

In collaboration
with Kearney



Scaling Reuse Models: A Guide to Standardized Measurement

WHITE PAPER
JANUARY 2024



Contents

Foreword	3
Executive summary	4
Introduction	5
1 Reuse measurement parameters and definitions	6
1.1 Reuse measurement scope and parameters: Inclusions and exclusions	6
1.2 Reuse definitions and terminology	11
2 Reuse measurement parameters and definitions	17
2.1 Reuse measurement guidelines journey	17
2.2 Outcomes from piloting the guidelines	19
3 Calculation models and measurement approaches	21
3.1 Metric 1 calculation approach	21
3.2 Metric 2 calculation approach	22
Conclusion	25
Contributors	26
Endnotes	27

Disclaimer

This document is published by the World Economic Forum as a contribution to a project, insight area or interaction. The views and opinions expressed herein do not necessarily reflect the views or opinions of any member of the Consumers Beyond Waste initiative or of any individual or entity mentioned in or consulted for this report. Notably, the measurement guidelines will be continually refined, as working group members are still seeking convergence on several areas noted in the document.

© 2024 World Economic Forum. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, or by any information storage and retrieval system.

Foreword



Gim Huay Neo
Managing Director,
World Economic Forum



Rajeev Prabhakar
Partner, Kearney,
United States

Accelerating the adoption of reuse is an important driver towards a world free of plastic pollution. Public and private sector efforts for reuse solutions have increased significantly in the last years. Notably, leading consumer goods companies have set commitments and implemented plans, amid a burgeoning innovation landscape. New policy frameworks such as the European Union's Packaging and Packaging Waste Regulation and the forthcoming United Nations Plastics Treaty will provide additional ballast to mainstream reuse systems.

Against these developments, it is becoming urgent to harmonize the way in which standards are set and progress measured. A fragmented approach in target-setting and measurement would slow down the widescale adoption of reuse models, create inconsistency in the quality of reporting and lead to a loss of consumer confidence.

It is with this objective in mind that the World Economic Forum's Consumers Beyond Waste initiative has been convening a multistakeholder working group since early 2022 to discuss reuse guidelines and standards.

This white paper provides guidance on standardized reuse measurement and offers corporate stakeholders, policy-makers, standard-setters and ecosystem actors a framework to track success on reuse models. It is the culmination of working group member inputs and based on recommendations from the team. Select companies in the group also piloted a preliminary version of the guidelines against their reuse activities to ensure the principles were tested in real-world settings.

These guidelines on standardized reuse measurement must be continually refined. The CBW initiative warmly welcomes stakeholders to provide feedback and join our strategic effort to focus on collaborative capacity building. Our goal is to work towards a gold standard on progress measurement for reuse models.

We wish to express our gratitude to all contributors and invite readers to explore our measurement guidance. Please join us in this endeavour to cut plastic pollution.

Executive summary

With governments and companies now setting reuse targets, it is essential to standardize how success is measured.

This is to avoid a fragmentation in target-setting and measurement approaches, which would slow down the widescale adoption of reuse.

The World Economic Forum's Consumers Beyond Waste (CBW) initiative has been convening a working group of leading consumer companies and non-profit organizations since early 2022 to build a seminal guide to standardized reuse measurement, with two priority metrics that in combination most robustly track progress on reuse.

At the end of 2022, the Forum published a preliminary version of the guidelines with the priority metrics, parameters with inclusions and exclusions, and calculation examples. In 2023, these guidelines were piloted and select companies in the working group tested the metrics in real-world settings against their respective reuse activities. The measurement guidelines have been refined based on testing outcomes and working group contributions throughout the past year.

In 2024, working group members will focus on collaborative capacity building and reaching convergence on remaining areas with divergent stakeholder perspectives (these areas are highlighted throughout the white paper). As such, this guide should be regarded as a status report that will be iterated and improved over the coming year. Ultimately, the ambition is for these reuse measurement guidelines to become the accepted standard for all stakeholders, which will support accelerating the adoption of reuse models at scale.

The Consumers Beyond Waste working group on standardized reuse measurement comprises Amcor, Coca-Cola, the Ellen MacArthur Foundation, Greenpeace, Nestlé, PepsiCo, TerraCycle, Unilever, Walmart and the World Wildlife Fund.

The white paper is targeted at:

- Corporate stakeholders committed to exploring, enabling and/or testing new reuse models, particularly within the consumer goods and retail sectors.
- Policy-makers and standard-setters seeking to better understand how to measure progress on reuse models and what metrics should be incorporated into future legislation and standards.
- The broader set of ecosystem actors (including other corporate players, non-profits, reuse solution providers and investors) interested in understanding thinking to date on standardized reuse measurement and who may wish to apply the guidelines to their own reuse activities.

This document provides a summary of three areas:

1. Reuse measurement parameters and definitions
2. Reuse metric prioritization and piloting outcomes
3. Calculation models and measurement approaches

Please note that in this document, reference to the stakeholder group that has been collaborating on the guidelines is referred to as “the working group”. The “CBW community” refers to the broader set of stakeholders that are part of the initiative. The World Economic Forum refers to the institution convening the CBW multistakeholder community on reuse.

