

A photograph of a person wearing a blue denim shirt with rolled-up sleeves, working in a kitchen or food service area. They are handling several white reusable cups that have black markings on them. The cups are arranged in rows, possibly on a tray or in a container. The background shows a stainless steel sink and other kitchen equipment.

Guidance for Reusable Packaging

Understanding goals and assumptions in order to design a more successful reusable packaging program

2022



SUSTAINABLE PACKAGING
COALITION®



About

GreenBlue is an environmental nonprofit dedicated to the sustainable use of materials in society. We bring together a diversity of stakeholders to encourage innovation and best practices to promote the creation of a more sustainable materials economy.

The Sustainable Packaging Coalition (SPC) is a membership-based collaborative that believes in the power of industry to make packaging more sustainable. We are the leading voice on sustainable packaging and we are passionate about the creation of packaging that is good for people + the environment. Our mission is to bring packaging sustainability stakeholders together to catalyze actionable improvements to packaging systems and lend an authoritative voice on issues related to packaging sustainability. The Sustainable Packaging Coalition is a trademark project of GreenBlue Org.

Lead Author

Olga Kachook, GreenBlue

Editors

Nina Goodrich, GreenBlue
Karen Hagerman, GreenBlue
Alyssa Harben, GreenBlue
Lucy Pierce, GreenBlue
Kelly Cramer, formerly of
GreenBlue

Reviewers

Caren McNamara, Conscious Container
Chris Macfarlane, Starbucks
Georgia Sherwin, Closed Loop Partners
Jennifer McCracken, HAVI
Mike Newman, Returnity
Tim Debus, Reusable Packaging Association



Purpose of this Document	3
Executive Summary	5
Part 1. Understanding Reusable Packaging	9
Reuse in the context of a product's life cycle	12
Single-use packaging versus reusable packaging	14
Theoretical reuse versus reuse in practice	15
Unpacking Industry Assumptions about Reuse	17
Assumption: Reuse results in a lower environmental footprint	18
Assumption: Reuse displaces single-use packaging and eliminates plastic pollution	19
Assumption: Reuse addresses excessive consumption	20
Assumption: Reuse is motivated primarily by sustainability considerations	23
Assumption: It is feasible to return to traditional systems of reuse like the milkman model	25
Assumption: Reuse shouldn't require significant behavior change	26
Establishing Goals for Reuse	29
What is the goal of reusable packaging?	29
Part 2. Designing Reusable Packaging	31
Reuse for various product categories	31
Customizing versus standardizing reusable packaging systems	33
Point-to-Point versus Hub-and-Spoke	35
Facilitating reuse in practice	37
Measuring success	39
Return and refill rates	40
Costs	42
Sales data	43
Best practices: how to have a successful program	43
Questions to ask about reusable packaging	45
Reuse Scoping and R&D	45
Program Set-Up and Consumer Participation	46
Material Sourcing	47
Reverse Logistics	47
Disposal	48
Conclusion	49



Purpose of this Document

Reuse may be one of sustainable packaging's most beloved yet misunderstood sustainability strategies.

Although successful reusable packaging systems have existed for decades for beverage containers and in business-to-business contexts such as produce crates, in 2019 companies began to consider what it might look like to apply reuse more broadly to food service and consumer packaged goods, among many other categories. Companies as large as Unilever began to launch pilots and invest in reusable solutions, while startups introduced innovative business models and services. Reuse as a pathway for recovery of packaging was written into the New Plastics Economy Global Commitment, which has hundreds of signatories and is the foundation of many Plastics Pacts around the world.

In 2020, the onset of the COVID-19 pandemic raised concerns about the safety of reusable packaging and called into question the likelihood that consumers would participate in these systems. Companies temporarily restricted refills and reusable food serviceware, and it took many months and campaigns by various NGOs and scientists to reestablish the safety of reuse. As the world has begun to reopen, reusable packaging is once again on the minds of brands and consumers alike.

Reuse is an opportunity to create a package-product system that is better for the environment than single-use packaging, since source reduction to prevent waste is preferred over recycling to manage waste. The life cycle of any packaging involves sourcing raw materials, distributing the product to retailers or directly to consumers, use of the packaged product, and disposal or recovery. Reusable packaging limits the consumption of the raw materials, postpones the disposal phase, and can displace the need for large amounts of single-use packaging. This is one of the primary reasons reuse has received attention from brands, but as this document explores, it is not the only driver, and questions about reuse remain.

Over the past several years, a number of guides, papers, and summaries of life cycle assessment research have been published on the topic of reusable packaging (see Reuse in the context of a product's life cycle). While these resources offer fantastic examples of innovations in the space and outline recommendations for specific applications such as food serviceware, there is little guidance for the decision-making process around reusable packaging. Today, it is unclear how reusable packaging should be deployed at scale to make the product-packaging-use system more sustainable - is it a blanket solution for the linear economy? Or is it suitable only for niche applications?



Purpose of this Document

For this reason, the Sustainable Packaging Coalition decided to formulate considerations for the success, applicability, and sustainability of reusable packaging systems. The purpose of this document is to:

- **Synthesize different definitions of reusable packaging**, including refillable and returnable packaging, and outline how it compares to single-use packaging
- Pose **questions about the role of reusable packaging**, including whether it effectively replaces single-use packaging, addresses overconsumption, or reduces the carbon footprint of products
- Consider how **consumers interact with reusable packaging** and the likelihood that it will be reused in practice
- Suggest important **considerations for designing reusable packaging**, including when reusable packaging **makes the most sense**
- Outline **best practices** for a successful reuse system and **ways to measure success**

We at the Sustainable Packaging Coalition believe that if companies spend some time discussing these questions internally and with partners, reusable packaging systems will be more appropriately applied, more successfully deployed, and ultimately, serve as a more sustainable alternative to the single-use systems they replace.



Executive Summary

The SPC defines reusable packaging as packaging that allows either the business or the consumer to put the same type of purchased product back into the original packaging, is designed to be returnable and/or refillable, and accomplishes a minimum number of reuses by being part of a system that enables reuse.

Today, brands operate under a number of assumptions about what reusable packaging should look like, what sustainability goals it can achieve, and how it should be designed. Uncovering these assumptions can help ensure that reusable packaging is both more successful and more sustainable in the long run. This guidance document examines and questions some of the most **common assumptions about reusable packaging**:



Assumption 1: Reuse results in a lower environmental footprint.

- *Consider:* The assumed environmental benefits of reuse are not guaranteed and depend on high return rates and reuse in practice.



Assumption 2: Reuse displaces single-use packaging and eliminates plastic pollution.

- *Consider:* Today most reusable options are offered alongside and in addition to the single-use options. To prevent greenwashing and consumer confusion, it is important for brands to avoid presenting reusable packaging as the silver bullet to plastic pollution.



Assumption 3: Reuse addresses excessive consumption.

- *Consider:* In many of the reusable packaging pilots and models on the market today, reuse is positioned as a way to alleviate some of the guilt consumers have historically had about the impacts of their purchasing and behavior. Simply changing the packaging does not address the underlying problems with the product or system.



Assumption 4: Reuse is motivated primarily by sustainability considerations.

- *Consider:* There are other drivers that compel both consumers and businesses to turn to reusable packaging, such as lifestyle advantages, financial incentives, user experience, and marketing advantages.



Assumption 5: It is feasible to return to traditional systems of reuse like the milkman model.

- *Consider:* Society has fundamentally changed since the heyday of the milkman model of the 1950s, and today's reusable packaging must navigate a number of new behaviors and expectations that society has adopted since the milkman days.



Assumption 6: Reuse shouldn't require significant behavior change.

- *Consider:* Reusable packaging, no matter how simple or convenient it is, will inherently require some behavior change, and if we hope to adequately address today's environmental problems, both consumers and companies will need to do things differently than they have in the past.

Executive Summary

With these assumptions unpacked and addressed, **it is time to refocus on the true goal of reusable packaging - to reduce the environmental footprint of the package-product system.**

Companies should aim to identify when reusable packaging will be environmentally-preferable to single-use, and pursue innovation in those categories and formats. Part of this decision requires brands and retailers to realistically assess the likelihood that consumers will sustain their participation in reuse and refill offerings, and the ways in which behavior change and friction can be optimized to ensure the greater success of reuse.

Brands should deploy reusable packaging in contexts where it is more likely to succeed. Reusable packaging may be a better fit for certain categories of product, such as:

- Items that are **used in food service** (e.g. beverage cups, takeout containers), are more likely to reach high levels of reuse in practice due to their pervasiveness
- Items that are **bought frequently** (e.g. personal care, home care, supplies for work environments), since they are consumed fairly quickly and have high levels of repeat purchasing
- Items **purchased online that are returned often** (e.g. clothes, footwear), since products are already being sent back by consumers when they don't fit or match expectations
- Where purchasing a **specific quantity of product** is important and consumers express a desire to purchase less or more than the standard quantity sold
- Where the current **packaging fails to adequately protect the product** and there are chronically high loss or damage rates
- Where there is already a **"closed loop system" of return in place**, such as rentals
- Where there is a **subscription model** in place and used packaging can be collected during the delivery of the next order
- Packaging that is often **stored in the open or on display** (e.g. soap dispensers) and a more durable, "counter-worthy" design is important to the consumer



In these instances, a reusable packaging offering makes sense because it has a high likelihood of being reused in practice, capitalizes on existing reuse systems, meets consumer needs, or provides added value by helping prevent damage and/or waste.

As brands design reusable packaging systems, it is necessary to consider the tradeoffs of customization vs. standardization. **Customization** refers to the process of designing reusable packaging that is visually or functionally distinct from competitors or other products in the category and is collected through a unique reverse logistics channel. **Standardization** refers to ways in which the reusable packaging may fit into existing recovery streams or may use one design across brands, platforms, or channels. Standardization often translates to a more economically viable logistics structure and cost-savings for stakeholders. The decision to customize or standardize can have direct implications for the adoption of reuse, and for reducing the environmental footprint of reusable packaging.

Brands and retailers should also take some time to consider the logistics structure underlying their reuse model. According to a [meta-analysis](#) conducted by Reloop and Zero Waste Europe, one of the biggest sources of environmental impact for reusable packaging is the transportation phase, which includes both sending packaging to consumers and collecting it once it is empty. For this reason, the decisions around how to structure reverse logistics using either the **point-to-point or a hub-and-spoke model** play an important role in determining the environmental footprint of reusable packaging.

When it comes to measuring success, it is important to apply rigor and data to understand whether reusable packaging is meeting the primary goal of reducing the environmental footprint of the package-product system. One of the best ways to do this is to analyze **return and refill rates** as an indicator of **reuse in practice**. This is different from metrics of theoretical reuse which many brands inadvertently focus on, such as how many uses reusable packaging is designed to withstand or when it would break even.

Other metrics, such as costs and sales data, can also be used to understand how reusable packaging is performing, yet they have pros and cons to consider. Cost and sales data are practical, easily-quantifiable metrics that are important for establishing the business case for reusable packaging. However, they may reflect only short-term performance, rather than long-term adoption that translates into positive environmental impact.



Ultimately, the success of reusable packaging can be measured by three aspects of the package-product system:



**Long-term consumer
engagement**



**Getting high return
rates in practice**



**Lower environmental
footprint**

Given the many considerations for reusable packaging, it's clear that it is not a one-size-fits-all solution to replace all types and formats of single-use packaging. Rather, because reusable packaging requires more materials and transportation, its success from a sustainability standpoint hinges on high levels of reuse or refill in practice by engaged consumers. It may not be the right fit for every category of packaging, and the environmental impacts should be weighed against the impacts of single-use packaging. With more careful consideration of the “why” and “when” around reusable packaging, it will be possible to achieve a more successful and sustainable transition to reusable packaging.

Part 1. Understanding Reusable Packaging

Before pursuing reusable packaging, it is important to first define reusability and the various related terms like “refillable” and “returnable”. Without clear parameters for what these words mean, companies may be inadvertently greenwashing their efforts or confusing consumers. For example, some brands have used the term “refillable” as a synonym for “reusable”, when in fact it is distinct. Other brands may call their packaging “reusable” even though it has not been intentionally designed for reuse, or may use a broader term like “reusable” when a more specific term like “returnable” would be more appropriate. Still other brands may note that their packaging can be “repurposed” or “up-cycled” for other uses.

