bottles include the US, Japan, and the EU. In the US and Japan, only 4% of non-alcoholic beverages are sold in reusable bottles. In the EU, Germany has the highest market share at 35%, whereas the reuse market share in Finland is 2%, France, Sweden, Ireland and the UK are 3%, Denmark, the Netherlands, and Greece are 4%, Romania and Portugal are 5%, and Spain is 6%.¹²⁹



A Deposit Return Scheme at a UK festival © Greenpeace

DRS helps to enable the switch to reuse

In the analysis of the costs of single-use vs. reuse, companies can no longer assume that the costs of single-use will continue to be externalized. The increasing push toward plastic taxes and producer responsibility laws, along with the growing risk of lawsuits, show that the public is no longer willing to allow businesses to exclude the environmental costs of single-use packaging from their balance sheets.

Decades of NGO advocacy in the EU for producer responsibility in the packaging sector are yielding improved results both for recycling and increasingly for reuse. Germany's 1991 Packaging Ordinance was the first Extended Producer Responsibility law in the world.¹³⁰ Zero waste advocates helped bring the concept of producer responsibility for the prevention of packaging waste to the whole EU in 1994 with the bloc's

Directive on Packaging and Packaging Waste. But because it only set targets for recycling, it never achieved the prevention of waste.

After decades more advocacy for packaging prevention, European zero waste advocates got reuse integrated into the proposed revision of the Packaging and Packaging Waste Directive from November 2022. It included a wide array of reuse quotas for packaging, including 10% of non-alcoholic beverages in reusable packaging by 2030 and 25% by 2040; 5% of wine by 2030 and 15% by 2040, 10% of alcohol by 2030 and 25% by 2040, and cold or hot beverages for take-away 20% by 2030 and 80% by 2040,¹³¹ which is receiving intensive pushback from industry, led by McDonald's.¹³² The fact that reuse quotas made it into the proposed revision of the Directive is evidence that reuse quotas are gaining traction. So too are the number of national and regional laws that establish targets for reusable beverage packaging.

Mandatory DRS policies are also increasing – from 38 in 2010 to 58 in 2020. The EU Directive on Single-Use Plastics targets a 90% rate of separate collection of plastic beverage bottles by 2029 (and 30% recycled content by 2030) and would require member states to establish DRS for single-use plastic and metal beverage containers.¹⁴⁰ The recycled content mandate drives industry support for DRS in order to recover enough materials to meet the requirement.

Jurisdictions with effective DRS programs and mandatory reuse quotas are more likely to see increases in the market share for reuse systems in the beverage sector because DRS provides the mechanism and incentives for consumers to return containers. Based on the growth of DRS policies, fueled by both the EU Single-Use Plastics Directive and the growth of DRS policies worldwide, CRI predicts that more than 1 billion people will live in jurisdictions with DRS in place by 2030 – up from nearly 300 million people in 2017.¹⁴¹

LAWS MANDATING QUOTAS FOR REUSABLE BEVERAGE CONTAINERS

An increasing number of countries have established beverage container policies with reuse quotas built-in:

- ▶ **Germany's** 2018 packaging law set a 70% reuse target for all beverage containers by 2022.¹³³
- ▶ **Navarra and the Balearic Islands** in Spain require hospitality businesses to serve bottled water in reusables (40% in Navarra and 50% in the Balearics), 70% of soft drinks and 80% of beer in reusable packaging, and retail stores must sell 15% of soft drinks in reusable packaging by 2028.¹³⁴
- ▶ **Austria** set a mandatory target of 25% reusable packaging by 2025 and 30% by 2030, which includes beverage packaging and set in place a national DRS and a levy on plastic packaging. By 2025, all retail stores are required to sell/accept returnables.¹³⁵
- ▶ **Romania** requires businesses to reach 5% annual average reusable packaging, increasing by 5% year on year to a minimum of 25% by 2025.¹³⁶
- ▶ **France's** Anti Waste Law aims to increase reusable packaging to 5% of the market by 2023 and 10% by 2027.¹³⁷
- ▶ **Spain** has adopted a national decree signaling its intent to adopt beverage reuse quotas in the hospitality sector for water, beer, juices, and soft drinks; as well as a general beverage packaging reuse target for domestic consumption.¹³⁸
- ▶ **Chile** has adopted a law that requires supermarkets to sell 30% of beverages sold in reusable returnable bottles in supermarkets.¹³⁹

