

**From
Start to
Success**

The Refill & Reuse
System Handbook

**Getting
Started**



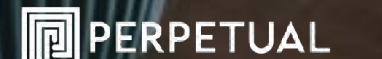
Getting Started!

Introduction to the Refill & Reuse Systems Handbook and how to use it.



Plastic Reboot

Executing Partner



Acknowledgments

About Plastic Reboot

Plastic Reboot is a \$108 Million program supported by the Global Environment Facility, co led by the United Nations Environment Programme and World Wildlife Fund, and implemented in partnership with the United Nations Development Programme and the United Nations Industrial Development Organization.

Plastic Reboot is focused on upstream and midstream solutions to plastic pollution in the food and beverage sector, and is delivered through a Global Project and a suite of 15 National Projects.

Together, we're working to transform material systems and engage governments, civil society organizations, and the private sector to reduce plastic pollution.

This document was prepared by Perpetual and WWF (World Wildlife Fund) under the Plastic Reboot Programme. It is funded by the Global Environment Facility. Its contents are the sole responsibility of Perpetual and WWF and do not necessarily reflect the views of the GEF Secretariat or any other organization.

The **Refill & Reuse Systems Handbook** was developed through a collaborative process bringing together global expertise and local insight.

This work was led by **Perpetual**, in close partnership with **WWF**, as part of the **Plastic Reboot Programme** — a multi-country initiative working to advance upstream solutions to plastic pollution in the food and beverage sector.

The development of this Handbook was informed by engagement with **national project teams, local partners, and practitioners working on reuse systems across diverse regional contexts**. Their insights helped ensure the guidance reflects real-world implementation challenges and opportunities.

Local partners played a critical role by contributing **country-level research, system insights, and interest holder perspectives**, helping ground this resource in the realities of different markets and infrastructure conditions.

We are grateful to all partners and contributors who shared their expertise and experiences to support the development of this resource.

Lead Authors:
Perpetual Use, Inc.
Dr. Dagny Tucker
Ellie Moss
Natalie Kra
Julia Marsh

Local Partners & Country Contributors:
We extend our sincere appreciation to the organizations and individuals who supported the development of this resource through research, consultation, and in-country insights.

Costa Rica
Alejandro Calderón Gómez - Ficus Box

Brazil, Peru
Sergio Talocchi – Natura

St. Lucia & SIDs
Michelle Headley

Jordan
Obyda Hummash - Future Pioneers for Empowering Communities

South Africa
Kiera Crowe Pettersson - ICLEI Africa

Reviewed by:
WWF Plastic Reboot Team

Design:
Emma Segal

Welcome!

You've found yourself in the right place if.....



You've heard about reuse and want to better understand the opportunity



You're exploring whether reuse is a viable alternative to single-use packaging



You're ready to pursue a reuse project but aren't sure where to start



You have an early concept and want guidance on possible system approaches



You're planning a project and need clarity on roles, steps, and interest holder engagement

What's Inside

This Handbook is a **practical resource for teams exploring or implementing refill and reuse systems**. It provides the knowledge, tools, and guidance needed to move from **early exploration to real-world implementation**.

The Handbook includes **three complementary components**:

- The 5-Part Primer
- Step-by-Step Guide & Training Modules
- Refill & Reuse System Dictionary

The 5-Part Primer

Builds the **foundational knowledge and shared vocabulary** needed to understand reuse systems and evaluate opportunities.



The Step-by-Step Guide

Provides **structured guidance for designing and implementing reuse interventions**, from concept through launch.



Refill & Reuse System Dictionary

Defines **key terminology and system elements** to support consistent language across interest holders.



From Start to Success: Refill and Reuse System Handbook

Interest in refill and reuse systems is growing globally as interest holders seek solutions that address plastic pollution **upstream of waste management systems.**

However, many teams encounter similar challenges when moving from ambition to implementation — including questions around system design, interest holder coordination, infrastructure, and operational feasibility.

The **From Start to Success Handbook** was developed to help bridge this gap between **concept and execution.**

Whether you are early in exploration or actively designing a pilot, this Handbook is intended to support decision-making at each stage of the reuse journey.



Start with the Primer

These components are designed to **work together as a complete toolkit.** We recommend beginning with the **Primer** to build foundational understanding and align teams around core system concepts.



Build with the Guide

The Step-by-Step Guide can then be used to move from strategy to action, helping you assess readiness, prioritize packaging types, design the intervention or system, plan implementation, go live, monitor and strategize how to grow.



Reference the Dictionary

The Dictionary serves as a reference throughout—supporting alignment across interest holders and ensuring consistent terminology.

These resources can be used **sequentially or independently,** depending on where you are in your reuse journey. We look forward to seeing your refill interventions and reuse systems come to life and are honored to support you on this journey.

-The Perpetual and WWF Teams

**From
Start to
Success**

The Refill & Reuse
System Handbook

PRIMER
Part 1

Why Refill & Reuse Systems

Timely Solutions to Plastic
Waste and Much More



Plastic Reboot

Executing Partner



PERPETUAL

From Start to Success: The Refill & Reuse System Handbook

The 5 Part Primer



PART 1

Why Refill & Reuse Systems

Information about the problems that reuse and refill solve and the many benefits of these programs



PART 2

How Refill & Reuse Systems Work

An introduction to the different types of refill interventions & reuse systems



PART 3

The Refill & Reuse Systems Landscape

An overview of active reuse and refill programs worldwide, including descriptions and links to more information



PART 4

Design Criteria and Considerations

Best practices for design and implementation of refill interventions & reuse systems



PART 5

Enabling Conditions

What enables reuse to succeed, including policy, regulation, infrastructure, technology and collaboration



From Start to Success: The Refill & Reuse System Handbook

Introduction



Making the Case

Why Reuse & Refill is a Critical Component of Addressing Single-Use Plastic Pollution (SUP)

Part 1: Why Refill & Reuse

Sets the stage with definitions, problem space and solutions to enable shared understanding and common vocabulary.

While many people are clear that SUP's need to be addressed, we recognize the need to increase buy-in from other interest holders.

Some of these interest holders would benefit from having further information on why SUP's are a problem and why reuse and refill are worthy of being considered as solutions.

This section provides a wealth of scientifically-backed information about current environmental, social and other issues associated with SUP's, as well as corresponding benefits of reuse and refill.

We intend this to be a resource to deepen your knowledge and act as a reference section to educate others - ultimately justifying the necessity of reuse and refill.

What's Inside

Defining Refill & Reuse Systems	5
<i>This is Reuse and Refill</i>	6
<i>Reuse and Refill Definitions</i>	7
<i>This is NOT Reuse or Refill</i>	8
<i>What Reuse or Refill Is</i>	9
Problems & Benefits	14
<i>Problems of Single Use Plastic</i>	15
<i>Benefits of Reuse and Refill</i>	16
Human Health — Problems & Benefits	17
Environmental Justice & Human Rights — Problems & Benefits	18
Environment — Problems & Benefits	19
Economic Impact — Problems & Benefits	20
Solutions	21
<i>Existing Solutions Will Not Be Enough</i>	22
References	24

About Plastic Reboot

Plastic Reboot is a \$108 Million program supported by the Global Environment Facility, co led by the United Nations Environment Programme and World Wildlife Fund, and implemented in partnership with the United Nations Development Programme and the United Nations Industrial Development Organization.

Plastic Reboot is focused on upstream and midstream solutions to plastic pollution in the food and beverage sector, and is delivered through a Global Project and a suite of 15 National Projects.

Together, we're working to transform material systems and engage governments, civil society organizations, and the private sector to reduce plastic pollution.

This document was prepared by Perpetual and WWF (World Wildlife Fund) under the Plastic Reboot Programme. It is funded by the Global Environment Facility. Its contents are the sole responsibility of Perpetual and WWF and do not necessarily reflect the views of the GEF Secretariat or any other organization.

Defining Refill & Reuse Systems



This is Reuse and Refill



REUSE SYSTEM

Any process or operation in which an item (e.g. reusable packaging, reusable food service ware) is used again for the same purpose for which it was originally designed and includes organisational, technical or financial arrangements, together with incentives, to ensure reuse. The *packaging remains in the ownership of the system or producer.*

Main reuse systems:

- Prefill
- Reusable food serviceware
- Asset sharing
- Reusable secondary packaging
- Reusable transport packaging
- Bulk ingredient or product delivery



REFILL

Any process or operation in which *consumer-owned packaging* is refilled at home or in the store by the consumer or at the point-of-purchase by the business.

Main refill models:

- In-store refill or dispensing
- Water refill
- Bring Your Own foodware or bags
- Refill at home through single-use packaging

Reuse and Refill Definitions

REUSE SYSTEMS

Prefill	In a prefill system, primary packaging is designed to be reused and sold off the shelf pre-filled to offer the convenience of single-use packaging.
Reusable food serviceware	Provider or system-owned reusable food serviceware is designed to be used for its originally intended purpose multiple times.
Asset sharing	Shared asset systems make reusable items available for community borrowing or rental, typically at smaller scales than commercial reuse programs.
Reusable secondary packaging	Packaging such as shipping mailers or delivery boxes used to transport products, deliver to customers, and collected during the next delivery or at return points.
Reusable transport packaging	Crates, bins, pallet, pallet wrap and insulated containers used to transport goods between businesses or to customers and returned for reuse.
Bulk ingredient or product delivery	Producers or co-packers fill reusable bulk containers, which are distributed through existing supply chains.

REFILL SYSTEMS

In-store refill or dispensing	Products are stored in larger containers or refill dispenser and dispensed in desired quantities into consumer-owned or pooled reusable containers.
Water refill	Water is filled in user's reusable containers, replacing single-use plastic bottles.
Bring your own foodware or bags	Consumers use their own cups, containers, or bags for products such as ready-to-eat food, beverages, or groceries.
Refill at home through single-use packaging	Consumers purchase smaller, lighter, or concentrated products that are used to top up durable containers at home.

See Part 2 for expanded definitions and examples of reuse and refill systems



This is NOT Reuse or Refill



REPAIR

Operation by which a faulty or broken product or component is returned back to a usable state to fulfil its intended use.



REPURPOSING

When an item is used again for a *different* purpose for which it was originally designed.

With reuse, an item is used again for its original purpose.



RECYCLING

Defined as “transforming a product or component into its basic materials or substances and reprocessing them into new materials.”

Reuse is a fundamentally different process; the same item stays in circulation, being used again and again, with systems to support the cycle as needed.

Common circular economy terms—such as “**recycling**,” “**refill**,” “**repair**,” and “**repurpose**” are often used interchangeably, despite having distinct meanings.

Reuse and refill solutions replace single-use, disposable products or packaging items with reusable ones.

Some types of reuse and refill are quite common and recognizable:



Glass bottles for beverages like soda and beer are often sold with a **deposit** that the retailer or consumer claims when the bottle is returned to the distributor.



Reusable **foodware** is often found at restaurants or food stands that serve meals on **durable plates** and wash them to use again.



Grocery stores often have **bulk bins** where dry goods like grains or liquids like oils and soaps can be purchased in the **customer's own container**.



Bringing your own bag for fruits and vegetables **or a container** to hold rice to a traditional market is common practice.



Reuse in Business to Business (B2B) contexts is well established and operating at scale with numerous examples of reusable shipping products like **pallets** and **crates**, and **bulk product delivery**.



Environmental Paper Network: 'Fast' food packaging? Reusable dishware vs single-use

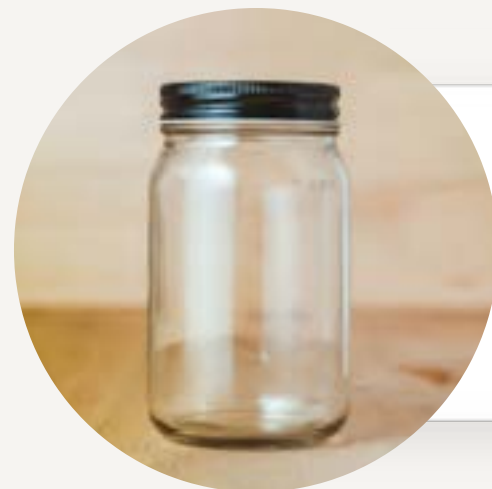
In addition to familiar forms of reuse and refill, many other types of reusable packaging systems are being deployed to replace single-use packaging. Examples include:

Retail System



A consumer purchases a jar of tomatoes at the store, and uses it at home.

1



The customer then returns the jar to be washed, sanitized and filled again by the producer with tomatoes or a similar product.

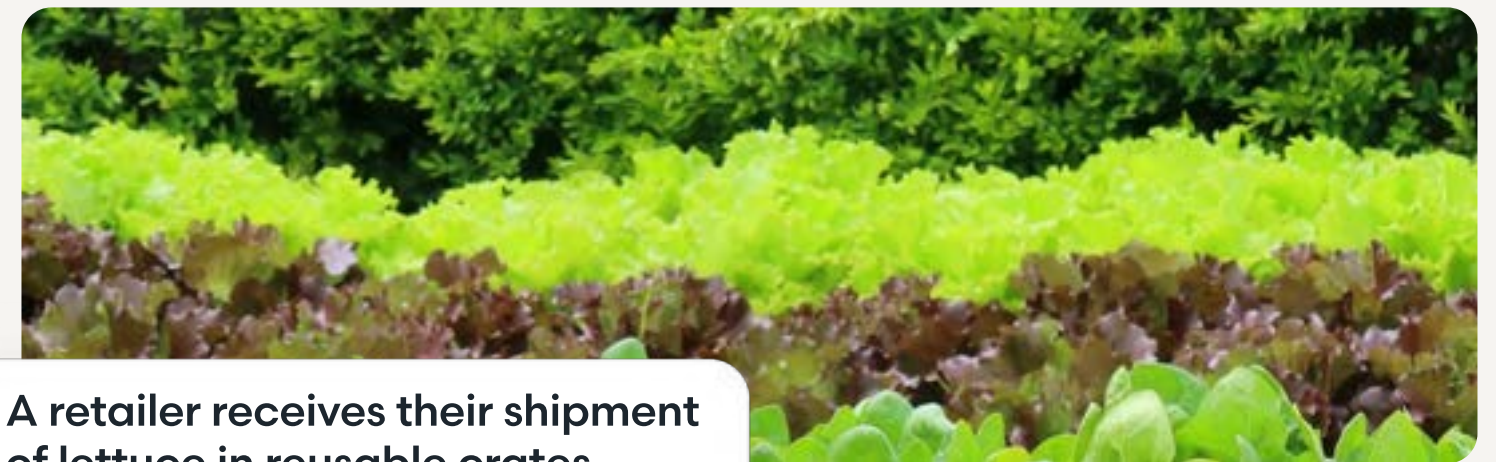
2



The washed and sanitized jar is filled with new product and redistributed to retailers to be sold again.

3

Wholesale System



1

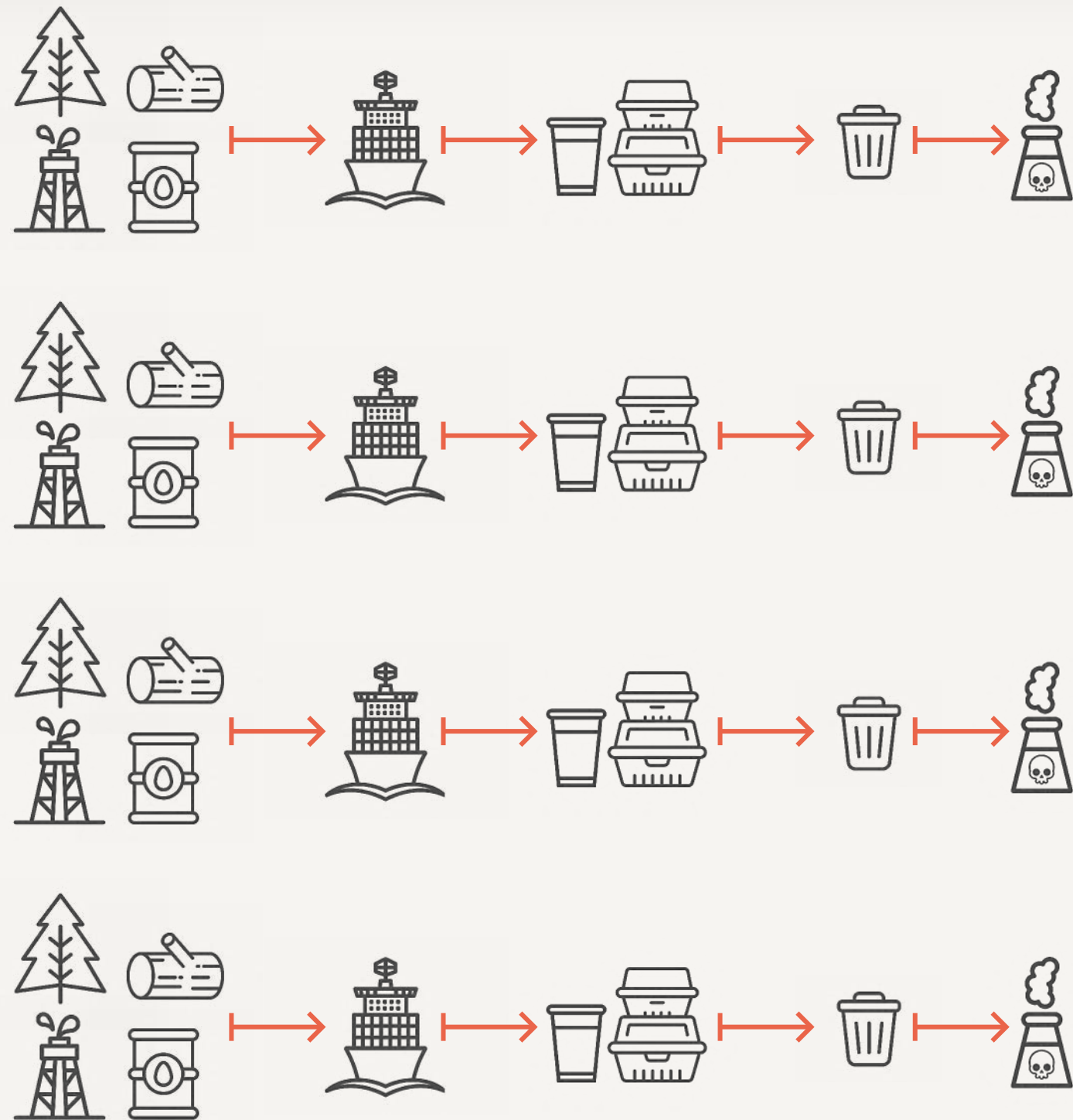
A retailer receives their shipment of lettuce in reusable crates designed to keep lettuce fresh.



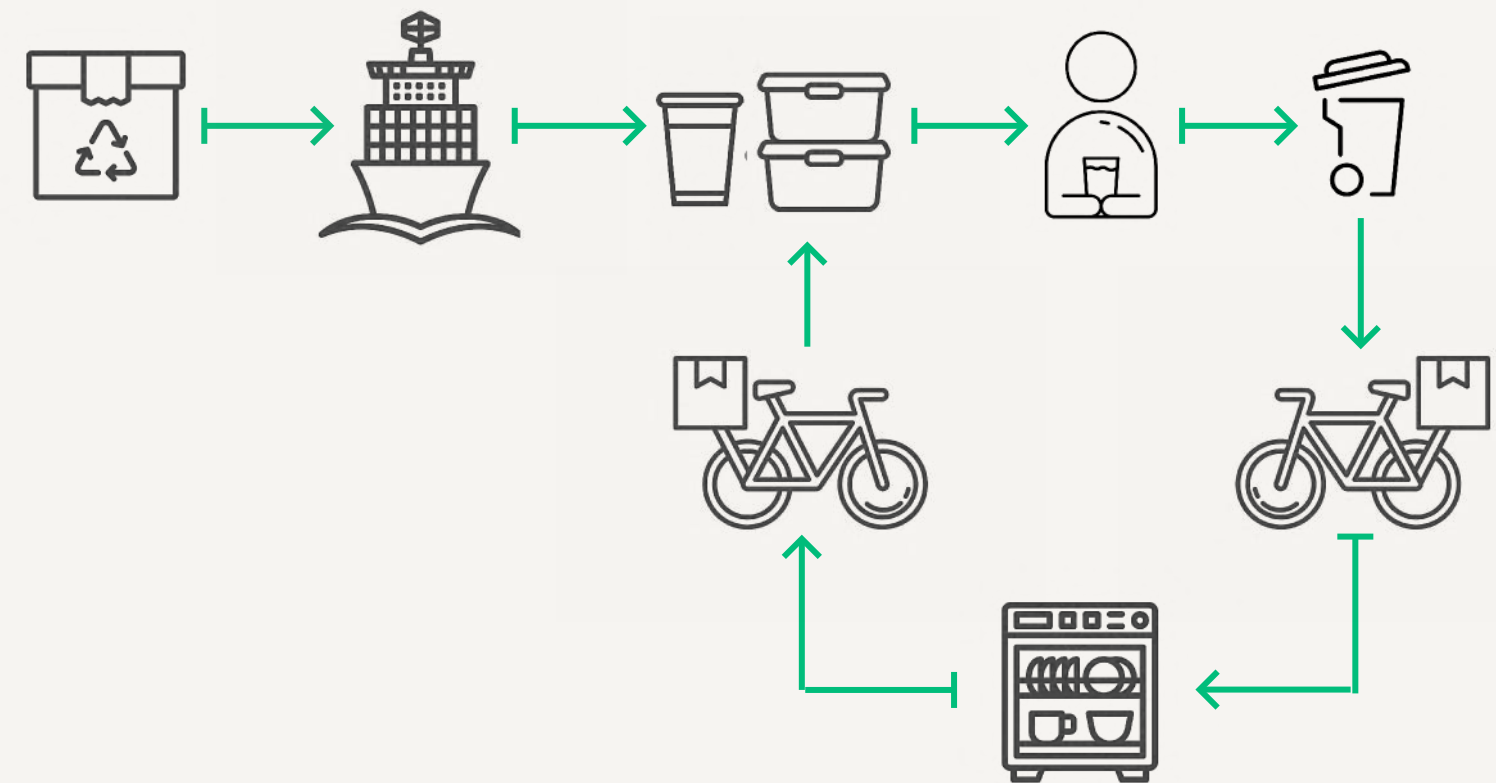
2

When the shipment is delivered, empty crates are collected and returned to the producer to be washed, filled and used again.

Reuse Simply Makes More Sense than Disposable...



Reuse systems prolong the useful life of items, such as packaging, by enabling them to be used over and over for the same use.



Disposable is a False Promise

/// The true cost of plastic on the environment, health and economies can be as much as 10 times higher for low-income countries, even though they consume almost three times less plastic per-capita, than high-income ones.

(WWF, 2023)

Over the past century, our world has increasingly embraced a culture of “disposability,” using single-use products and packaging once and then throwing them away. Decades of development of business models, investment in infrastructure, and reinforcement of single-use habits have gone into crystallizing this disposable consumption model.




Yet we have largely overlooked the devastating impacts on society, our health, the environment, and the economy.









Problems & Benefits



PROBLEMS

Single Use Plastic Imposes Many Costs Across its Life Cycle

	Extraction	Manufacture	Use	Disposal
Human Health	Exposure to upstream oil extraction is associated with 3.6x cancer rates , as well as liver damage, immunodeficiency, and neurological symptoms (1).	 Women working in plastic production facilities have breast cancer rates more than double (2) the general population.	Over 3,600 chemicals of concern found in food packaging were identified in human samples (3).	Between 400,000 and 1 million people die each year in developing countries because of diseases related to mismanaged waste, primarily plastic (4).
Environmental Justice & Human Rights	Minorities, marginalized communities, and people in the Global South bear a greater burden of the health consequences of plastic production (5).	Communities near plastic production facilities experience higher mortality rates , elevated rates of cancer and respiratory disease (6) and a 30% increased rate of leukemia (7).	Women and marginalized communities are disproportionately exposed to the risks of harmful chemicals in plastic (8).	Plastic pollution interferes with human rights , particularly the right to a clean, healthy, and sustainable environment (9).
Environment	 5% of fossil fuels extracted are used for plastic for packaging (10, 11).	By 2050, cumulative plastic manufacturing GHG emissions could reach over 56 gigatons , 10-13% of the entire remaining carbon budget (12). An estimated 10 trillion pre-production plastic pellets are swept into waterways annually, adding to harmful levels of plastic pollution in the environment (13).	The act of opening plastic packaging generates microplastics that can then enter the environment (125). 	Plastic accounts for 80% of all waste in the world's oceans (14). Plastic items in the environment damage ecosystems and wildlife and disrupt the natural systems that store carbon (15).
Cost	Many fossil fuel extraction projects that are profitable have a net negative impact on society when taking into account the social cost of carbon (16, 17).	Globally, the plastic polymer industry in the top 15 plastic-producing countries received an estimated USD 45 billion of government-funded subsidies annually (18).	Health impacts from the use of plastic are estimated to have cost USD \$920B in direct and indirect costs in the US alone (19).	Globally, the direct and indirect costs of waste and its mismanagement totaled USD 361 billion in 2020 (20). In low & middle-income countries, lifetime costs of plastic are 8x higher than in high income countries (21). Plastic causes an est. USD 13 billion in damage to marine ecosystems annually (22).

	Less Harm	More Good
Human Health	 <p>Reuse and refill systems using non-toxic, non-shedding items reduce human exposure to hazardous chemicals.</p>	<p>Reduction of plastic pollution as a result of reuse systems has the potential to minimize air pollution by avoiding unhealthy practices such as informal plastic incineration.</p> 
Environmental Justice & Human Rights	<p>Reuse & refill reduce negative human rights impacts associated with plastic, with prominent benefits to the most affected vulnerable communities.</p> 	 <p>Reuse systems create job opportunities, particularly for women, members of vulnerable or marginalized groups, and those working in the informal waste sector.</p>
Environment	 <p>Reuse & refill reduce the amount of disposable items, plastic or otherwise, that end up in the environment. These solutions cut carbon emissions by 35% to 69% compared with single use. (23).</p>	<p>A new study (pending publication in Dec 2025) finds that reuse could drive over two-thirds of the total reduction in plastic packaging waste by 2040—making it the single most critical lever for cutting plastic pollution and transforming product delivery systems (127).</p> 
Cost	<p>Reuse & refill avoid USD \$3.3 trillion of externalities and result in an 80% reduction of plastic pollution by 2040 (26).</p> 	 <p>Provide a USD \$10 billion opportunity through the conversion of 20% of global disposable plastic packaging into reusable packaging (28).</p>



PROBLEM

Single-use plastics have significant costs to human health

EXTRACT

Air, water, and soil have all been found to transmit pollutants associated with oil drilling operations, and studies suggest higher disease prevalence in humans and animals living nearby.

MANUFACTURE

People working in petrochemical and plastic production facilities have increased mortality and reproductive harms, including infertility, due to exposure to toxic chemicals. Chemicals were observed in workers' bodies even in workplaces where airborne concentrations were within legally permissible limits (30, 31, 32).

USE

Plastic packaging has been shown to expose humans to a range of hazardous chemicals with adverse health impacts. Many of these chemicals are endocrine disruptors that cause disease, contribute to decreased fertility, and are linked to cancers and impacts on child neurodevelopment (34-39).

DISPOSE

Plastic waste is a public health threat, especially where waste management is insufficient. Health risks include increase in insect-borne and diarrheal disease, danger from informal dumpsites, air pollution from open burning, and contamination of the food chain (40, 41, 42).

Plastic waste also breaks down into micro- and nanoplastics, which have been found in all parts of the human body (43-46).

BENEFITS

Reuse and refill systems that use non-toxic, non-shedding reusable items offer a safer and healthier alternative to single-use plastic, with benefits across the packaging life cycle.



Reuse and refill systems present an opportunity to use more durable, inert materials, such as stainless steel or glass, which are safer for human health (47).

Though single-use disposable items have been marketed as cleaner and safer, this is not supported by evidence. Reusable containers are generally safer and cleaner than single-use disposables when properly washed and sanitized, whereas single-use plastics can harbor pathogens and shed microplastics (48).



Reuse systems that use non-toxic materials will, at scale, reduce demand for the production of materials associated with hazardous chemicals, which will in turn minimize the manufacture, transportation, use, and disposal of single-use products and the resulting exposure to toxic chemicals and other co-pollutants.





PROBLEM | Plastic production and pollution negatively affect human rights.

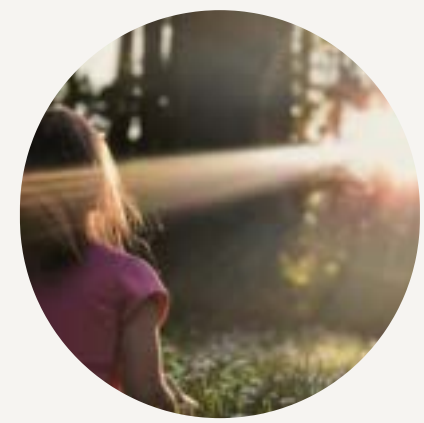
EXTRACT	Fossil fuel extraction and plastic and chemical production contribute to air and water pollution , which are more concentrated around production sites and in nearby communities (50).
MANUFACTURE	Plastic manufacturing processes often expose workers and nearby communities to hazardous chemicals, toxic emissions, and unsafe working conditions. These risks are frequently concentrated in Indigenous, low-income, and marginalized communities located near production facilities, which exacerbate health and human rights impacts (51).
USE	The disproportionate reliance of low income and marginalized communities on products like bottled water , as well as lower quality, packaged food products, increases their exposure to chemicals and microplastics (52, 53). Women and marginalized communities are disproportionately exposed to the risks of harmful chemicals in plastic during the use phase because of the many products associated with gender roles or feminine hygiene.
DISPOSE	Informal waste workers, responsible for much of the waste collection in developing countries, face occupational health and safety hazards, harsh working conditions, a lack of support and access to services, and social marginalization. (57) In the disposal phase, women make up a large share of waste and informal sector workers - further putting them at risk (54, 55, 56).

For more on the impact of plastic pollution on human rights, visit the [Geneva Environment Network's Plastics and Human Rights](#) page.

Part of the Geneva Environment Network's Plastics and the Environment Series, this page includes resources on the plastics crisis and its impact on human rights

BENEFITS

Reuse & refill systems reduce negative human rights impacts and create economic opportunities, which benefit the informal sector.



Reuse and refill actively support the human right to a clean, healthy, and sustainable environment. This has particular significance for vulnerable communities, which tend to be most affected by the health consequences of manufacturing, disposal, pollution, and climate change (59).

The co-benefits for human health in vulnerable communities from reduced GHG emissions include reductions in fine particle pollution and ozone-forming pollutants, including nitrogen oxides (NOx) and sulfur dioxide (SO2).



Well-designed, efficient reuse and refill systems can reduce the environmental and health burdens that disproportionately impact disadvantaged communities because they produce less waste and pollution, use less water, and emit less GHGs (60) per unit of product delivered.

Reuse presents an opportunity for the informal sector to be involved, helping to facilitate a just transition. The informal sector can play a role in reverse-logistics, washing facilities, as well as in handling some portion of forward-logistics. These opportunities provide opportunities to obtain training and improve earning, which can contribute to increased gender equality (61).





PROBLEM

“Single-use” or “disposable” products and packaging require illogical and unsustainable consumption of natural resources. Plastic and other disposable items in the environment damage ecosystems and wildlife and contribute to climate change.