Definitions of reusable packaging have been put forth across a range of sources, from academic publications, to industry-facing reports, to marketing guidance. For example, the International Organization for Standardization (ISO) defines reuse in standard [18603:2013](#), and this definition has since been incorporated in the [EU’s Packaging & Packaging Waste Directive](#). In the US, more comprehensive definitions of reusable packaging have been outlined in [CA’s SB 1335](#) and proposed WA state legislation. The definitions below are offered as a synthesis of existing definitions while also aiming to incorporate other aspects of the circular economy such as material health.

Reusable packaging is packaging that allows either the business or the consumer to put the same *type* of purchased product back into the original packaging, is *designed to be* returnable and/or refillable, is *free of chemicals of concern*, and accomplishes a *minimum number* of reuses by being part of a *system that enables reuse*.

Type: A category of products. For example, liquid personal care products, which can be poured back into a durable bottle when it is empty.

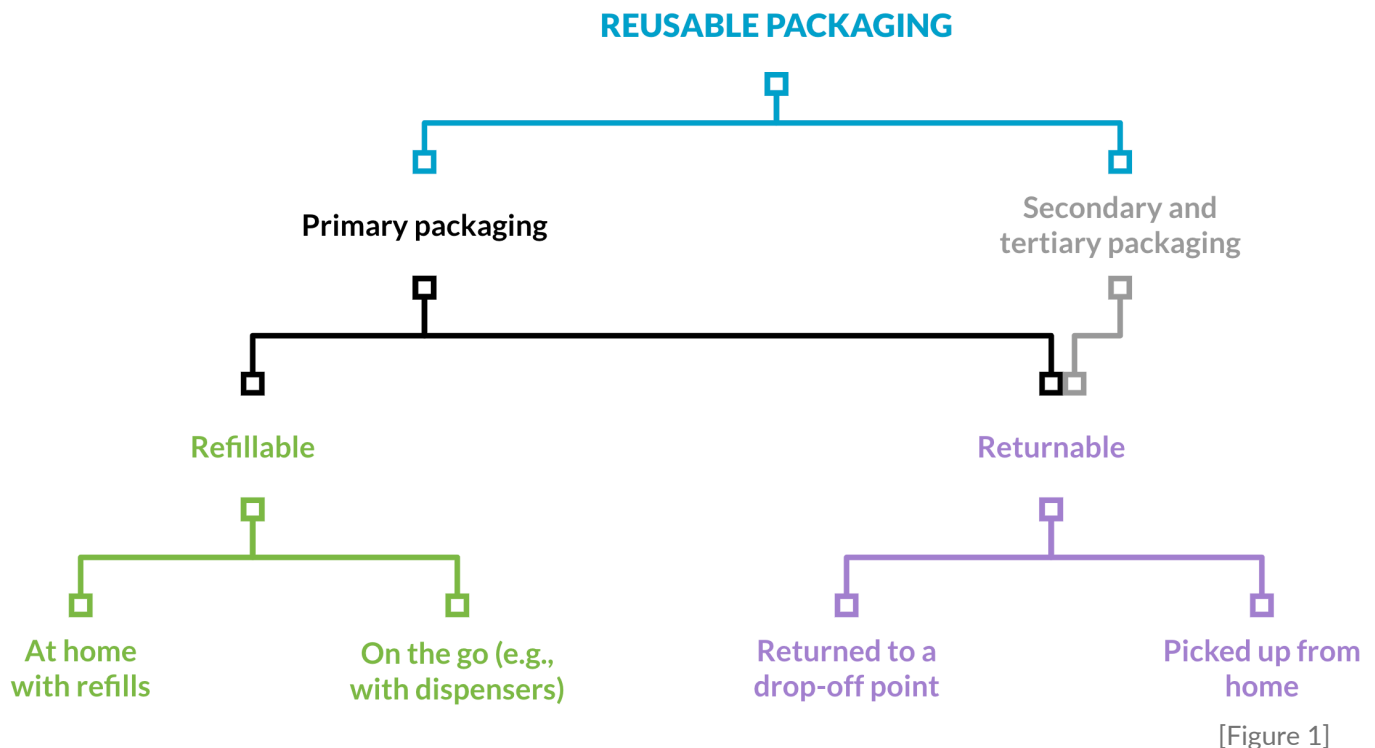
Designed to be: Reusability must be an intentional design choice on the part of the brand, rather than a consumer choosing to repurpose single-use packaging for other uses.

Free of chemicals of concern: The material used should not contain harmful chemical, physical, biological, or radiological substances that will pose a threat to human health or the environment.

Minimum number of reuses: While there is no single minimum number of reuses that is appropriate across all product categories, the carbon footprint of reuse is highly dependent on this metric. Achieving some minimum number of reuses in practice is vital for meeting the environmental goals of reusable packaging.

System that enables reuse: This refers to supporting elements that encourage packaging to be successfully reused, refilled, and/or returned, such as refills, dispensers, collection programs, deposits, container tracking, apps, etc.





[Figure 1]

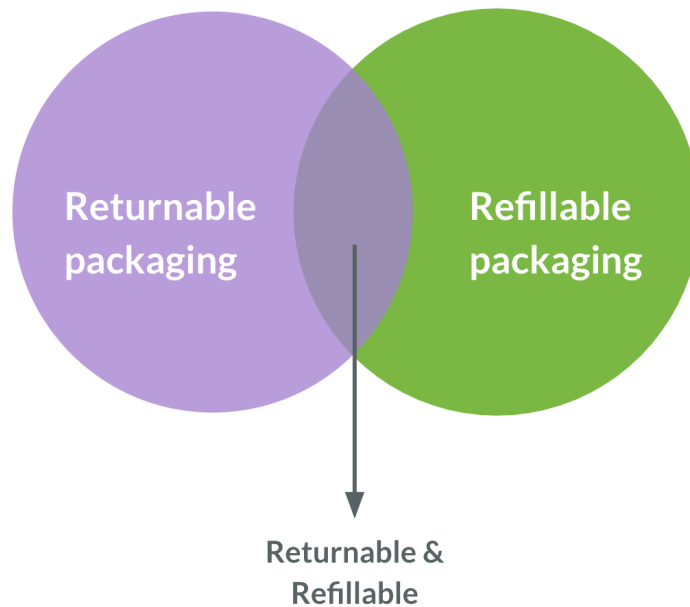
Fig [1]. The term “reusable packaging” can apply to both primary and secondary/tertiary packaging, and each will have its own formats and logistics depending on whether the packaging is returnable and/or refillable

There are two types of reusable packaging - refillable and returnable packaging.

Refillable packaging is packaging that is designed to be owned and refilled by consumers with separately-purchased product or through dispenser systems. Examples of startups and companies using dispensers and refill stations including [Algramo](#), [The Body Shop](#), [Waitrose](#), [Nestle](#), and [Asda](#). Examples of companies offering refills at home include [P&G](#), [Myro](#), [Blueland](#), and [Grove Collaborative](#).

Returnable packaging is packaging that is part of a system that provides for the collection and refill of the package by a business. Customers send the packaging back to the business, which in turn puts new products into the empty packaging. Notable examples include [Coca-Cola Brazil](#), [Loop](#), [Returnity](#), [Anheuser-Busch in partnership with Conscious Container](#), [DeliverZero](#), [ClubZero](#), and the various pilots by quick-service restaurants like [Burger King](#). In this system, packaging is treated as a business asset.

These two types of reusable packaging can overlap - for example, when a consumer has the option to both drop-off a reusable bottle at a store for the business to handle and refill, and to bring that same bottle to a retailer’s filling station and refill it themselves.



[Figure 2]

Fig [2]. Returnable and refillable packaging are not the same thing, although they can overlap

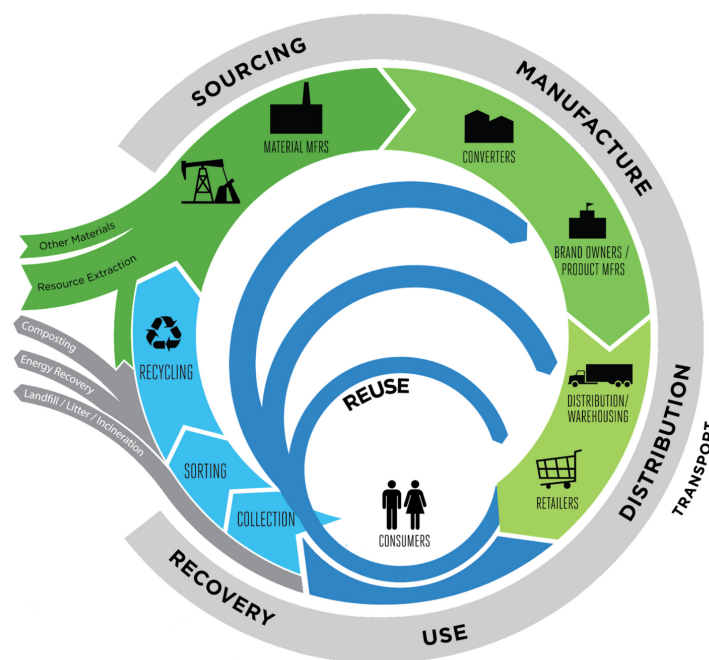
Packaging that is designed to be reusable (by being either returnable and/or refillable) but that does not actually get reused by a consumer or business for the originally-intended purpose should not be considered reusable. This will be discussed in more detail in the section [Theoretical reuse vs. reuse in practice](#).

The ultimate goal is to reduce the environmental footprint of the package-product system, and reusable packaging should be designed in whatever way is in service of this goal. One format is not necessarily better than the other, and there's no single "right" way to design reusable packaging. It doesn't need to involve dispensers in retail environments, although it can. It doesn't need to switch from plastic to aluminum or glass, nor does it need to offer home refill or packaging being mailed back to the business. For example, refillable systems that have some disposable components such as pouches or inserts are not inherently inferior to returnable packaging systems involving retailers or mail-back programs. In time, programs may transition from refillable to returnable, or some combination of the two, and back, and this is not an indication of the program's success or failure.

Learn more:

- [Ellen MacArthur Foundation, "Reuse - Rethinking Packaging" guide](#) - a framework to understand reuse models that identifies six major benefits of reuse and maps 69 reuse examples.
- ["Sustainability of reusable packaging—Current situation and trends"](#) - this paper includes a classification for reusable packaging systems.
- [FTC Green Guides](#) - these guides help marketers avoid making environmental marketing claims that are unfair or deceptive to consumers.

Reuse in the context of a product's life cycle



[Figure 3]

Fig [3]. Reuse creates internal loops within the larger life cycle of a package

The life cycle of any packaging involves sourcing raw materials, converting these materials into packaging, distributing the product to retailers or directly to consumers, use of the product by consumers, and disposal or recovery.

Reusable packaging creates a feedback loop between the use phase of a product and the manufacturing and distribution phases. In the case of returnable packaging, a consumer returns an empty package to brand owners, retailers, or distribution centers. In the case of refillable packaging, consumers may take the packaging to a retail dispensing station or purchase new products in the form of refills or inserts.

By facilitating an increased number of uses, reusable packaging postpones the disposal phase. Some reusable packaging, such as refillable glass beverage bottles, may be recoverable through recycling at its end-of-life while some may be landfilled or incinerated.

As a result of this, reusable packaging has some predictable environmental trade-offs. In the first three phases of the life cycle - raw material extraction, manufacturing, and distribution - reusable packaging usually has higher environmental impacts because its need for durability makes it heavier, requires more material, and/or involves reverse logistics. But with all subsequent uses, reusable packaging bypasses the material extraction and manufacturing phases, and the initial impacts are spread out over the number of uses. Because the environmental impacts of packaging are usually the highest in the sourcing and manufacturing phases, spreading these impacts over a larger number of uses can result in environmental benefits and cost savings.