Industry is already investing in reuse abroad

The global returnable-packaging market size was valued at \$30.5 billion in 2019, and is expected to grow at a rate of 5.4% from 2020-2027.¹⁴² In 2018, the value of the global reusable-water-bottle market was approximately \$8 billion; by 2025, it is projected to reach almost \$11 billion.¹⁴³

Beverage companies are beginning to grow their reusable businesses in important markets because of their appeal to more price-driven customers.¹⁴⁴ This trend can be seen particularly in Latin America; for example, in Brazil, where the reusables market share increased from the low single digits to over 20%.¹⁴⁵

The universal bottle initiative is part of a greater strategy for Coca-Cola Latin America to increase the share of reusable packaging (both glass and PET). Coca-Cola Latin America has invested more than \$500 million in expanding the reuse infrastructure (bottle cleaning, labeling, refilling) to accommodate the universal bottle. As of 2020, reusable bottles (glass and PET) represent 27% of sales and were the fastest-growing packaging format in 2018 and 2019. The universal PET bottle is being piloted in South Africa and in 2020 Coca-Cola stated it would launch a universal design of the reusable glass bottle as well.¹⁴⁶

Plastic pollution is a liability for the beverage industry

Institutional investors and banks report that the plastic pollution problem is creating economic and legal threats to companies.¹⁴⁷ Some investors are calling on big brands to decrease plastic usage,¹⁴⁸ while others are going further and encouraging a switch to reusables.¹⁴⁹

HSBC advises its investors to buy stock in Coca-Cola Euro Pacific Partners (CCEP) because of the opportunities in Indonesia, a country mired in plastic bottle pollution. They argue that CCEP's #1 ESG risk is the ocean plastic waste it generates, warning that rising consumer concern may cause brand rejection. Further, recycling can't ensure the return rates that refillables do in Indonesia as the growing quantity of plastic bottles is likely to outpace what waste pickers, the primary return mechanism, can collect.¹⁵¹

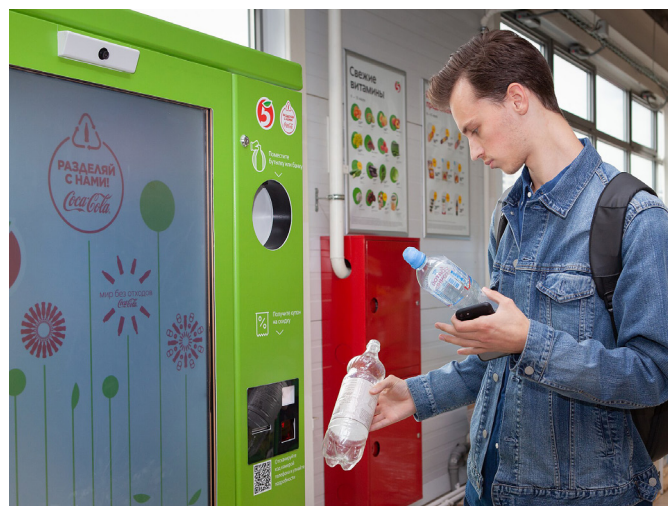
Pressure for beverage industry giants to shift to reusable packaging is also coming from inside the company's own shareholders. Coca-Cola's pledge was announced in part in response to a shareholder resolution filed by Green Century and As You Sow, urging Coca-Cola to reduce single-use plastic and raise its refillables commitment.¹⁵²

Expanding DRS and reuse provides economic opportunities for new businesses

The growth in DRS is creating the ideal conditions for companies with Reverse Vending Machine (RVM) technology, optical sorting and washing facilities, and mechanical recycling infrastructure.¹⁵³ Demand for convenient return options will drive the expansion of RVM technology. The RVM market is occupied by several key players, including Diebold Nixdorf, Envipco, Incom, Kansmacker, Siemens and TOMRA.¹⁵⁴