EXTRACT

More than 99% of plastics are made from fossil fuels, which contribute to climate change and other pollution (62). **Single-use plastics account for approximately half of all plastics produced**, and the food and beverage sector is the largest user of single-use packaging (63). **10% of wood harvested, 20% of aluminum mined, 40% of plastic created, and 50% of glass produced goes primarily to make single-use packaging for consumable products** (64).

MANUFACTURE

By 2050, cumulative **plastic manufacturing** GHG emissions could reach **over 56 gigatons, 10-13%** of the entire remaining carbon budget. An estimated **ten trillion pre-production plastic pellets are swept into waterways** annually, adding to harmful levels of plastic pollution in the environment.

USE

Plastics leach chemicals into their surroundings during use through various mechanisms, primarily when additives break down products and migrate from the plastic material into the environment (or the body!). A study showed that a single plastic product could leach up to **8,700 different substances** (126) into water.

DISPOSE

Plastic accounts for 80% of all waste in the world’s oceans. Packaging and consumer products are the most common product categories in rivers, which then flow to the oceans (65, 66).

BENEFITS

Reuse and refill solutions can drastically reduce plastic pollution and environmental damage.



Reuse represents the most significant opportunity to reduce plastic pollution, with the potential for a reduction of 30% by 2040.

Well-designed reuse systems outperform single-use across all environmental impact categories when they are operating efficiently. For example, reuse can use less energy and produce lower lifecycle greenhouse gas emissions than single-use disposables. (80, 81, 82).





PROBLEM

Single-use items are costly - from the lost value of the material itself to the direct and indirect costs borne by local governments, businesses, and communities.

EXTRACT

The lifetime cost of the plastic produced in 2019 is at least USD \$3.7 trillion. More than 90% of this cost is not included in the market price of plastics.

MANUFACTURE

Reliance on single-use plastics makes local economies vulnerable to price fluctuations and disruptions in the plastics supply chain. Regions that are net importers of plastics, including Africa and South Asia, are particularly vulnerable to supply chain disruptions, with price volatility affecting local businesses (93).

USE

Reports estimate the social cost of plastic pollution, including health impacts of chemicals in plastic, to be in the **hundreds of billions of USD per year globally (90).**

To mitigate the potential impact to tourism from plastic leakage to the environment, **local governments spend between 1% and 26% of municipal operating expenditure** for waste management on cleaning up plastic pollution (86).

DISPOSE

95% of the plastic used in packaging is disposed of after one use, resulting in a loss to the economy of up to USD 120 billion annually (83).

In the U.S., public, private, and institutional **organizations collectively spend USD \$11.5 billion annually to clean up litter,** with the majority of this cost (nearly 80%) borne by businesses (87).

BENEFITS

Reuse and refill systems reduce both the direct and associated costs of waste management (and mismanagement) as well as the health and economic impacts driven by pollution, exposure to hazardous chemicals, and climate change.



An 80% reduction of plastic pollution by 2040 would **avoid USD \$3.3 trillion of externalities** in the form of environmental and social costs. An **additional USD \$1.3 trillion in direct public and private costs would be avoided (94).**

Reuse creates an estimated 10x more jobs per ton of material than recycling and 200x more than landfilling and incineration (97, 98, 99).



In the U.S., transitioning from disposable food packaging to reusable alternatives could **save businesses and city governments an estimated USD \$5.1 billion** in solid waste management costs (95).

Converting 20% of global disposable plastic packaging into reusable packaging is a **USD \$10 billion opportunity (96).**



Solutions



Existing Solutions Will Not Be Enough

We need many solutions working together to successfully address plastic pollution.

Each solution has a role to play, and each works better in some contexts than others.

While there are promising solutions emerging, alternative single-use materials are not necessarily better than plastic and can have their own challenges.



Alternative single-use materials can contain **hazardous chemicals** that harm human health. (105, 106, 107)



Compostable products require highly specialized composting facilities that are **not widely available**. (108, 109)



Paper packaging produces **greater lifecycle emissions** than comparable plastic products. (110, 111)

Single-use items, even if from benign materials, are still using a linear system of resource extraction, use, and disposal, rather than supporting circular resource flows.

Existing Solutions Will Not Be Enough

Recycling rates are dropping around the world, a reflection of the many challenges. (119)



Plastic recycling poses numerous technical and economic challenges, limiting effectiveness. (119)



Many food & beverage packaging items are not recyclable.



Sachets are difficult to recover and rarely recycled.



Plastic recycling can expose consumers to hazardous chemicals and has been associated with environmental and human health concerns. (121, 123)

Recycling strategy
would cost governments:

**\$810
USD
billion**

*globally
(between 2021 and 2040)*

Reuse strategy
would cost governments:

**\$540
USD
billion**

*globally
(20% less than business-as-usual) (120)*

Reuse is the largest lever for reducing plastic waste and pollution compared to reduction, substitution, mechanical and advanced recycling, and waste management.

References



References

1. Impact of upstream oil extraction and environmental public health: a review of the evidence (Johnston et al., 2019)
2. Chemical exposures of women workers in the plastics industry with particular reference to breast cancer and reproductive hazards (Dematteo et al., 2012)
3. Geueke et al., 2024
4. No Time To Waste: Tackling the plastic pollution crisis before it's too late (Tearfund, 2019)
5. The Minderoo-Monaco Commission on Plastics and Human Health (Landrigan et al., 2023)
6. Health Status in Fence-Line Communities: The Impact of Air Pollution (Fos et al., 2021)
7. A systematic review and meta-analysis of haematological malignancies in residents living near petrochemical facilities (Jephcote et al., 2020)
8. United Nations A/76/207, 2021
9. UN Adopts First-Ever Resolution Recognizing the Link Between Plastic Pollution, Ocean Protection and the Right to a Healthy Environment (CIEL, 2025)
10. The Future of Petrochemicals: Towards more sustainable plastics and fertilisers (IEA, 2018)
11. Plastic manufacturing accounts for 12% of global oil consumption; this has been scaled based on the share of plastic used for packaging.
12. Plastic & Climate: The Hidden Costs of a Plastic Planet (CIEL et al., 2019)
13. Plastic Pellet Pollution (As You Sow)
14. Ocean plastic pollution an overview: data and statistics (UNESCO 2022)
15. Interactions of microplastic debris throughout the marine ecosystem (Galloway et al., 2017)
16. Social Cost of Carbon from Federal Oil and Gas Development (Friends of the Earth, 2022)
17. The Rising Cost of the Oil Industry's Slow Death (Olalde & Bowlin, 2024)
18. Plastic Money: Turning Off the Subsidies Tap (Phase 2) (QUNO & Eunomia, 2024)
19. The Minderoo-Monaco Commission on Plastics and Human Health (Landrigan et al., 2023)
20. Global Waste Management Outlook 2024: Beyond an age of waste – Turning rubbish into a resource (UNEP, 2024)
21. Who Pays for Plastic Pollution? (WWF, 2023)
22. Plastic Pellet Pollution (As You Sow)
23. Unlocking a Reuse Revolution: Scaling Returnable Packaging (EMF, 2023)
24. Breaking the Plastic Wave (Pew & Systemiq, 2020)
25. Scaling up reusable container systems through city-wide centralized collection and washing (Hitt et al., 2025)
26. Turning off the Tap: How the world can end plastic pollution and create a circular economy (UNEP, 2023)
27. Plastics: The Costs to Society, the Environment and the Economy (WWF, 2021)
28. The New Plastics Economy: Rethinking the Future of Plastics
29. Impact of upstream oil extraction and environmental public health: a review of the evidence (Johnston et al., 2019)
30. Cancer Incidence and Mortality among Petroleum Industry Workers and Residents Living in Oil Producing Communities: A Systematic Review and Meta-Analysis Onyije et al., 2021)
31. Chemical Exposures of Women Workers in the Plastics Industry with Particular Reference to Breast Cancer and Reproductive Hazards (Dematteo et al., 2012)
32. Urinary bisphenol A and plasma hormone concentrations in male workers exposed to bisphenol A diglycidyl ether and mixed organic solvents (Hanaoka et al., 2002)
33. Systematic evidence on migrating and extractable food contact chemicals: Most chemicals detected in food contact materials are not listed for use (Geueke et al., 2022)
34. Hazardous chemicals in recycled and reusable plastic food packaging (Geueke et al., 2023)
35. Evidence for widespread human exposure to food contact chemicals (Geueke et al., 2024)

References

36. Migration of endocrine and metabolism disrupting chemicals from plastic food packaging (Stevens et al., 2024)

37. State of the Science on Plastic Chemicals - Identifying and addressing chemicals and polymers of concern (Wagner et al., 2024)

38. An Umbrella Review of Meta-Analyses Evaluating Associations between Human Health and Exposure to Major Classes of Plastic-Associated Chemicals (Symeonides et al., 2024)

39. Impacts of food contact chemicals on human health: a consensus statement (Muncke et al., 2020)

40. Plastic pollution and infectious diseases (Maquart et al., 2022)

41. Tackling the Ubiquity of Plastic Waste for Human and Planetary Health (Veidis et al., 2022)

42. No Time To Waste: Tackling the plastic pollution crisis before it's too late (Tearfund, 2019)

43. Psychiatric Times: The Plastics Crisis - A Neuropsychiatric Problem Hidden in Plain Sight

44. Microplastics from food packaging: An overview of human consumption, health threats, and alternative solutions (Jadhav et al., 2021)

45. Microplastics On Human Health: How Much Do They Harm Us? (UNDP)

46. Bioaccumulation of microplastics in decedent human brains (Nihart et al., 2025)

47. How does glass protect people's health? (FEVE)

48. Reuse vs Single-use: Safety (Upstream)

49. The Minderoo-Monaco Commission on Plastics and Human Health (Landrigan et al., 2023)

50. Many oil wells, one evil: comprehensive assessment of toxic metals concentration, seasonal variation and human health risk in drinking water quality in areas surrounding crude oil exploration facilities in Rivers state, Nigeria (Raimi et al., 2022)

51. Earth-Insight.org

52. The Minderoo-Monaco Commission on Plastics and Human Health (Landrigan et al., 2023)

53. Synthetic Polymer Contamination in Bottled Water (Mason et al., 2018)

54. Neglected: Environmental justice impacts of marine litter and plastic pollution (UNEP, 2021)

55. Plastic and Gender: Exploring the intersection Hausmann, J. (2024) 24 June. Accessed 12 February 2025

56. Household waste and health risks affecting waste pickers and the environment in low- and middle-income countries (Gutberlet and Uddin, 2017)

57. UN Adopts First-Ever Resolution Recognizing the Link Between Plastic Pollution, Ocean Protection and the Right to a Healthy Environment CIEL (2025). 3 April.

58. Report of the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes (UN General Assembly, 2021)

59. UN general assembly resolution: A/RES/76/300

60. Scaling up reusable container systems through city-wide centralized collection and washing (Hitt et al., 2025)

61. Promoting a Just Transition to an Inclusive Circular Economy (Schröder, 2020)

62. Plastic & Climate: The Hidden Costs of a Plastic Planet (Hamilton et al., 2019)

63. Closing the loop: A framework for tackling single-use plastic waste in the food and beverage industry through circular economy-a review (Arijenewa et al., 2024)

64. The new reuse economy: How reuse systems and services will revolutionize how we consume (Prindiville, 2022)

65. Sources, transport, and accumulation of different types of plastic litter in aquatic environments: A review study (Schwarz et al., 2019)

References

66. OceanLiteracy.Unesco.org

67. An inshore–offshore sorting system revealed from global classification of ocean litter (Morales-Caselles et al., 2021)

68. Microplastics contaminate the deepest part of the world’s ocean (Pent et al., 2018)

69. Reaching New Heights in Plastic Pollution—Preliminary Findings of Microplastics on Mount Everest (Napper et al., 2020)

70. The toxicity of plastic nanoparticles to green algae as influenced by surface modification, medium hardness and cellular adsorption (Nolte et al., 2017)

71. Threat of plastic pollution to seabirds is global, pervasive, and increasing (Wilcox et al., 2015)

72. Microplastics as an emerging threat to terrestrial ecosystems (de Souza Machado et al., 2017)

73. Plastic pollution in terrestrial ecosystems: Current knowledge on impacts of micro and nano fragments on invertebrates (Richard et al., 2024)

74. Interactions of microplastic debris throughout the marine ecosystem (Galloway et al., 2017)

75. The knowns and unknowns in our understanding of how plastics impact climate change: a systematic review (Zhu et al., 2025)

76. Production of methane and ethylene from plastic in the environment (Royer et al., 2018)

77. The False Promise Of Bioplastics and Compostable Plastics (Beyond Plastics, Accessed Feb. 25 2025)

78. Evidence of compost contamination with per- and polyfluoroalkyl substances (PFAS) from “compostable” food serviceware (Goossen et al., 2023)

79. Breaking the Plastic Wave (Pew & Systemiq, 2020)

80. Circular economy as a climate strategy: Current knowledge and calls-to-action (Wang et al., 2022)

81. Reusable vs single-use packaging: a review of environmental impact (ReLoop & Zero Waste Europe, 2020)

82. Parametric life cycle assessment modeling of reusable and single-use restaurant food container systems (Hitt et al., 2020)

83. The New Plastics Economy: Rethinking the Future of Plastics

84. Global Waste Management Outlook 2024: Beyond an age of waste – Turning rubbish into a resource (UNEP, 2024)

85. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050 (Kaza et al. 2018)

86. Plastics: The Costs to Society, the Environment and the Economy (WWF, 2021)

87. 2009 National Visible Litter Survey and Litter Cost Study (Keep America Beautiful, Inc., 2009)

88. Plastics: The Costs to Society, the Environment and the Economy (WWF, 2021)

89. Who Pays for Plastic Pollution? (WWF, 2023)

90. The Price of Plastic Pollution: Social Costs and Corporate Liabilities (Merkl & Charles, 2022)

91. Plastics: The Costs to Society, the Environment and the Economy (WWF, 2021)

92. Plastic pollution and flood risk: An estimate of the number of people at risk of more severe and frequent flooding due to plastic pollution, and its relevance to the UN plastic treaty (Resource Futures, 2023)

93. unctad.org

94. Turning off the Tap: How the world can end plastic pollution and create a circular economy (UNEP, 2023)

95. Reuse Wins (Gordon, 2023)

96. World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company, The New Plastics Economy: Rethinking the future of plastics (2016)

97. Job Creation in the Re-Use Sector: Data Insights from Social Enterprises (Reuse, 2021)

98. Recycling Means Business: Job Creation Through Product Reuse (Institute for Local Self Reliance, 2000)

References

99. ZeroWaste and Economic Recovery: The Job Creation Potential of Zero Waste Solutions (Ribeiro-Broomhead & Tangri, 2021)
100. Economics of Reuse for Street Vendors in India, 2023
101. Circular economy as a climate strategy: Current knowledge and calls-to-action (Wang et al., 2022)
102. Reuse - Rethinking Packaging (EMF, 2019)
103. Refill Again: How just a 10-percentage point increase in reusable beverage packaging can help save the oceans by eliminating over 1 trillion single-use plastic bottles and cups (Oceana, 2023)
104. Circular Economy and Plastics: A Gap-Analysis in ASEAN Member States (Akenji et al., 2019)
105. Are bioplastics and plant-based materials safer than conventional plastics? In vitro toxicity and chemical composition (Zimmermann et al., 2020)
106. Evidence of compost contamination with per- and polyfluoroalkyl substances (PFAS) from "compostable" food serviceware (Goossen et al., 2023)
107. CEH, 2020
108. Bioplastics are trash: The unforeseen environmental consequences of PLA from production to disposal (Eunomia & Plastic Pollution Coalition, 2024)

109. Comprehensive analysis of bioplastics: Life cycle assessment, waste management, biodiversity impact, and sustainable mitigation strategies (Yadav & Nikalje, 2024)
110. Single-use beverage cups and their alternatives: Recommendations from Life Cycle Assessments (UNEP & Life Cycle Initiative, 2021)
111. An overview of paper and paper based food packaging materials: health safety and environmental concerns (Deshwal et al., 2019)
112. California Attorney General Bonta Sues ExxonMobil for Deceiving the Public on Recyclability of Plastic Products
113. Plastics recycling: Challenges and opportunities (Hopewell, Dvorak, & Kosior, 2009)
114. Production, use, and fate of all plastics ever made (Geyer, Jambeck, & Law, 2017)
115. Rethinking and optimizing plastic waste management under COVID-19 pandemic: Policy solutions based on redesign and reduction in plastic consumption (Silva, et al., 2020)
116. Plastics recycling: Challenges and opportunities (Hopewell, Dvorak, & Kosior, 2009)
117. Single-use beverage cups and their alternatives: Recommendations from Life Cycle Assessments (UNEP & Life Cycle Initiative, 2021)

118. Sachet Economy: Big Problems in Small Packets (GAIA, 2020)
119. Plastic recycling: A panacea or environmental pollution problem (Singh & Walker, 2024)
120. Breaking the Plastic Wave (Pew and Systemiq, 2020)
121. Forever toxic: The science on health threats from plastic recycling (Greenpeace, 2023)
122. Hazardous chemicals in recycled and reusable plastic food packaging (Geueke et al., 2023)
123. Chemical recycling: A dangerous deception - Why chemical recycling won't solve the plastic pollution problem (Bell and Gitlitz, 2023)
124. Breaking the Plastic Wave (Pew and Systemiq, 2020)
125. Microplastics generated when opening plastic packaging (Sobhani et al., 2020)
126. Plastics leach toxins (Norwegian University of Science and Technology, 2022)
127. *Breaking the Plastic Wave* (Pew Charitable Trusts & Systemiq, 2020)



Plastic Reboot



Executing Partner



PERPETUAL

Interested in learning more?

Get support to build reuse and refill into your plans.

Contact Dr. Dagny Tucker

hello@perpetualuse.org

**From
Start to
Success**

The Refill & Reuse
System Handbook

PRIMER
Part 2

How Refill & Reuse Systems Work

Understanding How Reuse &
Refill Systems Function Across
Diverse Contexts



From Start to Success: The Refill & Reuse System Handbook

The 5 Part Primer



**YOU ARE
HERE**

PART 1

Why Refill & Reuse Systems

Information about the problems that reuse and refill solve and the many benefits of these programs



PART 2

How Refill & Reuse Systems Work

An introduction to the different types of refill interventions & reuse systems



PART 3

The Refill & Reuse Systems Landscape

An overview of active reuse and refill programs worldwide, including descriptions and links to more information



PART 4

Design Criteria and Considerations

Best practices for design and implementation of refill interventions & reuse systems



PART 5

Enabling Conditions

What enables reuse to succeed, including policy, regulation, infrastructure, technology and collaboration



From Start to Success: The Refill & Reuse System Handbook

Introduction



Understanding the Models

How different refill interventions and reuse systems are structured — and what distinguishes one model from another.

Part 2: How Reuse & Refill Work

Establishes a shared understanding of reuse and refill models and how they function in practice.

Reuse and refill consist of a set of distinct models that vary based on infrastructure, ownership, market context and the role of different actors.

While these models share common principles such as reducing single-use packaging and extending container life, they differ in how containers circulate and who owns and manages them.

This section establishes a clear foundation for comparing reuse and refill models.

By breaking down how each model works, Part 2 equips practitioners with the clarity needed to evaluate which approaches are best suited to specific use cases and contexts.

This shared understanding sets the stage for deeper system design, planning, and decision-making in later sections.

What's Inside

Charting Types of Refill & Reuse	5
<i>How Our Framework Builds on Existing Refill / Reuse System Frameworks</i>	7
<i>Charting Categories</i>	8
<i>Behavior Change & System Requirements: Refill vs. Reuse</i>	9
<i>Burden Differentiators Between Refill and Reuse</i>	10
<i>Key Differentiators Between Refill and Reuse</i>	11
Refill Systems	12
<i>Charting Categories</i>	13
<i>Types of Refill Systems</i>	14
Key Elements of Refill	19
<i>Refill Access Points</i>	20
<i>Container</i>	21
<i>Incentives, Education & Marketing</i>	22
Reuse Systems	23
<i>Charting Categories</i>	24
<i>Types of Reuse Systems</i>	25
<i>B2C</i>	26
<i>B2B</i>	32
Key Elements of Reuse Systems	36
<i>What's Needed for Reuse Systems to Work</i>	37
<i>Packaging</i>	38
<i>Return & Collection Pathways</i>	39
<i>Cleaning & Sanitization</i>	40
<i>Reverse & Forward Logistics</i>	41
<i>Technology</i>	42
<i>Incentives, Education & Marketing</i>	43

Insights were validated through collaboration with local partners from Africa, Asia, Latin America, and the Caribbean.

About Plastic Reboot

Plastic Reboot is a \$108 Million program supported by the Global Environment Facility, co led by the United Nations Environment Programme and World Wildlife Fund, and implemented in partnership with the United Nations Development Programme and the United Nations Industrial Development Organization.

Plastic Reboot is focused on upstream and midstream solutions to plastic pollution in the food and beverage sector, and is delivered through a Global Project and a suite of 15 National Projects.

Together, we're working to transform material systems and engage governments, civil society organizations, and the private sector to reduce plastic pollution.

This document was prepared by Perpetual and WWF (World Wildlife Fund) under the Plastic Reboot Programme. It is funded by the Global Environment Facility. Its contents are the sole responsibility of Perpetual and WWF and do not necessarily reflect the views of the GEF Secretariat or any other organization.

Charting Types of Refill & Reuse



There are numerous variations of refill and reuse systems.

One key distinction in how they work is who manages the container.

When the consumer manages the container, it is **Refill**.

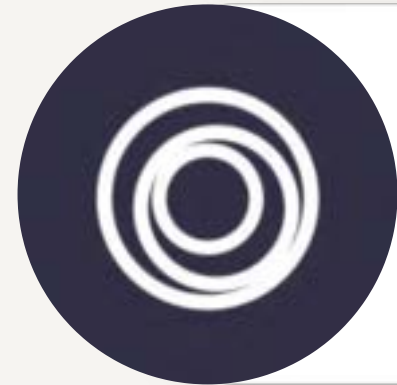
When the container is owned by a reuse service provider or business and managed as part of a system it is **Reuse**.

REUSE SYSTEMS



How Our Framework Builds on Existing Refill / Reuse System Frameworks

We align with global definitions



Ellen MacArthur Foundation

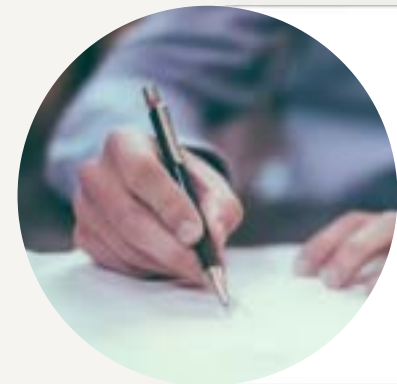
Reuse = packaging used multiple times

- *Refill (consumer-managed)*
- *Return (provider-managed)*



ISO / UN Environmental Programme

Differentiate refillable packaging from returnable/reusable packaging systems in international standards.



Asia Reuse Consortium & Sustainable Packaging Coalition

Separate refill from return/reuse to highlight distinct systems, infrastructure, and policy needs.

...and we add nuance for implementation



We break broad categories into operationally distinct sub-models such as:

- Water refill
- Reusable transport packaging
- B2B bulk delivery



We highlight Global South innovations that risk being invisible in higher-level taxonomies.

Charting Categories Reuse and refill take many forms, depending on who manages the container:

Refill

MODEL	MANAGER	TYPE	SUB TYPE
Consumer Facing 	Consumer Managed Container	In-Store Refill or Dispensing	<ul style="list-style-type: none"> • Instore refill bins and non-tech dispensers • Refill through tech-enabled equipment • Mobile & delivery refill
		Water Refill	<ul style="list-style-type: none"> • Water refill stations • Incentive/enabler program: water refill apps
		Bring Your Own Foodware or Bags	 <ul style="list-style-type: none"> • BYO cup or container (for ready to eat food or drink) • BYO shopping bag • Incentive/enabler program: BYO rewards apps
		Refill at Home Through Single-Use Packaging	<ul style="list-style-type: none"> • Concentrates • Large format packaging, alternate/partial packaging • Includes prefill-to-refill

Reuse

Consumer Facing	Provider Managed Container 	Prefill		
		Reusable Food Serviceware		<ul style="list-style-type: none"> • On-premises and off-premises consumption
		Asset Sharing		
		Reusable Secondary Packaging		<ul style="list-style-type: none"> • Mailers used in e-commerce, grocery deliver, and last-mile logistics
Business-to-Business	Business Managed	Reusable Transport Packaging	<ul style="list-style-type: none"> • Crates, pallets, pallet wrap 	
		Bulk Ingredient or Product Delivery	<ul style="list-style-type: none"> • Reusable drums, kegs, totes, intermediate bulk containers (IBCs) 	

Locally validated examples are featured in Part 3 of this series.

Behavior Change & System Requirements

Refill and reuse address the same waste challenge, but differ in where responsibility sits and how much system coordination is required.

	Refill	Reuse
Primary Responsibility	Consumer-led	Shared across system actors
Behavior Change	<ol style="list-style-type: none"> 1. Bring container 2. Clean container 3. Refill in-store or at home 4. Spend additional time at point of purchase 	<ul style="list-style-type: none"> • Return container to designated drop point • Or participate in home collection
System Requirements	<ul style="list-style-type: none"> • Store reconfiguration (dispensers, space allocation) • Staff time for maintenance & hygiene 	<ul style="list-style-type: none"> • Bulk supply logistics • Limited to certain product categories (e.g., dry goods, shelf-stable liquids)
Coordination/Threshold	Lower — can operate at single-store level	Higher — requires aligned system design

Refill concentrates responsibility at the consumer level and works best in select product categories.




Reuse distributes responsibility across actors and can substitute a broader range of packaging formats when infrastructure exists.

Distribution of Responsibility Across Refill and Reuse Systems

Refill and reuse differ in how responsibility is distributed across consumers, retailers, and producers.

With **refill**, the container is typically managed by the consumer. This means higher consumer responsibility (bring, clean, remember) and higher retailer involvement at the point of sale. The producer's role is comparatively limited.

In **reuse systems**, the container is owned and managed as part of a broader system — often by a producer or third-party service provider. This shifts some responsibility away from the consumer and retailer, and requires greater producer investment in collection, washing, logistics, and system coordination.

	Refill	Reuse
 Consumer Burden	HIGH	MED-LOW
 Retailer Burden	HIGH	MED-LOW
 Producer Burden	LOW	HIGH

Key Differentiators Between: Burden, Coordination & Applicability

Refill

Typically stand-alone, potentially system-capable

Often implemented as a single intervention. Can operate independently, especially at a micro level (i.e. a small market). Could be bolstered with bulk purchasing agreements with producers.

High consumer responsibility

Behavior-dependent model, requires consumers to remember containers, refill, clean, and transport.

Limited product applicability

Best suited for dry goods, shelf-stable liquids, or controlled environments. Not viable for all SKUs or formats.

Flexible pathways to scale

May remain intentionally stand-alone, or be designed to connect across retailers through shared bulk dispenser designs and bulk pricing alignment.

Reuse

Relies on multiple components working together as a system

Requires coordination across packaging design, collection, washing, redistribution, and tracking to function effectively.

Shared system responsibility

Responsibility distributed across brands, retailers, and service providers for collection, washing, redistribution.

Broad product substitution potential

Can replace a significant range of FMCG packaging formats, foodservice, beverages, and transport packaging when infrastructure exists.

Designed for interoperability

Built to function across brands or geographies from the outset, with shared standards and infrastructure supporting long-term performance and scale.

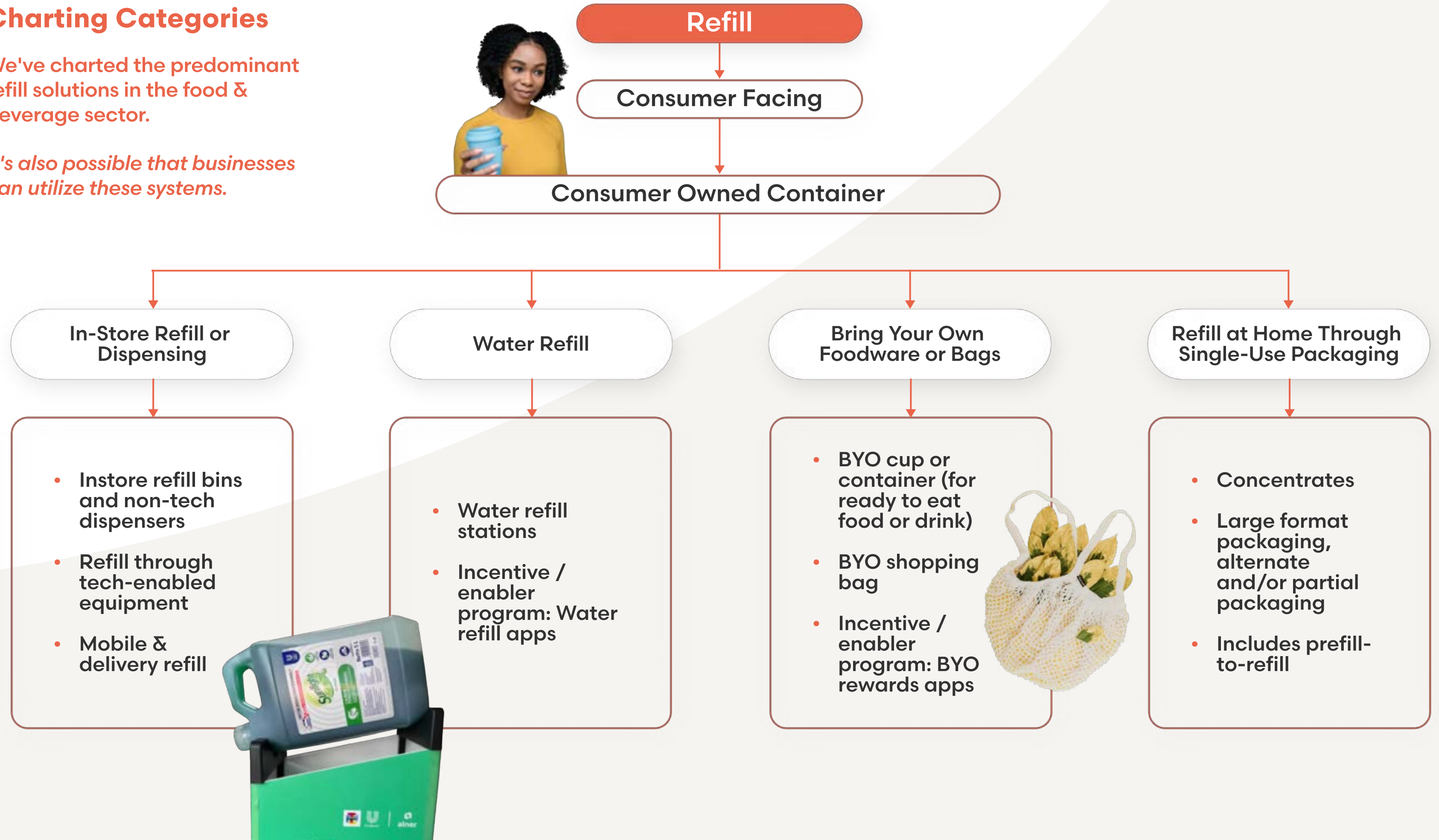
Refill



Charting Categories

We've charted the predominant refill solutions in the food & beverage sector.

It's also possible that businesses can utilize these systems.



Types of Refill Systems

In a refill system, packaging is typically owned and managed by the consumer. Refill is available in various purchase contexts, with options available in traditional and modern retail, mobile, and delivery services. Some stores are entirely dedicated to in-store refill products, while others dedicate only a part of their store or certain products to in-store refill.