Many of the environmental considerations for reusable packaging are similar to those of single-use packaging. What material is the packaging made out of? Does it include recycled content? What are the impacts from manufacturing, and how it will be disposed of at its end-of-life? For this reason, sustainable packaging strategies such as using recycled content and ensuring recyclability at end-of-life apply to reusable packaging in much the same way as they do for single-use packaging. Reusable packaging also needs to perform the same key functions as single-use packaging, such as product protection and distribution. If the product becomes damaged or spoiled, this product loss has a greater negative environmental footprint than the type of packaging used.

Yet reuse also presents unique considerations, primarily in the transportation and use phases, due to the logistics of refilling and returning packaging. How often a package is functionally reused, the distance required for transport, and the impacts from cleaning must all be taken into consideration. This can make one-for-one substitutions of single-use to reusable packaging more complex than they first seem.

This is compounded by the fact that many companies evaluate reusables based on whether they can be recycled at end-of-life. Clearly, there can be benefits from the package being designed for effective reuse and having a simple recycling option at end-of-life. **But it may also be the case that a non-recyclable reusable option can offer superior environmental benefits to a fully recyclable package.** Choosing to not pursue reuse because of limited recyclability at end-of-life might sacrifice net environmental benefits.

In many cases an environmental or economic comparison of a single-use system and a reusable system may require building a custom model that includes a particular product's assumptions about return rates, distances traveled, etc. However, existing tools are available to help inform these models or to perform more generalized calculations, including:

- [KIDV Excel-based LCA tool](#) | A tool to calculate the environmental impact and economic profitability of reusable packaging
- [Plastic IQ](#) | An online tool that can model the impacts of a new plastics strategy that includes reusable packaging



Despite the complexity of direct comparisons, one thing is clear - **the entire packaging-product system matters more than the materials used**. Reuse becomes environmentally preferable to single-use not when an aluminum cup replaces a plastic cup, but when a cup is functionally reused many times, in as concentrated of a geographic region as possible. Other factors that contribute to successful reuse systems are discussed in the **Measuring success** section.

Learn more:

- ["Reuse Wins"](#), Upstream - a meta analysis of life cycle assessment work comparing reusable packaging to single-use, and a review of available economic data on savings to businesses.
- ["Think reusable straws, wraps, and cups are always better for the environment? Think again."](#) Anthropocene Magazine - a summary of an LCA study published in The International Journal of Life Cycle Assessment that found reusable products are not necessarily always better for the environment, since their impact depends on how they are used
- ["Reusable vs. single-use packaging: a review of environmental impact"](#), Utrecht University, Zero Waste Europe, and Reloop - a report focusing on how and when the reuse of packaging is a better alternative than single-use.

Single-use packaging versus reusable packaging

Because of both the real and perceived negative environmental impacts of single-use packaging, brands may aim to move away from single-use options. As a result, brands may claim their packaging is already reusable, particularly when a package uses more durable materials such as glass. **Yet there are key differences between single-use and reusable packaging that make these kinds of claims inaccurate and misleading.**

Single use packaging is intended to store, protect, and deliver product contents until the packaging is empty, at which point it is thrown away by the consumer. Reusable packaging, on the other hand, enables the same type of purchased product to be placed into the packaging, displacing the need for new packaging.



Packaging that can be repurposed by consumers for other uses in theory, such as using a glass jam jar to store food or household items, for cooking, or for a craft, cannot be considered reusable packaging. This is because there is no system in place that enables consumers or businesses to place newly purchased contents into the packaging. It is clear that this type of “repurposable” packaging does not displace the need for more primary or secondary packaging, and is not included in the ISO standard’s definition for reuse.

Today, some reusable packaging systems include accessories or ancillary components (such as safety seals, portion cups, etc.) that are disposable. Future innovation may develop new, reusable alternatives to these components. In the meantime, these disposable components should not be counted as part of the reusable packaging system.

Theoretical reuse versus reuse in practice

When considering reuse, brands may focus on how many times reusable packaging can be functionally reused. They may test their reusable option for durability or source specific durable, often heavy-weight materials. Unfortunately, this focus on theoretical reuse often draws attention and resources away from ensuring reuse in practice.

Consider the case of shopping bags. As a result of plastic bag bans, some grocery retailers have switched to offering reusable shopping bags made of thicker material that they have determined can be reused a hundred times. This bag may have been selected after considerable procurement efforts, with internal debate about whether a hundred reuses is “enough” to be considered durable or reusable.

Yet the most important aspect of reusable shopping bags is how often a customer actually reuses their bag. If they use their reusable shopping bag twice, it doesn’t matter that it was designed to replace a hundred single-use plastic bags. In fact, in this case its durability is an environmental burden - rather than providing customers with a lightweight single-use package, you’ve now switched to a packaging material that is effectively still single-use but many times more resource-intensive.

The same holds true for all reusable packaging. If a refillable deodorant tube is made of a durable polypropylene that is 50% heavier than its single-use counterpart and designed to be reused 100 times, but a consumer only refills it three times before switching to a different brand, the theoretical reuse rate of 100 times is irrelevant.



Simply put, it's not enough to focus on how many times reusable packaging can be reused (also known as the theoretical lifespan of the packaging). Brands and retailers also need to ask:

- How do we know if it will get reused?
- What consumer research or indicators do we have that demonstrate that reuse is likely to occur?
- How many times will it get reused?
- How can we incentivize it to be reused?

Unfortunately, for many of today's reusable packaging pilots, the theoretical reuse rate is used as the primary metric of success, often highlighted in press releases and articles. Other, more accurate metrics of success are outlined in the **Measuring success** section of this guide.



Unpacking Industry Assumptions about Reuse

Today, it appears that brands often operate under a number of assumptions about what reusable packaging should look like, what sustainability goals it can achieve, and how it should be designed. Below are some of the most common assumptions about reusable packaging, as gleaned from conversations with reusable packaging professionals, discussions at industry events, corporate sustainability documents, pilot project communications, and press releases. Unpacking these assumptions can help ensure that reusable packaging is both more successful and more sustainable in the long run.

Reusable packaging, while not entirely new, is still an evolving space, particularly for categories such as consumer packaged goods, as well as refill and reuse handled primarily by consumers. Some of the assumptions below are a reflection of the nascent reuse industry as it grows beyond beverage and secondary packaging contexts to more widespread consumer applications. Furthermore, the nature of these assumptions is expected to change over time, and this document offers only a starting point for discussing the true goals and motivations of both consumers and brands.



Assumption 1: Reuse results in a lower environmental footprint

One of the main reasons both consumers and businesses pursue reusable packaging is to reduce their environmental impact. Sometimes the intended environmental effect is explicitly called out, such as when reusable packaging is made synonymous with “zero waste”, while in other instances reuse is more broadly couched under “eco-friendly” terms.

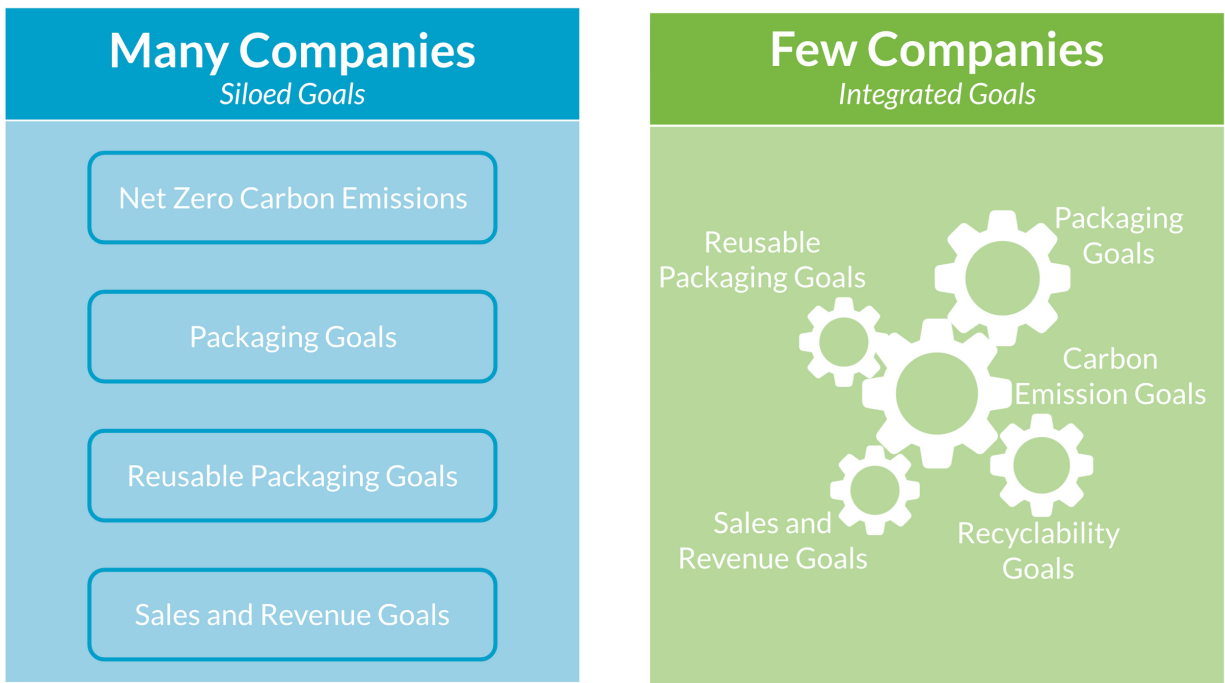
Consumers and businesses may turn to reusable packaging in order to:

- Reduce personal and societal packaging waste
- Move away from single-use packaging
- Eliminate material health concerns associated with plastics (e.g., phthalates, BPA, etc.)

But what about the environmental footprint? If reusable packaging reduces a product category’s packaging waste and eliminates single-use plastic and its related concerns, but increases the overall environmental footprint of the product because more materials are used or transported over long distances, should that still be considered a success?

Few brands have made an explicit commitment to reduce their carbon emissions through the use of reusable packaging. It is rare to hear of a company performing a rigorous analysis of a reusable packaging system’s carbon footprint before launching a program or pilot. It also appears uncommon for companies to engage in the economic analysis and consumer research necessary to determine a program’s likelihood of adoption and success, which in turn is key to determining whether a reusable package will “break even”.





[Figure 4]

Fig [4]. Company goals are often siloed and reusable packaging goals are often not linked to other goals like carbon reduction

Rather, the environmental benefits of reusable packaging remain aspirational until they can be accurately assessed and confirmed. Consumers are likely to assume they have already made the sustainable choice simply by purchasing products in reusable packaging. They are not typically prompted to consider how many times they are likely to reuse the item in practice. And businesses are likely to assume reusable packaging is an inherent solution to plastic pollution, for example, without always building the reuse system necessary for widespread use and adoption of reusables as a substitute to single-use packaging. The assumed environmental benefits of reusable packaging, which are possible but not guaranteed, are broken out further in some of the assumptions that follow.



Assumption 2: Reuse displaces single-use packaging and eliminates plastic pollution

Despite including reusable packaging in their sustainability goals, few companies have outlined what portion of their sales they expect to convert to reusables. Companies may not intend to cannibalize their own sales of products in single-use packaging with reusable packaging. Rather, many appear to be treating reusable packaging as a new revenue stream that attracts new customers, while continuing the status quo of manufacturing products in single-use packaging.

Because many of today's reusable packaging innovations are in pilot phases or are run at limited scale alongside single-use, they seem to be effectively growing the size of the packaging pie. Unless the single-use option is removed entirely in favor of the reusable option, it will be difficult to quantify to what extent reuse has displaced single-use packaging.

By the same token, it is unclear whether reusable packaging can be hailed as a direct solution to the plastic pollution problem. Reusable straws can displace plastic straws in the ocean, but this depends on a widespread and sustained replacement of the single-use option with the reusable option. Unfortunately, most of what is taking place today is reusable options being offered alongside and in addition to the single-use options that contribute to plastic pollution.

This does not discredit the potential of reusable packaging to tackle some of the problems associated with single-use packaging, such as the end-of-life challenges that ultimately lead to plastic pollution. Plastic pollution needs to be addressed through a number of strategies, such as consumer engagement, sufficient waste management infrastructure, and reduction of unnecessary formats, not just through reusable packaging.