INVESTORS URGE BEVERAGE BRANDS TO MOVE TO REUSABLE

Carlos Laboy – the Global Beverage Head and Latin American Food Analyst at HSBC – noted that “the global beverage industry is grappling with the risk of brand damage and higher regulatory costs from its outsized reliance on disposable plastic bottles.”¹⁵⁰



A Coca-Cola reverse vending machine in Moscow
© Flickr / X5 Retail Group

The global RVM market is expected to grow 8.4 times by 2029, from 84,100 installed machines in 2019 to a potential of 705,257 installed machines in 2029. Performance in the RVM market is typically linked with policy development. In Europe, this growth is likely to start to ramp up in response to the final adoption of the 2022 Plastics Directive update.¹⁵⁵

The expansion of reuse systems also creates opportunities for investment in refill machinery and the industrial machinery and reverse logistics for washing bottles. There are also growth opportunities for businesses that provide digital platforms that use RFID tags, QR codes, sensors, and GPS tracking in reuse systems that allow businesses to gather valuable information on user preferences and system performance.¹⁵⁶

DRS also creates business opportunities for companies that own and lease bottles to beverage producers.¹⁵⁷ Because the average number of cycles can be increased with containers designed to withstand rough handling through the supply chain, demand will be highest for durable, universally-designed containers that can be shared across brands, sectors, and networks of industry players.¹⁵⁸ Universally-designed containers come in standardized shapes that create efficiencies in storage and distribution space.¹⁵⁹

POOLED SYSTEMS PROVIDE EFFICIENCY FOR REFILLABLES – POLICY MANDATES WILL HELP THEM SCALE

Pooled systems operated by third parties, such as The Oregon Beverage Recycling Coop (OBRC), which manages the recovery of bottles for Oregon’s bottle deposit program, can provide efficiency in the reverse logistics for refillables. By owning the packaging and operating the storage, repair and redistribution, the system ensures against supply chain disruptions.¹⁶⁰

This only statewide refillable system in the US, with more than 2 million reusable glass bottles in circulation, the program started through a partnership between OBRC, a Distributor Responsibility Organization, and Double Mountain, a craft brewery. The partnership developed a standardized reusable glass bottle that is used by a dozen breweries, cideries and wineries across the state in delivering their beverages to customers. OBRC collects used bottles from thousands of points of return across the state, takes them to be washed and reused, and returns them to the breweries for refill.¹⁶¹ This is a great system but it has not expanded beyond craft brewers since its introduction in 2018. Policy mandates are needed to help systems like this scale.

“One of the recent tremendous benefits of being in the refillable program, we discovered during the pandemic’s related supply chain interruptions. Our competitors were running up with short supplies of both cans and traditional glass bottles with reduced production capacities and since we owned our supply of reusable bottles, we suffered zero disruptions from lack of packaging materials and our pricing stayed consistent through a tough inflationary period. I am sure it gave us a jump over other breweries and cideries in the market to be able to move faster.

Another advantage of returnable bottles is the reduction in packaging costs. Even with costs associated with shipping and cleaning, our reusable bottles are about 60% of the cost of new glass. So in addition to the added environmental benefits, it lowers our cost as well.”

**– Matt Swihart,
Double Mountain Brewery**



Photos courtesy of Double Mountain Brewery



6. Deposit Return Systems – the Key to Reducing Beverage Waste and Increasing Reuse in the United States

Bottle deposits are a longstanding method for ensuring high bottle return rates. In 1929, the Coca-Cola Company surveyed approximately 300 Coca-Cola bottlers and found that 80% of bottlers used a deposit system of two cents per bottle and the bottles were averaging 40-50 return trips to bottling plants. Soft drink bottles had a return rate of 96% as late as 1948.¹⁶²

Deposits ensure high return rates needed to achieve high use rates

There is ample evidence that attaching a deposit to the bottle drives customer returns. Internationally, on average, curbside collection systems for PET plastic beverage containers achieve a 47% recycling rate whereas DRS achieves 94%.¹⁶³