These are four primary types of refill happening today, with some variations within each type.



**In-Store Refill
and Dispensing**



**Water Refill
Stations**



**Bring Your Own
Foodware or Bags**



**Refill at Home Through
Single-Use Packaging**

Overall: All refill models fall under the business-to-consumer (B2C) category, with consumers playing a central role in managing the container. In many regions, informal refill practices already exist — for example refilling a detergent or shampoo container, meant as SUP, repeated times. These behaviors can be indicators for cultural readiness for refill & reuse systems.

In-Store Refill and Dispensing

Consumers purchase products in store by bringing their own containers or using returnable containers provided as a service by the retailer. Dispensing models utilizing reusable containers reduce single-use packaging and are adaptable to both traditional markets and modern retail formats.

What it includes:

- Scoop bins
- Gravity dispensers
- Pumps
- Vending machines
- Mobile refill units for food, beverages, household, and personal care products.

How it Works

Products are stored in larger containers or refill dispenser and dispensed in desired quantities into consumer-owned or pooled reusable containers.

Payment may be by weight, volume, or via digital tracking.

- **Scoop bins or non-tech dispensers:** Simple scoop bins, gravity bins, or pumps where products are measured and purchased by weight or volume.
- **Tech-enabled dispensers:** Automated machines or vending units in stores or standalone locations that control portion size, payment, and tracking.
- **Mobile and delivery refill:** Carts, vans, or “mobile refilleries” that travel to neighborhoods or deliver to homes, allowing convenient access to products sold in custom quantities.

Where it Happens



Grocery/
Convenience
Stores



Traditional
Markets



Refill Specialty
Shops



Mobile
Refilleries



Delivery
Services

Water Refill

Fixed refill dispensers provide safe, affordable drinking water. Water is filled in user's reusable containers, replacing single-use plastic bottles. Water dispensers are increasingly integrated into both public spaces and private venues.

Water-refill models not only displace single-use plastic but improve access to safe drinking water in remote areas.

What it includes:

- Public fountains
- Stand-alone kiosks
- In-store dispensers
- Office refill points
- Campus refill points

How it Works

Consumers bring their own bottles or use provided reusables to access filtered water.

In some cases, large jugs (10–20 liters) are delivered to homes or offices and returned for reuse.

Incentive/enabler program:
Water Refill Apps

Mobile apps map nearby refill points and incentivize consumers with discounts or rewards, making it easier to avoid single-use bottles.



Where it Happens



Grocery & Convenience Stores



Offices & Events



Public Parks



Transit Hubs



Schools & Universities

Bring Your Own (BYO) Foodware or Bags

Consumers use their own cups, containers, or bags for products such as ready-to-eat food, beverages, or groceries. This model reduces single-use packaging by shifting responsibility for the container to the consumer, and is often supported by reward programs, discounts, or digital apps.

What it includes:

- Resusable coffee cups
- Food containers
- Shopping bags
- Tiffins
- Personal containers

How it Works

Customers bring their own foodware or bags to retailers, cafes, markets, or restaurants. Businesses may support BYO through discounts, loyalty rewards, or digital tracking apps.

Incentive/enabler program:
BYO Rewards apps

Digital platforms encourage consumers to bring their own containers by offering loyalty points, discounts, or gamified rewards.

Local health codes or EPR policies determine acceptability of BYO in foodservice.



Where it Happens



Cafés



Restaurants



Street Food Vendors



Grocery Stores



Farmer's Markets

Refill at Home Through Single-Use Packaging

Consumers refill durable household containers using lighter-weight or alternative single-use formats, reducing packaging material while extending the life of sturdier containers.

What it includes:

- Concentrates
- Refill pouches
- Large-format packs
- Hybrid prefill-to-refill systems

How it Works

Consumers purchase smaller, lighter, or concentrated products that are used to top up durable containers at home.

These formats often reduce overall plastic use and packaging weight, while providing convenience.

Main formats:

- **Concentrates:** Water is added to powders, tablets, or liquids to reconstitute products at home (e.g., cleaners, soaps).
- **Alternate or Partial Packaging:** Lighter-weight refill packs, such as pouches, are used to refill sturdier bottles or dispensers.
- **Large Format Packaging:** Large jugs or containers are used to top up smaller day-to-day dispensers.
- **Prefill-to-Refill:** Initial purchase includes a prefilled durable container that is later refilled through concentrates, multi-unit packs, or dispenser systems.

Where it Happens



Household
Cleaning



Personal
Care



Beverages



Pantry
Staples

Key Elements of Refill



Refill Access Point

The physical point where consumers replenish products into containers. Access points shape convenience, trust, and participation, and often determine whether refill integrates into everyday routines.

Elements

Dispensers, refill stations, mobile refill units, or at-home refill formats supported by bulk supply, storage, and basic measurement or tracking systems.

Whose is Involved

Retailers, brands, equipment providers, and—in some contexts—municipal or community partners.

Models

In-store refill and dispensing, water refill stations, bring-your-own container programs, mobile or delivery-based refill, and refill-at-home systems using concentrates or large-format packaging.

Key Considerations

Ease of use, hygienic filling method, product integrity, regulatory alignment, hygiene and safety communication, space and maintenance requirements, cost to consumers, and alignment with local behaviors and norms.



Container

The vessel used by the consumer to store and dispense product. Usually owned by the consumer (brought from home or repurposed from another use) some models are emerging where vessel is provided by a brand or retailer as part of a refill or reuse system offering.

Elements

Retailers may provide free-to-use or pay-by-deposit containers to use in their refill/bulk section. Additionally, brands may sell their product in durable containers meant to be refilled with their product, once empty.

Formats

Consumer-owned bottles, jars, cups, bags, or other containers compatible with refill formats and products. This may include repurposed containers originally designed for other uses.

Models

Bring-your-own containers, brand-provided durable containers, prefill-to-refill starter packs.

Key Considerations

Durability, ease of cleaning, product compatibility, affordability, and cultural familiarity. Design choices should minimize reliance on single-use refill bags (plastic or paper) and reduce the need for additional packaging at point of sale.



Photo: Xiclo

Incentives, Education & Marketing

Mechanisms that encourage initial trial and sustained participation in refill systems by reducing friction and reinforcing new behaviors.

Approaches

Pricing incentives, loyalty or rewards programs, digital tools, signage, and hygiene or safety communications.

Who is Involved

Brands, retailers, technology providers, NGOs, community organizations, and local governments.

Types

Discounts for refill, loyalty points, gamified rewards, deposit-adjacent incentives, education or awareness campaigns.

Key Considerations

Trust, clarity of messaging, cultural relevance, avoiding stigma, and maintaining engagement beyond early adopters.

WATER BOTTLE FILLING STATION



FILL your water bottles HERE

Every litre of bottled water you buy costs the planet 0.2 litres of oil and 2 litres of water in manufacturing.

Stop using disposable plastic water bottles – Refill reusable water bottles here.



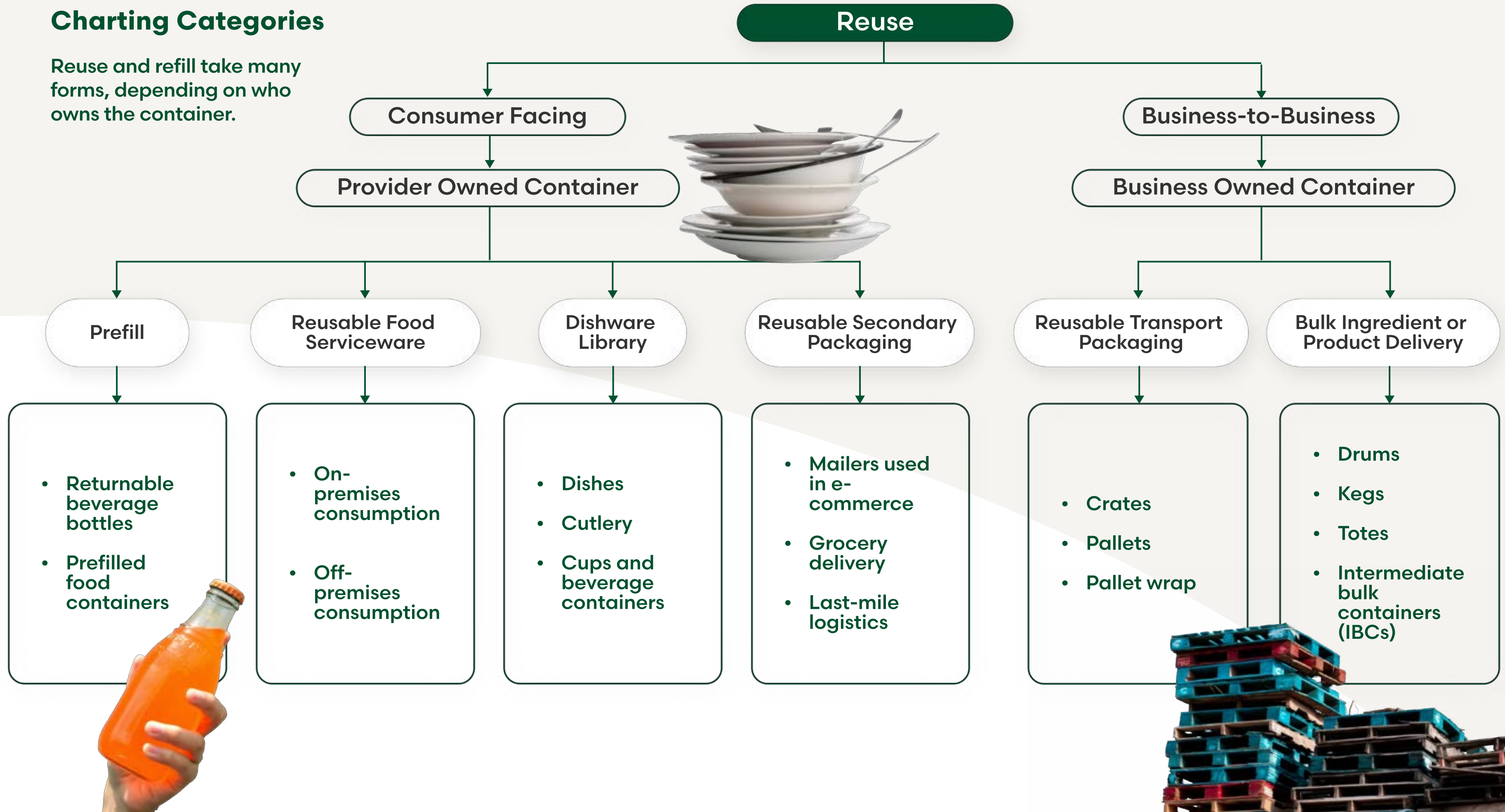
FILL your water bottles HERE

Reuse Systems



Charting Categories

Reuse and refill take many forms, depending on who owns the container.



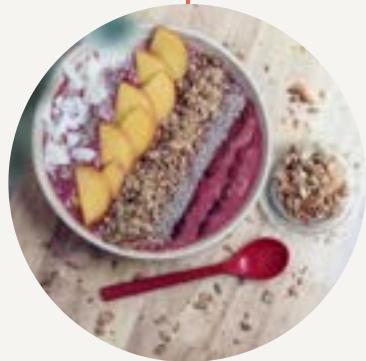
Types of Reuse Systems

In reuse systems, the packaging is owned by the business, reuse service provider, packaging as a service provider or other entity within the system such as a governance body. There are two primary types of reuse systems: Business to Consumer (B2C) and Business to Business (B2B).

B2C: Transactions where a business, non-profit, government, or other organization provides products directly to consumers



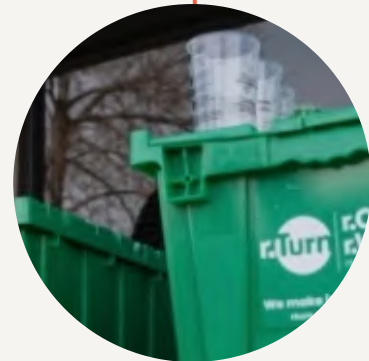
Prefill Systems



Reusable Food Serviceware



Asset Sharing

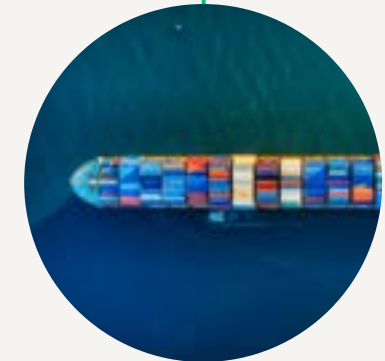


Reusable Secondary Packaging

B2B: Transactions between businesses



Reusable Transport Packaging



Prefill Bulk Ingredient or Product Delivery

The same actor may operate in both (B2C + B2B) contexts.

B2C

Business to Consumer Reuse Systems

Transactions where a business, non-profit, government, or other organization provides products directly to consumers

B2C Cycle of Reuse

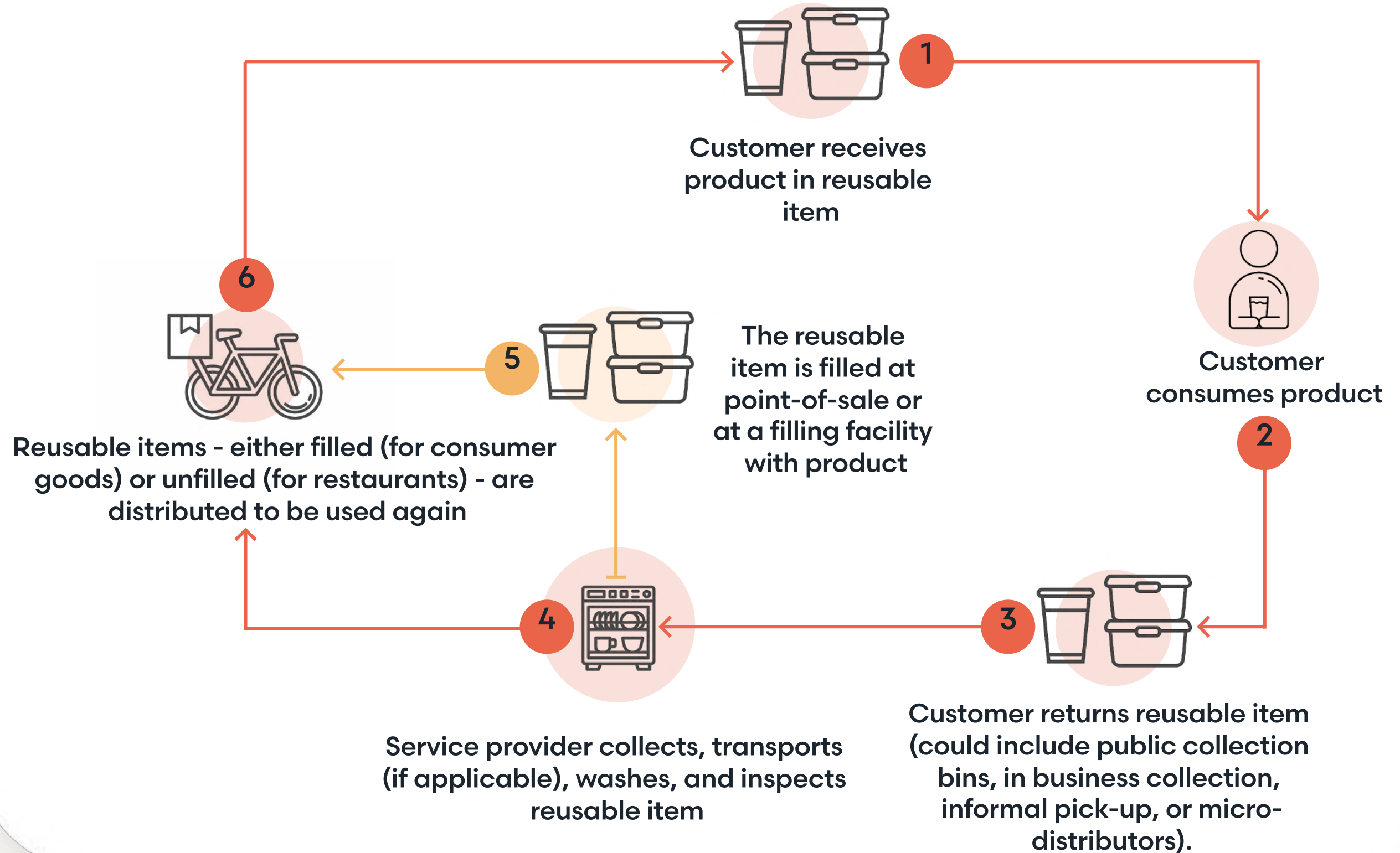
There are different variations of this cycle depending on the type of reuse, but all reuse systems include these 6 steps.

This cycle is adapted based on regional partner feedback to reflect varied collection and cleaning pathways.

For example, collection may be community led, pickup may be informal, or micro-distributors may be involved.

Washing infrastructure is critical in this system and uses multiple approaches.

Overall Reuse Cycle



Prefill Systems

In a prefill system, primary packaging is designed to be reused and sold off the shelf pre-filled to offer the convenience of single-use packaging.

What it includes:

Any primary packaging designed to be reused for the same or similar purpose.

Primary sectors:

Currently primarily used in home care, personal care, food and beverage.

There is potential for significant expansion within current sectors and to additional sectors and product types.

How it Works

Consumers purchase pre-packaged products in reusable packaging just as they might purchase a product in single-use packaging.

Packaging is returned after use, washed, sanitized and refilled again by the producer or an authorized third party.

Legacy Reuse System

Prefill has been used for many years in the beverage sector for returnable / refillable PET or glass bottles for soda, water, milk, and beer, and remains a strong practice in some countries.

Examples include Heineken & Coca-Cola bottle return programs in Latin America and the Caribbean.

Where it Happens



Grocery Stores



Superstores



Convenience Stores



Where Single-Use Products are Sold

Reusable Food Serviceware

There are two main ways in which reusable foodservice gets cycled: On and off premise, plus hybrid.

What it includes:

Cups, plates, bowls, trays, lids, utensils, and other serviceware.

Primary sectors:

Foodservice (i.e. restaurants, cafés, and street food vendors), institutions (i.e. schools, universities, and corporate campuses), hospitality (i.e. hotels, catering, event spaces, and stadiums).

How it Works

Provider or system-owned reusable food serviceware is designed to be used for its originally intended purpose multiple times. This is instead of being disposed of after a single use. Used for food and beverage served on-the-go from restaurants, cafes, street food vendors and/or for dine in services at schools, universities, corporate campuses, or for events. Return incentives and hygiene communication are critical for consumer trust.

HYBRID

Hybrid refers to those systems that are primarily on-premise but are not in a controlled environment, so the reusable items can move around a campus or even leave the campus and be brought back to be returned. These are sites like universities, malls, corporate campuses, hospitals or other places that have multiple buildings or spaces.

Where it Happens

ON PREMISE

Used and collected within controlled settings (e.g., restaurants, schools, offices, stadiums) where items are washed onsite and returned to circulation in the same location.



Restaurants



Schools



Offices



Stadiums

OFF PREMISE

Taken away by consumers (e.g., coffee cups, takeout containers) and returned via retail points, or app-enabled networks for washing and reuse.



Restaurants



Cafés



Hospitals



Retailers

Dishware Library

Shared dishware systems make reusable items available for community borrowing or rental, typically at smaller scales than commercial reuse programs. These initiatives work best with local government and/or community support.

What it includes:

Dish libraries, crockery banks, cutlery rentals, and other shared community resources.

Primary sectors:

Community groups and grassroots organizations, local governments and NGOs, event organizers, schools, and neighborhood associations.

How it Works

Items are borrowed for events or gatherings, returned after use, cleaned, and made available again.

A deposit may be charged to ensure returns, but fees rarely cover labor or washing costs.



Where it Happens



Community Groups



Grassroot Initiatives



Citizen Led Projects



Volunteer or Nonprofit Projects

Reusable Secondary Packaging

A durable alternative to single-use shipping and delivery materials, enabling businesses to circulate goods to consumers efficiently while reducing waste.

What it includes:

Insulated delivery boxes, mailers for e-commerce, grocery delivery, last-mile logistics

Primary sectors:

E-commerce platforms, retailers, grocery, meal-kit delivery services, logistics, courier companies, food, beverage distribution networks.

How it Works

Packaging such as shipping mailers, delivery boxes or cooler bags is used to transport products, delivered to customers, then collected during the next delivery or at designated return points.

Items are washed or sanitized as needed and redistributed for reuse.

Existing reuse practices in fresh-produce and beverage distribution could be formalized as B2B reuse systems.



Where it Happens



Grocery Delivery



Meal-Kit Delivery Services



E-commerce Platforms



B2B-to-Consumer Supply Chains

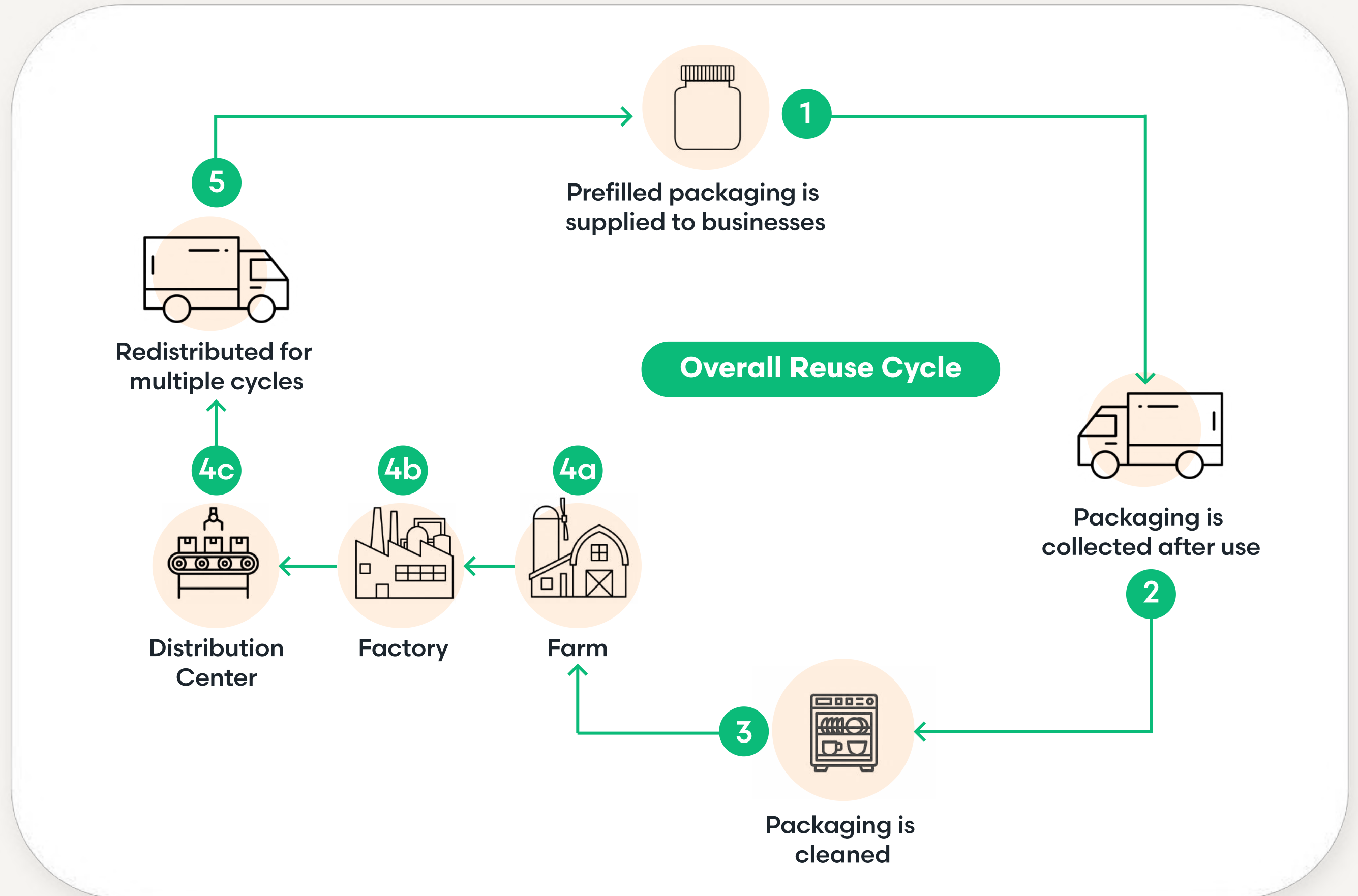
B2B

Business-to-Business Reuse Systems

Business-to-business (B2B) reuse systems circulate durable packaging between companies rather than directly with consumers, enabling efficiency and scale across supply chains. Prefilled packaging is supplied to businesses, collected after use, cleaned, and redistributed for multiple cycles.

B2B Cycle of Reuse

There are different variations of this cycle depending on the type of reuse, but all reuse systems include these 5 steps.



Reusable Transport Packaging

Used across numerous industries such as grocery, prepared food delivery, agriculture, e-commerce (fresh produce, insulated delivery boxes, shipping mailers). Distribution, cleaning, and return logistics typically managed by the producer, distributor, or reuse service provider.

What it includes:

Crates, pallets, bins, pallet wraps, drums, tanks, intermediate bulk containers (IBCs).

Primary sectors:

Food, beverage, agriculture, personal care, and logistics

How it Works

Durable crates, bins, pallet, pallet wrap and insulated containers are used to transport goods between businesses or to customers and then returned for reuse.

Prefilled packaging is supplied to businesses, collected after use, cleaned, and redistributed for multiple cycles.

In pooling models, third-party providers manage the entire process across multiple clients.

Considerations:

Success depends on efficient reverse logistics, standardization, and coordination between manufacturers, distributors, and retailers.

Where it Happens



Food & Beverage



Agriculture



Personal Care



Logistics Sectors

Prefill Bulk Ingredient or Product Delivery

Prefill bulk B2B delivery systems replace single-use packaging with durable, reusable containers designed for multiple trips.

What it includes:

Prefilled reusable drums, kegs, totes, and intermediate containers (IBCs) for items in bulk like cooking oil, sauces, condiments, coffee, spices, beverages, cleaning products.

Primary sectors:

Foodservice

How it Works

Commercial kitchens, universities, schools, corporate campuses, and other institutions operating at scale often require large quantities of food and beverage products.

Producers or co-packers fill reusable bulk containers, which are distributed through existing supply chains.

After use, containers are collected, washed, refilled, and reintroduced into circulation.

Where it Happens



Universities



Hotels



Quick-Service Restaurants



Hospitals



Corporate Dining Services

Key Elements of Reuse Systems



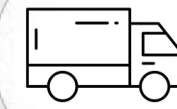
What's Needed for Reuse Systems to Work

For reuse systems to succeed, organizational, operational, technical, and financial frameworks, including any necessary governance models, infrastructure and incentives, are essential to create processes that enable packaging to be reused over and over for the same use.



Packaging

Enable durability and efficiency by designing standardized, safe, and cost-effective reusable formats.



Reverse & Forward Logistics

Keep reusable packaging in motion so that items reliably flow back into circulation at scale.



Return & Collection Pathways

Make it easy and convenient for people to return packaging so high recovery rates can be achieved.



Technology

Transparency & efficiency by tracking items, managing incentives, and generating data to optimize systems.



Cleaning & Sanitization

Guarantee consumer confidence by ensuring items are safe, hygienic, and ready for reuse.



Incentives, Education & Marketing

Build trust and support consumer and business behavior toward reuse as the new normal.

Packaging

Packaging design is the foundation of reuse systems. Standardization, durability, and safety are key to reducing costs and enabling interoperability across sectors. Standardization should allow for local manufacturing capabilities and existing bottle molds.

Infrastructure

Durable materials, harmonized formats, pooling networks. A third-party pooling provider supplies reusable packaging to businesses, collects it after use, cleans and inspects it, then redistributes it to other clients. Costs are spread through service or rental fees rather than ownership.

Interest Holders

Brands, packaging manufacturers, pooling providers, regulators

Models

Standardized bottle pools, industry-wide pooling systems, packaging-as-a-service models

Key Considerations

Material safety (food contact compliance, chemical safety), durability vs. weight, cost efficiency, alignment on design standards, recyclability at end of life



Photo: Xiclo

Return & Collection Pathways

Return and collection pathways are integral to any reuse system, providing consumers with convenient and reliable pathways to return packaging and operators with a means of easily getting the packaging back. Without easy return pathways, reuse cannot achieve the return rates or scale needed to compete with single-use. Variations include co-location with recycling, DRS, waste banks, retail take-back, mobile pick-up.

Infrastructure

Return kiosks, retail take-back counters, curbside/household pick-up, mail-back options

Interest Holders

Retailers, municipalities, waste banks, logistics providers, consumers

Models

Deposit return schemes, co-location with waste banks, staffed redemption centers, digital app-enabled return bins

Key Considerations

Accessibility, density of collection points, user convenience, cost efficiency, and integration with existing waste systems



Cleaning & Sanitization

Hygiene and safety are foundational cornerstones of a reuse system. Washing and sanitization must meet rigorous food safety standards and local, national and, in some cases, international washing standards. Commercial washing facility should be designed thoughtfully to scale efficiently, and be cost-effective.

Infrastructure

Centralized wash hubs, distributed/local wash hubs, mobile washing units

Interest Holders

Food safety regulators, logistics companies, reuse service providers, brands

Models

In-house washing by retailers/venues, third-party service providers, pooled/shared washing facilities

Key Considerations

Compliance with food safety standards, clear communication to consumers, cost-sharing models, energy and water efficiency



Photo: Glassia

Reverse & Forward Logistics

Logistics is the invisible backbone of reuse, moving packaging from point of return to cleaning and back into circulation. Efficient systems reduce costs, improve return rates, and keep packaging in play. Attention should be given to preexisting formal and informal collection networks to ensure inclusion and leverage pre-existing assets where feasible.

Infrastructure

Collection networks, transport fleets, centralized/decentralized distribution hubs

Interest Holders

Logistics firms, informal waste collectors, retailers, distributors, municipalities

Models

Direct business-managed routes, third-party logistics (3PL), cooperative or informal sector integration

Key Considerations

Cost, route optimization, reverse logistics integration with existing supply chains, role of informal sector, carbon footprint

The Informal Sector's Role in Reuse Logistics

In many regions, informal waste pickers are the backbone of recycling and waste collection.

Co-designing with the informal sector helps to ensure inclusivity and that their valuable insights and skills are integrated into the reuse system, ultimately expanding access and efficacy to lower costs, while ensuring fair pay, safety, and recognition.

This is further explored in Part 4: Design Criteria & Considerations

Technology

Digital tools provide transparency, efficiency, and accountability across reuse cycles. They help track items, incentivize consumers, and generate valuable data for operators and policymakers. Low-tech solutions like QR stickers or manual tracking can be effective where connectivity is limited.

Infrastructure

Scannable codes, scanners, digital platforms, consumer apps, back-end data systems

Interest Holders

Tech providers, brands, reuse operators, consumers, policymakers

Models

QR/Rfid/BLE tagging, deposit-refund apps, loyalty apps, digital dashboards for operators

Key Considerations

Data privacy, cost of adoption, interoperability between systems, consumer ease of use



Photo: Returnity

Incentives, Education & Marketing

Understanding and designing toward current behavior while incentivizing new behavior is central to reuse. Outside of bans or other policy enforced behavior change, refill interventions and reuse systems are more likely to succeed when they are intuitive, rewarding, and culturally relevant. Incentives and education help shift consumer norms from convenience-driven single-use toward reuse. Behavior change is strongest when trusted local voices lead the message. Schools and youth campaigns are often entry points for refill awareness.