Assumption 3: Reuse addresses excessive consumption

[By some measures](#), the environmental problems with packaged products lie not in the materials used for packaging or their recyclability (or lack thereof), but in the overwhelming increase in the volume of goods purchased globally, otherwise known as consumption. In almost all instances, the environmental footprint of the product itself [far outweighs](#) the footprint of the packaging. This means that pursuing sustainability will require a reduction in the amount of resources mined from the earth and the impacts of making new products, not just new packaging.

In many of the reusable packaging pilots and models on the market today, reuse is positioned as a way to alleviate some of the guilt consumers have historically had about the impacts of their purchasing and behavior. For example, many consumers feel guilty about the amount of packaging waste associated with their online purchases. In response, innovators and brands may turn to reusable packaging as a solution that allows consumers to order online “guilt-free” by getting their purchases in returnable mailers.

Though there is limited research on this topic, it is possible that reusable packaging may help to lower consumption. For instance, a brand may offer a multipurpose, refillable cleaning product, which takes the place of many individual products and perhaps lasts longer. In this way, offering less variety of product types, sizes, functions, etc., and instead focusing on “core” products, may result in fewer goods produced and sold. A consumer may buy a single product that performs a number of functions, and because of a limited selection, may be less prone to experimenting in a way that results in unused or unfinished products going to waste. More research is needed to better understand these long-term consumer purchasing behaviors when reuse is available.

However, in many cases, reusable packaging is not displacing consumption. **In other words, sometimes, the sustainability benefit of reusable packaging may be entirely illusory.** A retailer may introduce a reusable aisle or area of the store with reusable versions of products, thereby attracting new or more customers. These customers may purchase products in reusable packaging in addition to the single-use version they normally buy, due to factors like novelty and a desire to experiment. Consumers may also participate in reuse as part of virtue signaling, which is the practice of publicly expressing opinions or sentiments intended to demonstrate one's good character or the moral correctness of one's position on a particular issue. If the purchase of reusable packaging is superficial and does not lead to lasting change in consumption habits, the environmental benefits will not be realized.



Assumption 4: Reuse is motivated primarily by sustainability considerations

Although reusable packaging does not have a guaranteed environmental benefit over single-use packaging, it is often assumed that adoption of reuse is motivated by sustainability considerations. It is important to understand the true drivers that compel both consumers and businesses to turn to reusable packaging.

Consumers

Early versions of reusable packaging, namely bring-your-own cups, bags, and straws, can be thought of as “reuse 1.0” that may have started with environmentally-conscious consumers aiming to reduce their reliance on single-use packaging. Certainly, a segment of today's consumers continues to pressure brands to offer reusable packaging, particularly as a replacement to single-use plastic, due to concerns about plastic pollution in the environment.

But when it comes to “reuse 2.0” offerings, like refillable deodorant or laundry detergent, most consumers aren’t engaging solely for sustainability reasons. A recent [World Economic Forum](#) survey found that in Europe, nearly as many consumers (34%) seek out reusable packaging if it makes products less expensive, as those who do so for environmental reasons (38%). In North America, 31% want reusables to reduce harm to the environment, while 28% want it to make products less expensive and 22% want it to be more convenient than disposable packaging.

Clearly, consumers will participate in reuse systems for specific benefits during the use phase, not just because of concerns about the disposal of a product. Novelty, the desire to experiment or customize the product, and an improved user experience are all driving interest in reusables. These non-sustainability “ulterior motives” may be even higher in practice than the altruistic behaviors consumers tend to report in surveys. Many consumers turn to reuse for:

Lifestyle advantages - reusable packaging may attempt to provide lifestyle benefits to consumers, such as:



- Alleviating guilt about consumption
- Reducing or eliminating decision fatigue (through a more limited selection)
- Identify and experiment with new trends and/or products
- Saving money or getting a discount
- Fitting into a popular aesthetic (e.g. a streamlined, minimalist look)

Enhanced user experience - reusable packaging may attempt to improve the effectiveness, ease of use, or other benefits of a product, such as:



- Preventing leaks and spills
- Customizing and controlling formulas, fragrances, flavors, etc.
- Buying the correct amount of product
- Storing the product in the same container it was purchased in
- Reducing the frequency, amount, or size of purchases
- Being more fun or enjoyable to use
- Being aesthetically pleasing

Will these drivers sustain engagement? When reuse for consumers is motivated by lifestyle and user experience considerations, rather than sustainability, there may be less guarantee that reusable packaging will be used as intended. It may be purchased for novelty’s sake, used once, and then never refilled or returned again. **In this case, reusable packaging will simply be a heavier-weight, more resource-intensive single-use packaging.**

Businesses

At the same time, businesses are pursuing reusable packaging for a variety of strategic, branding, marketing, and/or operational reasons. For example, brands see reuse as a way to meet their sustainable packaging commitments, demonstrate action on single-use plastic concerns, or keep up with peers' progress on sustainability efforts.

While these marketing and business strategy drivers may refer to environmental problems and commitments, framing reuse as a business opportunity is a fundamentally different lens than framing it as a sustainability imperative. By focusing on goals, competitors, or industry trends, the sustainability of reuse in practice becomes secondary to other considerations. Many businesses turn to reuse because of:

- **Business/strategy considerations** - reusable packaging may attempt to solve strategic problems or provide a market advantage, such as:
 - Appealing to dark-green consumers who normally wouldn't buy the product
 - Selling more product through a new channel
 - Retaining consumers who like the product but are unhappy with the associated packaging waste
 - Getting data about consumer behavior and usage patterns
 - Locking customers in with unique formats and building brand loyalty
 - Signaling a brand's efforts to make progress on sustainability
 - Keeping up with peer companies' efforts
- **Operational considerations** - reusable packaging may attempt to solve operational challenges for a business, such as:
 - Eliminating safety and sanitation concerns with existing self-serve areas or dispensers
 - Improving the checkout experience by eliminating steps like consumers needing to weigh their own containers before filling
 - Saving on disposable packaging costs
 - Offering improved protection of contents during delivery

In some cases, brands may pursue a certain reuse strategy even if it is not perfectly suited to customers' needs or exactly what consumers are asking for. For example, they may pilot a dispensing system because it has been launched by their competitors, even though a dispenser might have a higher carbon footprint than a refill-at-home system. They may elect to offer a drop-off program because it involves simpler logistics, even though consumers may prefer to have empty containers picked up at home.





Assumption 5: It is feasible to return to traditional systems of reuse like the milkman model

Reusable packaging is often framed as a return to how society shopped and consumed products before the advent of plastic. This is seen in references to the “milkman model”, where your neighborhood milkman delivered milk to your doorstep in reusable glass bottles and then retrieved the empty containers as part of the next delivery. Some of today’s reusable packaging innovations aim to bring back these concepts.

How Shopping and Materials Have Changed Over Time

	1880s - 1890s	1910s - 1920s	1950s	1990s - Early 2000s	Today
Packaging materials and formats	Paper, glass Cellulose, metal cans Package-free (e.g. bar soap)	Aluminum	Plastic	RPCs (Reusable Produce Containers)	Multi-material flexible plastics, alternatives, fibers, bioplastics, compostables
Purchasing options	Bulk/loose items e.g. spice market or general store	Dispensers	Peak popularity of the milkman model	Separately-sold insert & refills	Diversity of products and SKUs Takeout packaging with high performance requirements
Shopping modes	Full service shopping	Return to store for deposit (e.g. soda bottles) Beginning of self service in grocery stores	Supermarkets	Increase in eating & drinking on the go Club stores	Comprehensive grocery delivery E-commerce delivery with secondary packaging

[Figure 5]

Fig [5] Materials and purchasing options have become increasingly varied and complex since the days of full-service shopping. Milkmen existed because it was a way to get an extremely perishable, staple product to people before it spoiled in the absence of efficient supply chains and refrigeration. The growing availability of refrigeration made it possible and popular for dairy to be sold at supermarkets, while increasing suburbanization made it harder for milkman businesses to be profitable. Ultimately, these businesses did not survive. Blindly returning to that model **ignores the fact that it was abandoned because it was inefficient and expensive** in both time and miles driven by milkmen, and in money for the consumer. Instead, we can learn from what caused the decline in reusable home delivery systems in order to figure out what aspects can be brought back and improved upon, and what aspects are unnecessary to revisit.



Today, a model that delivers only dairy products to consumers' doorstep would likely still be inefficient, while also feeling incredibly limited compared to what is available on e-commerce platforms like Amazon. At the same time, it would also be incompatible with some modern day realities - [since the 1950s](#) there has been a 50% reduction in the number of households with a stay-at-home parent, and an increase in single-person households. This has implications for reusable packaging because not having someone at home to put away perishables at any time during the day makes cold chain and timed delivery essential for certain goods.

Clearly, society has fundamentally changed since the “golden era” of reuse, and reusable packaging cannot simply be a return to how things were. Today's reusable packaging must navigate a number of new behaviors and expectations that society has adopted since the milkman days. These include shopping on-demand via e-commerce, ordering via apps, expecting a huge diversity of products, experimenting with products rather than locking themselves into a particular brand, expecting packaging to have properties such as grease barriers or heat retention, eating and drinking on the go, and ordering a wide variety of perishable groceries (not just milk) for home delivery. As just one indicator of these modern day demands, in the 1960s grocery stores tended to carry 6,000 SKUs, while now many stores have closer to [50,000 SKUs](#).

Many “old” systems of reuse depended exclusively on active participation from consumers, for example by shopping for themselves, returning bottles to stores, or bringing containers to fill. By contrast, many of today's reusable packaging pilots still require active participation, but aim to reduce what is asked of consumers - for example, by providing single-use refill containers as back-up in case consumers forgot to bring their own, or by outsourcing behaviors to logistics providers, such a mail carrier picking up the container rather than the consumer needing to return it to a store. This is because many brands implicitly assume that widespread adoption of reuse will only occur if reuse is made as easy as possible, which often means making it as similar to the single-use experience as possible. For more on this, see the next section **Assumption: reuse shouldn't require significant behavior change**. While this may or may not always be the best strategy for reusable packaging, it is markedly different from how reusable packaging systems used to operate.

Given the many new ways that consumers shop and the expectations they have, it's no wonder that adapting reusable packaging to today's world is a challenging task. While there is plenty of inspiration to be gained from reusable packaging systems of old, brands and solutions providers will need to learn how to adapt reusable packaging to modern day demands and realities.