Introduction

Public and private sector momentum for reuse models is growing, requiring a standardized approach to the measurement of progress.

The proliferation of plastic waste is harming the planet, people and economies. Half of global plastic production is for single-use and only 9% of plastics is recycled globally. Recycling alone will not solve the plastic waste crisis and innovative solutions are needed.¹ Aside from the alarming refuse footprint, plastic production increases carbon emissions and negatively impacts human health.² From an economic standpoint, single-use packaging is inefficient, with 95% of its value lost after initial use, equating to \$100 billion annually.³

Reuse has emerged as a promising solution amid the plastic waste crisis. Reusable packaging models designed to be used multiple times are pivotal to achieving a world free of plastic pollution. The United Nations Environment Programme underscores its potential in the *Turning off the Tap* report, announcing reuse as the most powerful market shift that must occur in a systems transformation to end plastic pollution. Lastly, reuse presents a significant economic opportunity. Converting 20% of single-use plastic packaging to reuse globally is estimated to be a \$10 billion opportunity.⁴

The most recent milestone for the reuse movement is the European Parliament vote to include reuse provisions in the Packaging and Packaging Waste Regulation. Historic United Nations negotiations are also underway to develop an international agreement to end plastic pollution, which can bolster reuse solutions. Moreover, governments such as France and Chile have designed

progressive laws on reuse. At the regional level, new extended producer responsibility laws in California and Oregon are encouraging waste reduction and New York City is evaluating a bill that would mandate fast-casual restaurants to serve food in reusable containers.

Businesses have also started to make new commitments, building additional momentum for reuse. Coca-Cola and PepsiCo announced industry-first targets in 2022 to achieve 20-25% reuse by 2030 as a share of their beverage portfolios. The start-up innovation ecosystem continues to flourish, with early pioneers such as Loop and Algramo expanding into new geographic markets and collaborating with retailers globally.

Innovative partnerships are playing an instrumental role in scaling reusable packaging systems. Having partnered with the likes of QYOS and Alner in Indonesia, Unilever has developed a network of more than 350 refill outlets in Greater Jakarta and Surabaya, dispensing products from many of its homecare brands, such as Rinso, Sunlight and Wipol. Walmart is testing a home delivery service with Loop in Arkansas with an assortment of products in reusable containers through Walmart+ InHome. Nestlé is partnering with start-up Circulation in Germany to pilot offering Nesquik in standardized, reusable containers. The combination of government and business activities is an exciting turning point and represents a key opportunity to accelerate reuse progress and standardize measurement.

“ Reuse has emerged as a promising solution amid the plastic waste crisis. Reusable packaging models designed to be used multiple times are pivotal to achieving a world free of plastic pollution.”

1

Reuse measurement parameters and definitions

The standardization of measurement requires a consistent approach to what constitutes reuse.

Given the multitude of containers and components enabling reuse systems, this chapter is divided into two sections. The first section provides an overview of the reuse measurement scope and parameters; the second outlines definitions of key terms.

Throughout these guidelines, the term “shall” denotes a mandatory requirement, while the term “should” implies a strong recommendation.

1.1 Reuse measurement scope and parameters: Inclusions and exclusions

While reuse is critical to combatting plastic pollution, there are other approaches that reduce the global waste footprint. Some are listed below as excluded but may still be effective waste-reduction strategies.

Reuse

Reuse is defined as an operation by which a container is refilled or reused for the same purpose for which it was conceived, with or without the support of auxiliary products present on the market enabling the container to be refilled. This reflects definitions of the International Organization for Standardization and Ellen MacArthur Foundation (EMF), along with working group input.

Reusable containers

These are designed to enable the principal components to accomplish a number of trips/ rotations (loops) in predictable conditions of use as part of a reuse system. This includes containers returned to companies for refilling and containers retained by consumers for refilling. Reusable containers should be designed to achieve at least the number of loops required to go beyond the

environmental break-even point to ensure the impact of reusable containers is less than single-use alternatives.