In the US, an average of 27% of beverage containers collected in states with bottle recovery are recycled in curbside systems and 72% are recycled in deposit systems.¹⁶⁴ Generally, DRS systems in the US lead to the recycling of approximately three times more beverage containers than states with no deposit and only curbside collection.¹⁶⁵

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This is in part due to the financial incentive DRS provides to return for recycling, and because materials collected through DRS are less contaminated than those collected curbside.¹⁶⁶

In newer European DRS programs such as those in Estonia and Lithuania that offer both reusable and single-use bottles as part of the program, DRS has been shown to improve the efficacy of reusable bottles because it achieves a high return rate.¹⁶⁷

The higher the deposit, the more containers will be returned

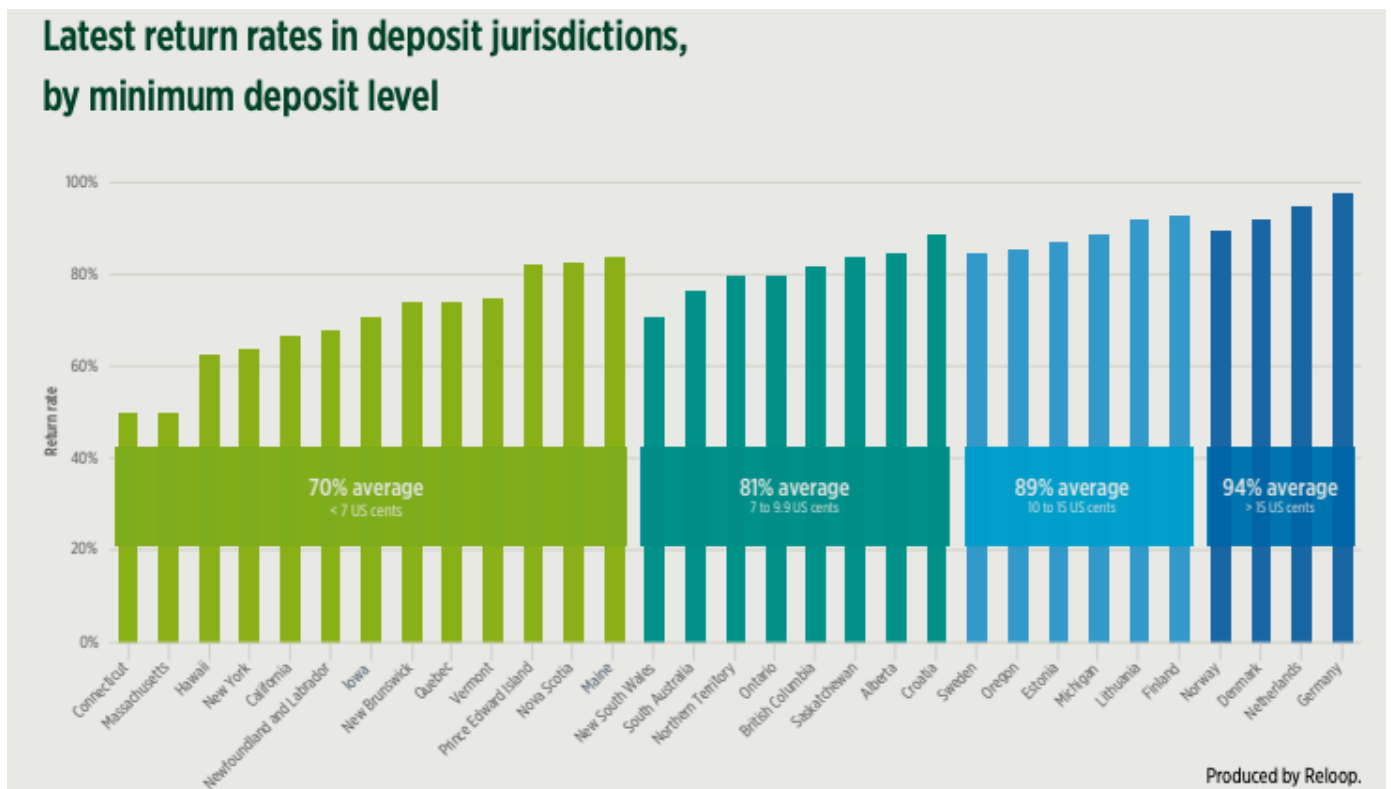
The average return or collection rate for jurisdictions with deposits in 2018-2019 was 79%. Jurisdictions with less than 7 US cents deposits achieve an average 70% return rate, whereas those with a 7 to 9 cents deposit achieve on average 81%, 10 to 15 cents yields an 89% average, and greater than 15 cents results in 94% returns on average.¹⁶⁸