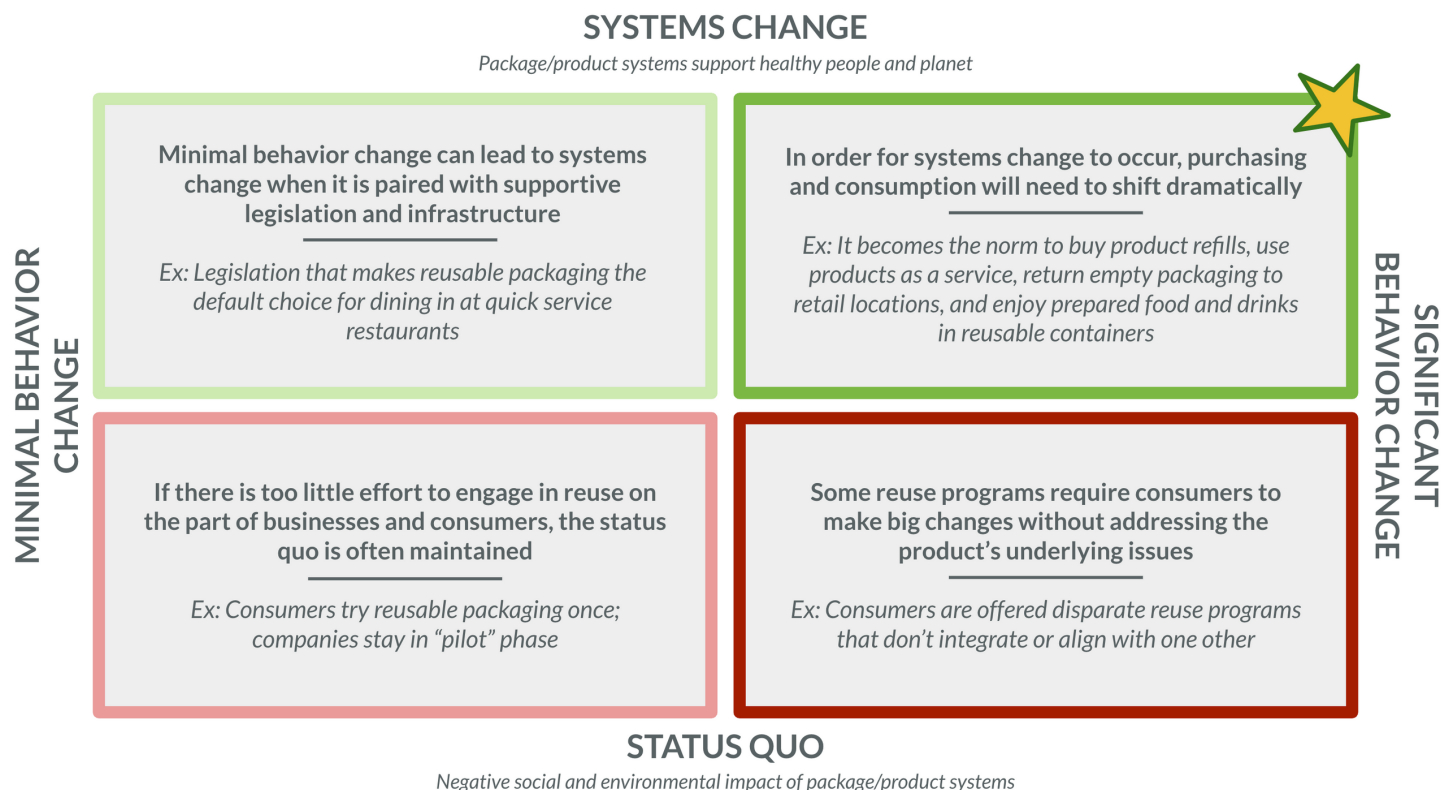


Assumption 6: Reuse shouldn't require significant behavior change

Reusable packaging often involves a strong, inherent tension between the behavioral status quo and behavior change. Time and time again, reusable packaging innovators and leading brands have emphasized the need for solutions that require little to no behavior change from consumers - reuse should be as easy as throwing something away. [McKinsey research shows](#) that consumers are unwilling to sacrifice convenience for sustainability considerations. This may lead companies to assume that asking consumers to perform new behaviors will doom a program to fail.

In many cases, this concern seems well-founded. Asking consumers to return containers to the store for refill is a big change from asking them to put packaging in their recycling bin at home. With the exception of areas where bottle bill redemption rates are high, few US consumers today have the practical experience of taking empty packaging with them to the store, with the exception of reusable bags. Since the sustainability of returnable packaging hinges on high return rates, perhaps more than any other reuse logistics, convenient returns are key.

Yet is behavior change necessarily always a bad thing? If we hope to adequately address climate change, plastic pollution, and a myriad of other environmental problems, both consumers and companies will need to do things differently than they have in the past. Incremental change and fitting reusable packaging into the existing system may not be the right solution to social or environmental problems. **Reusable packaging that requires too little behavior change may be evidence that a brands' efforts are "press release projects"** aimed at generating positive publicity or goodwill, rather than scalable, environmentally-preferable, and cost-effective solutions.



[Figure 6]

Fig [6]. Behavior change in reuse can reinforce the status quo, or it can move the package/product towards systems change

Because many consumers are looking for lifestyle and user experience benefits as part of their rationale for trying reusable packaging, behavior change may be a key part of meeting these needs. For example, a consumer desire to have more control over the scents and formulas of personal care products means the consumer wants to engage with the product in more ways than just buying, using, and throwing it away. When a consumer wants to participate in the “creation” of the product, such as making cleaning products at home by mixing water and concentrate, reusable packaging can support innovative, wholesale changes to the entire package-product system. To some extent, reusable packaging is what consumers want, regardless of the behavior change required. Indeed, a [joint survey](#) by the World Economic Forum, SAP, and Qualtrics found that around the world, people believe choosing products in reusable packaging is the “most adoptable” zero-waste measure they can take, and see cost as a bigger barrier than potential inconvenience.

Ultimately, reusable packaging, no matter how simple or convenient it is, will inherently require behavior change, and brands can consider ways to embrace and better design for that change. Returning or refilling a package is fundamentally different from throwing it away. Rather than denying or avoiding this, brands and solutions providers can use the required behavior change to their advantage, creating a new offering that adds more value to consumers. This can be done by removing friction in a current system, thereby making the reusable packaging more attractive than the single-use packaging option.



What is friction? Friction can be thought of as the barriers, real or perceived, associated with an action, such as participating in a reusable packaging program. These can include financial barriers, such as having to pay more money or put down a deposit, retail experience barriers, such as different check-out procedures for reusable packaging, and barriers to convenience, such as unfamiliar behaviors required to use a product or send it back.

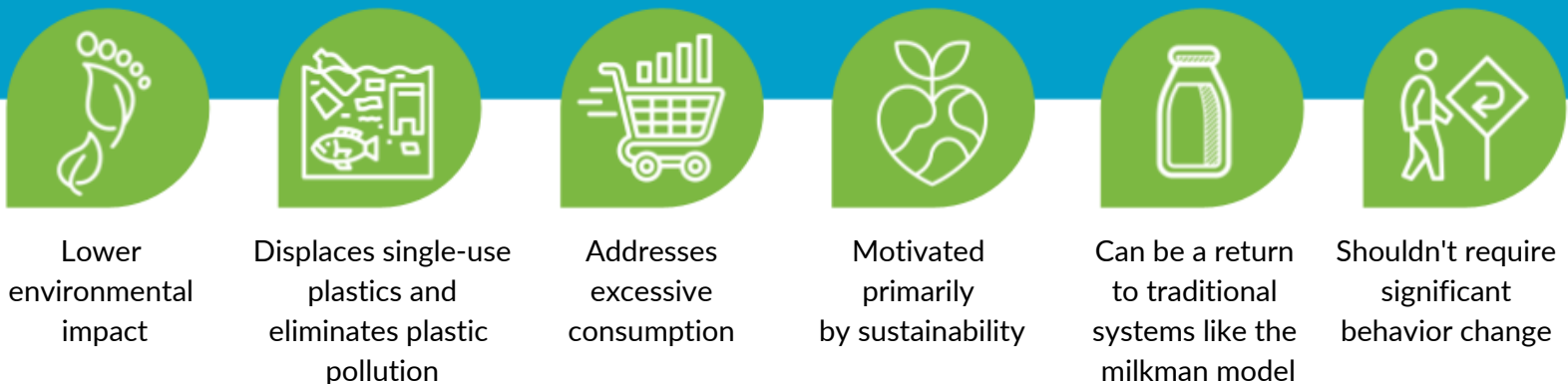
New behaviors associated with reusable packaging can add friction, but they may also remove friction, as shown in the examples of behaviors in the table below:

	Examples of reuse behaviors that may add friction	Examples of ways reuse may remove friction
Before purchase	<ul style="list-style-type: none"> • Bring empty container to store or retail location • Create an account on an app or website to purchase products or pay a deposit 	<ul style="list-style-type: none"> • Less decision fatigue as a result of more limited selection • Smaller amount of product to buy (e.g. refill insert rather than entire item)
Ordering/Paying	<ul style="list-style-type: none"> • Pay separately for a container you keep • Purchase on a platform or website different from other avenues of shopping • Get a weight (tare) on empty container • Pay a deposit on a container you need to return 	<ul style="list-style-type: none"> • Receive a discount for participating in the reusable system • Pre-weighed packaging that eliminates having to weigh (tare) a container • Buy product at a lower cost • Pay with packaging features (e.g. RFID codes) / "packaging as a wallet"
In the home / Use phase	<ul style="list-style-type: none"> • Store returnable secondary packaging until it needs to be returned • Store empty returnable primary packaging until it is returned • Dissolve a product / finish "making" the product • Communicate to household / remember that the packaging is not single-use (i.e. should be saved) 	<ul style="list-style-type: none"> • Store product in the purchased container; don't need to repackage
Done with product / End of life	<ul style="list-style-type: none"> • Schedule a pick-up of the returnable container • Clean primary packaging • Return packaging to store/drop-off point or mail it back • Dispose of reusable packaging at its end-of-life 	<ul style="list-style-type: none"> • No need to dispose of packaging (e.g. put it in the bin, take it to the curb)

It is interesting to note that today, reusable packaging appears to mostly add, rather than remove, friction. Going forward, brands can embrace reusable packaging as a tool for increasing brand loyalty and offering a radically improved product or better customer experience. For example, craft breweries that use reusable growlers can offer seasonal varieties of beer to customers that are members, increasing the likelihood that these customers will return for refills to get the unique product. For personal care or food products, a subscription service with auto-replenishment of smaller batches of product can lead to higher customer satisfaction through enhanced freshness and the convenience of automated orders.

Going forward, future disruptive innovations or collaborations across industries may support a more seamless and convenient experience for customers. For example, the ability to access reusable offerings at one type of location (for example, a restaurant) and return the empty packaging to another type of location (for example, a retailer) will help make reusable packaging more accessible and familiar to consumers. As reuse becomes more widespread, both the perceived and real behavior change required are likely to lessen.

Unpacking Industry Assumptions About Reuse



[Figure 7]

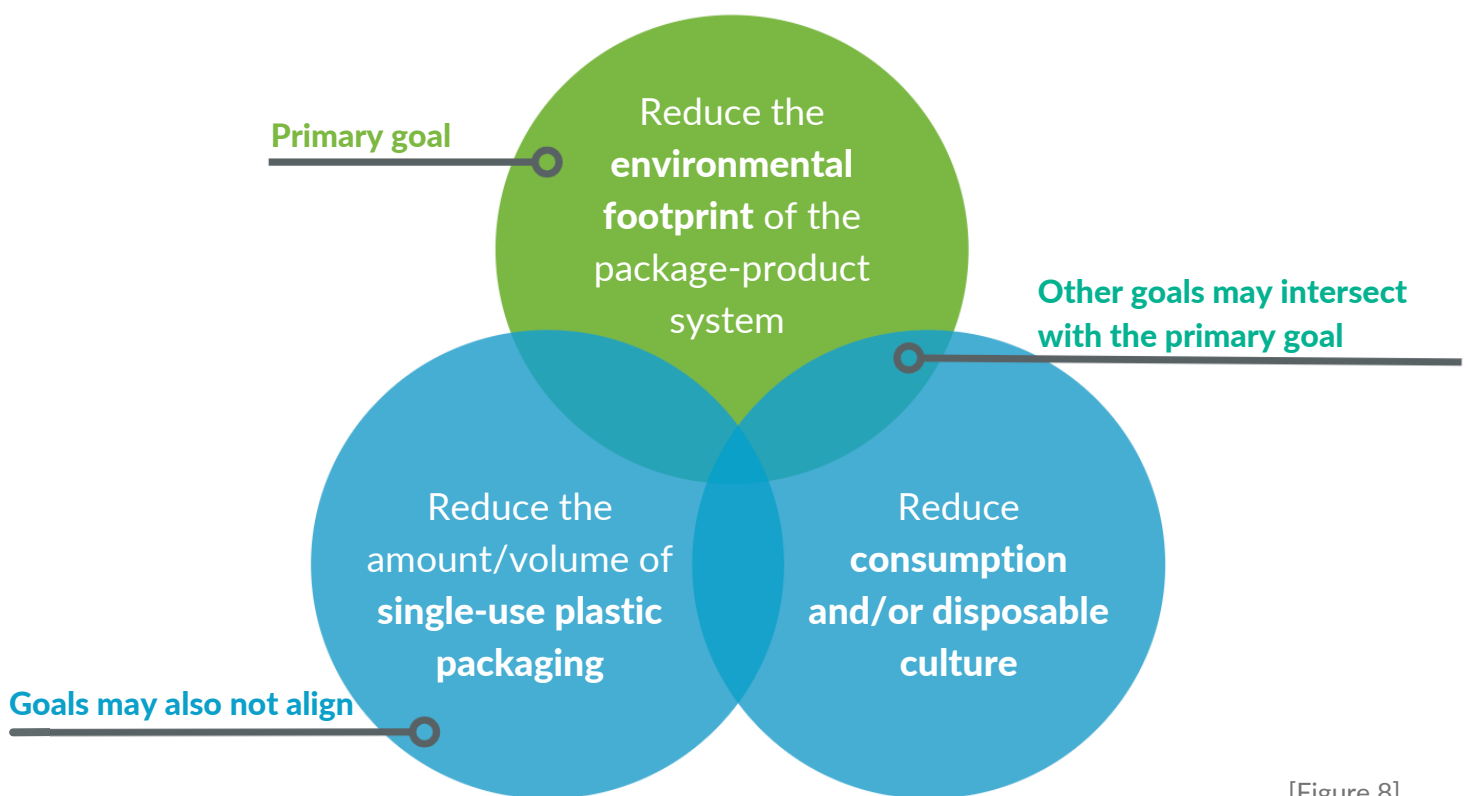
Fig [7]. Common industry assumptions about the purpose and design of reusable packaging

Establishing Goals for Reuse

What is the goal of reusable packaging?