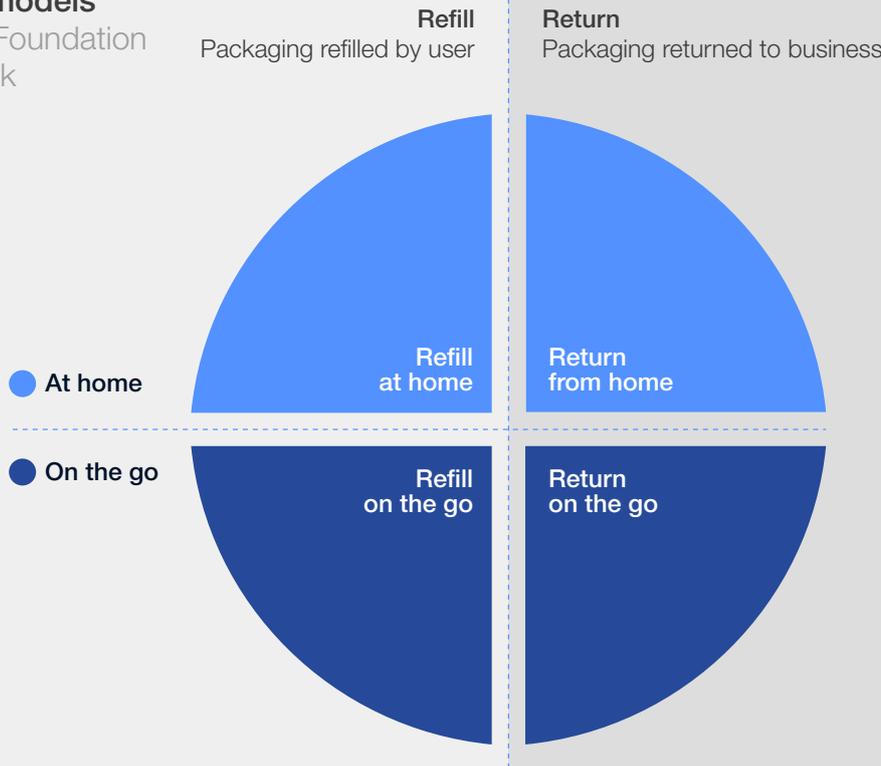
Reuse modalities

This effort follows EMF’s categorization, covering four modalities along two modes: refill (container refilled by consumers) and return (container returned to businesses).

1. Refill at home: Consumers refill their reusable container at home and are responsible for maintenance.
2. Refill on the go: Consumers refill their reusable container away from home and ensure maintenance.
3. Return from home: The container is picked up and a business is responsible for cleaning and processing.
4. Return on the go: Consumers return the container at a drop-off point and a business is then responsible.

The four reuse models

Ellen MacArthur Foundation
Reuse Framework



Source: Ellen MacArthur Foundation, Reuse – rethinking packaging, 2019.

Primary packaging

This effort focuses only on primary packaging, defined as packaging that comes directly in contact with the product. All secondary and tertiary packaging is excluded.

Consumer goods focus

This effort focuses on packaging for consumer goods products. All other sectors were excluded from the analysis.

Packaging materials

These guidelines are material agnostic when it comes to reusable packaging models, so long as the criteria set out below are met and the packaging item serves to mitigate plastic pollution.

Reuse parameters

For models to qualify as reuse, they should fulfil two essential criteria:

1. Reusable containers are part of a broader reuse system, meaning there are established arrangements ensuring the possibility of reuse so that the container is reusable in practice.

2. Reuse models are environmentally beneficial. Reuse models are intended to reduce the overall amount of single-use and virgin packaging used. Companies shall ensure that reuse systems do not inadvertently add to packaging waste or proliferate problematic packaging.

There are many containers and components enabling reuse systems. The World Economic Forum recommends the following inclusions and exclusions for what constitutes reuse. These are based on a realistic, current state of reuse systems. This allows for some non-reusable, but recyclable, containers and components to facilitate reuse systems in certain instances. Single-use components that are not recyclable will not be counted as reuse.

Ideally, reuse systems will evolve such that all system components are reusable. However, the Forum recognizes that industry capabilities and infrastructure are not in place today to achieve this. To promote a transition to reuse, the Forum believes the inclusions and exclusions below balance the goal of reducing plastic waste with the realities of current business capabilities.

The inclusions and exclusions may result in some product formats not counting towards reuse. However, these may represent other circularity types or achieve beneficial outcomes like plastic waste reduction. Ultimately, circular solutions are key to mitigating plastic waste and companies

shall ensure other packaging waste reduction approaches do not undermine reuse and recycling.

This section represents general agreement from the working group, however, alignment on several topics is still sought. These include parameters for business-to-business (B2B) refill containers and auxiliary product containers. In particular, the group has yet to agree on recyclability requirements and timeline, and mechanisms to ensure packaging waste reduction. The working group is also exploring

if refill at home should be reported on separately vis-a-vis the other modalities until measurement ability is improved, as there is less visibility into consumer behaviour and number of fills.

Containers must meet several conditions across a system for a reuse model to qualify. These parameters ensure reusable containers and reuse systems lead to plastic waste reduction compared to single use and prevent unintended consequences leading to greater material use.