The success of DRS at achieving high collection and recycling rates for bottles is leading more jurisdictions to enact DRS legislation. In 2010, there were 38 jurisdictions worldwide, including 10 in the US, that had enacted deposit laws or ‘bottle bills’ to address the litter problem, recover valuable resources, and boost recycling.¹⁶⁹ By the start of 2020, there were 58.¹⁷⁰ The number of DRS policies is expected to grow to more than 70 by the end of 2026.¹⁷¹

DRS reduces litter and marine plastic pollution

The proportion of containers found in coastal litter surveys in states with DRS laws is approximately 40% lower than in states without these laws.¹⁷² Oceana reports that a modern, well-designed DRS, whether implemented for refill or recycling, could reduce the littering of beverage containers by 95% and the volume of litter could be reduced by approximately one-third.¹⁷³ Changing Markets Foundation calculates that improving the Californian bottle bill to align it with a best-in-class DRS system could further decrease aluminum can and PET bottle litter by 45%.¹⁷⁴

Produced by Reloop in 2019 from What We Waste (2021)



Reusables and DRS correlate with lower waste disposal rates

Reloop evaluated data from 93 countries to examine the trends in sales, collection, and waste disposal of beverage containers between 1999 and 2019. These countries comprise 81% of the world's population. Countries with the lowest waste rates (landfill, incineration, and litter) per person collect beverage containers in a DRS program both for single-use and reusable containers.¹⁷⁵ In countries with DRS, waste disposal levels were on average 78.6% lower in 2017 than those without DRS.¹⁷⁶

In general, countries with greater than 25% reusable market share, even if they have no DRS, have lower per capita waste disposal rates than those whose reusable market share is below 25%. In countries with a 25%+ market share of reusables in 2017, the average per capita waste disposable rate was 46 bottles, whereas for those with a smaller or nonexistent reusables market share, the average waste disposal rate was doubled, at 95 per capita on average.¹⁷⁷

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In countries with DRS, waste disposal levels were on average 78.6% lower in 2017 than those without DRS.

Why DRS is the preferred system for bringing back refillables in the US

Government-mandated DRS aren't the only way to ensure high return rates. Coca-Cola's bottlers that used to and/or still use refillable bottles in countries that don't have DRS achieve high return rates also through applying deposits. In addition, container deposits. In Latin America, Coca-Cola FEMSA has been expanding its refillable bottle portfolio with significant investment in the Universal PET bottle system. Consumers pay an indirect deposit on bottles which results in a discount - or reward- when the bottle is returned. The reward system achieves high return rates with its discount reward system. The system achieves a 90% return rate.¹⁷⁸ Container deposits, eco-taxes and reusables quotas are all elements of producer responsibility schemes that governments use to build the environmental costs of the packaging into the product cost and ensure that beverage companies take responsibility for their packaging.

Government-mandated DRS is preferable because it ensures that the infrastructure is created for return logistics that can work across an entire industry rather than one brand enabling the possibility of achieving far greater scale for reusables. DRS is also proven to be the most effective way to achieve high recovery rates for beverage containers and ensure material quality. For these reasons, DRS is the best policy mechanism for transitioning to reusable beverage bottles in the US.¹⁷⁹

7.