Enablers

Awareness campaigns, app-based reward systems, community outreach channels

Interest Holders

Brands, retailers, NGOs, schools, community organizations, governments

Models

Behavioral nudges (discounts for reuse, loyalty rewards, prizes, gamification) school-based education programs

Key Considerations

Trust, cultural resonance, avoiding stigma, long-term consumer engagement beyond initial novelty



Photo: Trash Hero



Plastic Reboot



Executing Partner

PERPETUAL

Interested in learning more?

Get support to build reuse and refill into your plans.

Contact Dr. Dagny Tucker

hello@perpetualuse.org

**From
Start to
Success**

The Refill & Reuse
System Handbook

PRIMER
Part 3

The Refill & Reuse Systems Landscape

Reuse and Refill Programs
in the Global South



From Start to Success: The Refill & Reuse System Handbook

The 5 Part Primer



PART 1

Why Refill & Reuse Systems

Information about the problems that reuse and refill solve and the many benefits of these programs



PART 2

How Refill & Reuse Systems Work

An introduction to the different types of refill interventions & reuse systems



PART 3

The Refill & Reuse Systems Landscape

An overview of active reuse and refill programs worldwide, including descriptions and links to more information



PART 4

Design Criteria and Considerations

Best practices for design and implementation of refill interventions & reuse systems



PART 5

Enabling Conditions

What enables reuse to succeed, including policy, regulation, infrastructure, technology and collaboration



From Start to Success: The Refill & Reuse System Handbook

Part 3: The Reuse & Refill Landscape



Mapping the Landscape

Who's involved, what exists today, and how reuse and refill are taking shape across contexts.

Part 3: The Reuse & Refill Landscape

Situates reuse and refill models within real-world contexts.

This section explores the reuse and refill landscape as it exists today — highlighting real-world actors, initiatives, and conditions that influence how systems are being designed and implemented across different settings.

This landscape view surfaces the diversity of approaches already in play across regions, sectors, and value chains.

Part 3 is designed to help readers situate reuse and refill within their own local and sectoral context.

By showcasing existing initiatives, this section provides inspiration and reference points that make reuse and refill more tangible and relevant — helping interest holders see how different approaches align with different contexts.

What's Inside

The Refill and Reuse Landscape	5
Refill Systems	7
How Refill Works	8
Types of B2C Refill Systems	9
Understanding Refill Systems	10
Examples of Refill Systems	11
Examples of In-Store Refill or Dispensing	12
Examples of Water Refill	16
Examples of Bring Your Own Foodware or Bags	18
Examples of Refill at Home Through Single-Use Packaging	20
Examples of Solutions Created through Multi-Interest Holder Collaboration	22
Reuse Systems	24
How Reuse Works	25
Types of Reuse Systems	26
B2C Reuse Systems	27
Understanding B2C Reuse Systems	28
Examples of B2C Reuse Systems	29
Examples of Prefill Systems	30
Reusable Food Serviceware	34
Examples of Off-Premise Food Serviceware	35
Examples of Hybrid Reusable Food Serviceware	39
Examples of On-Premise Reusable Food Serviceware	41
Examples of Dishware Libraries	44
Examples of Reusable Secondary Packaging	47
Consumer Facing Enablers	49
B2B Reuse Systems	50
Understanding B2B Reuse Systems	51
Examples of B2B Reuse Systems	52
Examples of Reusable Transport Packaging	53
Examples of Bulk Ingredient or Product Delivery	55
Resources	58

About Plastic Reboot

Plastic Reboot is a \$108 Million program supported by the Global Environment Facility, co led by the United Nations Environment Programme and World Wildlife Fund, and implemented in partnership with the United Nations Development Programme and the United Nations Industrial Development Organization.

Plastic Reboot is focused on upstream and midstream solutions to plastic pollution in the food and beverage sector, and is delivered through a Global Project and a suite of 15 National Projects.

Together, we're working to transform material systems and engage governments, civil society organizations, and the private sector to reduce plastic pollution.

This document was prepared by Perpetual and WWF (World Wildlife Fund) under the Plastic Reboot Programme. It is funded by the Global Environment Facility. Its contents are the sole responsibility of Perpetual and WWF and do not necessarily reflect the views of the GEF Secretariat or any other organization.




The Refill & Reuse Landscape



Reuse & Refill Solutions Happening Around the World




North America

Operations in retail, campuses, and community libraries are normalizing reuse through everyday touchpoints.

-  Mercado Circular, Mexico (p.14)
-  West End Dish Box, Canada (p.23)
-  Imperfect Foods, United States (p.29)




Latin America

Prefill beverage systems and refill networks are scaling rapidly, driven by consumer demand and legacy infrastructure.

-  Sr. A Granel, Brazil (pg. 10)
-  Ficus Box, Costa Rica (p.28)
-  Mottainai, Colombia (pg. 13)




Europe & UK

Policy and reuse model innovation is fueling growth across cities, HoReCa, events and retailers.

-  Vytal, Germany (p.25)
-  Circolution, Europe (p.21)
-  Incredible Bulk, UK (p.13)




Asia

Prefill models and community driven sachet alternatives are making reuse accessible at the neighborhood level.

-  Kuha Sa Tingi, Philippines (p.15)
-  Alner, Indonesia (p.21)
-  Leap, India (p.34)

Africa

Refill kiosks and low-cost dispensers are expanding access to reuse in underserved communities.

-  Sonke, Zambia (p.11)
-  Smartfill, Kenya (p.11)
-  Nude Foods, South Africa (p.10)

Refill Systems



How Refill Works



Refill is when the consumer's container is filled with product, either by the consumer or a business, at the point of purchase.



Consumers pay based on the weight or volume purchased.



As the owner of the container, the consumer is responsible for cleaning, storing, and transporting the container.

How widespread is Refill?

The exact number of refill solutions worldwide is unknown. Many retailers or shops offering refill solutions are independently-owned, single-location operations and may not have a web presence. We know that there are at least hundreds of refill solutions operating globally, and likely many thousands more.

Many informal everyday examples also exist, such as refilling rice or vinegar at traditional markets.

Types of B2C Refill Systems

In a refill system, packaging is typically owned and managed by the consumer. Refill is available in various purchase contexts, with options available in traditional and modern retail, mobile, and delivery services. Some stores are entirely dedicated to in-store refill products, while others dedicate part of their store to in-store refill and the rest to products in single-use packaging.

These are four primary types of B2C refill happening today, with some variations within each type.



**In-Store Refill
or Dispensing**



**Water Refill
Stations**



**Bring Your Own
Foodware or Bags**



**Refill at Home Through
Single-Use Packaging**

Overall: All refill models fall under the business-to-consumer (B2C) category, with consumers playing a central role in managing the container and ensuring reuse.

Sub-categories of Refill

Understanding Refill Systems



In-Store Refill or Dispensing

Consumers purchase products in store by bringing their own containers or using reusable options provided by retailers. Dispensing models reduce single-use packaging and are adaptable to both traditional markets and modern retail formats.



Water Refill Stations

Fixed refill dispensers provide safe, affordable drinking water in reusable containers, replacing single-use plastic bottles. These systems are increasingly integrated into both public spaces and private venues.



Bring Your Own Foodware or Bags

Consumers use their own cups, containers, or bags for products such as ready-to-eat food, beverages, or groceries. This model reduces single-use packaging by shifting responsibility for the container to the consumer, and is often supported by reward programs, discounts, or digital apps.





Refill at Home Through Single-Use Packaging

Consumers refill durable household containers using lighter-weight or alternative single-use formats, reducing packaging material while extending the life of sturdier containers.

Examples of Refill Systems


-  In-Store Refill or Dispensing
-  Water Refill
-  Bring Your Own Foodware or Bags
-  Refill at Home Through Single-Use Packaging

Global
 SodaStream

 University of Toronto Mississauga

 Utrecht University

 Blueland

 Oasis

 Adrish


 Rifils

North America

Canada

Netherlands

 RefilMe


 Sr. A Granel

Brazil

 Meu Copo Eco

Namibia

South Africa

 Nude Foods


Botswana

Eswatini

 Goodfill


India

Indonesia

 Izifill

Philippines

Vietnam

 Back to Basics Ecostore

 Refillable Hoi Ann

 Manzi

Examples of In-Store Refill or Dispensing



Examples of In-Store Refill or Dispensing

Mercado Circular

- Refill dispensary for cleaning products under the EcoCarga brand in locations such as supermarkets and parks.
- Offers products at 10% to 30% lower prices



Mexico

Chile

Photo: Mercado Circular

Sr. A Granel

- Small chain of zero-waste grocery stores with bins and dispensers
- Emphasis on specialty categories such as organic or lactose-free products



Brazil

Photo: Sr. A Granel

Nude Foods

- Plastic-free grocery store with bulk bins
- Non-GMO bulk locally supplied foods and eco products sold by weight



South Africa

Photo: Nude Foods

Sonke

- Refill vending machines in supermarkets
- Replaced over 2.5m single-use bottles in South Africa and 500k in Zimbabwe



South Africa

Photo: Sonke

Examples of In-Store Refill or Dispensing

Adrish

- Zero-waste local goods grocery store with bulk bins
- Has saved an estimated 295,810 kgs of packaging waste from landfill since its 2018 launch



India

Photo: Adrish

Back to Basics Ecostore

- Zero waste store with bulk bins
- Eco-friendly products, including some produced by women-led community social enterprises



Philippines

Photo: Back to Basics Ecostore

Refillable Hoi An

- Zero waste store with bulk bins
- Offering a wide range of home and personal care products and healthy food options



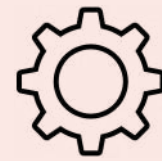
Vietnam

Photo: Refillable Hoi An

Case Study of In-Store Dispensing: Refill-On-The-Go

Sonke

Social enterprise operating in South Africa that provides refillable cooking oil systems for small retailers and consumers by offering refill stations and reusable bottles in low-income and peri-urban communities.



SYSTEM TYPE

Refill-on-the-Go: Consumer-owned containers refilled at local stores, markets, and mobile stations managed by Sonke and community distributors.



INFRASTRUCTURE

Implements gravity-fed refill dispensers and returnable bulk containers that supply neighbourhood shops. Each station is serviced by regional distribution hubs that ensure safe storage, quality control and refill tracking.



POLICY CONTEXT

Aligns with South Africa's Extended Producer Responsibility (ERP) regulations for packaging and supports national circular economy goals that promote reuse and waste prevention at the retail level.



CONSUMER BEHAVIOUR

Consumers bring back their bottles for refill, saving 10-15% per purchase compared to buying single-use packaging. Trust is built through product quality, hygiene, and transparency in pricing.



PARTNERSHIPS

Sonke collaborates with local retailers, community cooperatives, and oil producers to scale refill access, create local jobs, and strengthen sustainable distribution networks across southern Africa.



Photo: Sonke

Examples of Water Refill



Examples of Water Refill

RefilMe

- Refill dispensary for cleaning products under the EcoCarga brand in locations such as supermarkets and parks.
- Offers products at 10% to 30% lower prices
- Pilot refill for hair care products with Proctor & Gamble in Mexico.
- Reaches 150,000 families in Chile and has expanded into Mexico



Brazil

Photo: RefilMe

Izifill

- Smart water dispenser pilot for Danone water in universities and food courts.
- The pilot has replaced over 2,300 single-use bottles since late 2023
- Consumers use the app to scan a QR code on the refill station, select the amount of water they want, and fill their reusable bottle - all through a touch-free process



Indonesia

Photo: Izifill

Oasis

- Water dispensers for home or office
- Purified water in 10L or 25L bottles with taps that can be refilled at its 360 Oasis stores
- Provides in-store water purification with on-site quality control and testing.
- Operates a franchise-based network of water purification and refill outlets across SA.



Namibia South Africa Eswatini Botswana

Photo: Oasis

Manzi

- Water refill for home, office, and retail locations
- Provides refill stations, refillable bottles, and purified water delivery service in bulk sizes
- Delivers bulk purified water for commercial and institutional clients.
- Focuses on refill-based access to safe drinking water in urban and peri-urban areas.



South Africa

Photo: Manzi

Examples of Bring Your Own Foodware or Bags



Examples of Bring Your Own Foodware or Bags

Meu Copo Eco

- A large-scale reuse initiative operating across Brazil that provides reusable cups for events and festivals but also encourages consumers to bring their own cups or bottles for discounts at partner cafés and bars.
- The program builds community awareness around reuse while reducing waste from single-use cups in public events.



Brazil

Photo: Meu Copo Eco

University of Toronto Mississauga

- Their food-services team offers a “Bring Your Own Cup” (BYOC) discount at all locations for students, faculty, and staff who bring reusable mugs or containers.



Canada

Photo: University of Toronto

Utrecht University

- Their Green Office campaign encourages reusable cups and offers a €0.10 discount (10 cent) when students bring their own cup to coffee machines across campus.



Netherlands

Photo: Utrecht University

Examples of Refill at Home Through Single-Use Packaging



Examples of Refill at Home Through Single-Use Packaging

Blueland

- Buy empty reusable spray bottles and hand soap pumps designed to be refilled with branded tablets and tap water.
- Can be ordered online and found in major retail and grocery chains
- Saved estimated 6,417,804 plastic containers from landfills in 2024



North America

Photo: Blueland

SodaStream

- Home carbonation system (machine, returnable, refillable CO2 cylinder)
- Bottle can be used up to 3,000 times
- Concentrated flavor liquid in single-use cartridges to make flavored water or sodas, including branded drinks
- Available at 80,000+ retail stores across 45 countries



Global

Photo: SodaStream

Skipper

- Concentrated refill products for cleaning and home care.
- Reusable, durable bottles designed for repeated at-home refilling.
- Lightweight refill pouches reduce packaging material and shipping weight.



Australia

Photo: Skipper

Dr. Bronner

- Gable Top Carton Refill pack for PCR Soap Bottles
- Designed to refill Dr. Bronner's 100% Post-Consumer-Recycled bottle, foaming hand soap pump dispenser, and more



North America

Photo: Dr. Bronner

Examples of Solutions Created through Multi-Interest Holder Collaboration

Introducing new ways of delivering products to consumers can be challenging for individual interest holders on their own.

The following examples illustrate the success of refill models implemented by groups of interest holders who were able to shift the system and achieve positive results.

The term “sachet economy” describes the widespread practice of selling goods in small, affordable quantities.

This is embodied in the Filipino custom of “tingi,” which traces its roots to the phrase “konting hingi,” meaning asking for a little bit more of something.

Today, tingi manifests in everyday transactions at local sari-sari stores, where consumers buy just enough for their day-to-day needs. [Source](#)





Kuha Sa Tingi

Philippines

Collaborators

Spearheaded by Greenpeace Philippines in collaboration with Innovation Catalyst (formerly Impact Hub Manila) and various local government units.

Objective

Kuha sa Tingi is reducing the use of sachets by developing a zero waste Alternative Delivery System (ADS) with affordable pricing, empowering consumers from all socio-economic sectors to refill their reusable containers with the exact quantities they need while advocating for refill and reuse.

How it Works

Existing small, neighborhood convenience stores ("sari-sari stores") offer small-portion refill systems for everyday home and personal care commodities. The process and logistics were designed to be as uncomplicated and accessible as possible. For example, the equipment can be interchanged and does not require power or too much space.

Results

From the initial 2022 pilot with 10 stores in San Juan, the project has expanded to two other cities and more than 1,000 stores.



Bottle Free Seas Project

Thailand

Collaborators

Initiated by the Environmental Justice Foundation (EJF) in collaboration with the Bangkok Metropolitan Administration and funded by the Norwegian Retailers' Environment Fund

Objective

Reduce the use of single-use water bottles

How it Works

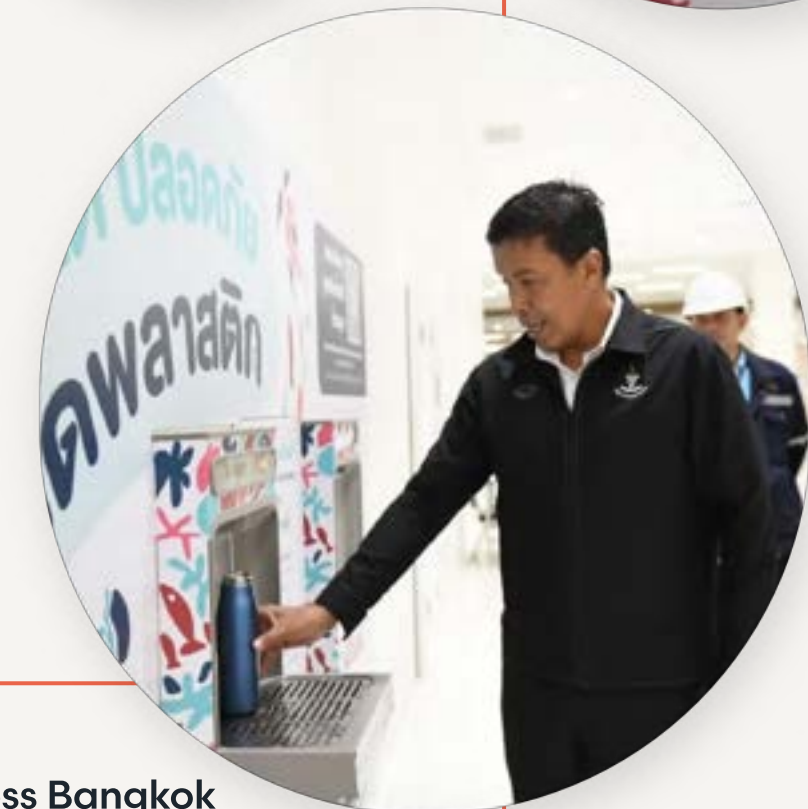
Stations filter and refrigerate tap water and are free to the public.

Advertisements around the city promote them as free, drinkable, and safe sources of water.

The first 10 stations are located at public locations like parks, bus stops, and shopping centers.

Results

The 10 pilot water refill stations installed across Bangkok in 2023 demonstrated an average reduction of 100,000 bottles per month. EJF aims to expand to 2,500 in 2025 and 5,000 in 2026.



Reuse Systems



How Reuse Works



Reuse systems operate when packaging is used multiple times for the same purpose through a structured return-and-recirculation process.



After use, containers are collected, cleaned, and redistributed by a business, service provider, or logistics partner.



Consumers typically participate in a return program or pay a deposit, while the business is responsible for maintaining the packaging and ensuring its safe reuse.

How widespread is Reuse?

Reuse systems exist across sectors — from beverages and foodservice ware to logistics and e-commerce. While comprehensive global data is limited, reuse is common in established categories such as refillable beverage bottles, pooled crates, and foodservice containers. Hundreds of organized reuse networks now operate globally, with new operations and service providers emerging every year.

Types of Reuse Systems

In reuse systems, the packaging is owned by the business, reuse service provider, packaging as a service provider or other entity. There are two primary types of reuse systems: Business to Consumer (B2C) and Business to Business (B2B).

B2C: Transactions where a business, non-profit, government, or other organization provides products directly to consumers



Prefill



Reusable Food Serviceware



Asset Sharing

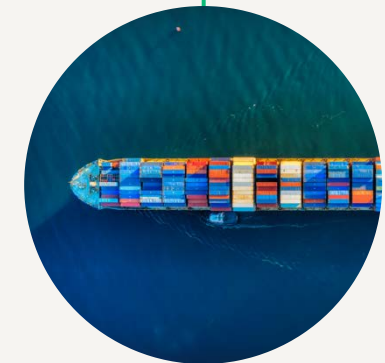


Reusable Secondary Packaging

B2B: Transactions between businesses



Reusable Transport Packaging



Bulk Ingredient or Product Delivery

B2C

Business-to-Consumer Reuse Systems

Business-to-consumer transactions are when a business, non-profit, government, or other organization provides products directly to consumers.

Sub-categories of Reuse

Understanding B2C Reuse



Prefill Systems

“Prefill” lets consumers buy products in reusable packaging that is already filled and on the shelf, rather than needing to fill the container themselves. The reusable packaging is returned by the consumer to be washed, filled, and sold again by the service provider, producer or packing facility.

Beverage prefill systems commonly use a Deposit Return Scheme (DRS) in which a deposit is used to incentivize the return of the reusable bottle.



Reusable Food Serviceware

Reusable food serviceware is provider-owned food serviceware that is designed to be used for its originally intended purpose multiple times by a consumer, rather than disposed of after a single use.

The food serviceware is cleaned and redeployed by the provider. Food serviceware can include cups, plates, bowls, trays, lids, utensils, and other food serviceware items.



Dishware Libraries

Dishware libraries are resources available for use by multiple users through borrow or rental models.

Sometimes, these are free programs offered by community groups or volunteers dedicated to waste reduction.



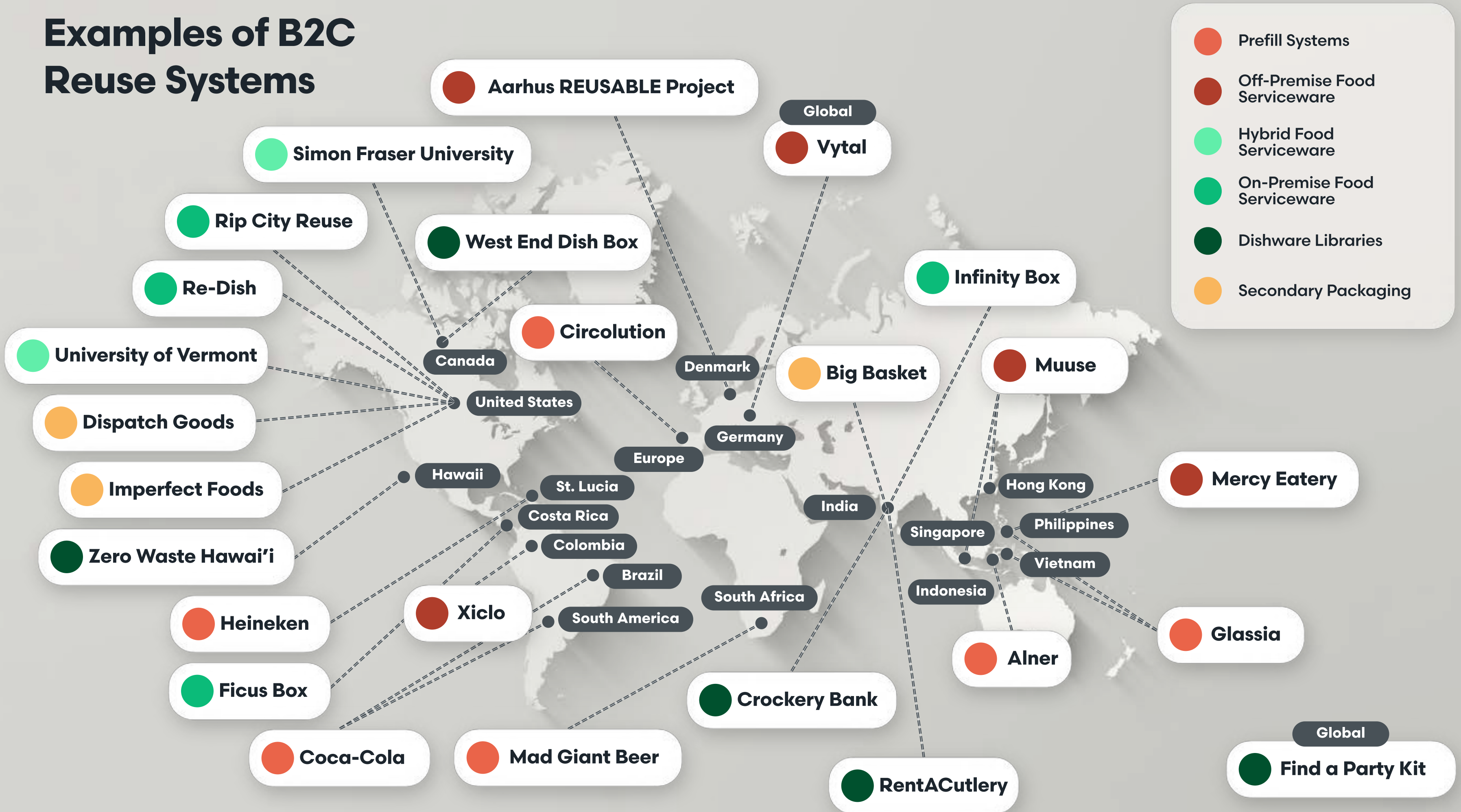
Reusable Secondary Packaging

Reusable secondary packaging refers to outer packaging, such as insulated boxes, that contain and protect the goods within them.

They are usually designed for multiple delivery and return cycles.

Unlike single-use shipping materials, these durable containers protect goods in transit, can be easily cleaned or sanitized, and are returned to the provider for repeated use.

Examples of B2C Reuse Systems



Examples of Prefill Systems

“Prefill” lets consumers buy products in reusable packaging that is already filled and on the shelf.

Locally sourced washing infrastructure and/or bottle-buy-back programs add feasibility in small markets.



Examples of Prefill Systems

Coca-Cola Universal Bottle

- Reusable PET soda bottles returned to point-of-sale and then collected and refilled by the local bottler
- Bottles reused up to 25 times, reducing plastic use by 90%; fastest-growing Coca-Cola format in the region



South America Brazil

Photo: Coca Cola

Heineken St. Lucia

- Circular, returnable glass bottle program operated by Carib Brewery in St. Lucia.
- Customers return empty bottles to designated drop-off locations for cleaning and reuse.
- Deposit-refund incentive of approximately \$0.30 per bottle and \$2.80 per crate.



St. Lucia

Photo: Heineken St. Lucia

Mad Giant Beer

- Brewery delivers beer in reusable glass bottles directly or via bottle shops
- Deposit-refund system has avoided 60,000 single-use bottles in the first year



South Africa

Photo: Mad Giant Beer

Examples of Prefill Systems

Circolution

- Partnered with Nestle to offer reusable stainless-steel Nesquik containers that are returned via reverse vending or in-store
- Containers distributed via retail and returned through reverse vending or in-store collection.
- Designed for scalable, cross-retailer deployment in Europe.



Europe

Photo: Circolution

Glassia

- Delivers water in reusable glass bottles to hotels, who offer them to their guests
- Full-service model including delivery, collection, sanitation, and redistribution.
- Designed to replace single-use bottled water in guest settings.



Philippines

Vietnam

Photo: Glassia

Alner

- Delivers refillable personal and home care products
- Returns managed via micro-distributors or home collection
- Centralized cleaning and refill before redistribution.
- Focused on building localized reuse infrastructure in Indonesia.



Indonesia

Photo: Alner

Case Study of Prefill/Refill

Aner

In Indonesia, Aner partners with Unilever, Nestlé and others to distribute household products like detergent and beverages in refillable, returnable containers.

Consumers pay a small surcharge when purchasing, and receive credit toward their next order when they return empty packaging through collection partners or delivery riders to .

[See extended case study](#)



SYSTEM TYPE

Prefill: Producer-owned reusable packaging managed through a digital tracking and redistribution system integrated with brand supply chains.



INFRASTRUCTURE

Uses a network of local collection partners and e-commerce delivery riders to retrieve and redistribute containers. Returned items are cleaned, refilled, and returned to market through the same retail or delivery channels.



POLICY CONTEXT

Aligns with Indonesia's Extended Producer Responsibility (EPR) roadmap and voluntary corporate reuse targets, helping brands meet commitments under national waste reduction regulations.



CONSUMER BEHAVIOUR

Deposit-return and app-based credit incentives promote accountability and repeat participation. The model leverages Indonesia's growing digital economy and delivery culture to make reuse convenient.



PARTNERSHIPS

Aner works closely with Nestlé, Unilever and Grab to connect reuse systems with existing retail and logistics infrastructure, demonstrating how private-sector collaboration can accelerate reuse adoption at scale.



Photo: Aner



Photo: Aner

Reusable Food Serviceware

Where does Reusable Food Serviceware get used?

Reusable food serviceware systems can vary in the level of control the provider has over the packaging throughout the product's lifecycle. There are two main models: on-premise and off-premise, plus a combination of the two (hybrid).

Street festivals, universities and local eateries are often early adopters of on-premise systems.

LESSONS LEARNED

Need for awareness of the system
Need for robust hygiene protocols

On-Premise

Taken away by consumers, used and collected within controlled settings (e.g., restaurants, schools, offices, stadiums) where items are washed onsite and returned to circulation.



Off-Premise

Taken away by consumers (e.g., coffee cups, takeout containers) and returned via drop bins, retail points, or app-enabled networks for washing and reuse.

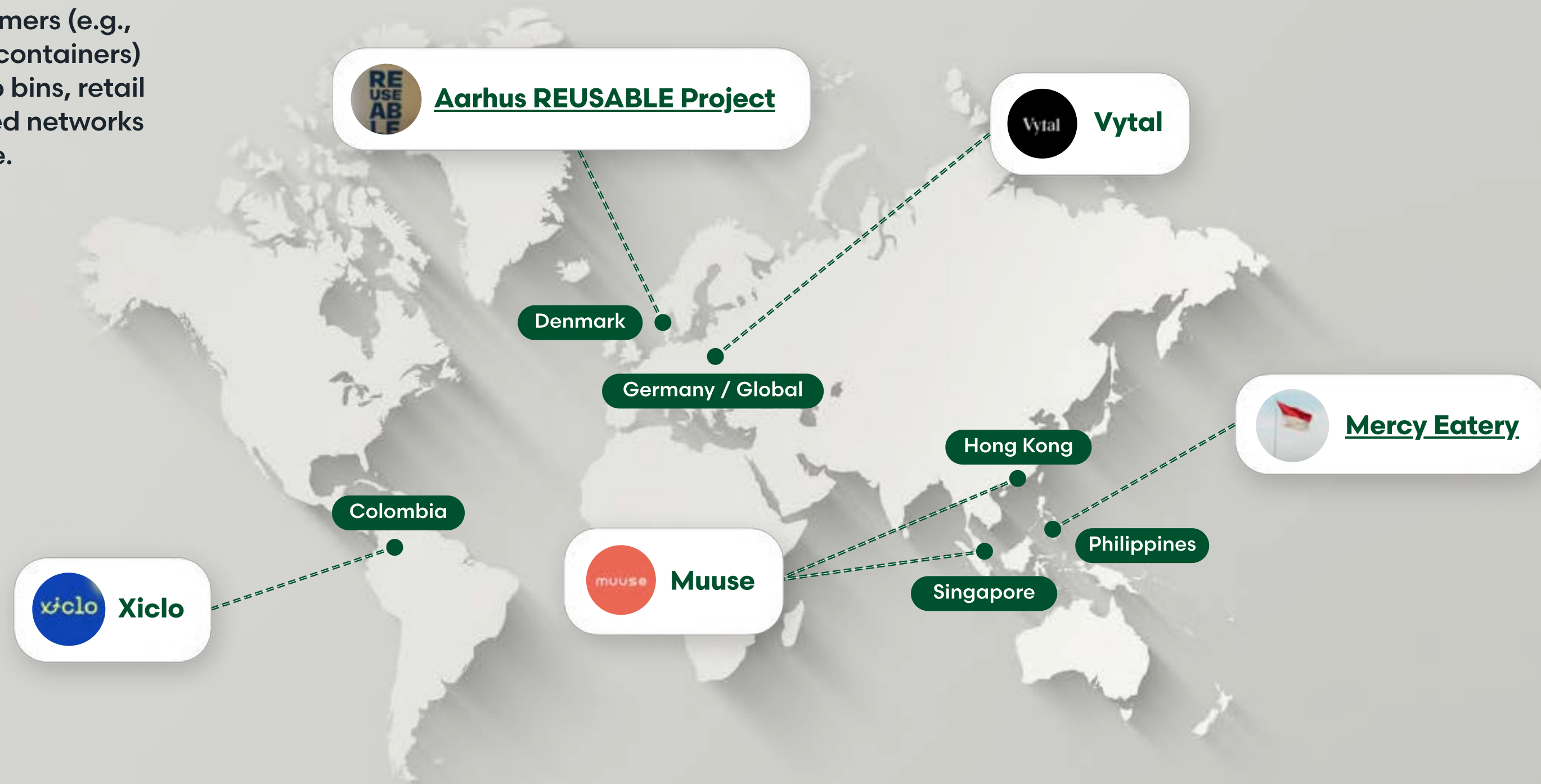


Hybrid

Hybrid refers to those systems that are primarily on-premise but are not in a controlled environment, so the reusable items can move around a campus or even leave the campus and be brought back to be returned. These are sites like universities, malls, corporate campuses, hospitals or other places that have multiple buildings or spaces.