FIGURE 2 Reuse inclusions and exclusions by modality

Reuse modality	Packaging type	Key assumptions	Inclusions vs exclusions
Return on the go	2.A.1. Reusable container	Reusable (returnable) packaging container	✓
	Single-use container	Single-use recyclable packaging container	✗
		Single-use non-recyclable packaging container	✗
Return from home	2.A.1. Reusable container	Reusable (returnable) packaging container	✓
	Single-use container	Single-use recyclable packaging container	✗
		Single-use non-recyclable packaging container	✗
Refill on the go	2.A.2. B2B refill container	Reusable (returnable or refillable) container used to refill a dispenser system – e.g. container used by consumer packaged goods (CPG) company to refill a food dispensing system	✓
		Single-use recyclable container used to refill a dispenser system – e.g. container used by CPG company to refill a food dispensing system that is recyclable	✓*
		Single-use non-recyclable container used to refill a dispenser system – e.g. container used by CPG company to refill a food dispensing system that is not recyclable	✗
	2.A.1. Reusable container (keeper container)	Reusable (refillable) container used by a consumer – e.g. consumer brings a refillable container and refills it using the food dispenser system	✓
	Single-use container	Single-use recyclable container used by a consumer – e.g. consumer uses a provided single-use bag with the food dispenser system that is recyclable	✗
		Single-use non-recyclable container used by a consumer – e.g. consumer uses a provided single-use bag with the food dispenser system	✗
Refill at home	2.A.1. Reusable container (keeper container)	Reusable (refillable) dispenser container – e.g. refillable hand soap dispenser	✓
	Single-use container	Single-use recyclable dispenser container – e.g. single-use hand soap dispenser that is recyclable	✗
		Single-use non-recyclable dispenser container – e.g. single-use hand soap dispenser that is not recyclable	✗
	2.A.3. Auxiliary product container	Reusable (refillable) individual container used to refill a dispenser – e.g. individual soap carton used to refill the hand soap dispenser	✓
		Single-use recyclable container used to refill a dispenser – e.g. individual soap carton used to refill the hand soap dispenser that is recyclable	✓*
		Single-use non-recyclable container used to refill a dispenser – e.g. individual soap carton used to refill dispenser that is not recyclable	✗

*Designed for recycling today and should be recyclable in practice and at scale by 2030 (see recyclability section below).

Recyclability

In practice and at scale

For a container to count as recyclable, it must be recyclable “in practice” and “at scale” as defined by EMF. “At scale” means that a container must be proven to be recyclable, beyond tests, pilots or single geographies. “In practice” means that significant recycling rates are achieved by that type of container. The threshold for a container to be recyclable “in practice and at scale” is that it achieves a “30% post-consumer recycling rate in multiple regions collectively representing at least 400 million inhabitants. A possible alternative, especially relevant for more local players, is to check if a 30% post-consumer recycling rate is achieved in all the markets where their packaging is sold.”⁵

Alternatively, companies may take a more local approach in which they monitor at a country level whether a packaging type achieves a 30% post-consumer recycling rate. Reuse volume would only count in countries where this is achieved, irrespective of meeting the 400-million-person threshold.

Recyclable containers

Furthermore, in accordance with the guidance of EMF, a container “can be considered recyclable if its main packaging components, together representing >95% of the entire packaging weight, are recyclable according to the above definition, and if the remaining minor components are compatible with the recycling process and do not hinder the recyclability of the main components.”⁶

Designed for recycling

A container format is designed for recycling if it meets international design for recycling standards (e.g., RecyClass and APR), which provide guidance on the compatibility of packaging elements with existing recycling streams.

Timeline grace period

The Forum recognizes that several products on the market today are designed for recycling but are not yet recyclable in practice and at scale. To support organizations in transitioning to reuse and scaling infrastructure while mitigating unintended consequences, these container types may be counted until 2030 if they are designed for recycling.

This grace period aims to incentivize efforts to scale recycling infrastructure for container types showing promise in meeting recyclable in practice and at scale criteria and/or to allow companies to transition container types to those meeting these requirements. The Forum anticipates that the timeline grace period approach will be nuanced next year.

Additional transparency

To guard against the unintended proliferation of plastic waste, companies shall be transparent on progress by reporting the percentage of products in their reusable portfolio that are sold in containers that do and do not meet the recyclable in practice and at scale criteria.

Reusable container requirements

Reusability

For a container to count as reusable, at least 95% of a reusable container by weight should be reusable (including all packaging components). At a minimum, the main container shall be reusable. This includes returnable containers and refillable/keeper containers. For example, if a bottle is reusable but the lid is not, the container is considered reusable. However, if only the lid can be reused, this would not count because the main container is not reusable.

Reusable containers should be part of a broader reuse system, meaning there are established arrangements ensuring the possibility of reuse so that the container is reusable in practice.

Recyclability

As each container will eventually reach the end of its useful life, reusable containers should be recyclable in practice and at scale.

Durable containers designed to be used for at least three years do not need to be recyclable in practice and at scale (e.g., metal water bottles, ceramic soap dispensers).

Business-to-business (B2B) refill container requirements

To ensure reuse systems lead to a reduction in virgin materials, containers used by businesses on the back end must also meet certain criteria (e.g. to fill product into a refill station).

Reusability

B2B refill containers should ideally be reusable. If B2B refill containers are not reusable, companies should strive for reusable solutions.

Recyclability

At a minimum, B2B refill containers shall be designed for recycling and be recyclable in practice and at scale by 2030.



Packaging reduction

To ensure there is not a direct replacement of single-use packaging with B2B refill containers, companies shall ensure B2B refill containers are delivering products with meaningfully less packaging than single-use. For instance, this may be achieved by changing the format of the product to provide more functional units in less space or by lightweighting container materials. The working group recognizes the need to specify what “meaningfully less” means and will explore determining thresholds for packaging reduction.

Format comparisons

When comparing B2B refill containers to their single-use alternatives to assess packaging reduction, the use case of the reusable product should be the same as that of the original product sold in single-use containers to ensure like-for-like comparisons. Furthermore, the format should be considered and products compared in a standard manner (e.g. diluted liquid volume).