The goal of reusable packaging should be to reduce the environmental footprint of the package-product system. This includes carbon emissions, associated water use, material health and chemical concerns, energy use, and impacts from disposal, including leakage into the environment and the negative effects of plastic pollution.

This goal - to reduce the environmental footprint - is not the same as reducing the amount or volume of single-use packaging sold. Though closely related, in some instances these goals may be at odds with each other. Reusable packaging may increase the carbon emissions or energy consumption of the package-product system, particularly if it is not reused many times by consumers. In cases where packaging will not be reused enough times to justify the more durable materials and reverse logistics, single-use packaging may still be preferable.



[Figure 8]

Fig [8]. The primary goal of reusable packaging and how it intersects with other goals

After acknowledging that reusable packaging is not always guaranteed to be more sustainable than single-use packaging, the next step is to consider what might be the best role for reusable packaging. Should 100% of the packaging we have today be reusable? What would be the environmental impact of doing so? If not 100%, how much of their single-use packaging should brands aim to replace with reusable packaging?

Companies should identify when reusable packaging will be environmentally-preferable to single-use, and pursue innovation in those categories and formats. Part of this decision requires brands and retailers to realistically assess the likelihood that consumers will sustain their participation in reuse and refill offerings, and the ways in which behavior change and friction can be optimized to ensure the greater success of reuse. This is discussed in further detail in the **Designing Reusable Packaging** section of this document.

By reducing the volume of single-use packaging and consumption of raw materials, a reusable packaging system also creates new value. After all, a circular economy in which reuse is prioritized is an economic model that decouples growth from resource consumption. This involves achieving economic growth from the utility and durability of products and by offering new features and technologies, rather than focusing on the lowest-cost delivery of products in single-use packaging. Brands and retailers may find that this value-creating opportunity of reuse is one of the best levers for internally advancing reusable packaging goals and initiatives.



Part 2. Designing Reusable Packaging

As explored in the previous section, reusable packaging should aim to have a lower environmental footprint than single-use packaging, as well as high return and refill rates in practice. How might it achieve these goals?

Part of what determines the success of reusable packaging is the design of the product-package system. This section outlines the important decisions brands need to make about how reusable packaging systems are structured and which product categories may be a good fit for reuse. It also explores some best practices for designing reusable packaging to be both environmentally preferable and successful.

As reuse continues to be an evolving space, the recommendations for designing reusable packaging for a broad range of product categories is likely to change over time, and will be revisited as more is uncovered about the best practices for reuse.

Reuse for various product categories

Brands often assume that all packaging is a good candidate to move to reusable packaging, but this may not be the case. When pursuing reusable packaging innovations, it is important to acknowledge that reuse is not always a good fit for every product category.

Reusable packaging may be a better fit for categories that meet certain criteria, such as:

- **Items that are used in foodservice (e.g. beverage cups, takeout containers).** Businesses go through large quantities of these items and consumers purchase them frequently, making it more likely that reusable packaging alternatives will quickly meet the high levels of reuse in practice.
 - Example: [ClubZero](#) reusable cups and containers
- **Items that are bought frequently (e.g. personal care, home care, supplies for work environments).** Because these products are consumed fairly quickly and have high levels of repeat purchasing, it is more likely that the reusable packaging will have high return/refill rates, thereby lowering the environmental footprint.
 - Example: [Unilever and Asda](#) offering refillable household products
- **Items purchased online that are returned often (e.g. clothes, footwear).** These products are already being sent back by consumers when they don't fit or match expectations, and the single-use secondary packaging can be replaced with reusable packaging. However, for products with high return rates it is equally important to prevent overconsumption.
 - Example: [RePack's](#) reusable mailers used by MUD Jeans



- **Where purchasing a specific quantity of product is important.** For some product categories, consumers express a desire to purchase less or more than the standard quantity sold, such as in the case of cleaning supplies, spices, or condiments. They may do so because purchasing a smaller amount is cheaper, matches what they need in a recipe, or because they don't use it often and don't want the product to expire. In these instances, a refill system may provide added value and help prevent food and product waste.
 - Example: [Algramo's](#) dispensers of cleaning products and detergents
- **Where the current packaging fails to adequately protect the product.** One of the primary functions of packaging is to protect the product. This is especially critical for e-commerce channels, where protection should be one of the main goals of packaging. If single-use packaging is not able to adequately protect the product and there are chronically high loss or damage rates, reusable packaging may help to reduce product damage and loss while also enabling reuse.
 - Example: [Liviri's](#) reusable cooler for wine shipments
- **Where there is already a “closed loop system” of return in place (e.g. rentals).** Instances where products are already circulating from one business to another and back, or from the business to the consumer and back, such as rentals, are low-hanging fruit for reusable packaging.
 - Example: [Rent the Runway](#) using Returnity's reusable mailer
- **Where there is a subscription model in place.** Products that are purchased via a monthly subscription model, such as wine or produce, may have success with collecting used packaging during the delivery of the next order. This is easier to facilitate when the delivery logistics are managed by the company, rather than a third-party carrier.
 - Example: [Imperfect Foods'](#) return program for grocery delivery packaging
- **Packaging that is often stored in the open or on display (e.g. soap dispensers).** For these products, external appearance is often important, and the more durable, “counter-worthy” design of reusable packaging may add additional value to the consumer.
 - Example: Refillable hand soap systems like [Blueland](#)

As just one example of this criteria in practice, consider products that are bought relatively infrequently, such as seasonal decorations. Packaging for this category may not be well suited to reusability because the packaging is not likely to be reused often enough to merit the additional materials and reverse logistics needed to produce and sustain it.



Learn more:

- [“Bringing Reusable Packaging Systems to Life: Lessons Learned from Testing Reusable Cups”](#), Closed Loop Partners - a report of learnings from multiple pilots of smart, modern reusable cup systems
- [Design Principles for Materials used in Reusable Packaging and Foodware Services, Upstream](#) - a set of guiding principles surrounding the material choices for reusable packaging and foodware

Customizing versus standardizing reusable packaging systems

When designing reusable packaging, brands need to decide what format their packaging will take, and whether this format will match industry norms. For example -

- Should a refillable soap bottle be the same volume as existing soap bottles on the market, with an opening that allows for refill using a variety of product types (e.g. concentrates, tablets, liquids)?
- Will the retail dispenser be able to accept a variety of bottle shapes, sizes, and brands, or will it only allow consumers to refill packaging that is a particular size or brand?
- Will the payment platform and/or app be unique to each solution, or will the reusable packaging be offered via third-party platforms such as Amazon or UberEats?

In the context of reusable packaging, **customization** refers to the process of designing reusable packaging that is visually or functionally distinct from competitors or other products in the category, and is collected through a unique reverse logistics channel. Meanwhile, standardization refers to ways in which the reusable packaging may fit into existing recovery streams or may use one design across brands, platforms, or channels. The decision to customize or standardize can have direct implications for the adoption of reuse, and for reducing the environmental footprint of reusable packaging.

Industry examples of standardization include [Coca-Cola’s Universal Bottle](#), used in Latin America and South Africa, as well as the Oregon Beverage Recycling Cooperative’s [refillable beer bottle program](#).



Additional considerations for customization versus standardization are listed below:

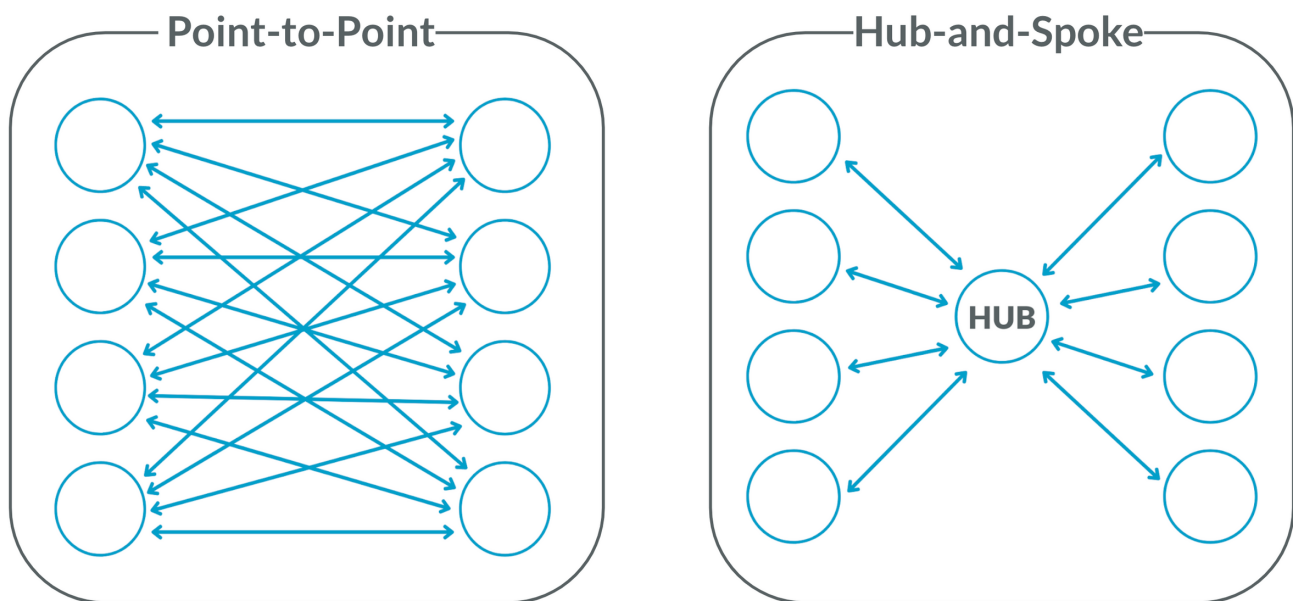
	Customization	Standardization
Pros	<ul style="list-style-type: none"> • Meets the specific needs of the brand or retailer • May have a lower carbon footprint, particularly if it is designed to address barriers to adoption or return rates, or to create more efficient reverse logistics • May encourage brand loyalty 	<ul style="list-style-type: none"> • Gives consumers more choices (i.e. can refill with any brand's product, return it to any location) • Easier for reverse logistics providers to service, clean, and/or store • May have a lower carbon footprint, particularly if it leads to wider adoption and operational efficiencies of scale
Cons	<ul style="list-style-type: none"> • Requires consumers to keep track of and/or store a variety of brand-specific containers and systems, lowering likelihood of participation • Consumers may not want to return packaging that is too beautiful or unique • Too much customization may hinder widespread adoption of reuse, since consumers are locked in to a particular brand's offering • May have a higher footprint, particularly if there are low return/reuse rates due to consumers not participating in the reuse system for a sustained period of time 	<ul style="list-style-type: none"> • May not meet the needs of all brands, retailers, or consumers • May eliminate important brand identify or product differentiation • May lack the novelty or experimentation consumers are seeking from reuse • May lack important features, such as effectively protecting the product • May have a higher carbon footprint, particularly if a one-size-fits-all approach results in low return/reuse rates • Requires coordination between brands and/or involved parties

Ultimately, the decision to standardize versus customize may depend on the product category. Many categories already have standardized formats that do not serve as product differentiators (e.g. paper coffee cup, laundry detergent jug, yogurt tub, pizza box). Here, these standard formats offer efficiencies of scale for brands and retailers, and can do the same for reusable packaging.