Examples of Off-Premise Reusable Food Serviceware

Taken away by consumers (e.g., coffee cups, takeout containers) and returned via drop bins, retail points, or app-enabled networks for washing and reuse.



Examples of Off-Premise Reusable Food Serviceware

Xiclo

- Reusable packaging for food and beverage delivery and tracked via SaaS platform
- Consumers borrow containers and return them to participating locations.
- Operates with restaurant partners to replace single-use delivery packaging in Colombia.



Colombia

Photo: Xiclo

Aarhus REUSABLE Project

- Citywide reusable cup Deposit Return System (DRS)
- Collaboration between the Municipality of Aarhus and TOMRA Reuse
- 85% return rate; over 1 million cups collected since January 2024



Denmark

Photo: Aarhus REUSABLE

Muuse

- App-enabled reusable container borrowing for takeaway food and beverages
- Approximately 2,000 users and 25 partner cafes in Singapore



Hong Kong

Singapore

Photo: MUUSE

Examples of Off-Premise Reusable Food Serviceware

Vytal

- App-based reusable container program for restaurants, caterers, and event organizers
- 15 million disposables eliminated globally



Germany / Global

Photo: Vytal

Mercy Eatery

- Local Manila eatery
- Deposit Return System (DRS) for takeaway containers
- Bring-Your-Own-Container (BYOC program)



Philippines

Photo: Unsplash

Case Study of Reusable Takeaway Platform

Vytal

Vytal has an active presence across the Global South, with adaptations of its digital reuse model in India, Indonesia and Latin America, where app-based borrowing enable returnable food packaging for restaurants, cafeterias, and delivery platforms.

[See extended case study](#)



SYSTEM TYPE

Off-premise reusable foodware — provider-owned containers tracked through a QR-based digital platform, enabling deposit-free borrowing and return across multiple venues.



INFRASTRUCTURE

Leverages existing restaurant delivery networks and centralized washing hubs that service clusters of eateries. Returns are handled by delivery riders or drop points, reducing dependency on new infrastructure.



POLICY CONTEXT

Aligns with emerging EPR and plastic reduction policies in Indonesia, India and Colombia, which encourage businesses to pilot reuse and take-back systems for food packaging.



CONSUMER BEHAVIOUR

Customers borrow containers for free through the app or delivery platforms and return them to any participating location. Digital reminders, ease of use and social rewards drive strong participation among urban consumer.



PARTNERSHIPS

Implemented through collaborations between delivery apps, restaurants and local reuse service providers, supported by municipal governments and corporate sustainability programs.



Photos: Vytal

Examples of Hybrid Reusable Food Serviceware

Hybrid refers to those systems that are primarily on-premise but are not in a controlled environment, so the reusable items can move around a campus or even leave the campus and be brought back to be returned.

These are sites like universities, malls, corporate campuses, hospitals or other places that have multiple buildings or spaces.



Simon Fraser University

Canada

United States



University of Vermont

Examples of Hybrid Reusable Food Serviceware

Simon Fraser University

- Implemented smart reusable take-out container system: students check out containers via RFID and return them to automated bins
- 97.5% return rate achieved



Canada

Photo: Simon Fraser University

University of Vermont

- Runs the EcoWare via ReusePass program
- Reusable take-out containers are provided to-go
- Returned to designated bins to minimize single-use waste

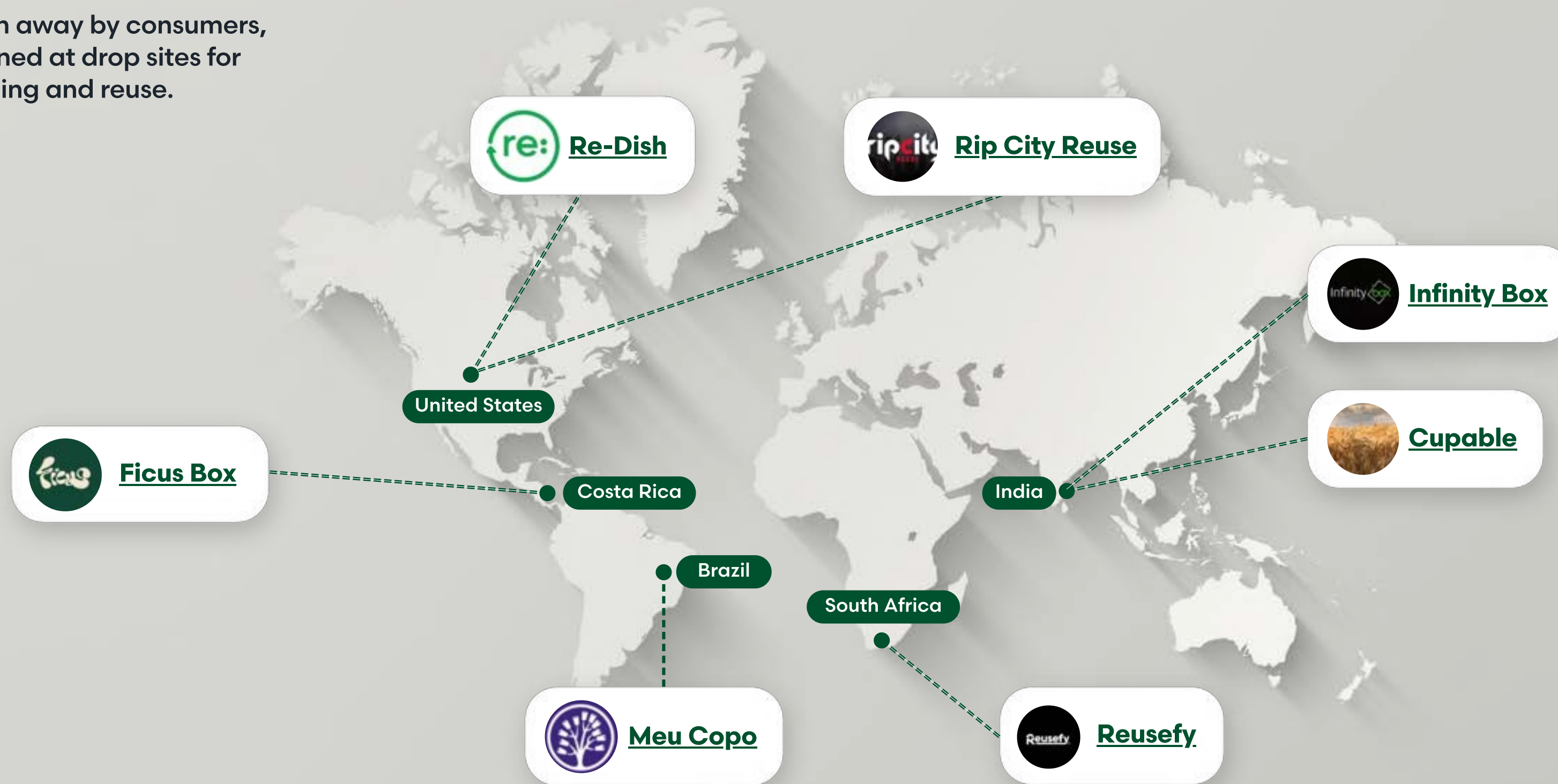


United States

Photo: University of Vermont

Examples of On-Premise Reusable Food Serviceware

Taken away by consumers, returned at drop sites for washing and reuse.



Examples of On-Premise Reusable Food Serviceware

Ficus Box

- Provides reusable serviceware and sustainability support for events and small food businesses



Costa Rica

Photo: Ficus Box

Re-Dish

- Reusable containers at Barclay's NYC office cafeteria, displacing 250,000 single-use products/year

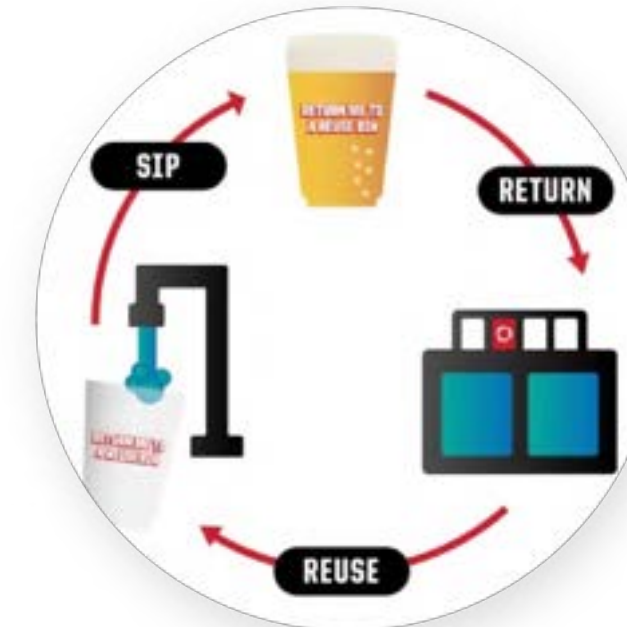


United States

Photo: Re-Dish

Rip City Reuse

- Reusable cup program at Portland Trail Blazers stadium
- 1 million cups eliminated as of June 2025



United States

Photo: Rip City Reuse

Infinity Box

- 'Serviceware as a service' for institutions and events
- Sets up dishwashing hubs either on-site or nearby



India

Photo: Infinity Box

Examples of On-Premise Reusable Food Serviceware

Meu Copo

- Reusable beverage cup system for festivals, concerts, and large events.
- Uses a deposit system and offers custom branding options.
- Deposit-return model to incentivize cup recovery.
- On-site collection and washing before redistribution.



Brazil

Photo: Meu Copo

Reusefy

- Reusable cup service for stadiums and large venues.
- Deposit-based system to drive high return rates.
- Provides collection logistics and washing services.
- Focused on scalable event and sports venue deployment in South Africa.



South Africa

Photo: Reusefy

Cupable

- Reusable rice husk cups with collection and washing services for events.
- Designed for events, offices, and institutional settings.
- Collection and centralized washing services included.
- Durable, lightweight format suited for repeated use cycles.



India

Photo: Cupable

Examples of Dishware Libraries

Resources available for use by multiple users through borrow or rental models.



Examples of Dishware Libraries

Zero Waste Hawai'i Island No Pohō

- Library of dishes, stainless steel tableware, and Mason jars available for community use
- Borrowers are required to wash all items before returning them
- Dish Library is free to use



Hawaii

Photo: Zero Waste Hawai'i Island No Pohō

West End Dish Box

- Zero Waste Dish Library for borrowing a wide selection of reusable dinnerware and flatware for free in Vancouver
- Users must reserve the items in advance and clean them before returning them on the agreed-upon date



Canada

Photo: West End Dish Box

Find a Party Kit

- The Party Kit Network supports over 500 members across the world to set up and run local party kits through resources, training and community-building
- Helps users locate available Party Kits in their region



Global

Photo: Find a Party Kit

Examples of Dishware Libraries

RentACutlery

- Provides reusable plates, bowls, spoons, and tumblers for parties and events
- Citizen activists launched the Rent-A-Cutlery initiative in July 2016 in Bengaluru to address waste from community events.



India

Photo: RentACutlery

Crockery Bank

- Event reuse initiative established in 2018 and now has 41 chapters
- Has replaced over 1.2 million disposables over six years



India

Photo: Crockery Bank

Examples of Reusable Secondary Packaging

Durable crates, bins, pallet, pallet wrap and insulated containers are used to transport goods between businesses or to customers and then returned for reuse.



Examples of Reusable Secondary Packaging

Imperfect Foods

- Delivers groceries, primarily fresh produce that is not cosmetically perfect or of irregular sizes.
- Cleaning partner Dispatch Goods collects gel packs for cleaning and reuse.



United States

Photo: Imperfect Foods

Dispatch Goods

- Provides reusable packaging, collection, and washing services for grocery delivery operations.
- Delivery operator brings the used packaging to the distribution center.
- Dispatch receives them, routes them for cleaning, and returns them to the distribution center ready to be reused.



India

Photo: Dispatch Goods

Big Basket

- Delivers groceries in reusable crates, reducing single-use paper and plastic bags.
- Delivery staff collect empty crates and packaging during subsequent deliveries.
- Packaging returned to distribution centers for cleaning and reuse.



India

Photo: Zero Big Basket

Consumer-Facing Enablers

Incentive and Advocacy Initiatives

Consumer-facing enablers are resources and tools that facilitate access to or use of reuse and refill models. They could include digital platforms, apps, maps, or other tools to help consumers identify, find, or more easily use available solutions.



Refill the World

Global database of water refill stations replacing single-use bottles

Global



Trash Hero

- Water bottle refill network
- Selling reusable bottles at a small profit covers the cost of providing water refills
- Trash Hero has sold over 111,000 bottles through refill partners'
- Avoided more than 42 million single-use bottles since 2014

Europe

Southeast Asia

B2B

Business-to-Business Reuse Systems

Business-to-business systems are where one organization provides products or packaging to another organization. These are not intended for direct consumer use.

Understanding B2B Reuse

Business-to-business (B2B) systems are where one organization provides products or packaging to another organization. These are not intended for direct consumer use.



Reusable Transport Packaging

Durable crates, bins, pallet, pallet wrap and insulated containers are used to transport goods between businesses or to customers and then returned for reuse.

These systems are commonly used in grocery/prepared food delivery, agriculture, and e-commerce (e.g., reusable crates for fresh produce, insulated delivery boxes, or reusable shipping mailers).

Distribution, cleaning, and return logistics are typically managed by the producer, distributor, or a specialized reuse service provider.



Bulk Ingredient or Product Delivery

Commercial kitchens, universities, schools, corporate campuses, and other institutions operating at scale often require large quantities of food and beverage products.

Bulk delivery systems replace single-use packaging with durable, reusable containers designed for multiple trips.

Many reuse practices exist informally in local supply chains—these slides highlight opportunities to formalize and scale.

Examples of B2B Reuse Systems

- Reusable Transport Packaging
- Bulk Ingredient or Product Delivery

Global

IFCO

Returnity

United States

Leap

India

EcoRefill Solutions

Colombia

South Africa

South America

Galaxy Pack

SmartLoad



Examples of Reusable Transport Packaging

Bulk delivery systems replace single-use packaging with durable, reusable containers designed for multiple trips.



United States

Colombia & South America



Galaxy Pack

Global

IFCO IFCO

Examples of Reusable Transport Packaging

Returnity

- Works with brands and retailers to design durable, reusable bags and boxes for shipping and delivery
- Designs reusable shipping bags/boxes and supporting logistics systems



United States

Photo: Returnity

Galaxy Pack

- Customized reusable mesh pallet covers
- Designed for up to 3,000 uses and easy refurbishment



Colombia & South America

Photo: Galaxy Pack

IFCO

- Reusable Produce Containers (RPCs) system launched in 1992 for fresh goods supply chains
- Growers pack produce in the RPCs, which are then transported to distribution centers and on to retailers
- Empty RPCs are returned to distribution centers where they are inspected, cleaned and disinfected for reuse

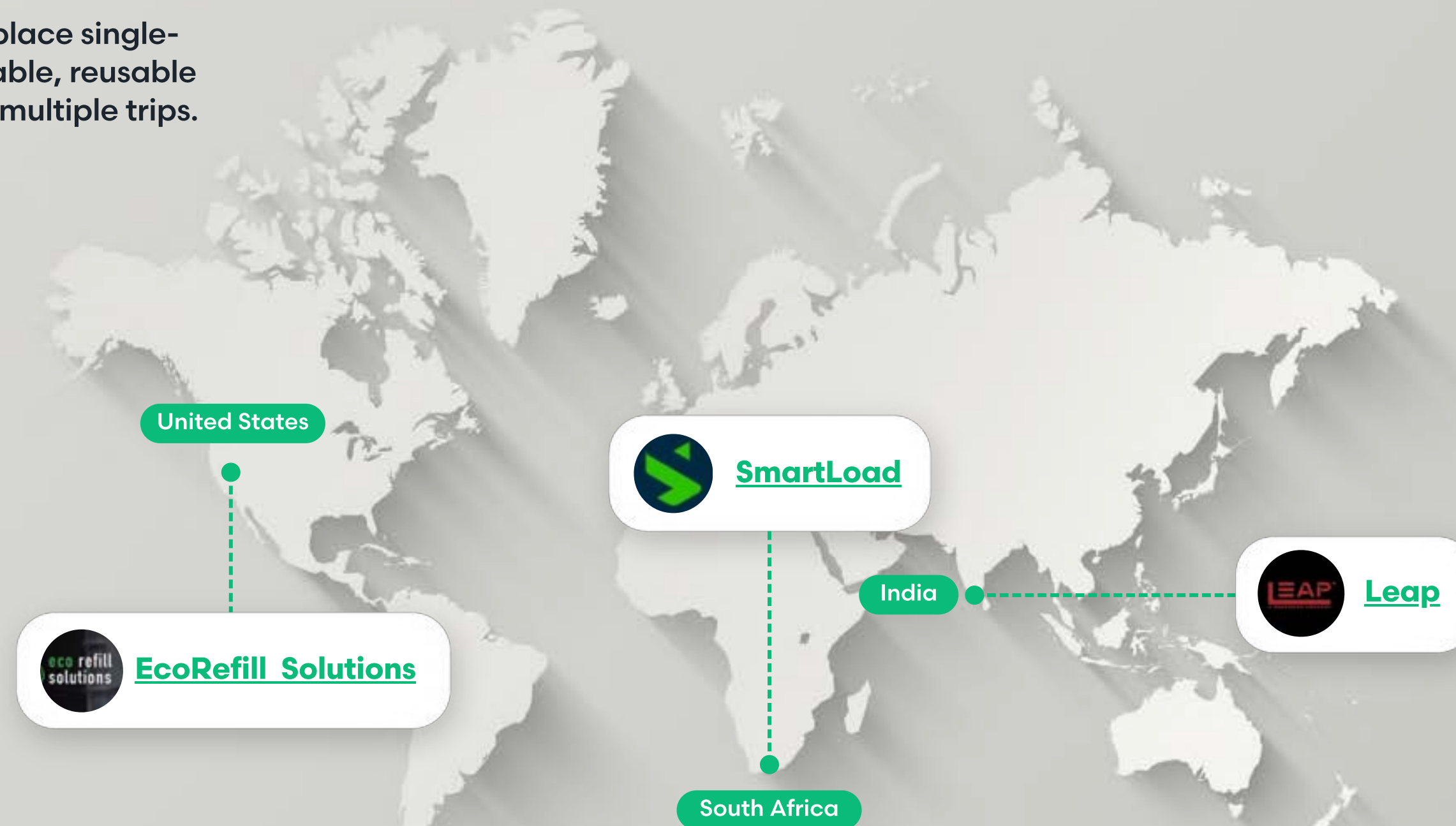


Global

Photo: IFCO

Examples of Bulk Ingredient or Product Delivery

Bulk delivery systems replace single-use packaging with durable, reusable containers designed for multiple trips.



Examples of Bulk Ingredient or Product Delivery

EcoRefill Solutions

- Offer weekly or bi-weekly refillable oil delivery to food service kitchens throughout California.
- Stainless steel containers collected, cleaned, and refilled on a recurring schedule.



California

Photo: EcoRefill Solutions

SmartLoad

- Rents and sells reusable bulk liquid and foldable containers, plus plastic pallets.
- Offers reusable pallets and transport packaging for supply chains.
- Packaging pooled and circulated across multiple clients.



South Africa

Photo: SmartLoad

Leap

- Reusable packaging and pooling solutions for supply chains across 2,500+ locations.
- Offers crates, pallets, intermediate bulk containers, and transport assets.
- Serves large-scale retail and FMCG networks across India.



India

Photo: Leap

Resources



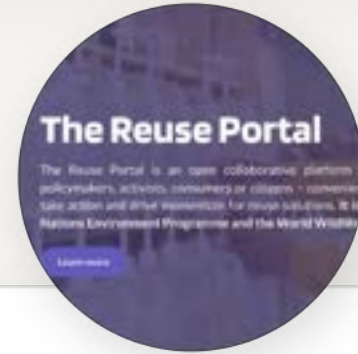
Additional Examples



Living Landscape of Reusable Solutions

The Living Landscape of Reuse Solutions database is a regularly updated global list of for-profit and nonprofit programs and campaigns that provide reusable solutions to eliminate waste.

Local partner examples featured here will be continuously added to the Living Landscape database.



The Reuse Portal

Championed by the World Economic Forum, United Nations Environment Programme, and the World Wildlife Fund.

The Reuse Portal is an open collaborative platform that provides innovators, businesses, policymakers, activists, consumers, and citizens convenient access to practical guidance, tools, and networks to take action and drive momentum for reuse solutions.



WWF/EMF Reuse in Global South

A WWF report examining the opportunities and enabling conditions for scaling reuse systems across low- and middle-income countries.

The report highlights policy frameworks, business models, financing mechanisms, and infrastructure considerations needed to support locally appropriate, inclusive, and economically viable reuse systems.



Unpacking Reuse in Asia

A regional report spotlighting reuse practitioners, policies, and system innovations emerging across Asia.

The publication documents case studies, regulatory drivers, and grassroots initiatives that demonstrate how reuse can reduce plastic pollution while supporting local economies and informal sector inclusion.



Upstream Solutions Reuse Business Directory

A curated directory of reuse businesses, service providers, and innovators working to advance reuse systems across sectors.

The directory helps brands, retailers, and policymakers identify partners, technologies, and solution providers that support the transition to scalable reuse models.

The programs highlighted in this document represent only a fraction of the worldwide reuse and refill efforts. Consult the resources listed here for additional examples.



Plastic Reboot



Executing Partner

PERPETUAL

**Interested in
learning more?
Get support to build reuse
and refill into your plans.**

Contact Dr. Dagny Tucker
hello@perpetualuse.org

**From
Start to
Success**


The Refill & Reuse
System Handbook

PRIMER
Part 4

Design Criteria & Considerations

For Refill and
Reuse Programs



 **Plastic Reboot**



Executing Partner

 **PERPETUAL**

From Start to Success: The Refill & Reuse System Handbook

The 5 Part Primer



PART 1

Why Refill & Reuse

Information about the problems that reuse and refill solve and the many benefits of these programs



PART 2

How Refill & Reuse Systems Work

An introduction to the different types of refill interventions and reuse systems



PART 3

The Refill & Reuse Landscape

An overview of active reuse and refill programs worldwide, including descriptions and links to more information



PART 4

Design Criteria & Considerations

Best practices for design and implementation of refill interventions and reuse systems



PART 5

Enabling Conditions

What enables reuse to succeed, including policy, regulation, infrastructure, technology and collaboration



From Start to Success: The Refill & Reuse System Handbook

Primer Part 4



Designing for System Performance

The critical considerations that determine whether refill and reuse systems function effectively in practice.

Part 4: Design Criteria & Considerations

Outlines the core factors that shape effective, context-appropriate refill and reuse systems.

This section translates reuse and refill concepts into practical design guidance, identifying the technical, operational, behavioral, and financial criteria that must be addressed when developing a system.

Part 4 is designed to support informed refill and reuse design by surfacing the factors that most directly impact real-world implementation.

While this section discusses distinct design considerations for refill versus reuse systems, in practice, they need not be mutually exclusive. Refill and reuse systems can be designed to be interoperable, such as where prefill and in-store refill coexist -often sharing infrastructure, retail touch points, and logistics.

Teams are encouraged to think about design decisions that ensure interoperability from the outset so the system can grow over time.

What's Inside

Design for Refill Solutions	5
<i>Designing refill</i>	6
<i>What makes refill different from reuse</i>	7
<i>Key considerations</i>	8
<i>Spotlight on Bopinc</i>	9
Core Principles of Good Design for Reuse & Refill Solutions	11
<i>Core principles</i>	12
<i>Unpacking the economics of reuse</i>	13
<i>Economic viability</i>	14
<i>Environmental impact</i>	18
<i>Health and safety</i>	22
<i>Experience</i>	26
<i>Integration</i>	31
The Role of Data in Design	35
<i>The Role of Ecosystem Assessments</i>	36
<i>Importance of Data Collection</i>	37
<i>Sample Monitoring Framework</i>	38
<i>WEF's Guide to Standardized Measurement</i>	39

About Plastic Reboot

Plastic Reboot is a \$108 Million program supported by the Global Environment Facility, co led by the United Nations Environment Programme and World Wildlife Fund, and implemented in partnership with the United Nations Development Programme and the United Nations Industrial Development Organization.

Plastic Reboot is focused on upstream and midstream solutions to plastic pollution in the food and beverage sector, and is delivered through a Global Project and a suite of 15 National Projects.

Together, we're working to transform material systems and engage governments, civil society organizations, and the private sector to reduce plastic pollution.

This document was prepared by Perpetual and WWF (World Wildlife Fund) under the Plastic Reboot Programme. It is funded by the Global Environment Facility. Its contents are the sole responsibility of Perpetual and WWF and do not necessarily reflect the views of the GEF Secretariat or any other organization.

Design for Refill Solutions



Designing Refill

Refill systems represent one of the most practical and culturally grounded strategies for reducing single-use packaging.

In many traditional and modern markets around the world, refill remains an existing norm embedded within everyday consumption patterns.

Maintaining refill where it already exists and thoughtfully expanding it into categories well-suited for refill is an important strategy in packaging reduction efforts.

However, it's critical to ensure refill models avoid dependence on single-use packaging with more durable materials—such as thicker plastic or fiber bags that are still given away to consumers.

If these items are distributed as free takeaways, they often become just another form of disposable packaging, regardless of their material durability.

Increasing material strength without changing the consumption model does not meaningfully reduce waste; it can even increase material intensity per unit. Applying good design principles in the design phase can help to guide the path to achieving desirable outcomes and avoiding regrettable substitutions.



Designing for Interoperability: Refill models can interoperate with reuse systems, leveraging the best of both to unlock greater efficiency, accessibility, and system-wide impact. See Slide 32 for more information.




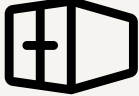




What Makes Refill Different from Reuse Design

In some ways, refill interventions have a lower design lift than reuse systems, since they are often stand-alone or store-level interventions and rely on consumer packaging.

However, refill still requires significant design to encourage adoption by businesses and consumers, ensure product integrity and safety, affordability, brand and user trust, and operational feasibility.

If a refill model includes B2B prefilled bulk ingredient delivery with returnable bulk containers, shared washing infrastructure, and a service system to support these items – **the B2B portion becomes a reuse system**, even though the end user still uses consumer containers. The B2B prefilled bulk containers are part of a system, and designers of these systems should adopt reuse system principles (see Slide 11).

For more detailed guidance on how to choose the right intervention for your context, see the Step by Step Guide to support your decision making.

REFILL	REUSE
 Can leverage consumer owned containers	 Requires durable system-owned containers
 May operate at single store or micro scale	 Requires coordinated multi-actor system
 Lower capital intensity (in some models)	 Infrastructure investment (reusable containers, washing, reverse logistics)

Key Considerations of Refill Solutions



End Packaging

- Design systems that encourage consumers to bring and repeatedly use their own containers
- Consider the final package that the consumer fills into to avoid the automatic provision of new “durable” bags or containers at each purchase



Frictionless

- Ensure refill stations are convenient and compatible with existing shopping habits
- Minimize friction at serving point
- Minimize spillage/messy stations at serving point
- Align the transaction model with consumer behavior



Trustworthy

- Hygienic
- Maintains product integrity
- Minimizes product loss



A number of organizations have developed practical resources to guide refill system design.

Insights from initiatives such as **Bopinc’s refill system** design work and the **Refill Coalition Trials: Key Learnings for Industry** highlight common success factors including convenience, trust, and alignment with consumer behavior.

This section summarizes key themes from these efforts and we encourage you to **use the tools linked in the following pages to dig deeper.**

SPOTLIGHT

Bopinc's Framework for Designing Refill Models

Designing Refill Models — Practical Blueprint for Entrepreneurs



👉 This [playbook](#) is part of the **Refill Realities Series** developed by Bopinc in partnership with TRANSFORM and Smartfill

Why This Matters for Plastic Reboot

The Bopinc framework provides a practical design pathway for refill interventions, particularly in low-income and emerging market contexts.

Key Strengths

- Clear distinction between product, serving point, and target consumer
- Explicit treatment of transaction models and pricing
- Real-world implementation experience (Bangladesh, Kenya)
- Practical operational design guidance

How-To Apply

- Apply **Strategic Scope** to pressure test country-level refill concepts
- Use **Model Blueprint** to align transaction, packaging, and supply logic
- Draw from **Asset Design** when specifying dispenser or bulk container requirements
- Apply **Operational Design** to define roles and responsibilities
- **Enterprise Design** supports ownership and collaboration

SPOTLIGHT

Bopinc's Framework for Designing Refill Models

Designing Refill Models — Practical Blueprint for Entrepreneurs

Refill succeeds when core design decisions are made intentionally and early.

Bopinc's framework highlights four interdependent levers. Together they shape consumer adoption, operational feasibility, and long-term economic viability.

Every refill concept must answer four core questions:

- *How will people pay?*
- *What container will they use?*
- *How will the product be dispensed?*
- *How will stock be replenished?*

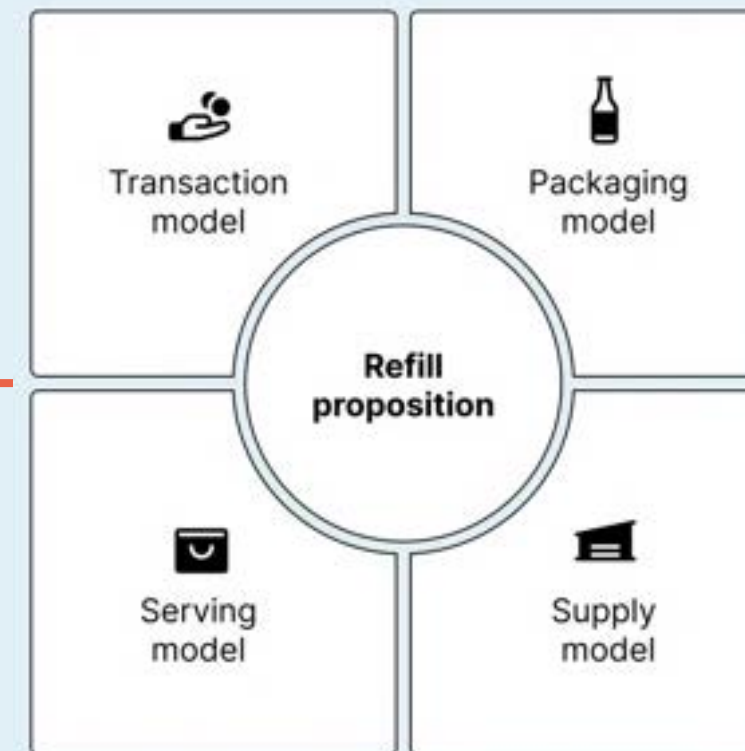
Four Design Levers That Determine Refill Success

Transaction Model describes how consumers will purchase the product.