These criteria intend to promote accurate comparisons ensuring reuse models are developed to reduce plastic packaging across product formats while allowing for business innovation.

Auxiliary product container requirements

Auxiliary products are used to refill reusable containers that a consumer retains (keeper containers). Auxiliaries fall under refill at home and may require separate reporting vis-a-vis the other modalities. To count as reuse, auxiliary product containers should be designed and marketed to be used in tandem with a keeper container. Keeper containers and auxiliary product containers do not need to be sold together. Auxiliary product containers should deliver the final products without the need for transformation except with dilution of the product in water.

Reusability

Ideally, the auxiliary product container should also be reusable. If auxiliary product containers are not reusable, companies should strive for reusable solutions.

Recyclability

At a minimum, auxiliary product containers shall be designed for recycling and be recyclable in practice and at scale by 2030.

Packaging reduction

To ensure there is no direct replacement of single-use packaging with auxiliary product containers, companies shall ensure auxiliary containers are delivering the product with less packaging than single-use containers. Ideally, auxiliary product containers should also deliver more functional units per container than single-use containers and fill a keeper container multiple times. The working group recognizes the need to specify what “meaningfully less” means and will explore determining thresholds for packaging reduction.

Format comparisons

When comparing reusable product containers to their single-use alternatives to assess packaging reduction, the format and use case of the reusable product should be comparable to that of the original product sold in single-use containers to ensure like-for-like comparisons.

Supplemental product container requirements

Supplementary products are those designed and marketed to be used with a reuse system to enhance

the customer experience but are not functional needs (e.g., optional flavour additives).

Reusability

Supplementary product containers should ideally be reusable.

Recyclability

At a minimum, supplementary product containers shall be designed for recycling and be recyclable in practice and at scale by 2030.

Packaging reduction

Furthermore, to minimize any additional plastic supplementary product containers adding to the quantity of plastic waste, if the supplemental product container is not reusable, companies should strive to ensure as many functional units are delivered with as little packaging as possible.

Reuse inclusion and exclusion examples

Detailed examples of inclusions and exclusions for all four modalities of reuse are included in a separate annex document, the link to which is available in endnote 7.

1.2 Reuse definitions and terminology

Many terms and concepts are applied in a specific way when discussing reuse systems. To ensure

common understanding, terms and definitions used by the initiative are captured below.

FIGURE 3 Definitions and terminology

Term	Definitions	Term	Definitions
Reuse	An operation by which a container is refilled or reused for the same purpose for which it was conceived, with or without the support of auxiliary products present on the market enabling the container to be refilled.	Reuseable container	Packaging designed to enable the principal components to accomplish a number of trips or rotations in normally predictable conditions of use as part of a system of reuse. Containers should be designed to achieve at least the number of loops required to go beyond the environmental break-even point to ensure that the impacts of reusable containers are less than their single-use alternatives.
Refill	A mode of reuse in which a consumer fills their own container with product. The consumer is responsible for cleaning/maintenance of the container.	Uses	One use equates to a container being filled and then subsequently emptied.
Return	A mode of reuse in which a consumer gives a container back to a company to clean and fill. The consumer is not responsible for cleaning/maintenance of the container.	Loops	The number of turns an individual packaging item takes. One loop is completed when a container has been filled for use a second time. <i>Detailed examples of loops by reuse modality are provided below.</i>
Return on the go	Consumers return the packaging at a store or drop-off point (e.g. in a deposit return machine or mailbox).	System of reuse	Established arrangements (organizational, technical or financial) which ensure the possibility of reuse , in closed-loop, open-loop or a hybrid system (ISO 18603).
Return from home	Packaging is picked up from home by a pickup service (e.g. by a logistics company).		

Loop definitions by modality

FIGURE 4 Return from home example

Subscription service – personal care item such as shampoo

In this example of a subscription service for a personal care item such as shampoo, a loop is achieved once the reusable shampoo bottle is returned to the service provider, cleaned and refilled for a new consumer.



FIGURE 5 Return on the go example

Reusable coffee cup

When the cup has been refilled successfully for a second consumer after being collected, cleaned and returned to the vendor, the cup has achieved a loop.