The Need for Policy to Drive the Transition to DRS and Reuse

Voluntary industry pledges have failed to deliver results

Coca-Cola and the rest of the beverage industry have a history of broken promises when it comes to its commitments to recycled content, recycling, and the introduction of alternative materials. Despite the dreadful track record of these initiatives, such announcements frequently benefit from uncritical positive media coverage and provide a sense of progress, therefore diluting a perceived need for legislation.

For example, in 1990, Coca-Cola claimed it would sell soft drinks in bottles made from 25% recycled PET (rPET) by 1994, but reduced it to 10% in 2001 and failed to meet the revised 2005 deadline. In 2008, the company's target for rPET in their bottles was 25% by 2015; but by 2010/11, the company redefined the target to 'recycled or renewable' content by 2015. By 2014/15, Coca-Cola claimed it used 12.5% recycled or renewable content.¹⁸⁰

In 2018, Coca-Cola established a "World Without Waste" goal, promising to collect 100% of the packaging they sold and use at least 50% recycled material in packaging by 2030. It's unclear how they plan to do this, or whether they will simply revise the goal as they get closer to the deadline. Now their bottles include only 10% rPET. They are still far off from achieving the 100% collection rate.¹⁸¹

In 2010, PepsiCo pledged to increase its US beverage-container recycling rate to 50% by 2018. In early 2018, when it became apparent that they would not come close to meeting the goal, the company instead made a \$10 million donation to the Recycling Partnership. PepsiCo also set a target to increase recycled content to 25% by 2025 in all of its plastic packaging, and to 50% rPET content in the EU by 2030. According to PepsiCo's 2019 Sustainability Report, recycled content currently makes up just 4% of its total plastic packaging, barely increasing from 3% in 2018.¹⁸²

These are just a few of the many sustainability initiatives announced by the beverage industry that have benefited from publicity and have provided them goodwill despite the results, which have amounted to little progress. The US PET bottle recycling rate only increased 2% from 2007 to 2020, where it landed at 26.6%.

With respect to Coca-Cola's recent pledge to increase the overall market share of its products sold in reusable packaging to 25% by 2030; the potential for this pledge to be added to the list of broken promises seems high since their share of reusable packaging declined in 2022 from 16% to 14%, despite this being the year the company made its reuse pledge.

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Mandatory policies are changing the industry's position on DRS in Europe

With the 2019 Single-Use Plastics Directive resulting in national policies that require producers to collect 90% of single-use plastic bottles and achieve 30% recycled content by 2029,¹⁸⁵ industry opposition to DRS policies in Europe has shifted.

An early indication of change was in 2018, when Coca-Cola European Partners and Coca-Cola Great Britain outlined key principles for a well-designed DRS system in the UK seemingly in response to the revelations of their anti-DRS lobbying agenda.¹⁸⁶ In 2022, an unprecedented cross-sector coalition of industry and NGOs published a joint position paper that states, "we support DRS because in most Member States there are no other means to achieve 90%+ separate collection for recycling in a short timeframe with sustained performance."¹⁸⁷

The US lags far behind Europe in this work. Coca-Cola and the ABA are still the primary opponents of mandatory deposit systems (i.e. bottle bills) in the US.¹⁸⁸ A memo to the US Securities and Exchange Commission reveals that Coca-Cola's opposition to DRS in the US is again based on protecting profitability and antipathy to making major changes to its distribution model.¹⁸⁹

Coca-Cola has pursued a strategy to ensure profit over people and the planet while hiding its opposition to taking responsibility for its waste behind relentless marketing campaigns to show its support for curbside recycling and its numerous (failed) voluntary initiatives to demonstrate its commitment to sustainability. Despite industry claims, a recent report shows that deposits have not reduced beverage sales.¹⁹⁰

Since PET bottles are recovered at a rate of 57% in bottle bill states, and only 17% in others,¹⁹¹ it would make sense for the beverage industry to support these bills to help achieve their climate and recycling commitments. But the industry continues to fight bottle bills. No new bottle deposit laws have been enacted since 2004. It isn't for lack of trying. As of 2020, nine states that lacked bottle deposits had bill introductions – Arkansas, Colorado, Florida, Illinois, New Jersey, Nevada, Pennsylvania, Tennessee, West Virginia.¹⁹² Several states had bill revisions, some of which passed, and many that failed.