- *Linear vs slab pricing*
- *Cash vs digital*
- *Price-per-gram vs price-per-use*

Packaging Model describes what consumers will use and reuse.

- *Open vs dedicated packaging*
- *Branded vs white label*
- *Low barrier entry vs long-term commitment*



Serving Model describes how consumers will be served.

- *Self-service vs assisted*
- *Visibility vs category placement*

Supply Model describes how serving locations will be replenished.

- *Bulk storage vs lean provision*
- *Sealed safety vs efficiency*
- *Reverse logistics vs one-way*

Core Principles of Good Design for Reuse Systems



Core Principles of Reuse Systems

Reuse represents a significant departure from current consumption models.

The system needs to be immersive, comprehensive, and at a scale large enough to unlock economic and environmental benefits.

To achieve this, it must be thoughtfully designed from the beginning and intentionally built for the community it is serving, with extensive interest holder buy-in and local involvement throughout the process.

Effective reuse systems depend on five foundational design principles that inform implementation and ensure long-term success.



Economics



Environment



Health & Safety



Access & Ease



Integration

Plan for Sustained Economic Viability



A reuse system should be designed to grow — starting with foundational building blocks and expanding as more packaging types and product categories transition to reusable packaging.

Building from existing infrastructure, keeping upfront and operating costs low, and continually identifying efficiency opportunities all help strengthen the financial foundation.

The goal is to create a system that becomes more cost-effective over time, allowing it to sustain itself and grow while delivering lasting value.

Unpacking the Economics of Reuse

While reuse systems can demonstrate a positive financial return on investment (ROI) in specific contexts, they face significant competition from the artificially low cost of single-use packaging (SUP) making it hard for reuse systems to compete on price in some contexts.

The true cost of disposables is masked by governmental services where they exist (ex. (waste management)), and unpriced externalities — litter clean-up, environmental degradation, and carbon emissions — which are absorbed by society rather than the producers.

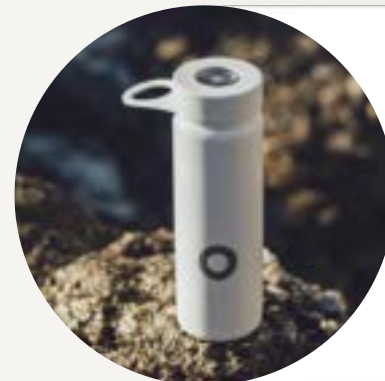
Resources:

- See Part 5 – Enabling Conditions to explore conditions that internalize externalities and improve financial viability.
- [This analysis from Zero Waste Europe](#) offers detailed insights into the cost structures of reuse systems. It highlights how scale, shared infrastructure, labor, and loss rates shape economic performance and long-term feasibility.
- See the Step by Step Guide for detailed guidance on different revenue models, cost drivers, and financial modeling considerations.



Key Points

Single-use appears cheaper only because its environmental and social costs are not reflected in market prices.



Challenge

Reuse must overcome this distorted baseline while building infrastructure and consumer trust.



Opportunity

Well-designed enabling conditions — including Extended Producer Responsibility (EPR), public incentives, and shared infrastructure — can level the playing field and make reuse more competitive.

Align Revenue Streams with Value Creation

Reuse systems succeed over the long-term when their revenues are greater than their costs, and they are not reliant on charitable or philanthropic funding.

Revenue flows are most sustainable when they are derived from where value is generated.

This means identifying how the reuse system is benefitting brands, municipalities, consumers, and other businesses — and designing funding models that sustain operations while reducing waste management costs.

Best Practices



REVENUE

Align revenue with where the reuse system creates value.



VISIBILITY

Leverage visibility and, where applicable, brand value as part of the financial model.



SAVINGS

Use savings from litter cleanup or waste collection to support reuse operations.

Case Example



A quantitative analysis for a reusable packaging system in India's street food sector showed that reuse has the potential to:

- Reduce costs for vendors and customers
- Reduce packaging stock
- Offer a 21% projected return on investment (ROI) with a 2.3-year payback period.

Economics of Reuse for Street Vendors in India

Use Scale to Unlock Efficiencies and Keep Costs Down

Systems must operate at sufficient size to unlock both economic and environmental benefits. Shared logistics, standardized packaging formats, and centralized washing infrastructure are key to achieving efficiency, reducing per unit costs, and cutting greenhouse gas emissions.

Achieving meaningful scale requires intentional system design, interest holder alignment, and community-level engagement.

When implemented at scale, reuse has the potential to deliver measurable cost and impact advantages over single-use packaging.

Best Practices



SCALE

Increase participation to drive economies of scale and reduce operating costs.



SHARE

Pool infrastructure regionally (e.g., shared washing hubs, co-collection) and align standards across municipalities.



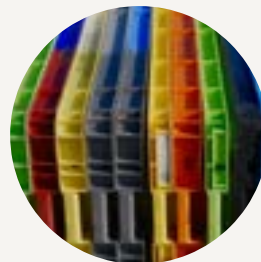
ALIGN

Coordinate through public-private partnerships to leverage shared investments and enable cohesive logistics systems.

Case Example



Ambev's refill program in Brazil demonstrates how large-scale coordination across retailers and distributors reduces transportation emissions and operational costs.



IFCO's city-scale reusable crate network showcases how centralized logistics and washing systems improve efficiency and reliability at scale.

Additional Resources

- [Unlocking a Reuse Revolution: Scaling Returnable Packaging](#) (EMF, 2025).
- [Modelling Technical Appendix](#) (EMF, 2025).

- [Unpacking the Circular Economy: Unlocking Reuse at Scale](#)
- [Scaling Up Reusable Container Systems through City-Wide Centralized Collection and Washing](#) (Hitt et al., 2025).

Choose System Models Where Costs Remain Below Revenue

Financially viable reuse systems should account for the full cost of ownership, including infrastructure and logistics, while leveraging savings from waste reduction.

By balancing costs with multiple revenue streams, systems can outperform disposables over time.

Best Practices



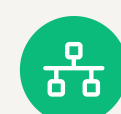
VALUE

Demonstrate that reusing products via refill or reuse can save businesses money by redirecting the budget previously spent on disposables to reusable items, or by paying only slightly more depending on the cost of their previous disposables.



SCALE

Design systems that remain cost neutral or cheaper for businesses and users once scaled. Participating in or offering reusable or refillable solutions should be comparable in cost to disposables.



LEVERAGE

Leverage EPR, deposit-return, or public-private financing to fill early-stage gaps.

Case Example



The [Technology Value Assessment Calculator](#) from the Reusable Packaging Association helps teams evaluate the financial performance of reuse systems. By inputting key variables—such as container costs, return rates, washing expenses, and logistics—teams can model when and how reuse systems become cost-competitive or cost-saving.

- Identifies break-even points based on system scale and return rates
- Compares reusable systems directly against single-use costs
- Highlights key cost drivers (e.g., reverse logistics, washing, loss rates)

Using tools like this enables teams to design systems where costs remain below revenue over time, strengthening the business case for reuse and reducing financial risk.



Minimize Impact



Reuse systems must be designed to achieve meaningful environmental gains over single-use alternatives.

This means maximizing the number of effective use cycles, while minimizing transport emissions, diverting waste from landfill and the environment, and optimizing energy and water use.

Each design choice needs to be carefully weighed to ensure overall environmental benefits, health, and safety of the system.

Maximize the Number of Uses Per Item

Durability and design for longevity and returns help determine the environmental payoff of reuse.

The greater the number of cycles achieved before an item is no longer used, the lower its per-use footprint and the stronger the justification for system investment.

Best Practices



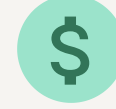
DESIGN

Design packaging for durability and reuse across multiple cycles.



OPERATIONS

Optimize washing, logistics, and handling processes to minimize wear and maximize cycles achieved.



ROI

Create clear return pathways and incentives to prevent loss.

Case Example



This study examines the life-cycle environmental performance of reusable packaging, offering data on how design choices (such as material durability, washing processes, and optimized logistics) shape GHG emissions and resource use outcomes:

- Achieved impact break-even in as few as 4–6 uses for GHG and primary energy.
- Delivered lower GHG, energy, water, waste, and cost impacts than single-use in the base case.
- Reuse consistently outperforms single-use (except under extreme behaviors e.g., excess washing).

Optimize Transportation Distance Per Item

Transport logistics can make or break a system's environmental performance. In many cases, shorter transport distances improve system performance, but the optimal configuration depends on local infrastructure, hub efficiency, and system scale.

Designing local loops and strategically locating washing hubs can significantly reduce emissions and operational costs associated with the forward and reverse logistics.

Best Practices



LOCALIZE

Use localized collection and washing hubs to reduce emissions.



LOOP

Build regional closed loops aligned with distribution and consumer routes.



EFFICIENCY

Employ renewable energy and efficient logistics vehicles where possible.

Case Example



Modelling by the Ellen MacArthur Foundation shows that compared to single-use alternatives, returnable packaging systems implemented at scale with shared infrastructure could:

- Reduce GHG emissions by 35-70%
- Reduce water use by 45-70%
- Reduce material use by 45-76%

Select Washing Equipment for Efficiency

Washing is one of the more resource-intensive parts of a reuse system.

Choosing equipment that minimizes water, energy, and chemical use — while ensuring consistent sanitization — is essential for environmental performance and operational viability.

Efficient washing systems help reduce lifecycle impacts and make reuse competitive with single-use models.

Best Practices



USE

Choose high-efficiency washers designed for repeated commercial use.



EFFICIENCY

Use water-recirculating and heat-recovery systems to cut resource demand.



STANDARDS

Standardize cleaning protocols for safety, consistency, and quality control.

Case Example



Eternity Systems operates high-efficiency industrial washing hubs designed specifically for reusable packaging.

Their system uses closed-loop water recirculation, heat-recovery technology, and optimized detergent dosing to significantly cut water, energy, and chemical use.

They also provide their customers with the ecological and social impact analysis to help you carry out carbon assessments, life cycle analyzes and CSR reports to understand the footprint associated with the washing stage of reuse.



Ensure Safety & Public Trust



Consumer and worker safety are crucial elements of reuse design.

Ensuring hygienic handling, non-toxic materials, and safe operations builds public confidence and compliance.

Standardized procedures for cleaning and handling protect both people and product integrity across the value chain.

Choose Safest Available Materials

Material choice directly affects user safety, system longevity, and environmental integrity.

Non-toxic, inert materials such as glass or stainless steel maintain performance through repeated cycles without introducing microplastics or harmful chemicals.

Best Practices



USE

Avoid hazardous chemicals such as PFAS and BPA.



EFFICIENCY

Select materials that withstand repeated sanitation without degradation, do not shed microplastics during washing or heat exposure and/or are chemically inert and safe for repeated use (such as glass or stainless steel).

Case Example



These resources from the Center for Environmental Health provide evidence on hazardous chemicals commonly found in food-contact materials and offer guidance for selecting safer, non-toxic alternatives for reuse systems.

The UP Scorecard offers a science-based tool for evaluating foodware and food-service packaging on safety, environmental impact, and performance—helping operators choose safer, low-toxicity materials for reuse applications.

Define Cleaning and Sanitization Protocols

Effective protocols define clear standards for collection, transport, washing, and inspection to prevent contamination and maintain product integrity.

These systems typically specify temperature controls, detergent requirements, handling procedures, and verification checks to ensure containers consistently meet food-safety and hygiene standards before being returned to use.

Best Practices



USE

Apply standardized washing and inspection systems following PR3 and RPA guidelines.



OPERATE

Ensure washing equipment is calibrated to maintain consistent time, temperature, and detergent concentrations for effective sanitization.



VERIFY

Implement routine quality checks to confirm containers meet hygiene and safety standards before re-circulation.

Case Example



InfinityBox in India runs mobile dishwashing hubs following clear protocols to ensure consistent sanitation.

InfinityBox has partnered with universities and event organizers to provide reusable food containers supported by mobile washing hubs.

Containers are collected onsite after use, sanitized in mobile dishwashing units, and returned to circulation the same day.

Protect Worker Safety

Reuse systems depend on human labor at multiple points in the loop.

Prioritizing ergonomic practices — such as minimizing heavy lifting, repetitive strain, and unsafe handling conditions — providing fair compensation, and ensuring occupational health measures protects workers and strengthens long-term system reliability.

Best Practices



DESIGN

Implement comprehensive worker protection programs (PPE, ergonomic design, fair wages).



ROI

Establish safety audits and ongoing training for handling reusable materials.

Case Example



NGO-led pilots in Jordan deploy mobile sterilization units and provide safety training for workers in a low-infrastructure region.

- **Onsite sterilization** units reduce heavy lifting and long transport distances for workers.
- **Mobile training teams** provide hands-on instruction for safe handling, washing, and inspection.
- **PPE kits** are provided and maintained as part of the service, ensuring consistent compliance.



Maximize Access & Ease of Use for All



User and business adoption drive system success. Convenient, intuitive, and equitable reuse that matches or exceeds the ease of single-use should be the long-term goal.

Systems should be equitably accessible for individual and business participants. Remove barriers for participation—financial, technological, or physical—to embed reuse into everyday operations and behaviors.

Promoting ease of adoption and return and integration into business that mimics single-use convenience is essential.

Make Reuse Free or Accessible for Users

For reuse to scale, participation must feel effortless and equitable.

Removing cost and access barriers encourages all users (regardless of income or technology) to engage confidently.

Best Practices



ACCESS

Offer free or low-deposit access to reduce participation barriers with easy and intuitive return systems.



MEASURE

Use behavioral nudges such as loyalty incentives to encourage participation and offset any costs.



SCALE

Promote ease of adoption and return to mimic the convenience of single-use infrastructure.

Case Example



Research from WRAP shows that reducing friction, removing participation barriers, and designing reuse systems that align with existing habits are essential for driving widespread user uptake.

- Participation increased significantly when reuse systems were designed to fit seamlessly into users' existing routines
- Removing or reducing costs, deposits, and app requirements led to notable increases in first-time and repeat participation.
- Simple, consistent communication about hygiene, return steps, and system benefits resulted in higher user trust and more frequent reuse behavior.

Minimize Friction for Business & Consumer Participants

Successful systems meet people where they already are. Designing collection, return, and refill moments that fit seamlessly into daily routines ensures sustained engagement and high return rates.

Consumers

- Try to match/align with existing consumption and return habits for smoother adoption.
- Co-locate drop-off bins at logical touchpoints (retail exits, delivery stops, public waste bins).
- Make reuse the default choice.

Case Example

Siklus in Indonesia built reuse models around household delivery routes, aligning with local shopping patterns.

Businesses

- Integrate reuse into existing workflows (use current delivery routes, storage areas, and staff routines).
- Standardize and simplify operations (uniform containers, clear SOPs, easy-to-wash designs).
- Use digital tools to reduce admin (QR/RFID tracking, automated deposits, streamlined inventory).

Case Example

Multi-retailer pilots at CVS Health, Target & Walmart (under the Consortium to Reinvent the Retail Bag) tested reusable bag systems with in-store borrow/return logistics and incentives. Results emphasized that convenience (easy sign-up & return) was crucial for adoption.

Ensure System is Equitable

Accessibility goes beyond convenience — it's about inclusion.

Systems that consider diverse user needs, from digital access to mobility constraints, foster trust and long-term participation.

This might look like providing non-digital participation options (no app or bank account required).

[Learn more about Critical Actions](#)

[Learn more about Inclusive Design](#)

5 Critical Actions



Map the ecosystem

Understand all interest holders, incentives, and infrastructure before designing the system.



Align ambitions and benefits

Create a shared vision with clear value for every actor.



Ask interest holders to adapt

Encourage new practices and mindsets across the value chain.



Use blended finance

Combine funding sources to de-risk and scale pilots.



Engage consistently

Maintain continuous execution with clear milestones and long-term commitment.

Key Principles of Inclusive Design



Places people at the heart of the design process.



Acknowledges diversity and difference.



Offers choice where a single design solution cannot accommodate all users.



Provides for flexibility in use.

The Role of Effective Communication

Behavioral adoption hinges on clear, relatable storytelling. Communicating reuse as easy, familiar, and rewarding transforms perception from niche sustainability to everyday habit. Understanding cultural perceptions and infrastructure realities is essential. In some countries, refills are viewed as a “premium” behavior, while in others they are associated with lower-income or informal markets. Communication strategies need to consider the local social contexts to be effective.



HIGHLIGHT THE VALUE PROPOSITION

Why will the consumer prefer reuse?

Identify and showcase key elements, which could include an elevated eating experience, portion flexibility in purchases, containers with inert materials, avoiding waste that has to be managed later, or other benefits.



USE MESSAGES THAT RESONATE

Use culturally relevant values such as health, savings, and tradition.

Minimize the mental or perceived ‘distance’ between the system and the community by showing how the impacts of the problem and the benefits of the reuse system are felt locally.



BE CAREFUL WITH MESSAGING

Find messages that are inclusive and broadly appealing.

Depending on the local context, environmental messages can be perceived as feminizing, political, or otherwise identity-based in a way that can result in some people feeling reuse is ‘not for them.’

Leverage Existing Infrastructure, Assets & Services



Integrating reuse systems into the existing social and physical fabric of communities enables scalability. This means collaborating with municipalities, leveraging informal sector expertise, and aligning with current infrastructure to build on—not duplicate—what already works.

Creating shared infrastructure and utilizing existing assets are critical for achieving efficiency. Integration requires coordinated collaboration across interest holders—municipalities, service providers, informal sector, local NGOs, cooperatives, and businesses—to ensure systems are built upon existing assets rather than creating parallel infrastructure.

Overarching Design Consideration: Interoperability

Interoperable Reuse Systems take into account the need for reusable packaging to function seamlessly across multiple companies, brands, or geographic regions. Collection and distribution networks are simplified with standardization of packaging, digital tracking protocols, and cleaning logistics to permit the exchange of items within a shared infrastructure. The principal function is to maximize accessibility by all interest holders and to minimize the logistical complexity in order to achieve the necessary scale and convenience to compete effectively with single-use items. Interoperability should be considered in the system itself and in integrating refill and reuse systems.

Refill + Reuse:

Refill and reuse systems are often presented as distinct models - but in practice, can operate together with thoughtful integration. They can be designed to complement one another across different product categories, use cases, and user preferences.

In practice, combined approaches may include:

- Shared infrastructure such washing facilities or reverse logistics networks
- Common retail environments where both models are offered side-by-side

Rather than selecting a single model, consider how reuse and refill can be combined to create a more flexible, efficient, and context-appropriate system.

Leverage Existing Waste, Water, and Transport Infrastructure

Every reuse system operates within a unique social and infrastructure landscape.

Designing around local realities ensures practicality, cost-efficiency, and long-term relevance.

Best Practices



DESIGN

Conduct local assessments of infrastructure, water availability, and logistics.



INTEGRATE

With existing waste, water, and transport systems to reduce duplication and lower operational costs.



ROI

Adapt system design to community resources and constraints.

Case Example



In South Africa, reuse pilots integrate with municipal services and existing return infrastructure to reduce cost and duplication.

- **Leverage municipal waste networks** to co-locate return points and collection routes
- **Partner with local recyclers** and washing hubs to use underutilized capacity
- **Align with national reuse targets** and SAPP guidelines, ensuring pilots support long-term circularity goals

Collaborate with Municipalities and Businesses

No single actor can build reuse infrastructure alone.

Cross-sector collaboration enables shared investments, consistent standards, and collective ownership of outcomes.

Best Practices



DESIGN

Engage local governments, cooperatives, and private sector partners.



ROI

Create shared investment models for washing and logistics.

Case Example



The city of Aarhus partnered with TOMRA, restaurants, and municipal interest holders to pilot a city-wide reusable takeaway packaging system designed to reduce single-use food packaging waste.

Key features include:

- **Municipal leadership** helping convene restaurants, infrastructure providers, and technology partners
- **Shared return infrastructure**, including reverse vending machines placed throughout the city
- **Centralized washing and logistics systems** to clean and redistribute containers
- **Deposit-based consumer participation**, making reuse convenient and intuitive

Opportunities for Informal Sector Workers

Informal workers are essential contributors to circular economies.

Integrating their expertise in collection, sorting, and washing ensures equity and accelerates adoption through existing community trust networks.



A Just Transition

A just transition, as defined by the International Labour Organization (ILO), means “greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities and leaving no one behind” (ILO 2024 p.1).

It is critical to ensure that the transition from single use to reuse includes the individuals who earn a living collecting and recycling waste, and in particular those who operate within the informal sector.

The role that most closely mirrors existing informal sector workers’ activities is the collection of reusable packaging. Additionally, reuse systems can provide opportunities in transportation, sorting, washing, and redistribution.

In this process, it will be important to preserve the elements that informal sector workers may want, such as flexibility and autonomy.

While there could be pathways to formalization for informal waste workers, a just transition should not necessarily require structured formalization, and, besides improving conditions and basic protections, it should not necessarily transform how these workers work.

For more information on the just transition, see this report from Switch Asia, published in 2025 [Just Reuse: The Waste Picker Perspective on Reuse](#)

The Role of Data in Design



The Role of Ecosystem Assessments in Understanding the Local Landscape

Ecosystem assessments help identify the infrastructure, partnerships, and governance arrangements needed to design effective reuse systems.

Collaboration across municipalities, service providers, cooperatives, NGOs, and businesses ensures that systems build on local assets rather than creating costly parallel structures.



Interest Holder Identification

Local NGOs, municipal agencies, private sector partners, cooperatives, national Plastics Pacts (e.g., South Africa, India).



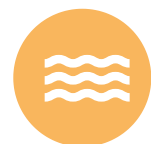
Existing Infrastructure Scan

Waste management systems, dishwashing / sterilization capacity, collection routes, reverse logistics networks.



Available Resources

Local funding, capital, technical capacity, transport assets.



Local Environmental Considerations

Resource constraints (e.g., water scarcity), climate risk, urban density.



Gaps & Constraints

Limited municipal budgets, informal-sector fragmentation, water scarcity, limited washing capacity, low baseline data availability.



Municipal Departments to Engage

Solid waste management, public health, water utilities, sustainability, small business departments, planning/transport authorities.

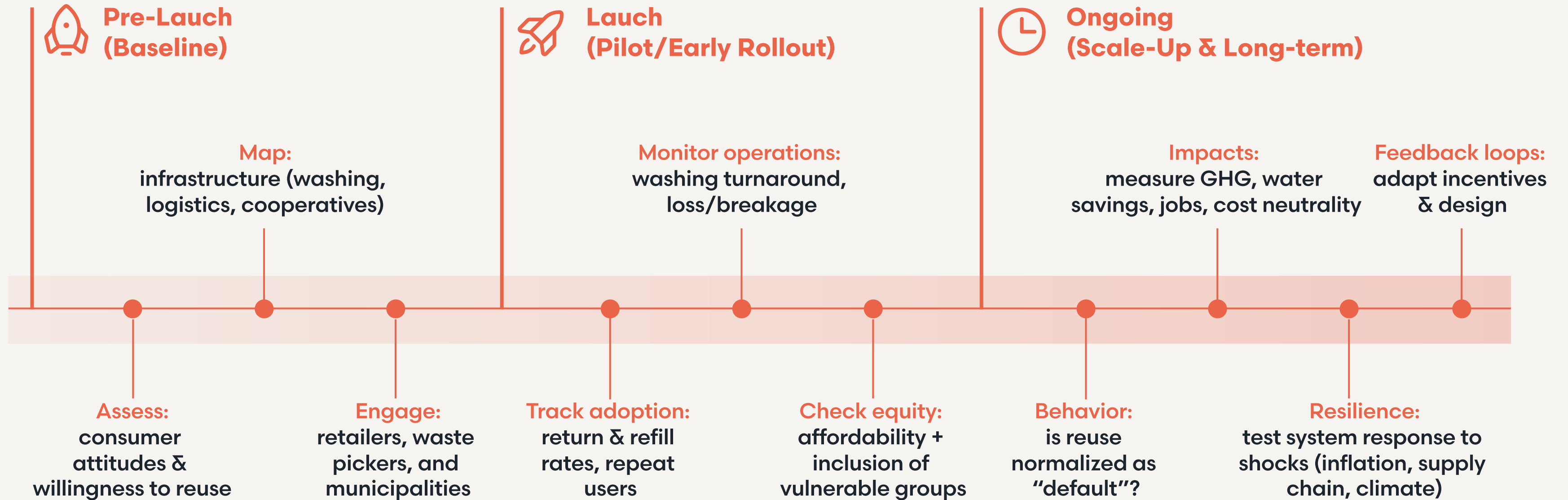


Collaboration & Governance

Encourage contracting models between reuse service providers (RSPs), municipalities, and businesses to ensure accountability and collective investment.


The Importance of Data Collection

Data is critical to inform all aspects of the project. Robust monitoring frameworks enable the tracking and use of key information at each stage of the project's lifecycle.



Sample Monitoring Framework

This framework helps establish baseline expectations, measure early adoption, identify operational bottlenecks, and ensure long-term economic and environmental viability.

Key Trackable Metrics	<p> Pre-Launch (Baseline)</p> <ul style="list-style-type: none"> • % of consumers willing to participate in reuse/refill (survey) • # of participating retailers committed before launch • # of washing/collection points mapped • % of interest holder groups represented in planning meetings 	<p> Launch (Pilot/Early Rollout)</p> <ul style="list-style-type: none"> • Return rate (%) of reusable packaging • Average washing turnaround time (hours/days) • Packaging loss rate (%) • % of participating users returning within target return period • Inclusion index (% low-income or informal participants engaged) 	<p> Ongoing (Scale-Up & Long-term)</p> <ul style="list-style-type: none"> • % of consumers regularly choosing reuse as default option • % Return rate - Average # of reuses per container (cycles) • CO₂e emissions reduction per use (%) • Liters of water saved per 1,000 uses • % change in total system cost per use compared to baseline
	Tools	<ul style="list-style-type: none"> • Surveys • Focus groups • Infrastructure audits • Interest Holder mapping 	<ul style="list-style-type: none"> • RFID/barcode tracking • POS data • Cooperative collection reports

WEF's Guide to Standardized Measurement

The World Economic Forum's 2025 framework provides a standardized approach for companies to measure progress toward reusable packaging systems.

Although primarily designed for multinational brand portfolios, it offers useful guidance on defining measurable indicators of reuse performance, aligning global reuse tracking standards and establishing a common language across interest holders.

The WEF framework focuses on two key metrics:



Share of Volume or Units

Share of volume or units delivered through reuse (measures the scale of reuse)



Reuse Effectiveness

Average number of loops achieved (measures the effectiveness of reuse)



Plastic Reboot



Executing Partner



**Interested in
learning more?
Get support to build refill
and reuse into your plans.**

Contact Dr. Dagny Tucker

hello@perpetualuse.org

**From
Start to
Success**

The Refill & Reuse
System Handbook

PRIMER
Part 5

Enabling Conditions

For Refill and
Reuse Programs



Plastic Reboot

Exciting Part



PERPETUAL

From Start to Success: The Refill & Reuse System Handbook

The 5 Part Primer



PART 1

Why Refill & Reuse

Information about the problems that reuse and refill solve and the many benefits of these programs



PART 2

How Refill & Reuse Systems Work

An introduction to the different types of refill interventions & reuse systems



PART 3

The Refill & Reuse Landscape

An overview of active reuse and refill programs worldwide, including descriptions and links to more information



PART 4

Design Criteria & Considerations

Best practices for design and implementation of refill interventions & reuse systems



PART 5

Enabling Conditions

What enables reuse to succeed, including policy, regulation, infrastructure, technology and collaboration



From Start to Success: The Refill & Reuse System Handbook

Introduction



Understanding the Enabling Environment

The policies, partnerships, and infrastructure that allow refill and reuse systems to function and endure.

Part 5: Enabling Conditions

Identifies the policies, infrastructure, and system supports that make refill and reuse possible at scale.

This section examines the foundational conditions that support successful refill and reuse systems — from regulatory frameworks and financing mechanisms to infrastructure, governance models, and interest holder alignment.

Rather than focusing on individual models, Part 5 highlights the broader ecosystem factors that determine whether systems can move beyond pilots and achieve long-term viability.

By outlining key system supports and common gaps, this section helps interest holders identify where advocacy, investment, capacity-building, or policy reform may be needed to unlock scale and sustained impact.

Ultimately, this section provides the structural lens necessary to transition from designing systems to embedding them within supportive market and policy environments.

What's Inside

Enabling Conditions	5
<i>Definitions</i>	10
<i>Policy & Regulation</i>	12
<i>Public Sector Leadership</i>	23
<i>Standards</i>	30
<i>Presence of Relevant Assets, Infrastructure & Services</i>	35
<i>Private Sector Leadership & Willingness to Collaborate</i>	42
<i>Consumption Norms & Behaviors</i>	47
<i>Availability of Funding</i>	52

About Plastic Reboot

Plastic Reboot is a \$108 Million program supported by the Global Environment Facility, co led by the United Nations Environment Programme and World Wildlife Fund, and implemented in partnership with the United Nations Development Programme and the United Nations Industrial Development Organization.

Plastic Reboot is focused on upstream and midstream solutions to plastic pollution in the food and beverage sector, and is delivered through a Global Project and a suite of 15 National Projects.

Together, we're working to transform material systems and engage governments, civil society organizations, and the private sector to reduce plastic pollution.

This document was prepared by Perpetual and World Wildlife Fund (WWF) under the Plastic Reboot Programme. It is funded by the Global Environment Facility. Its contents are the sole responsibility of Perpetual and WWF and do not necessarily reflect the views of the GEF Secretariat or any other organization.

Enabling Conditions



Assessing Enabling Conditions for Refill & Reuse

Part 5 is not a checklist of prerequisites. It is a diagnostic and strategic reference designed to help you:

- Assess which enabling conditions already exist in your context
- Identify gaps that may affect feasibility or pace of implementation
- Prioritize advocacy, partnerships, or investment needed to move forward
- Sequence your approach based on ecosystem maturity and readiness

Rather than assuming all conditions must be in place before starting, this section helps teams **understand the landscape and identify the most effective entry points for action.**

The goal is not to wait for perfect conditions — but to understand the system and identify where targeted action can unlock progress.

Think of this section as:

A Diagnostic Tool

- What enabling conditions are already strong?
- What systems, infrastructure, or policies are emerging?
- Where do critical gaps remain?

A Strategic Planning Lens

- Which conditions are most important to strengthen first?
- What partnerships, policy changes, or investments could accelerate progress?

An Advocacy Reference

- What regulatory frameworks, financial mechanisms, or institutional actors could unlock refill and reuse at scale?

What Are Enabling Conditions?

Enabling conditions are factors outside the direct scope or control of the refill or reuse solution that can impact the success of the solution. These enablers can often be the other side of the coin from barriers.



Success factors that can be addressed through design:

- Plan for sustained economic viability
- Minimize environmental impact
- Ensure health & safety
- Consider local context, behavior and norms
- Maximize ease of use for all
- Integrate with existing infrastructure, assets & services

Enabling conditions outside the scope of what design can control:

- Policy & regulation (local, regional, national, supranational)
- Standards
- Existence of relevant infrastructure
- Public sector leadership
- Private sector leadership, and/or willingness to collaborate
- Marketplace conditions, e.g., pricing for single-use plastic items
- Current consumption norms and behaviors
- Availability of funding

These conditions build on one another, and not all are required at once. Strong foundations make scaling easier—but scaling efforts can also catalyze stronger foundations.