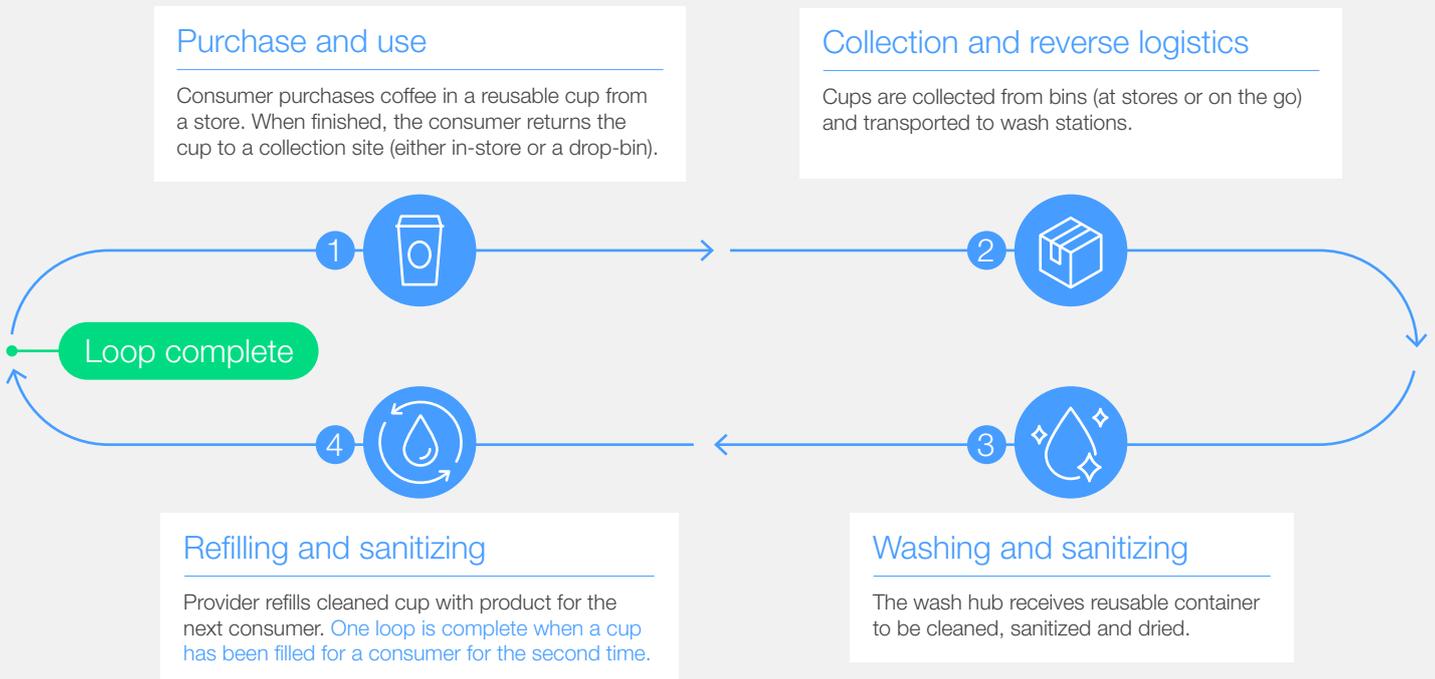


FIGURE 6 | Refill on the go example

Beverage refill station

The first loop occurs when the bottle has been filled, emptied and filled for a second time.