Public support for DRS legislation and reusables in the US

By the end of 2022, Reloop stated that more than 350 million people are living in jurisdictions with DRS in place (there were 48 such jurisdictions in 2020) and that this could increase to 750 million by the end of 2026, based on its assessment that more than 70 jurisdictions would have DRS in place by that time.¹⁹³ After reviewing more than 100 public opinion surveys between 2003 and 2022, Reloop's analysis demonstrates that the public is strongly in favor of bottle deposit legislation. The findings show public support in the US for new DRS laws (80%) and expanding existing measures (78%).¹⁹⁴

Policies are needed to hold companies accountable

With the US beverage industry's entrenched opposition to taking responsibility for and reducing its waste, the government must take action to hold the beverage industry accountable. By adding reuse quotas into mandatory DRS policies, policymakers can lay the foundation for systemic transformation from single-use to reusable systems.¹⁹⁵ This type of regulation not only ensures that the beverage industry will re-introduce the infrastructure for reusable bottles into the US market, it will set the stage for scaling reuse by creating a stable and dependable regulatory environment that will level the playing field and turn reuse into a good investment opportunity.¹⁹⁶

Key elements of an effective reusable beverage container policy

In order to integrate reusable beverage containers into DRS systems, new DRS laws or updates of existing ones should incorporate the following key policy elements:

- 1. Establish mandatory targets or quotas for reusables.** At a minimum, each company should be held accountable for 25% reusable by 2030. The reuse quotas can be phased to increase over time.
- 2. Set high redemption rates for containers in order to make achieving high reuse targets possible.**
- 3. Ensure container deposit rates are high enough – \$0.10 at a minimum, in some cases higher rates may be needed.** Add a trigger that automatically raises the value of the deposit if the collection rate drops below the predetermined level of 90%. Additionally, the deposit and handling fee should automatically increase over time to account for inflation so the deposit remains a large enough incentive for customers to return their bottles and cans. The deposits need to be applied to both refillable and non-refillable bottles.
- 4. Consider setting a higher handling fee for single-use bottles** to help incentivize producers to choose the reusables (a handling fee is a small amount provided to retailers for receiving the containers).
- 5. Include all types and sizes of beverage containers and all materials (plastic, aluminum, glass),** both carbonated and non-carbonated drinks, water, soft drinks, beer, wine and spirits, energy and sports drinks, juices, kombucha, and dairy products.

Just Zero has published “A Model Policy for State Bottle Bills with Reuse Quotas” which includes all of the above elements.¹⁹⁷

8.

Calling on Coca-Cola and State Lawmakers to Bring Reuse Back to the Beverage Industry in the US

Today, the beverage industry plays a significant role in the fossil carbon addiction that propels two interrelated crises – climate change and plastic pollution.

Across the world, we are witnessing the effects of the unbridled addiction to fossil carbon fuels and products. The climate crisis is on track to exceed several dangerous tipping points related to the 1.1°C of global heating caused by humanity to date: the collapse of Greenland's ice cap, the collapse of a key current in the North Atlantic disrupting rain essential to food production, and the melting of carbon-rich permafrost. Researchers conclude that the Earth may already have left a 'safe' climate state beyond 1.5°C global warming.¹⁹⁸

The marine plastic pollution crisis is visible evidence of the indifference of the bottled beverage industry in continuing to deliver their products to consumers in single-use plastic – a material that is propelling climate change and poisoning the planet and all its inhabitants, disproportionately for people of color and lower income groups who face more direct impacts of plastics at each stage of their life cycle.

The marine plastic pollution crisis is visible evidence of the indifference of the bottled beverage industry in continuing to deliver their products to consumers in single-use plastic.



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This report has made the connection between single-use PET plastic bottles and climate change and ecological damage and the fact that the US is the greatest waster of these bottles by far. It has also provided evidence that reuse is increasingly viewed as a good financial investment and a proven job creator. Since reusable beverage bottles could reduce the industry's greenhouse gas emissions by as much as 50%,¹⁹⁹ and a 50% increase in reusables could decrease marine plastic pollution by 83%,²⁰⁰ there is no time to waste in taking action.