Why Enabling Conditions Matter

The success and scalability of refill and reuse systems are impacted by the maturity of the surrounding ecosystem.

Enabling conditions affect:



The degree to which a model can operate viably today.



Whether the system will require up front and/or ongoing financial support.



The pace at which adoption can be expected to occur.

Some models can thrive under current conditions. Others may require incremental ecosystem strengthening over time. Understanding enabling conditions helps teams identify where to start—and what to build toward.



Which refill and reuse solutions are feasible now.



Which enabling conditions would create opportunities for additional refill and reuse solutions to succeed.



Where to focus efforts for private sector collaborations, policy and public sector collaboration, and other opportunities to create the conditions for refill and reuse solutions to thrive.

Enabling conditions should not be interpreted as prerequisites. They represent leverage points. If these conditions exist, leverage them. If they do not, they highlight reasons a system may need longer runways, patient capital, and provide direction for policy-makers, coalition-building, and progressive strengthening.

Enabling Conditions are Dynamic and Context-Dependent

Though some refill and reuse solutions have been in use for generations, there is a renewed focus on them in the context of the plastic waste and pollution crisis and the desire to transition to a circular economy.

Refill and reuse systems are rapidly evolving around the world.

Countries, cities, companies, and entrepreneurs are testing different models, adapting them to local conditions, and building the policy and infrastructure needed for these solutions to thrive.

The guidance presented here provides key concepts of enabling conditions and specific examples of how they are impacting the development of refill and reuse solutions.

This is not a comprehensive analysis or overview of current policies, regulations, or other enabling conditions.

Such conditions are often highly context-specific and can vary significantly by location.

Rather, this guidance is intended to support an understanding of the presence or absence of key enabling conditions for refill & reuse to inform the work required to develop, sustain, and strengthen a specific project.



Definitions



Definitions are a critical enabling condition across standards, policy, and measurement



The way that the terms 'reuse,' 'refill,' and 'return,' and other related terms, are used today can be inconsistent and confusing, and they can also be confused with recycling, repurposing, and other similar words.

How well these key terms are defined can have significant impacts on how reuse systems are supported, or not, by policy, regulation, and standards.

Potential Implications:

Supports regulatory and consumer clarity, facilitates enforcement, and builds investor confidence in refill and reuse systems.

Imprecise definitions can create loopholes in policy or standards that result in undesirable outcomes.

Key Players/Interest Holders

- **National regulators:** Codify strong, harmonized definitions and labeling standards.
- **Standards bodies (ISO, CEN):** Develop technical definitions and interest holder alignment.
- **Industry and NGO's:** Collaborate with standards bodies and regulators to inform and test definitions

If Clear Definitions Don't Exist Yet...

- Start by aligning interest holders around shared working definitions.
- Use international standards (ISO, Plastics Pact, PR3) as interim references while national alignment evolves.

Examples

EU Single-Use Plastics Directive

Provides harmonized definitions for reuse and recyclability, guiding compliance across 27 countries.

ISO 18601:2013 Packaging and the Environment

ISO establishes internationally recognized terminology and criteria for reusable packaging, including requirements related to durability, multiple use cycles, system performance, and return logistics. ISO definitions are often used to support consistent interpretation of refill and reuse claims across companies, geographies, and reporting frameworks.

Ellen MacArthur Foundation (EMF) & The Global Commitment

EMF has developed widely referenced definitions for reusable, recyclable, and compostable packaging within the Global Commitment framework.

Policy & Regulation



How Policy & Regulation Affect Refill and Reuse Solutions

Policy and regulation can be **supportive** of, or be a **barrier** to, refill and reuse solutions.

Policy and regulation can also have unintended consequences based on loopholes, unclear language or definitions.

This section explores several key policy and regulatory levers, discusses different ways they can impact refill and reuse solutions and what to look out for in existing or proposed policy or regulation.



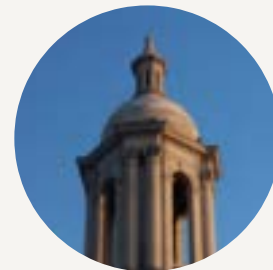
Global Frameworks

Usually happen at the global level



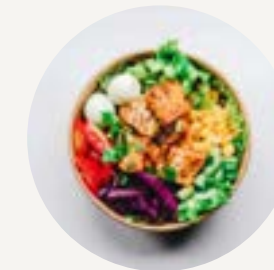
Financial incentives for reuse

Can happen at any level of government



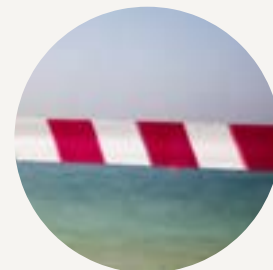
Extended Producer Responsibility (EPR)

Primarily coordinated at the national level; also implemented at state or provincial levels in some countries



Health, Food, and Other Municipal Regulation

Coordination and implementation varies



Reuse targets or bans on single-use items

Can happen at any level of government



Deposit Return Schemes (DRS)

Often coordinated at the national level; implemented at state or provincial levels in some countries

Global Frameworks

A global framework is a set of agreed-upon international rules, standards, norms, or structures designed to manage shared challenges, guide policies, and create order across countries, covering areas from climate (Paris Agreement) and development (2030 Agenda) to labor (Global Framework Agreements (GFAs)).

These frameworks provide common principles for actions that no single nation can effectively handle alone.

Currently, the most significant potential global framework affecting refill and reuse is the Global Plastics Treaty, which is under negotiation through a process facilitated by the United Nations Environment Programme, and would be a legally binding global agreement to end plastic pollution by 2040. It is expected to include measures on reduction, reuse, recycling, and transparency.

As of the time of publication, March 2026, The Global Plastics Treaty has not yet been adopted.

The most recent round of negotiations (INC-5.2, held August 2025 in Geneva) ended without consensus on a final treaty text. As a result, there is no agreed-upon legally binding instrument at this time.

Check [UNEP website here](#) for updates on the progress of the treaty process.

Potential Implications

Global frameworks, when broadly adopted, strengthen international policy alignment, reduce fragmentation across markets, and provide clearer long-term signals for organizations planning investments in reuse, such as brands transitioning to reusable packaging or investment funding to stand-up shared washing infrastructure.

They also help countries adopt consistent rules, making cross-border supply chains and infrastructure development more efficient.

Key Players / Interest Holders

- **UN Member States:** Negotiate commitments and adopt framework text.
- **UNEP:** Convene and facilitate treaty negotiations and technical guidance.
- **Regional blocs (AFG, ASP, EEG, GRULAC, WEOG):** Coordinate regional positions and harmonize policies.
- **National governments:** Translate global commitments into national legislation.
- **NGOs & scientific bodies:** Provide evidence, analysis, and accountability
- **Private sector:** Provides inputs on market constraints, barriers for implementation, tax implications, suggests economic instruments and knowledge about consumer behavior / culture.



Extended Producer Responsibility (EPR)

EPR policies impose requirements on producers for the products, and sometimes packaging, that they place in the market.

There is broad variation in EPR policy which ranges from basic reporting rules to as stringent as full financial and/or operational responsibility for the end-of-life management of products and/or packaging falling to producers.

When designed to incorporate upstream solutions as well as downstream ones, EPR programs can leverage reuse as a critical component to reduction.

Some approaches being employed today include reuse targets, eco-modulated fee structures that reward qualifying reuse systems, defining reuse as a preferred option, and allocating funding to reuse infrastructure and program development.

In well-designed systems, incentives are structured to reflect actual reuse performance — ideally rewarding packaging on a per-use basis rather than simply on a per-package basis — to avoid encouraging packaging that is technically reusable but not reused in practice.

Where implemented at the national level, harmonization can reduce fragmentation, simplify compliance for brands, and improve infrastructure efficiency across regions.

While reuse is not yet systematically incorporated into EPR globally, it is increasingly being explored as a structured pathway for upstream waste prevention.

If EPR Does Not Include Reuse...

- Engage early in policy revisions or consultations.
- Advocate for reuse to count toward reduction targets.



Extended Producer Responsibility (EPR)

Potential Implications

There are many forms of EPR, both voluntary and mandatory, that are structured in different ways. When reuse is intentionally accounted for in EPR schemes, EPR can enhance economic signals needed for reuse to compete, clarify long-term compliance pathways for producers, and/or expand funding streams that can support reuse and refill programs or infrastructure.

Schemes can unintentionally create perverse incentives if reuse provisions are poorly defined. Fee reductions or waivers for reusable packaging must be paired with clear eligibility criteria, verification mechanisms, and performance requirements (e.g., minimum return rates or reuse cycles).

In well-designed systems, incentives are structured to reflect actual reuse performance — ideally rewarding packaging on a per-use basis rather than simply on a per-package basis — to avoid encouraging packaging that is technically reusable but not reused in practice.

Key Players / Interest Holders

- **Producers/brands:** Adjust packaging decisions or pay fees based on fee structures (where applicable).
- **Producer Responsibility Organizations (PROs):** Collect fees and deploy funds, set performance requirements, and monitor compliance.
- **Government regulators:** Define EPR rules, oversee implementation, and enforce performance targets.
- **Waste management, recycling companies, informal sector:** Supply data; and handle collection or processing functions of reusable items.
- **Civil society / NGOs:** Provide monitoring, demand transparency, and offer guidance on environmental performance.



Extended Producer Responsibility (EPR)



Plastic Reboot Executing Partner for EPR: WRAP

The Extended Producer Responsibility (EPR) landscape is a major focus area within Plastic Reboot, and WRAP leads a dedicated workstream advancing policy design and implementation support across countries.

We encourage readers to explore WRAP's policy resources and country guidance, which complement the Refill and Reuse materials as well.

Examples



Chile REP Law

Introduces eco-modulated fees that reward reusable or refillable packaging formats, creating incentives for businesses to explore reuse.



California SB54

Establishes an EPR program for packaging and single-use plastic products and includes explicit authority for the Producer Responsibility



India EPR Framework

The existing EPR Rules (2022) regulate plastic packaging nationwide. Recent draft amendments propose adding reuse-related obligations for select high-volume categories, signaling a potential shift toward integrating reuse more formally into India's compliance framework.



France's Anti-Waste Law for a Circular Economy (AGEC)

Requires reuse and refill targets for packaging placed on the market (currently 10% by 2027 for certain categories), and obligates PROs to dedicate a minimum share of their budget (currently 5%) to the development of reuse and refill infrastructure, experimentation, and programs. These targets are expected to evolve over time as implementation progresses.

Producer Responsibility Organization (PRO)

A collective entity that producers establish to fulfill their obligations under an EPR system.

PROs collect fees, coordinate collection and recycling programs, ensure compliance with regulatory targets, and may fund innovation such as refill and reuse infrastructure.

For example, CITEO funded, coordinated design and supported the launch of a region wide reusable packaging system for FMCG. Circular Action Alliance (CAA) is the established PRO in California, supporting transition of 10% of packaging to reuse/refill by 2032.

Reuse Targets or Bans on Single-Use Items

Reuse targets or single-use bans are legal mandates that determine what items can be used in the local market at what levels.

These policies can work in many different ways: they can set reuse quotas, restrict or prohibit certain single-use items, or require reuse in specific applications, such as bottled beverages.

Relevant Reuse/Refill Models

Models that can replace the banned item are most likely to benefit, including but not limited to, prefill and foodservice ware systems.

These models tend to be most directly enabled by reuse targets or bans because they replace high-volume single-use items—such as cups, containers, and sachets—that are typically targeted in legislation.



Potential Implications

These policies provide strong market signals, create predictable demand for reusable systems, and reduce the dominance of disposable packaging. Mandates help normalize reuse and encourage coordinated system development. Removing certain items from the marketplace can also impact the prices that reusable programs are competing with.

Key Players / Interest Holders

- **National and local governments:** Set targets and timelines.
- **Regulators:** Define compliance mechanisms.
- **Businesses:** Adjust packaging strategies and invest / participate in reuse systems. Can be both the producers of and the customers for packaging and foodservice ware.
- **Civil society:** Advocate for robust implementation and enforcement.

Examples

France AGEC Law: Reduction of single-use plastics with target of 10% reusable packaging by 2027, promotion of bulk (i.e. stores larger than 400 m² must dedicate space to bulk offerings), and sector-specific mandates focus on places with high, predictable packaging volume where packaging reduction is most feasible.

If There Are No Reuse Mandates

- Voluntary retailer or brand commitments can generate demand signals.
- Municipal pilots can demonstrate feasibility and build momentum for future policy.
- Start with high-visibility categories (e.g., takeaway foodware, beverages).



Financial Incentives for Reuse

Incentives — such as reduced EPR fees, grants, development bank funding, tax credits, or municipal in-kind support — help offset upfront costs and accelerate the development of reuse systems.

Relevant Refill/Reuse Models

Models that leverage shared washing hubs and prefill services face some of the highest upfront capital costs in reuse systems—such as equipment, vehicles, containers, and digital systems.

Financial incentives directly reduce these barriers, allowing operators to launch and scale models that would otherwise be cost prohibitive.

Potential Implications

Financial incentives lower early-stage risk, support system development, and encourage participation among businesses that might otherwise face cost barriers. These mechanisms can accelerate innovation and scaling.

Key Players / Interest Holders

- **Government ministries (Environmental, Finance, Development, others):** Offer subsidies, tax incentives, grant programs for municipalities, or other financial mechanisms.
- **Development banks:** Provide concessionary loans for infrastructure, typically in partnership with other funders.
- **Municipalities:** Provide grants and may also contribute non-financial assets — such as public space access, concessions, transport/logistics coordination, regulatory facilitation, or communication and education support.
- **Philanthropic funders:** Support innovation, early demonstration projects, and larger scale efforts where funding permits.
- **Businesses (e.g., brands, logistics companies, reuse startups):** Use incentives to reduce capital barriers to establishing reuse and refill infrastructure and systems

Examples

- **Tübingen, Germany – Disposable Packaging Tax** - The city introduced a **local tax on single-use takeaway packaging** (e.g., €0.50 per disposable cup or container and €0.20 per utensil). The policy encourages restaurants and retailers to shift toward **reusable container systems**, helping offset the cost advantage historically held by disposable packaging while accelerating adoption of reuse solutions.
- The city of **Boulder, Colorado** offers reuse incentives to small, local businesses to help businesses replace disposable utensils, cups, plates and to-go containers with reusable items.

If No Financial Incentives Exist

- Explore blended funding models (brand co-investment + grants + philanthropy).
- Use cost-benefit analysis to build the case for future public funding.



Health, Food, and Other Municipal Regulation

Multiple government departments and agencies at the municipal level play a role in defining and ensuring compliance in reuse and refill systems - and some can determine whether a refill intervention or reuse system is able to operate or not.

For example, agencies responsible for food safety and health determine what types of reusable containers are permitted, how and where they can be refilled, how washing must be done, and where containers can be accepted, amongst other things.

City planning, public works, and parks and recreation departments define what can be placed in the public right of way or other public spaces, and may need to approve items such as return infrastructure.

Each of these agencies plays an important role, but since refill and reuse systems are emerging rapidly, many of these agencies may still need to come up to speed.

Early engagement can foster understanding that encourages collaboration and alignment on regulatory changes, gaps or additions that may be needed to support the implementation of refill and reuse systems.

Regulators and/or experts may publish supporting guidance on how to meet the code to further enable compliance and safety.

Potential Implications

Clear regulation helps to unlock new business models by clarifying what is allowed, reducing regulatory ambiguity, and enabling consistent practices across regions.

Clear health standards build public trust in safety, accelerate permitting for washing and refill facilities, and allow governments to guide safe reuse expansion rather than reactively manage compliance issues. A lack of regulatory support for refill and reuse can hinder or deny system approval, deployment and/or expansion.

Key Players / Interest Holders

- **Health ministries:** Adopt / establish food safety requirements.
- **Local health and safety regulators:** Approve reusable containers, washing facilities, and enforce regulation.
- **Department of Public Works / Planning:** Approve / permit placement of infrastructure (ie return bin, water dispensers) in right of way.
- **Department of Parks & Recreation:** Approve / permit placement of items (ie return bin, water dispensers) in parks and public recreational facilities.

If Regulations Are Unclear or Restrictive

- Engage regulators early to co-design compliant programs.
- Start in controlled environments (schools, institutions, events).
- Document safety protocols to support future regulatory updates.



Health, Food, and Other Municipal Regulation

Relevant Refill/Reuse Models

Generally, all refill and reuse solutions benefit from regulation.

In particular, prefill, reusable foodservice ware, and off-premises takeaway systems rely heavily on clear, consistent, regulation and health codes because they involve direct food contact, off-site washing, and repeated circulation across multiple users.



Examples

California AB 619

Updates the California Retail Food Code to explicitly permit reusable food containers and clarify safety, sanitation, and operational requirements for washing, return, and refill systems—providing regulatory certainty for reuse operators and foodservice businesses.

Jordan Mobile Sterilization Units

NGO-led reusable container pilots supported by centralized, mobile washing and sterilization units that have been reviewed and accepted by local health authorities, enabling reuse in contexts with limited fixed sanitation infrastructure.

US Food and Drug Administration (FDA) Food Code

The US FDA Food Code has been updated to explicitly accommodate reusable containers, and the FDA has published the Conference for Food Protection Guidance Document for the Safe Use of Reusable Containers.

Together, these provide a nationally recognized framework for food safety controls, cleaning protocols, and risk management for reuse systems, which state and local health departments can adopt or reference.

- Conference for Food Protection Guidance Document for Safe Use of Reusable Containers.



Deposit Return Schemes (DRS)

Deposit Return Schemes are systems in which consumers pay a refundable deposit on a beverage container at the time of purchase, which is returned when the container is brought back. These systems are currently used to recover reusable beverage bottles for reuse and single-use beverage bottles for recycling (depending on the system). The same return infrastructure, incentives, and logistics can support both systems.

DRS is fundamentally a regulatory mechanism, established by national or subnational legislation that mandates deposits, sets return targets, defines system operators, and ensures compliance. Although some retailers or brands may choose to offer their own voluntary deposit programs, these are separate initiatives and distinct from formal DRS, which are legally governed.

Relevant Refill/Reuse Models

Prefill beverage bottle systems, open-loop foodservice ware.

Potential Implications

DRS legislation provides predictable return behavior, enables very high return rates (often 70–90+% in mature systems), and creates dependable collection and counting infrastructure. These features can be leveraged or adapted for refillable beverage systems, reusable foodservice ware, and other container-return models.

Key Departments / Agencies / Ministries to consider

- **National & local governments:** Enact DRS legislation, set deposit levels, and enforce compliance.
- **System operators / Producer Responsibility Organizations:** Manage logistics, counting centers, and financial flows.
- **Retailers:** Serve as mandated return points; sometimes manage reverse logistics.
- **Beverage producers:** Fund the system, design refillable/compatible packaging, and ensure take-back.
- **Municipalities:** Integrate DRS infrastructure with local collection systems.

Examples

- **Brazil:** Ambev's Guaraná Antarctica refill system is integrated with deposit logistics and leverages DRS-style deposit incentives and retail return points.
- **Germany's DRS** for single-use beverage containers achieves a ~98% return rate on eligible containers.

If No DRS Exists

- Retail-based return pilots can test deposit systems at small scale.
- Leverage existing reverse logistics networks (retail backhaul, delivery routes).
- Demonstrate return rate data to inform future legislation.



Public Sector Leadership

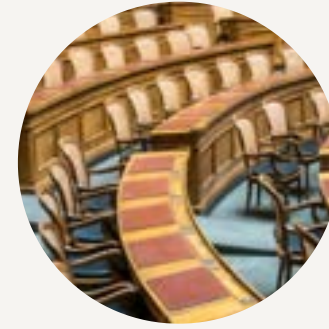


How Public Sector Leadership Affects Refill and Reuse Solutions

Government leadership shapes the policy environment, coordinates interest holders, enables implementation, and signals a long-term commitment to reuse.

Cities and states can create demand, reduce risk, and support infrastructure development through procurement and regulatory pathways.

This section includes:



Publicly Funded Tests & Programs



Municipal Contracting for Reuse Services



Innovation Zones & Regulatory Sandboxes



Integrated Waste & Circular Economy Planning

Publicly Funded Tests & Programs

Government-funded programs help test models, demonstrate feasibility, and support early operators

Potential Implications

Publicly funded pilots or programs demonstrate proof of concept and reduce initial costs for businesses, helping new models reach viability more quickly. These programs generate real-world data that guide long-term policy and infrastructure planning.

They also establish public trust by showing that reuse can work safely and reliably. One thing to recognize is that reuse systems are most successful when they have the full supporting ecosystem to make participation easy and convenient, and this can be hard to do at pilot scale.

Pilots or tests should be conceived to answer specific locally-relevant questions, not just generally explore the feasibility of reuse as a model.

Key Departments / Agencies / Ministries to consider

- **Municipal Governments:** Fund pilots, select locations, and integrate pilots into city services.
- **State/Regional Governments:** Provide grants, enabling regulations, and support for scaling.
- **Development Agencies:** Offer technical assistance, evaluation, and capacity-building.
- **NGOs:** Engage communities, support implementation, and document outcomes.
- **Universities:** Host controlled pilots and evaluate environmental/economic performance.

Examples

Santiago, Chile – **School-based refill pilots:** City-funded pilots testing water refill stations in public schools, demonstrating feasibility in controlled, high-volume settings and informing national reuse policies.

If Public Funding Is Limited

- Partner with anchor institutions willing to trial reuse voluntarily.
- Start with grant-seeking coalitions to strengthen applications.



Municipal Contracting for Reuse Services

Cities or states create demand by contracting reuse providers for services such as washing, logistics, or return systems.

Relevant Refill/Reuse Models

Models that leverage washing hubs, institutional (i.e. school/hospital) foodservice reuse, and shared return logistics rely on consistent, high-volume demand.

Municipal contracting provides predictable flows, making these models operationally and financially viable.



Potential Implications

Local governments contracting reuse service providers (e.g., washing services, reusable foodware for schools) provides stable demand. This strengthens local markets for reuse, accelerates infrastructure investment, and anchors long-term system viability.

Key Players / Interest Holders

- **Municipal Governments:** Contract reuse services, provide stable demand, set service requirements.
- **Reuse Service Providers (RSPs):** Deliver washing, logistics, and container management under contract.
- **Private Contractors/Cooperatives:** Support distribution, staffing, and return-point operations.
- **Public Institutions (schools, hospitals):** Serve as anchor clients and integrate reuse into daily operations.

Examples

USA – San Francisco & **Re:Dish**: City contracts reusable serviceware for public schools, demonstrating how municipal demand enables scalable washing and logistics.

If Municipal Contracting Is Not Yet Leveraged

- Identify one high-volume public institution (school, hospital, events).
- Propose reuse within existing service contracts during renewal periods.
- Demonstrate cost-neutral or cost-saving models over time.



Green Procurement Requirements

Public sector purchasing rules that mandate or favor reusable products and packaging help to create guaranteed demand for reuse systems.

Relevant Refill/Reuse Models

Foodservice ware in schools, hospitals, and other large public institutions relies on high-volume, consistent purchasing to function efficiently.

Green procurement standards guarantee this steady demand by requiring or preferring reusable serviceware.



Potential Implications

Government purchasing requirements using reusable formats (or disallowing certain disposable items) create stable demand. This strengthens market certainty, supports local providers, and accelerates infrastructure development.

Key Players / Interest Holders

- **National & Municipal Governments:** Set procurement rules and mandate or prefer reusable formats.
- **Procurement Agencies:** Implement standards, manage contracts, and verify compliance.
- **Large Public Institutions (schools, hospitals):** Provide high-volume demand and integrate reusable systems into daily operations.
- **Reuse Service Providers:** Supply reusable products, washing, and logistics services in line with procurement requirements.

Examples

- **Chile:** Public procurement standards for schools encourage reusable foodservice ware.
- **Costa Rica:** National Policy for Sustainable Public Procurement that establishes economic, social, and environmental criteria for government purchases of goods and services - includes the use of reusable utensils by food service providers as one of the environmental criteria.
- **Brazil:** National Public Procurement Strategy for Sustainable Development (Decree No. 12,771/2025) guides federal purchasing toward circular economy solutions — encouraging the phase-out of single-use items, prioritizing reusable and returnable packaging, and requiring life-cycle criteria in technical specifications.

If Procurement Policies Don't Favor Reuse

- Develop voluntary procurement guidelines within institutions.
- Pilot reuse in one department before scaling citywide.
- Use performance data to inform future procurement reform.



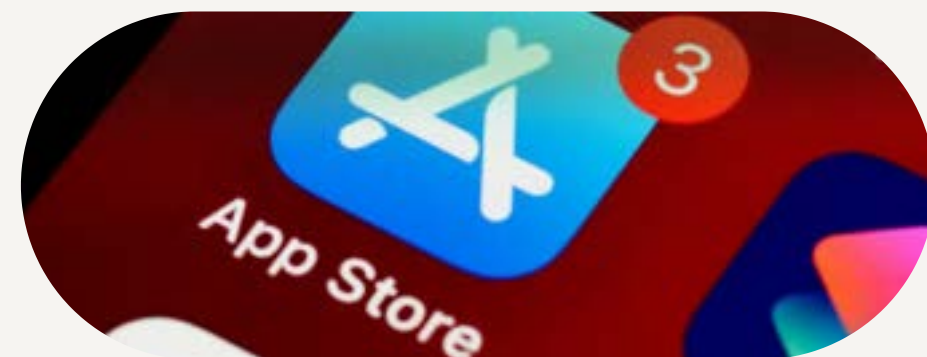
Innovation Zones & Regulatory Sandboxes

Safe spaces for testing novel reuse and refill models with temporary regulatory flexibility.

Relevant Refill/Reuse Models

Emerging tech-enabled refill, mobile washing units, and app-based borrowing models often face regulatory uncertainty (e.g., food safety rules, return logistics, digital deposit systems).

Sandboxes remove early barriers, allowing these models to test safely, gather evidence, and refine operations before formal regulation adapts.



Potential Implications

These allow cities or agencies to temporarily relax or clarify regulations for testing new models. This strengthens experimentation, promotes learning, and accelerates regulatory adaptation.

Key Players / Interest Holders

- **Municipal Regulators:** Provide temporary regulatory flexibility and oversee sandbox conditions.
- **Innovation Agencies:** Fund pilots, coordinate partners, and evaluate outcomes.
- **NGOs:** Support implementation, community engagement, and documentation.
- **Private Reuse Operators:** Test new business models, technologies, and operational workflows.

Examples

- Singapore – **Hawker Centre Reuse Sandbox:** Enabled reusable container trials in food courts where strict food-safety rules would otherwise limit testing.
- Kenya – Nairobi Innovation Fund for **Refill Kiosks:** Supported pilots of refill kiosks in informal markets where existing regulations did not clearly allow dispensing.

If No Formal Sandbox Exists

- Request temporary waivers or pilot authorizations.
- Document outcomes to inform permanent regulatory pathways.



Integrated Waste & Circular Economy Planning

The coordinated planning of waste management, resource recovery, and circular economy systems to ensure reuse, refill, recycling, and disposal strategies are designed together rather than in isolation.

Potential Implications

Integrated planning enables governments to align refill and reuse systems with existing and planned waste infrastructure. This approach supports long-term system efficiency, reduces stranded assets, and ensures that reuse is considered alongside recycling, composting, and residual waste management from the outset.

In many Global South contexts where Integrated Waste Management (IWM) planning is already standard, incorporating reuse upstream can reduce pressure on downstream systems and avoid significant capital and operating costs associated with collection, treatment, and disposal.

Relevant Refill/Reuse Models

Citywide reusable foodware programs, refill stations, shared logistics and washing infrastructure, and B2B transport packaging systems benefit from integrated planning that aligns collection routes, facilities, and investment decisions across waste and reuse systems.

Key Players / Interest Holders

- **Municipal & Regional Governments:** Integrate refill and reuse into waste management, climate, and infrastructure plans.
- **Waste Authorities & Utilities:** Align collection, sorting, and treatment systems with circular economy goals.
- **Producer Responsibility Organizations (PROs):** Coordinate EPR investments with broader system planning priorities.
- **Urban Planners & Infrastructure Agencies:** Ensure land use, facilities, and logistics support circular systems.
- **Private Operators & NGOs:** Provide implementation insights, pilots, and operational data.

Examples

- **San Francisco – Zero Waste & Reuse Integration:** San Francisco’s zero waste planning integrates reuse and source reduction priorities alongside recycling and composting, creating enabling conditions for reusable foodware and packaging systems.
- **Amsterdam – Circular Economy Strategy:** Amsterdam’s circular economy strategy embeds reuse, repair, and refill into broader waste, procurement, and urban planning frameworks, ensuring infrastructure investments support circular outcomes.

If Reuse Isn’t Integrated Into Waste Planning

- Engage planning departments during waste strategy revisions.
- Position reuse as upstream waste prevention, not competing with recycling.
- Highlight cost savings from avoided downstream infrastructure expansion.



Standards

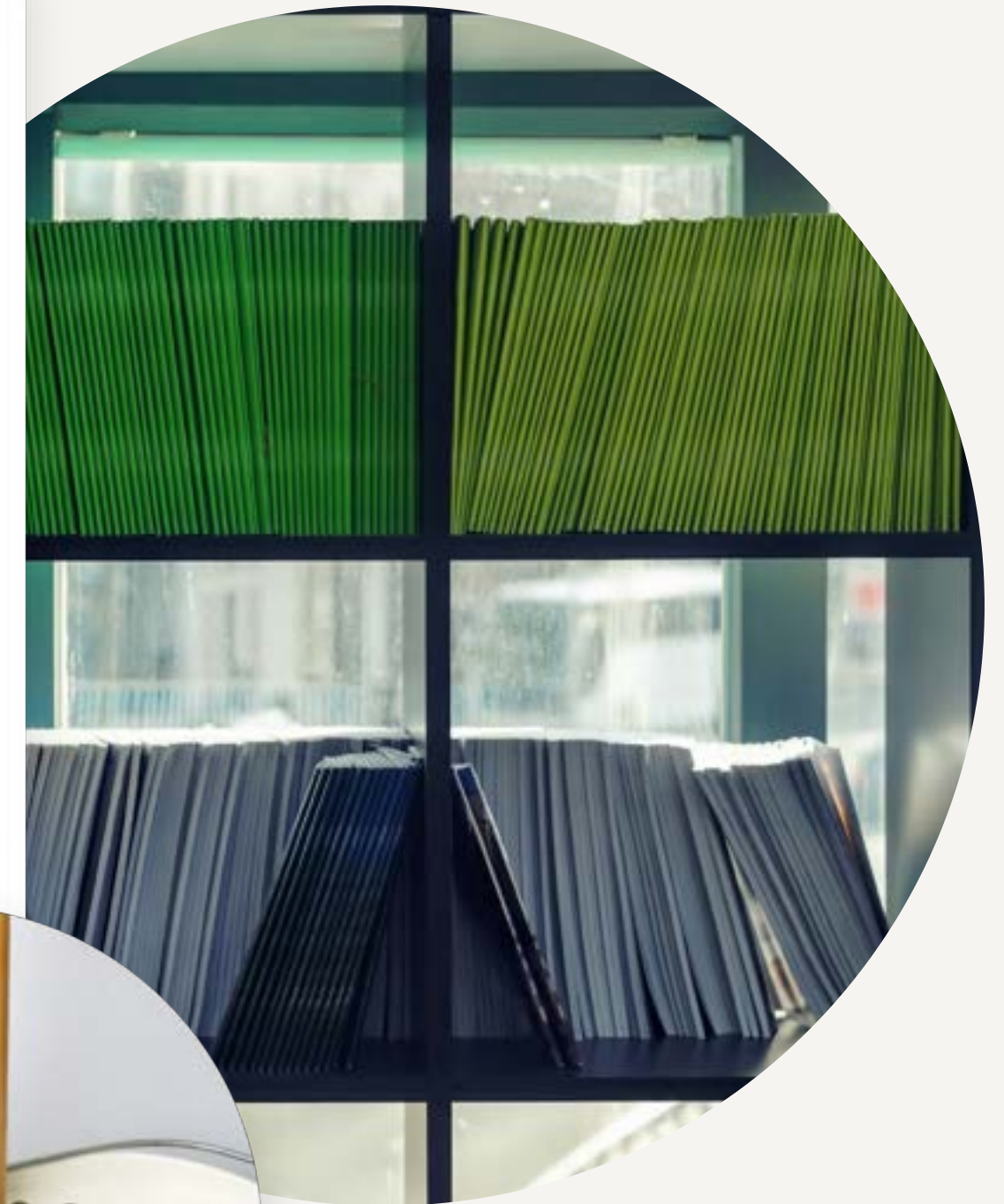


How Standards Affect Refill and Reuse Solutions

Standards provide authoritative definitions, technical specifications, and safety requirements that influence how reuse systems can operate and scale. Clear and harmonized standards reduce consumer and business confusion, increase interoperability and system efficiency, and support investments in shared infrastructure.