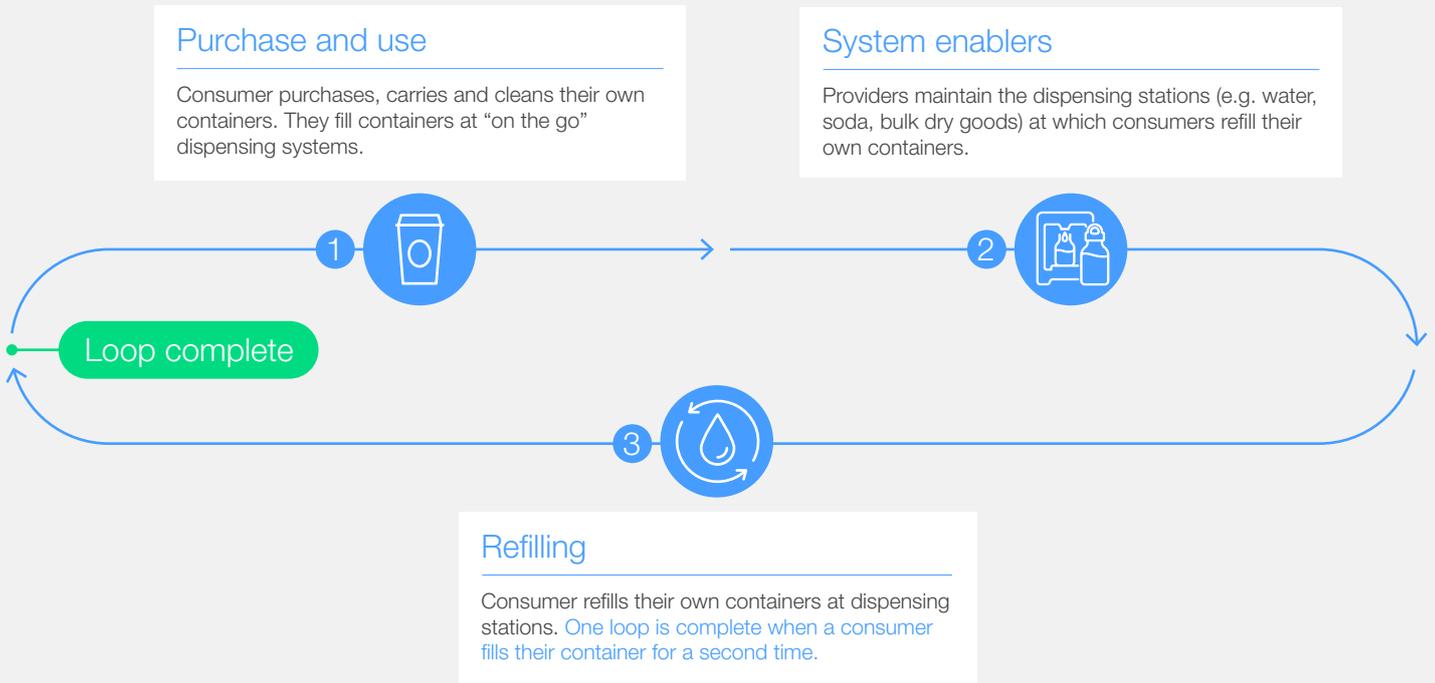
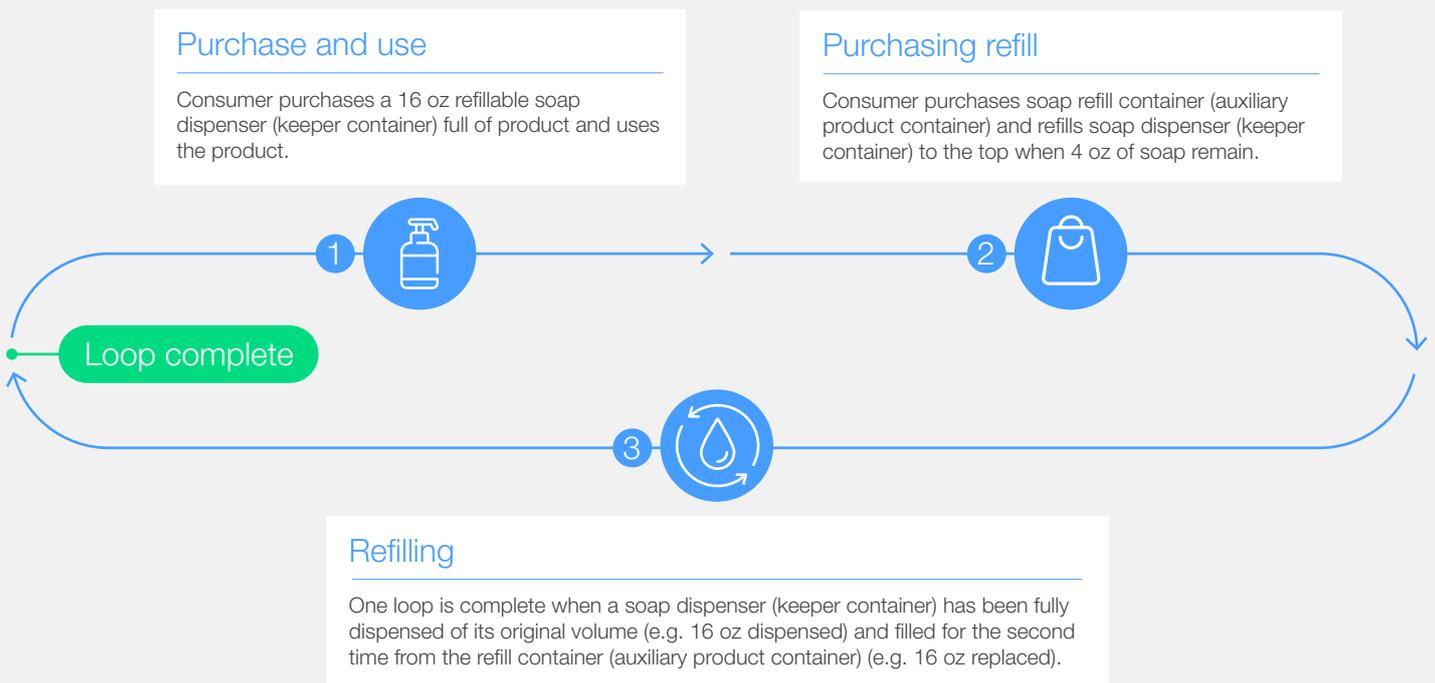


FIGURE 7 | Refill at home example

Refillable hand soap dispenser

In this example, when the first 16 oz have been dispensed and 16 oz refilled, one loop is complete. For instance, a reusable soap dispenser that dispenses 160 oz liquid soap before it reaches the end of its useful life has achieved 9 loops.



Packaging type terms and definitions

Packaging type terms and definitions are expanded upon below to ensure a common understanding.