In product categories with high levels of consumer experimentation, such as beauty, it is unlikely that consumers will stay with one brand long enough to facilitate the high levels of reuse in practice necessary for sustainability. Can a consumer really be expected to refill a bespoke lipstick container from a single brand hundreds of times? Instead, competing brands can offer refills for the iconic lipstick packaging format, giving consumers more options for when they inevitably want to experiment while also helping to ensure the environmental gains of reuse over single-use.

Point-to-Point versus Hub-and-Spoke

An important consideration for reusable packaging is whether it will be sent out or collected using a point-to-point model or a hub-and-spoke model.



[Figure 9]

Fig [9]. In the context of reuse, point-to-point models typically offer consumers individualized reverse logistics, while hub-and-spoke models rely on central locations such as retailers to facilitate returns

Reusable systems using point-to-point delivery and return may include:

- Delivering reusable packaging directly to consumers via e-commerce
- Providing consumers with a return label that sends the empty packaging directly to the brand for refill
- Picking up empty containers directly from consumers' homes

Reusable systems using hub-and-spoke delivery and return may include:

- Making a trip to a retail location to purchase the product or use a dispenser
- Returning reusable packaging to a central location, such as a restaurant or retailer
- Sending reusable packaging to a third-party location, such as a distribution center or cleaning center

According to a meta-analysis conducted by Reloop and Zero Waste Europe, one of the biggest sources of environmental impact for reusable packaging is the transportation phase, which includes both sending packaging to consumers and collecting it once it is empty. For this reason, the decisions around how to structure reverse logistics using either the point-to-point or a hub-and-spoke model play an important role in determining the environmental footprint of reusable packaging.

While the point-to-point model may offer more convenience by enabling delivery and pick-up directly from a consumer's home, it may have a higher environmental impact during the transportation phase due to the increase in individual trips. This will vary depending on how much of the pick-up route is "unique and empty", and on whether the reverse logistics are performed by a small business or a parcel carrier with a national network. For example, in the case of a UPS or FedEx, empty packages may be picked up one at a time but are immediately aggregated with other packages traveling similar routes. Though there is a net addition of miles driven, the impact of a unique mile driven may be fairly low.

In the case of frequent purchases or repeat deliveries, such as groceries or restaurant takeout, point-to-point collection may be warranted. Because in these instances home delivery is already taking place with regular cadence, it can make sense to pair it with the collection of empty or used reusable packaging. Although the pick-up part of the route may be "empty", it is not "unique", and is likely to have lower environmental impact from transportation.



Some businesses may prefer the hub-and-spoke model, which uses retail or restaurant locations to refill and return packaging. Here, the expectation is that consumers will return the packaging, taking some of the reverse logistics out of the hands of businesses. Though there are efficiencies gained from centralizing collection, the hub-and-spoke model may be more inconvenient for consumers. As mentioned earlier, today's consumers do not have experience bringing numerous empty containers with them as they shop or run errands. And while this model builds on existing infrastructure, there may be issues with capacity or space on-site.

Ultimately, the decision to use a point-to-point or hub-and spoke model, or some combination of both, will depend on the specific reusable packaging system in question. However, it is a decision that should be made carefully due to the implications on transportation emissions and the required level of behavior change for consumers.

Facilitating reuse in practice

One of the biggest challenges for reusable packaging programs is whether and how consumers will return packaging to the retailer or brand owner, or bring empty packaging back to retail stations for refilling. This guide has emphasized the importance of reuse in practice since it is key to a lower environmental footprint for reusable packaging. Yet reuse in practice is also one of the biggest unknowns for brands looking to introduce and scale reusable packaging programs. [A 2021 report of consumer behavior](#) in the UK found that 83% of consumers are open to change when it comes to reusable packaging and 4 in 10 have used reusable packaging. Clearly, there is growing evidence that consumers are ready for reusable packaging, but a well-designed, thoughtful foundation to reuse is the first step to ensuring consumer participation in reuse. Brands and designers can return to the key decision points that have been presented in this guide, considering how they can incentivize consumers by:

- Designing for consumer motivations that go beyond sustainability considerations
- Understanding how consumer behavior change can lead to positive systems change
- Designing reusable packaging programs in product categories that have higher likelihoods of consumer uptake
- Deciding whether to customize or to standardize reusable packaging design and ecosystems
- Deciding whether to deploy a point-to-point versus hub-and-spoke model

Other practical considerations, such as cost, ease of use, and reverse logistics, are outlined in the section [Questions to ask about reusable packaging](#).



Incentives like discounts and promotions are essential for drawing in a more mainstream customer, who may need a financial reason to participate in reuse. For example, in the case of refillable soap sold through retail dispensers, the extra step of remembering to bring a container may be offset by the discounted price, as well as the ability to purchase only the desired quantity. Ultimately, the right mix of incentives and convenience will help reusable packaging programs stick.

Another tool aimed at promoting the return of reusable packaging is a deposit. Deposits are small charges - often ranging from 5 cents to a few dollars - that consumers pay to use a container, and that are refunded to the consumer once the container is returned. There is no clear answer as to what constitutes the best deposit amount for reusable containers in the context of foodservice and food packaging. The deposit amount needs to be high enough to incentivize customers to return containers and communicate that a container has value, but not so high that the deposit acts as a barrier to entry, particularly to individuals of lower income.

In some cases, charging a deposit for initial use of a container may not be the right tool for increasing participation. Numerous behavioral economics studies have found that people are more motivated to avoid a fine or tax, because of loss aversion, than to take advantage of a reimbursement. This means that a typical consumer is more likely to change their behavior to avoid a 10 cent charge on a single-use shopping bag, for instance, than to bring their own bags to get a 10 cent discount. Other alternatives to deposits include membership pricing models or charges to a customer's account if the container is not returned within a certain period of time.

As an alternative to financial incentives, brands can also integrate track and trace technologies into their design of the reusable packaging system. For example, digital trackers, "passports", and unique barcodes can help integrate reusable packaging into apps that then prompt and incentivize consumers to return packaging, as well as keep track of reusable packaging throughout the reverse logistics journey. They could also enable brands to verify and quantify reuse in practice for marketing and further consumer engagement. Reuse programs that are integrated with tracking technologies seem better positioned to overcome barriers and provide meaningful incentives for customers.

Learn more:

- "[Circular Economy Infrastructure: why we need track and trace for reusable packaging](#)," Ellsworth-Krebs, K. (2021), Sustainable Production and Consumption - a paper exploring the ways in which digital tracking could audit and incentivize reuse of packaging
- "[How to help consumers adopt reusable packaging](#)", IGD - a report based on research with over 2,000 UK consumers, outlining key opportunities to help consumers adopt refill and return packaging solutions.



Brands don't have to do this alone. An entire ecosystem of reusable packaging solutions providers exists to improve the user experience of reusable packaging and solve reverse logistics challenges.

Brands can identify partners using the following directories:

- [Upstream - Reuse Business Directory](#)
- [Reusable Packaging Association - Reusables Marketplace](#)
- [Source Green Packaging - Reusable Packaging](#)

Measuring Success

It is important to apply rigor and data to understand whether reusable packaging is meeting the primary goal of reducing the environmental footprint of the package-product system. How do we know if reusable packaging has achieved its environmental goal? Life cycle analysis calculations are one tool to help demonstrate the reduced environmental footprint of reusable packaging.

In addition to life cycle assessments, brands and retailers can explore other metrics for reusable packaging. Perhaps the best way is to analyze return and refill rates. That's because this metric centers the goal of reusable packaging, which is to have a lower environmental footprint than the single-use packaging system. A return rate is calculated as the number of reusable packaging that has been returned after being used, divided by the total reusable packaging in circulation.

Other metrics, such as costs and sales data, can also be used to understand how reusable packaging is performing, yet they have pros and cons to consider. Cost and sales data are practical, easily-quantifiable metrics that are important for establishing the business case for reusable packaging. However, they may reflect only short-term performance, rather than long-term adoption that translates into positive environmental impact.

More considerations around these metrics are outlined below.



Return and refill rates

Because the environmental benefits of reusable packaging depend on reuse in practice, metrics for success should include return and refill rates. As noted in earlier sections of this document, reusable packaging shouldn't be measured by how many cycles it can withstand (e.g. built for 1,000 reuses), but how often it is actually being reused.

For returnable packaging, this means success will require high return rates. What is high? According to some experts and research in this space, high return rates should be defined as at least 80%, but even higher return rates, around 90%, are better. This is because without high return rates, a package won't be used more than a handful of times on average. Consider how, over time, a return or refill rate multiplied by itself translates to the following average number of uses:

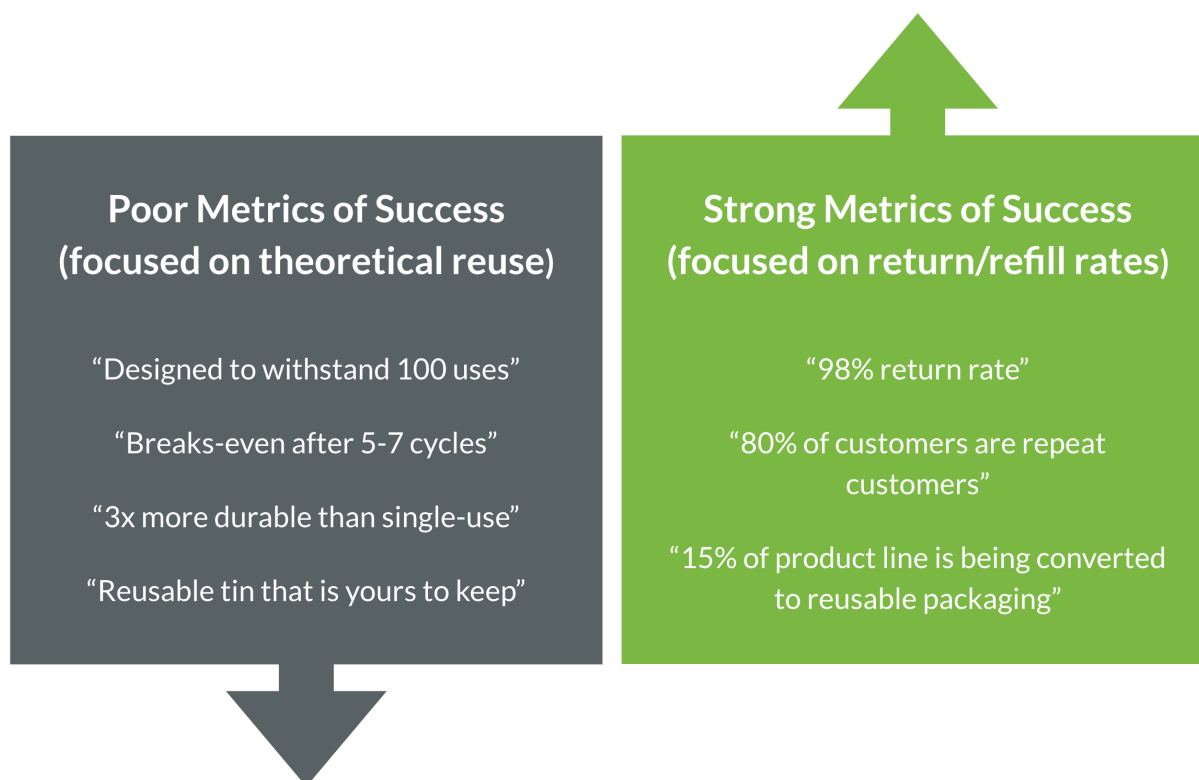
Return or Refill Rate	Uses on Average
50%	2 uses
60%	2.5 uses
70%	3.3 uses
80%	5 uses
85%	6.67 uses
90%	10 uses
95%	20 uses
97.5%	40 uses

Even a return or refill rate as high as 70% corresponds to just 3.3 uses on average, which is likely not enough to outweigh the environmental impacts of producing a more durable, reusable container.