For example, standards aimed at **Consumer Safety & Health** can ensure reusable packaging meets strict hygiene and safety requirements. Standards can encourage interoperability through **technical specifications** for packaging compatibility across operators and regions

Numerous standards that apply in some way to refill and reuse solutions already exist in various geographies globally but PR3 is advancing a new ANSI-accredited standard for reuse systems—one of the first comprehensive efforts to formalize reuse operations, safety, logistics, and labeling at an international level.



Emerging Global Standards for Reuse Systems

PR3's global, voluntary standards for reuse systems

PR3 - a multi-interest holder standards initiative - has brought together a diverse panel of industry experts, reuse operators, policymakers, and technical specialists to co-develop a suite of six global standards to harmonize reuse systems across markets.

Through this collaborative process, PR3's standards are designed to work globally, supporting safe scaling of reuse systems in both developed and emerging markets



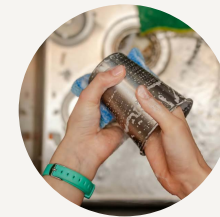
Collection Points

Specifies minimum requirements and recommendations for the design of collection points for reusable packaging systems



Container Design and Performance

Requirements & recommendations for container design and performance in reuse systems.



Container Washing, Inspection & Packing for Distribution

Requirements & recommendations for washing containers, inspecting them, and packing them for distribution in a reusable packaging system.



Digital*

Requirements for globally unique and unambiguous identity of assets in use and minimum requirements of product data for each asset



Systems Operations & Performance*

Provides design and performance requirements and recommendations for reuse infrastructure and operations.



Marking & Labeling of Reusable Containers, Collection Points, Signage, & Other Asset

Specifies requirements and recommendations for marking and labeling containers, collection points, and signage in a reusable packaging system.

**DRAFT: Standard is still in draft form*

Existing and/or Regional Standards Affecting Reuse Systems

GS1

GLOBAL Developing voluntary standards for digital identification, traceability, and data interoperability to enable consistent tracking of reusable containers across systems. GS1 is a membership-based organization that operates in over 110 countries.

Citeo

FRANCE Has developed packaging format guidance and technical parameters as part of the ReUse Project, supporting harmonized reusable packaging specifications for brands and operators.

CEN

EUROPEAN UNION Drafting new European technical specifications for reusable packaging, including performance, durability, hygiene, and reuse cycle criteria. CEN, the European Committee for Standardization, is an association that brings together the National Standardization Bodies of 34 European countries.

ENFIT

GERMANY Working Group on Food Safety and Hygiene - Developing standards for reusable food & beverage containers, including guidance on hygiene, operations, and reusable packaging cycles. DIN is also working on standards for reusable PET beverage containers.

Cetie

GLOBAL Develops open access voluntary industry standards for reusable glass food & drink containers and will launch a new group for reuse of PET containers.

Presence of Relevant Assets, Infrastructure and Services



How Infrastructure Affects Refill & Reuse Solutions

Infrastructure underpins the practical feasibility of reuse systems.

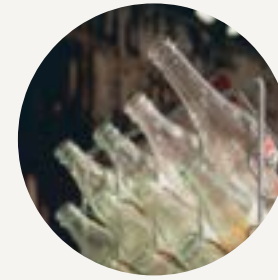
Collection, washing, logistics, and digital systems must function reliably for reuse to work at scale.

Existing infrastructure can accelerate adoption; gaps may require investment or collaboration.

This section includes:



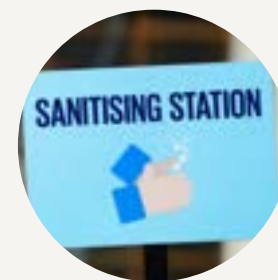
Integration with Existing Reverse Logistics / DRS



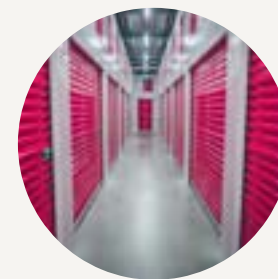
Shared Collection & Logistics Infrastructure



Copackaging / Cofilling



Washing & Sanitization Infrastructure



Storage & Redistribution Infrastructure

Existing Collection & Logistics Infrastructure

Reuse programs can integrate with existing public, private, and cooperative collection and logistics systems, such as municipal recycling routes, retail backhaul networks, informal collector systems, industrial transport loops, shared third-party logistics hubs and others.

Collaboration with or adaptation of these established networks reduces the need to build new collection and logistics capacity from the ground up.

Relevant Refill/Reuse Models

Prefill, off-premises reusable foodservice ware, and B2B reuse models depend on centralized or shared logistics because they circulate across many locations, users, and operators. These systems require coordinated return points, efficient routing, sorting, and large-scale washing operations—functions that are costly or impractical for any single business to manage alone.

Potential Implications

Building on existing collection and logistics infrastructure where appropriate can reduce the need for up-front investment in new collection and logistics capacity for reuse programs and provide the opportunity to start at a larger scale or level of geographic coverage than might otherwise be possible. Shared logistics models can reduce duplication of services and increase operational efficiency, reducing costs for the reuse operator.

Key Players / Interest Holders

- **Municipalities:** Offer access to public collection routes, sorting stations, or co-location opportunities.
- **Logistics companies:** Provide existing transportation, routing, backhaul capacity, and depot networks.
- **Retailers & brands:** Contribute store backrooms, return counters, and reverse logistics flows.
- **Cooperatives & informal sector groups:** Operate established collection routes and sorting sites that can be integrated or supplemented.
- **Waste management operators:** Offer existing depots, transfer stations, or shared container-handling capacity.

**Engagement with these players helps identify underutilized capacity that can be dedicated to reuse collection—or opportunities to co-invest in expanded, shared infrastructure.*

Examples

- **South Africa Informal Collector Integration:** Refill/reuse pilots integrate informal workers into collection routes, improving return rates and providing income stability.
- **Berkeley Curbside Co-collection for Reuse:** Berkeley has piloted curbside collection of reusable foodware alongside existing waste streams, demonstrating how municipal hauling and sorting infrastructure can be leveraged to support reuse systems without creating entirely new logistics networks.

If Dedicated Reuse Logistics Don't Exist

- Map existing logistics (retail backhaul, municipal routes, delivery fleets).
- Layer reuse flows into underutilized capacity.
- Start geographically concentrated to minimize complexity.



Integration with Existing Deposit Return Scheme (DRS) or Reverse logistics

Integrating with existing systems and operations for reuse collection and redistribution could include opportunities to work with:

1. Deposit return schemes (DRS)
2. Beverage bottle return programs
3. Other parallel reverse logistics such as e-commerce reverse logistics and retail backhaul operations.

Relevant Refill/Reuse Models

Prefill systems, reusable foodservice ware, and e-commerce reusable shipping models depend heavily on efficient, reliable return pathways to keep packaging circulating at scale.

Leveraging existing DRS infrastructure, beverage backhaul routes, or e-commerce reverse logistics dramatically reduces the cost and complexity of building new return networks from scratch.

Potential Implications

Integrating with existing systems can enable greater cost efficiency, reduce infrastructure build-out needs, and accelerate early implementation by using existing pathways.

Key Players / Interest Holders

- **DRS Operators:** Manage counting centers, verify returns, and coordinate backhaul.
- **Retailers:** Provide return points and consolidate items for transport.
- **E-commerce platforms:** Use return-to-doorstep channels for retrieval.
- **Beverage producers:** Often the predominant participants in DRS schemes, with operations that support collection & refilling of bottles.
- **Logistics firms:** Integrate reusable container flows into established routes.

Examples

- **Ambev “Universal Bottle” (Brazil):** Uses retail backhaul routes to collect refillable bottles, reducing logistics costs and increasing efficiency.
- **German DRS Integration with Refillables**
Many refillable glass bottles move through the same return infrastructure as single-use containers, leveraging the DRS network.

If Reverse Logistics Networks Are Fragmented

- Begin with one supply chain (e.g., beverage, foodservice, e-commerce).
- Test consolidation hubs before full network expansion.
- Explore digital tracking to reduce loss rates.



Co-Packing/ Co-Filling

Shared packaging and filling facilities that enable multiple brands or products to use common equipment, space, and operational services—reducing barriers to entry and supporting scalable refill and reuse systems.

Relevant Refill/Reuse Models

Pre-fill models are particularly well-suited to co-packing and co-filling infrastructure. In these models, reusable containers are filled at centralized facilities before being distributed to retail, foodservice, or institutional channels.

This approach aligns naturally with shared filling environments, where standardized equipment, quality control protocols, and logistics systems already exist.



Potential Implications

Co-packaging and co-filling infrastructure lowers capital and operational barriers for brands transitioning to refill and reuse by avoiding the need for dedicated, single-brand facilities. Shared infrastructure supports faster market entry, improves asset utilization, and enables experimentation while reducing financial risk—particularly for small and medium enterprises and early-stage reuse models.

Key Players / Interest Holders

- **Contract Packers & Fillers:** Provide shared filling, washing, labeling, and logistics services.
- **Brand Owners:** Access refill and reuse infrastructure without owning facilities.
- **Reuse Service Providers:** Integrate washing, tracking, and container circulation systems.
- **Equipment Manufacturers:** Supply modular, flexible systems compatible with multiple formats.
- **Governments & Development Agencies:** Support infrastructure investment through incentives or public-private partnerships.
- **NGOs & Industry Platforms:** Facilitate matchmaking, standards alignment, and pilot coordination.

Examples

- **Loop:** Operates centralized cleaning and refill infrastructure in partnership with major brands and retailers, enabling pre-filled reusable packaging across multiple product categories.
- **Brazil - 10L & 20L Refillable Water Jugs:** ABNT-standardized containers allow multiple brands to share identical returnable water jugs, with filling facilities serving as regulated sanitization hubs. Containers circulate across companies for hundreds of refill cycles, representing ~60% of bottled water consumption nationally.

If Shared Filling Facilities Don't Exist

- Explore contract manufacturers willing to pilot small batches.
- Aggregate demand across multiple brands to justify shared equipment.
- Start with limited SKUs to test operational feasibility.



Existing Washing & Sanitization Infrastructure

Reuse systems can tap into existing commercial washing and sanitization infrastructure—such as hospitality dishwashing stations, industrial laundry facilities, centralized commissary kitchens, and B2B washing hubs—to clean, sanitize, and prepare reusable packaging.

These facilities already meet strict hygiene standards and can often be adapted to handle reusable containers with limited upgrades.

Relevant Refill/Reuse Models

Reusable foodservice ware, prefill models, off-premise takeaway systems, and some models of B2B reuse depend on frequent, high-volume cleaning and sanitization because their containers come into direct contact with food and beverages and are shared across many users.

These models cannot function without reliable, compliant washing infrastructure to ensure safety, hygiene, and performance.

Potential Implications

Using existing infrastructure can dramatically lower start-up costs, shorten permitting timelines, and accelerate early-stage reuse deployment. It allows operators to test and scale reuse models without building new washing hubs from scratch.

Key Players / Interest Holders

- **Hospitality & institutions:** Offer existing dishwashing capacity for early-stage pilots.
- **Industrial laundries/kitchens:** Adapt equipment/processes to accommodate reusable containers.
- **Municipalities:** Identify underutilized facilities and integrate them into reuse pilots.
- **Reuse operators:** Coordinate workflows, quality checks, and redistribution.
- **Food safety regulators:** Approve adapted workflows and ensure compliance.

Examples

Muuse (Singapore/Canada): Uses decentralized washing partners and tech-enabled verification to support reusable cup systems across multiple cities.

If Industrial Washing Is Limited

- Partner with hospitality kitchens or institutional dishwashing facilities.
- Explore mobile or modular washing units.



Storage & Redistribution Infrastructure

Facilities or designated spaces where clean containers are stored before being redistributed to retailers, foodservice operators, or consumers.

In some cases, storage may be accommodated at the washing facility itself, while other times items will need to be moved to a location with more ample space.

Relevant Refill/Reuse Models

Reusable foodservice ware, prefill models, off-premise takeaway systems, and some models of B2B reuse depend on frequent, high-volume cleaning and sanitization because their containers come into direct contact with food and beverages and are shared across many users.

These models cannot function without reliable, compliant washing infrastructure to ensure safety, hygiene, and performance.

Potential Implications

Storage and redistribution hubs are essential for maintaining a steady supply of clean, ready-to-use containers. Efficient storage systems reduce turnaround time and improve overall system reliability, especially for high-volume reuse models.

Key Players / Interest Holders

- **Warehousing operators:** Manage inventory and ensure proper storage conditions.
- **Reuse operators:** Coordinate redistribution and ensure containers meet quality standards.
- **Delivery/logistics firms:** Handle last-mile distribution.
- **Retailers/foodservice partners:** Receive and stage clean containers for service.
- **Municipalities:** Offer local facilities or support urban micro-hubs.

Examples

ReCircle (Switzerland): Uses a distributed network of partner restaurants that store and recirculate reusable containers, reducing transport needs.

If Storage Capacity Is Constrained

Use decentralized micro-hubs (retail backrooms, community facilities).



Private Sector Leadership and Willingness to Collaborate



How Private Sector Leadership Affects Refill & Reuse Solutions

Private-sector engagement is essential for scaling reuse, from manufacturers and retailers to service providers and logistics operators.

Collective action and collaboration reduce duplication, build interoperability, and strengthen business cases for new models.

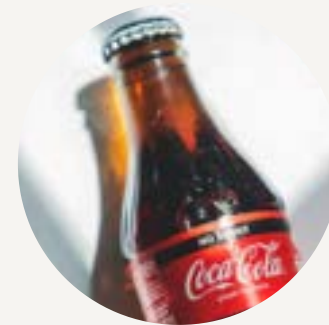
This section includes:



Multi-Interest Holder Reuse Coalitions



Retailer & Foodservice Participation



Brand Commitments

Multi-Interest Holder Reuse Coalitions

Collaborative platforms bringing together producers, retailers, logistics providers, and governments to co-develop reuse systems.

Relevant Refill/Reuse Models

Reusable foodservice ware, prefill models, off-premise takeaway systems, and some models of B2B reuse depend on frequent, high-volume cleaning and sanitization because their containers come into direct contact with food and beverages and are shared across many users.

These models cannot function without reliable, compliant washing infrastructure to ensure safety, hygiene, and performance.



Potential Implications

Retailers, restaurants, and delivery platforms play a key role in return point access, consumer-facing engagement, and integration with daily routines. This strengthens consumer uptake, expands accessible return locations, and supports the operational success of reuse programs.

Key Players / Interest Holders

- **PROs:** Coordinate producers, align investments, and integrate reuse into EPR systems.
- **Brand Coalitions:** Set shared reuse goals and co-develop harmonized packaging.
- **NGOs:** Facilitate collaboration and provide technical support.
- **Governments:** Enable regulatory alignment and support project approvals.

Examples

- **Zero Waste Europe** – Reuse Vanguard Project: Coalition piloting harmonized reuse infrastructure across European cities.
- **India Plastics Pact**: Cross-sector platform convening brands, NGOs, and retailers to coordinate refill and reuse pilots nationwide.

If No Coalition Exists

- Start with a small working group of motivated actors.
- Align on one shared product category.



Retailer & Foodservice Participation

Commitment from retailers and foodservice providers to implement, accept, return, and/or promote reusable packaging systems.

Relevant Refill/Reuse Models

BYO bag/container schemes, off-premises reusable serviceware, and in-store refill stations depend on high-visibility retail touchpoints where consumers already shop or eat. Retail and foodservice participation increases return convenience, enhances program credibility, drives consumer uptake, and anchors consistent container circulation.

Potential Implications

Retailers, restaurants, and delivery platforms play a key role in return point access, consumer-facing engagement, and integration with daily routines. This strengthens consumer uptake, expands accessible return locations, and supports the operational success of reuse programs.

Key Players / Interest Holders

- **Retail Chains & Supermarkets:** Host return points, integrate reuse into checkout and customer flows.
- **Quick-Service Restaurants & Cafes:** Accept returns, offer reusable cups/containers, and engage consumers.
- **Food Delivery Platforms:** Enable reusable packaging options, manage return logistics, and support consumer reminders.

Examples

- **Brazil – Meu Copo Eco:** Partners with bars, cafés, and event venues to offer reusable cups and collection points, demonstrating how retailer participation increases accessibility and return rates.
- **USA – Starbucks & McDonald’s Reusable Cup Pilots:** Large QSR chains piloting standardized reusable cups integrated into store operations, showing how retailer commitment can scale returnable packaging models.
- **Petaluma – Reusable Foodware Pilot:** Petaluma’s reuse pilot engaged local restaurants, national foodservice brands, municipal partners, haulers, and a reuse service provider, generating data on customer participation, return rates, and operational feasibility—illustrating the importance of early, cross-value-chain retailer and foodservice participation in successful reuse system design.

If Retailers Are Hesitant

- Start with mission-aligned independents.
- Provide operational simplicity and clear value proposition.
- Use consumer demand data to build momentum.



Brand Commitments

Public, time-bound commitments made by brands to pilot, scale, or integrate refill and reuse solutions across their product portfolios, channels, or regions.

These commitments signal demand, de-risk investment in shared infrastructure, and help align internal teams and external partners around clear reuse objectives.

Potential Implications

Brand commitments play a critical role in moving reuse from pilots to scale.

Clear commitments help justify investment in shared washing, filling, and logistics infrastructure; create predictable demand for service providers; and accelerate learning by moving beyond one-off trials. Internally, commitments drive cross-functional alignment across packaging, procurement, marketing, and operations.

Externally, they strengthen the business case for collaboration with retailers, reuse providers, and governments, and can help unlock co-investment, incentives, or policy support.

Key Players / Interest Holders

- **Brand Teams:** Set reuse targets, allocate internal resources, and integrate reuse into product and packaging strategies.
- **Procurement & Operations Teams:** Translate commitments into supplier requirements, contracts, and operational changes.
- **Retailers & Foodservice Partners:** Enable in-market execution through shelf space, reverse logistics, and consumer engagement.
- **Reuse Service Providers:** Scale washing, tracking, and container circulation systems in response to committed demand.
- **Investors & Funders:** Use brand commitments as demand signals to support infrastructure and platform development.

Examples

- Nestlé commitments on packaging sustainability (including reusable packaging ambition): Outlines Nestlé's public goals to make packaging recyclable/reusable and support systems, part of broader circular ambition
- Carrefour confirms nationwide reusable packaging rollout & deposit/refund schemes: Details Carrefour's reusable packaging program and expansion commitments in stores

If Brands Have Not Committed Publicly

- Engage innovation or sustainability teams through proposals.
- Frame reuse as risk mitigation and regulatory readiness.
- Encourage time-bound, category-specific commitments.



Consumption Norms & Behaviors



How Consumer Norms & Behaviors Affect Refill & Reuse Solutions

Consumer awareness, convenience expectations, hygiene perceptions, and cultural norms significantly influence reuse adoption.

Behavior change requires accessible systems, clear communication, and reinforcement across multiple touchpoints.

This section includes:



Convenient Return Infrastructure



Public Education & Awareness



Cultural Familiarity with Reuse

Convenient Return Infrastructure

Widely accessible drop points, kiosks, or household collection systems that make returning reusable packaging easy and reliable.

Relevant Refill/Reuse Models

Off-premises foodservice ware and prefill systems rely on high return rates and easy access to drop-off points.

Convenient return infrastructure reduces friction for users, increases participation, and ensures containers flow reliably back into circulation.



Potential Implications

Widely available drop-off points, home collection systems, or retail return locations encourage user participation. This strengthens ease of use, normalizes return behavior, and improves return rates necessary for system viability.

Key Players / Interest Holders

- **Municipalities:** Provide public return points, support integration with city services.
- **Retailers:** Host in-store drop points and encourage customer participation.
- **Reverse Logistics Providers:** Manage routing, pickups, and consolidation of returned containers.
- **Reuse Service Providers (RSPs):** Operate return bins, verify container quality, and manage recirculation.
- **Informal Sector Collectors:** Support container retrieval and reduce losses, especially in open or dispersed systems.

Examples

- Germany – **National Deposit Return Scheme (DRS) Return Network:** A nationwide network of bottle return points integrated with DRS provides dense, convenient return locations — demonstrating how widespread access boosts return rates and supports reusable beverage systems.
- Brazil - **Shopee:** Mercado Livre and Shopee operate thousands of local pickup and return points across Brazil, illustrating how distributed retail networks can enable convenient reverse logistics pathways adaptable for reusable packaging systems.

If Return Points Are Sparse

- Begin with high-traffic retail clusters.
- Integrate returns into existing consumer touchpoints.
- Incentivize participation through deposits or rewards.



Public Education & Awareness

Campaigns and outreach programs that normalize reuse, build consumer trust, and address hygiene and safety concerns.



For examples on how to effectively engage the public, see the in-depth Step by Step Guide for marketing & education guidance.

Potential Implications

Communication campaigns build trust, clarify safety, and support behavioral change. This strengthens public understanding, supports regulatory acceptance, and builds demand for reuse.

Key Players / Interest Holders

- **Governments:** Lead national/local campaigns and align messaging with policy goals.
- **NGOs:** Deliver community outreach, training, and culturally relevant messaging.
- **Schools:** Integrate education into curricula and normalize reuse behaviors among youth.
- **Retailers:** Promote reuse options at point of sale and engage consumers directly.
- **Community Organizations & Media:** Amplify messages, build trust, and address safety/hygiene concerns.

Examples

- **Be Ready to Change** - Pan-European campaign encouraging waste reduction and reuse practices through public education, media outreach, and local engagement initiatives aimed at shifting everyday consumption norms.
- **Brazil – Coca-Cola “Live More Returnable” Campaign:** Mass media and retail campaign encouraging the use of returnable PET and glass bottles, emphasizing cost savings and multiple reuse cycles to normalize returnable packaging.

If Awareness Is Low

- Leverage trusted local messengers (schools, community groups).
- Start with simple, visible systems that demonstrate hygiene and safety.

Cultural Familiarity with Reuse



Consumer participation in refill and reuse systems is strongly influenced by what feels normal, safe, and worth the effort.

Cultural familiarity can either lower friction or introduce resistance, depending on past experience, perceived hygiene, and alignment with everyday routines.



What Supports Reuse Adoption

Existing cultural precedents

Familiarity with returnable bottles, market refills, bulk buying, or communal washing reduces learning curves and normalizes participation.

Social proof and normalization

Seeing others participate (in stores, public spaces, or through trusted brands) reinforces reuse as acceptable and expected behavior.

What Hinders Reuse Adoption

Hygiene and safety concerns

Fear of contamination, unclear cleaning standards, or lack of transparency can undermine trust—especially in food and personal care contexts.

Perceived inconvenience or effort

Extra steps (returns, deposits, storage) can feel burdensome if not well-designed or supported by infrastructure.

Low familiarity or negative past experiences

Markets without reuse precedent may associate reuse with informality, lower quality, or inconvenience.

Unclear responsibility

Confusion over who cleans, who owns containers, or what happens if something goes wrong reduces participation.

Availability of Funding

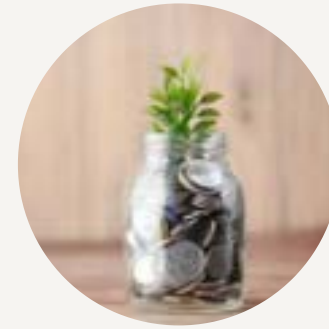


How Funding Availability Affects Refill & Reuse Solutions

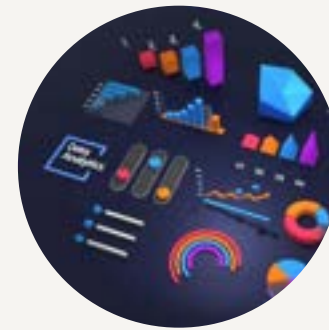
Reuse systems often require upfront capital for washing, logistics, training, and design.

Access to grants, investment capital, producer fees, or development financing determines how quickly systems can launch and scale.

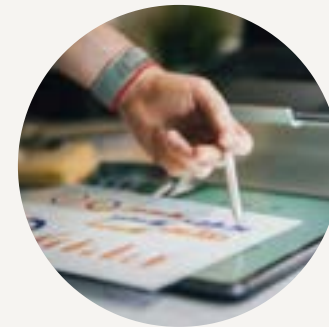
This section includes:



Access to Capital & Funding



Data & Measurement Capacity



Life Cycle & Cost-Benefit Assessments

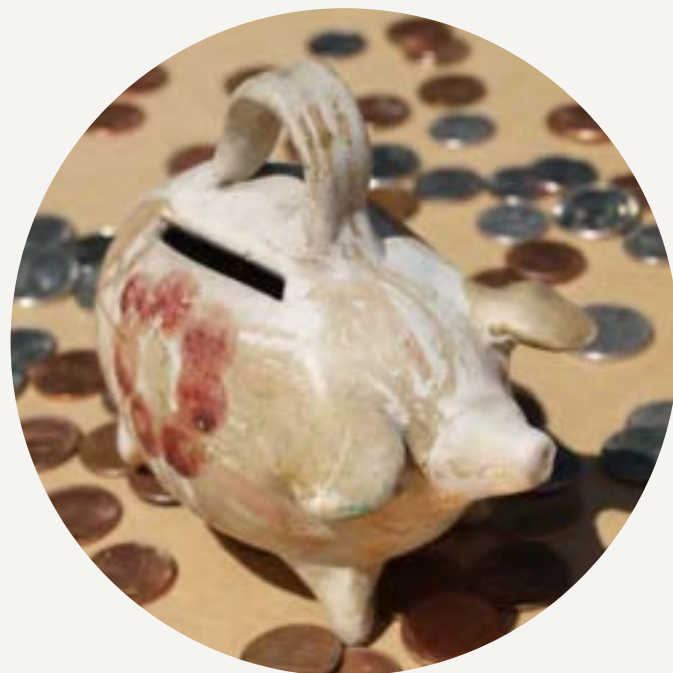
Access to Capital & Funding

Start-up or transition grants, concessional loans, or blended finance mechanisms to offset the high upfront costs of launching reuse systems.

Potential Implications

Early-stage capital supports infrastructure build-out, operational innovation, and pilot-to-scale transitions.

This strengthens financial viability, reduces operator risk, and accelerates system readiness.



Key Players / Interest Holders

- **Development Banks:** Provide concessional loans and blended finance for early infrastructure.
- **Philanthropic Donors:** Fund pilots, de-risk innovation, and support community-led initiatives.
- **Impact Investors:** Offer patient capital for scalable refill/reuse enterprises.
- **Government Grant Agencies:** Issue grants for pilot launches, SMEs, and infrastructure build-out.
- **Local Cooperatives:** Mobilize community savings and manage small-scale reuse/refill operations.

Examples

Solid Waste Infrastructure for Recycling Grant Program (US)

The Solid Waste Infrastructure for Recycling grant program is a new grant program authorized by the Save Our Seas 2.0 Act and funded through the Infrastructure Investment and Jobs Act.

The Infrastructure Investment and Jobs Act provides \$275 million for Solid Waste Infrastructure for Recycling grants to support Building a Better America.

Perpetual's program in Hilo, HI was a recipient of this grant funding to implement a bespoke reusable foodware system on the island.



Data Measurement Capacity

Collection and analysis of data on packaging use, waste generation, and material flows to support baseline setting, system design, and impact modeling.

Potential Implications

Baseline data helps teams model reuse systems accurately and target interventions to maximize impact.

This strengthens decision-making, supports compliance, and aligns interest holders around shared evidence.



Key Players / Interest Holders

- **Municipal Governments:** Collect local waste and packaging data; provide access to public facilities and waste streams.
- **NGOs:** Conduct audits, support data collection, and translate findings into actionable insights.
- **Academia:** Lead research, modeling, and life-cycle analysis to inform system design.
- **PROs:** Gather producer-level packaging data and support compliance reporting.
- **Waste Management Companies:** Supply operational data on materials flows, contamination, and recovery rates.

Examples

- India – **India Plastics Pact** Packaging & Waste Audits: Systematic audits of packaging types and waste flows help identify priority materials and guide the design of reuse pilots, ensuring interventions match real market and waste realities.
- **Costa Rica – “Consumo 180º” (UNDP):** National initiative systematizing plastic material flow data and calculating Costa Rica’s plastic footprint — linking imports, exports, waste generation, and industry profiles to inform evidence-based policy and reuse system design.

If Baseline Data Is Limited

- Conduct targeted waste audits.
- Partner with universities or NGOs for modeling support.
- Start with simple KPIs before expanding analytics.



Life Cycle & Cost-Benefit Assessments

Evidence-based studies that compare environmental and economic impacts of refill/reuse systems against single-use alternatives.

Potential Implications

Independent assessments comparing reuse to single-use help build trust and support for the transition.

This strengthens the business case, supports fundraising, and guides private-sector investment decisions.



Key Players / Interest Holders

- **Academia:** Conduct independent LCAs and techno-economic analyses to validate system impacts.
- **LCA Consultants:** Provide standardized methodologies and comparative assessments.
- **NGOs:** Commission studies, interpret results, and communicate findings to policymakers and the public.
- **Brands:** Supply packaging and operational data; use results to guide investment and design decisions.
- **Development Agencies:** Fund LCAs and use evidence to support policy and pilot development.

Examples

Europe – **Zero Waste Europe Cost-Benefit Analysis (2023):** A comprehensive economic assessment shows that well-designed reuse systems (cups, takeaway containers, transport packaging) can outperform single-use when optimized for return rates, logistics efficiency, and washing capacity.

If No Local LCA Exists

- Reference international studies while adapting assumptions.
- Commission targeted assessments for high-impact categories.
- Use comparative cost modeling to inform decision-making.





Plastic Reboot



Executive Partner
PERPETUAL

**Interested in
learning more?
Get support to build refill
and reuse into your plans.**

Contact Dr. Dagny Tucker

hello@perpetualuse.org