It's time to stop Coca-Cola and other beverage companies from externalizing the range of costs (environmental, health, and real operational costs) associated with the packaging of their products to consumers, taxpayers and ratepayers. If Coca-Cola is serious about reuse, it should support bottle bills with serious recycling and reuse targets in the United States, rather than continue to make empty promises of voluntary action.

We call on legislators to require that the beverage industry achieve 25% Real Reuse by 2030 through well-designed DRS policies with mandatory reuse quotas. Legislators should require the Coca-Cola company and the rest of the beverage industry to make the same shift in the US as in Europe and support DRS policies designed to achieve at least a 90% return rate – as the EU did -- and reach the 25% reusables target by 2030. Anything less than this will fail to push the beverage industry to meaningfully address its contribution to the critical environmental catastrophes they have helped to create.

We call on legislators to require that the beverage industry achieve 25% Real Reuse by 2030 through well-designed DRS policies with mandatory reuse quotas. Legislators should require the Coca-Cola company to support DRS policies designed to achieve at least a 90% return rate and reach the 25% reusables target by 2030.



A supermarket shelf displaying Coca-Cola in São Paulo, Brazil © Barbara Veiga / Greenpeace

While government-mandated DRS sprung up to address litter caused by single-use beverage containers, mandatory reusable targets combined with DRS can ensure high enough reuse rates to make reusable beverage containers a climate and plastic pollution solution – one that can reduce reliance on an extractive economy, easing the burden on frontline communities, reducing the waste and the energy demands of production and recycling, and creating an economic model that centers jobs prioritizing a clean, green materials economy.

GLOSSARY OF ACRONYMS

CO2 Carbon dioxide. Used in this report to discuss climate-related emissions.

DRS Deposit Return System. DRS is a system where consumers, when purchasing a product, pay an additional amount of money (a deposit) that is reimbursed upon the return of the packaging or product to a collection point. In the case of beverage containers, the system provides an economic incentive for consumers to return empty containers to a collection point to ensure that they will be reused or recycled.

PET Polyethylene Terephthalate. PET plastic is a thermoplastic polymer resin that is derived from petroleum. It is a clear, strong, and lightweight material that is commonly used for packaging purposes but also for

textiles. It is the most common plastic used to make single-use plastic bottles.

ROI Return on Investment. ROI is a measure of the profit earned from an investment relative to the amount of money invested. It is generally expressed as a percentage and is typically used to compare different investments or to compare the efficiency of an investment over time.

RVM Reverse Vending Machine. An RVM is an empty container return and handling machine that allows a person to insert a used or empty glass bottle, plastic bottle, or aluminum can in exchange for a reward or refund of a deposit.

US The United States of America

GLOSSARY OF TERMS

Bottle Bill In the US, laws that mandate DRS are often called “bottle bills.”

Reusable or Refillable Packaging refers to packaging that has been conceived, designed and placed on the market to accomplish within its life cycle multiple trips or rotations by being refilled or reused for the same purpose for which it was conceived

Use Cycles refers to the number of times a reusable package is used throughout its lifetime, it can also be thought of as the number of uses.

CO2 Emissions and Global Warming Potential (GWP) Global Warming Potential is used as the main impact indicator of climate impact since it allows the conversion of any greenhouse gas emissions (responsible for global warming) into CO2 equivalent emissions.

Recycled Content refers to the percentage of recycled post-consumer waste used in the production of certain packaging.

Recycling Credit The recycling of products provides environmental benefits since instead of just disposing of waste, we are generating valuable recycled material that will avoid the need for virgin material. These benefits are referred to as “recycling credits” and can be attributed to the product being recycled, or/and the product using the recycled material.

Backhaul or Reverse Logistics refers to the return trip(s), or in other words, the transport of the packaging after being used, back to the retailer and/or producer which will make it possible that the packaging is cleaned and reinserted in the production line to be reused.

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