To determine whether the number of uses on average is sufficiently high, consider a package's breakeven rate. This is the number of times a reusable item has to be reused in order to "breakeven" with single-use packaging, or to have the same environmental impact as single-use. As outlined in **Reuse in the context of a product's life cycle**, in the initial cycles of reusable packaging, it has a higher environmental impact because of the additional materials and transportation required.

It is helpful to know the breakeven rate and evaluate whether it can be met with a low return or refill rate. For example, if the breakeven rate for a refillable deodorant pod is 15 uses assuming a 100% refill rate by consumers, and yet only 10% of consumers are likely to refill it 15 times, the environmental footprint of the refillable deodorant pod may ultimately be higher than for single-use. However, the breakeven rate is not the only metric that should be used, since breakeven rates are subject to variability in reverse logistics and actual return rates.

For reusable packaging in food service settings, it can be effective to focus on building repeat ordering. Repeat ordering indicates consumer adoption and follow-through, and demonstrates that participation is not just part of a fad or virtue signaling.



[Figure 10]

Fig [10]. Poor metrics of success generally focus on theoretical reuse, while strong metrics of success tend to focus on return/refill rates

Inventory Utility and Management

Successful reuse models also require keeping a close eye on inventory utility and management metrics. These include:

- The quantity of reusable packaging shipped (also known as trip or issue volume)
- The number of uses of the same asset over a particular period of time (also known as turns)
- The speed with which a reusable product completes an entire cycle (also known as cycle times or pool speed)
- The period of time a reusable container is available for use but remains unused (also known as dwell or idle time)
- Breakage or loss rates

These metrics help paint a picture of how efficiently the reusable system is operating. For example, both costs and environmental footprint could be reduced by increasing the turns and cycle times, while also decreasing dwell time and breakage rates.

Cost

When considering reusable packaging, there are both one-time and ongoing costs that should be evaluated. A number of these are outlined in the Questions to ask about reusable packaging section of this document.

Cost-savings can be a primary driver for reuse in some instances. For example, returnable packaging that is used in place of single-use packaging has the opportunity to reduce a business's operational costs. This is because the ongoing costs of single-use packaging are converted into upfront costs for durable packaging, which can be managed as assets over time. Returnable packaging can also help a business mitigate the cost impacts of supply chain shortages for single-use packaging, or the costs of complying with an EPR program for single-use packaging. Where cost savings align with carbon footprint savings, the tailwinds are much stronger for reusable packaging.

In some cases, costs will be higher for reusable packaging. While pilots are inherently more expensive than the status quo and require startup costs, ultimately, cycle costs need to try to get close to cost parity with today's system. Solutions providers, brands, and retailers need to have a plan for bringing down the implementation costs of reusable packaging over time. If the cost of retrieving reusable packaging and redeploying it into the system, or running a refill program, remains more expensive than single-use, the solution won't scale. Ending a reusable packaging pilot for reasons such as cost not only diminishes brand credibility and frustrates engaged consumers, it may also result in a higher environmental footprint, since the reusable packaging will not have had a chance to reach high reuse rates.



Sales Data

Companies should not use short term sales data as the primary measure of success. This is particularly true because changes to shopping behavior and personal care routines take time, and short term sales data may not reflect one-time or repeat purchases for some time. Short term sales data also does not guarantee ongoing participation by consumers, and is unlikely to be a good proxy for high return and refill rates.

As noted in earlier sections of this document, few companies have outlined what portion of their sales they expect to convert to reusables. Companies can consider setting sales targets that represent a conversion from single-use to reuse as a way to measure whether reuse has displaced single-use, or simply extended the range and number of products consumers are buying.



Best practices: how to have a successful program

Ultimately, the success of reusable packaging can be measured by three aspects of the package-product system:

- Success is: getting high return rates in practice. How can this be achieved?
 - Program accounts for logistics across the entire system from collection to reuse
 - Program measures the actual reuse/refill rates by consumers as a key metric
 - Container is prominently and clearly labeled for reuse and/or refill
 - Deposit amount, if charged, is high enough to ensure return rates
- Success is: long-term consumer engagement. How can this be achieved?
 - Consumers see cost savings through participating in program OR:
 - Reuse offers other benefits, such as lifestyle advantages, since most customers don't do it for sustainability
 - Deposits aren't too high, remaining affordable and equitable
 - System incentivizes participation through rewards, etc.
 - Minimal behavior change or inconvenience and/or maximum removal of friction
 - Integration with technology by using apps to facilitate payment, returns, deposits
- Success is: lower environmental footprint. How can this be achieved?
 - Reuse is replacing and/or capturing share of single-use packaging
 - Reusable packaging is durable yet lightweight
 - Primary packaging, and ideally all accessory parts, are recyclable at end of life
 - Reusable program is laser-focused on getting high return rates
 - Reusable program aims to lower transport (reverse logistics) miles and looks for better transport modes

Success for Reusable Packaging



Long-term consumer engagement



High return rates in practice



Lower environmental footprint

[Figure 11]

Fig [11]. Success for reusable packaging relies on long-term consumer engagement, high return rates in practice, and lower environmental footprint

Questions to ask about reusable packaging

The following questions are designed to help companies explore the wide range of considerations surrounding reusable packaging, determining whether reusable packaging is the right fit and how it may be designed more sustainably.

Reuse Scoping and R&D

Consider the following questions to determine if there is a strong case for reusability. Being able to answer as many of these questions as possible before a pilot is launched can improve the likelihood that the three objectives of reusable packaging - high return rates in practice, long-term consumer engagement, and lower environmental footprint - will be met.

- **Is this a good idea for my category?**
 - Does the reuse system have a lower environmental impact than the impact of single use packaging?
 - What is the likelihood of high consumer participation and high return rates?
 - Are we adding new products, or are we replacing single use packaging with reusables?
 - What is the expected return rate for the package?
 - Would a broader redesign of the product/package system be more impactful?
 - What will we do if the program “fails”? Will we landfill all the reusables and related assets such as dispensers?



- **What other problems can I solve with reusable packaging? What other benefits can I offer consumers?**
 - Can I solve operational challenges/inefficiencies? (e.g. have to use box cutters, stacking/space issues, taring/pricing/sanitation in bulk areas)
 - Can I solve food waste challenges? (e.g. make food more appealing or store it better, improve product evacuation, extend shelf life, etc.)
 - Can I offer cost savings to the consumer?
 - Can I offer new benefits? (e.g. personalization, loyalty program)
- **What is the environmental impact of the reusable system, considering...**
 - The materials used for the new reusable packaging, including replenishment
 - The reverse logistics, including transportation, washing
 - The system with low reuse rates - e.g. if consumers just try it once or twice
 - The system with medium reuse rates - e.g. 20-70%
 - The system with high reuse rates - e.g. 90%

Program Set-Up and Consumer Participation

Thinking through the following questions can increase the likelihood of high consumer participation and establish realistic expectations for sustained program costs.

- **How many consumers will participate in the program?**
 - How many customers will switch to the reusable version of this product? (e.g. what is the expected adoption rate?)
 - How many consumers will engage in repeat ordering? At what frequency?
 - Will this be appealing to dark green consumers or all types of consumers?
 - Are there financial/access barriers like deposits, credit card holds, setting up accounts, needing an app, etc.?
 - How long is the product typically used by the consumer?
 - How much of a refill product will a customer purchase?
 - How frequently will a customer purchase a refill?
- **What will the reuse program cost?**
 - Set-up costs (e.g. physical costs of containers, displays and other infrastructure, etc.)
 - Ongoing costs (e.g. employee training, transportation, redistribution, cleaning, replacement, etc.)
- **What internal operational changes will be needed?**
 - Staff training, distribution/warehouse changes
 - Payment/tech changes (e.g. apps, payment processes)
 - How it is displayed/sold in retail (e.g. in a reuse “block” or on shelf with non-reusables)



Material Sourcing

Consider the following questions to evaluate and better understand the tradeoffs of common material choices for reusable packaging, such as plastic, aluminum, and glass.

- **What material will be used?**
 - Does it include recycled content?
 - Are there relevant certifications available for this material (e.g. USDA certified biobased content, Recycled Material Standard)?
 - How much does the package weigh? How much heavier is the reusable system over the traditional packaging?
- **What chemicals of concern may be present in the material used?**
 - What is the risk of these chemicals migrating into the package contents, particularly if the packaging will be used to heat or store food long-term?
 - Were any chemicals of concern used in the manufacture of the packaging, e.g. as processing agents or lubricants?
 - Has the material been screened using any material health tools (e.g. GreenScreen, SciveraLens, etc.)?
- **Can a sufficiently durable material be sourced?**
 - How many uses (or “cycles”) in the program will this material choice sustain?
 - What additional benefits can this material deliver?
 - Is it enjoyable to use, “rememberable”, lightweight, counterworthy, beautiful, etc.?

Reverse Logistics

The following questions can help to outline and assess the environmental implications of various reverse logistics associated with reusable packaging, such as returns, refills, and sanitization.

- **Who will be my “solutions provider” partners (e.g. dispenser company, take-back company, cleaning company)?**
 - What is the cost of their services?
 - What service levels will be needed (e.g. frequency of cleaning, shipping of containers back and forth, restocking, etc)?
- **Refill logistics - direct-to-consumer:**
 - What material is the refillable insert/sachet/etc. made out of?
 - What is the weight of the refillable insert/sachet/etc.?
 - Is the refillable insert/sachet delivered to the consumer via disposable secondary packaging? If so, what is the weight and material of the secondary packaging



- **Refill logistics - in-store:**
 - What materials were used to produce the refill station/machine?
 - What is the energy use of the refill station/machine?
 - What is the end-of-life pathway for the refill station/machine?
- **Return logistics:**
 - What is the expected amount of float (extra containers) that will need to be maintained by the business?
 - What is the weight of the packaging being returned?
 - What is the weight and material of the return infrastructure (e.g. kiosk, station, machine)?
 - What is the distance traveled by the empty container?
 - Are there additional components that are disposable (e.g. seals, stickers, labels)?
- **Sanitization:**
 - What is the amount of water/cleaning solution required to sanitize each package?
 - Are any chemicals of concern used during the cleaning/sanitization?
 - What is the energy required to sanitize each package?
 - How will you communicate sanitization and safety to your customers?

Disposal

It is important to consider that reusable packaging will eventually reach its end-of-life and will need to be disposed of properly.

- What will be the end-of-life pathway for the durable reusable packaging? (e.g. manufacturer take-back, curbside recycling, store drop-off, composting, landfill)
- What are the recycling rates for this material/product category?
- Is there a disposable insert or other components? If so:
 - What is its end-of-life pathway?
 - What are the recycling rates for this material/product category?

Learn more:

- [Design Guidelines](#) and [Safety Guidelines](#) for Reusable Packaging, World Economic Forum - resources that aim to coalesce the most important considerations designers should take into account for reusable packaging.
- [PR3 Reusable Packaging System Design Standard](#), RESOLVE - a draft standard to integrate and support reuse initiatives for the long haul, offering broad strokes and detailed requirements on how to integrate and build the complex needs of reuse infrastructure





Conclusion

While reusable packaging has been in place for many decades for certain product categories like beverage containers and secondary packaging in produce, for other categories like personal care, reuse is still in the early phases of adoption. There remains more to learn from trials to unlock the potential of reusable packaging, and standards and innovation are still evolving in this space.

Given the many considerations for reusable packaging, it's clear that it is not a one-size-fits-all solution to replace all types and formats of single-use packaging. Rather, because reusable packaging requires more materials and transportation, its success from a sustainability standpoint hinges on high levels of reuse or refill in practice by engaged consumers. It may not be the right fit for every category of packaging, and the environmental impacts should be weighed against the impacts of single-use packaging.

We hope that this guidance helps companies understand the various types of reusable packaging, determine what their internal goals for reuse are, consider how consumers interact with reuse, and ultimately implement best practices for their reusable packaging innovations. With more careful consideration of the “why” and “when” around reusable packaging, it will be possible to achieve a more successful and sustainable transition to reusable packaging.