FIGURE 8 Definitions and terminology

Term	Definitions	Term	Definitions
Primary	Consumer/retail packaging – packaging directly in contact with product.	Auxiliary product container	Container used to refill a keeper container and by which volume delivered via reuse can be determined. May serve as a proxy to inform number of loops.
Secondary	Packaging used to group a number of primary packages together (e.g. boxes).	Supplementary product	Product that can be used with a system of reuse to enhance the experience but is not required for it to function (e.g. an optional flavour additive to a beverage).
Tertiary	Packaging used for the transport of packaging units (e.g. pallets).	Supplementary product container	Container used to deliver supplementary product.
Returnable container	A type of reusable container. Container taken back or sent back to a business for cleaning and filling (e.g. a soda bottle returned at a deposit box, a ketchup bottle picked up from a home and returned to a company to refill).	B2B refill container	Container used by a business to deliver product to a refill station for subsequent access by a consumer (e.g. a bag of coffee grounds use to fill a refill station in a grocery store).
Keeper container	A type of reusable container. Container is designed to be reused and is kept by consumer to be refilled for use by the consumer in refill modalities (e.g. refillable water bottle, laundry detergent bottle). Note: a dispenser container is a type of keeper container (e.g. soap dispenser). Keeper containers may be referred to as "parent containers" in other fora.	System enabling mechanism	Product or container that is not the primary packaging itself (e.g. keeper container or auxiliary product container) but is necessary for a system of reuse to function or supports the refilling of a container (e.g. bulk dispenser, refill kiosks).
Auxiliary product	Product used to refill or load reusable container . An example of an auxiliary product is the detergent used to refill a reusable container at home (keeper container). The container used to transport the detergent home to the keeper container is the auxiliary product container (adapted from ISO 18603).	Packaging component	A part of packaging that can be separated by hand or by using simple physical means (e.g. a cap, a lid) (ISO 18601).

FIGURE 9 | Refill at home illustration

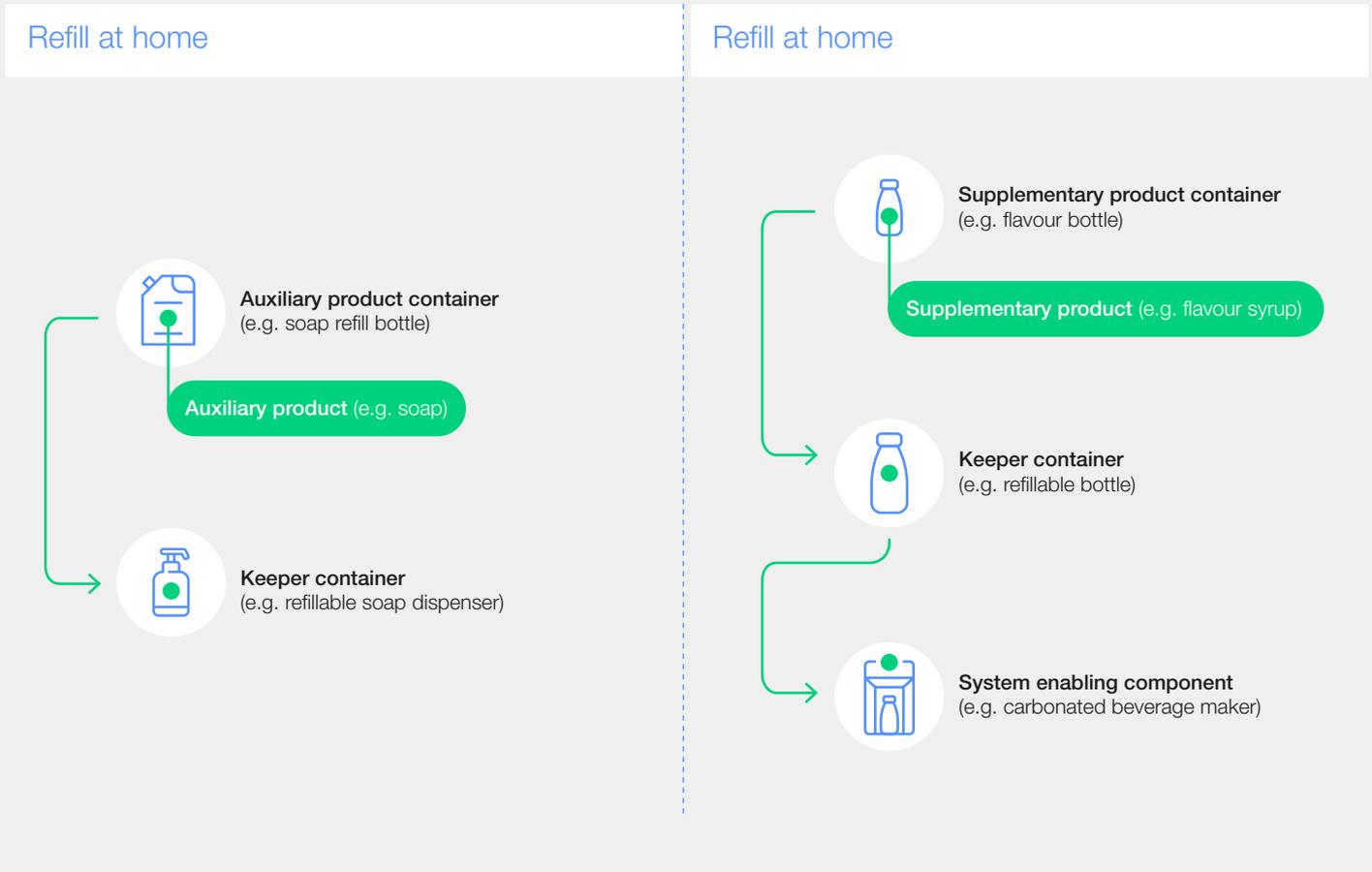


FIGURE 10 | Refill and return on the go illustration



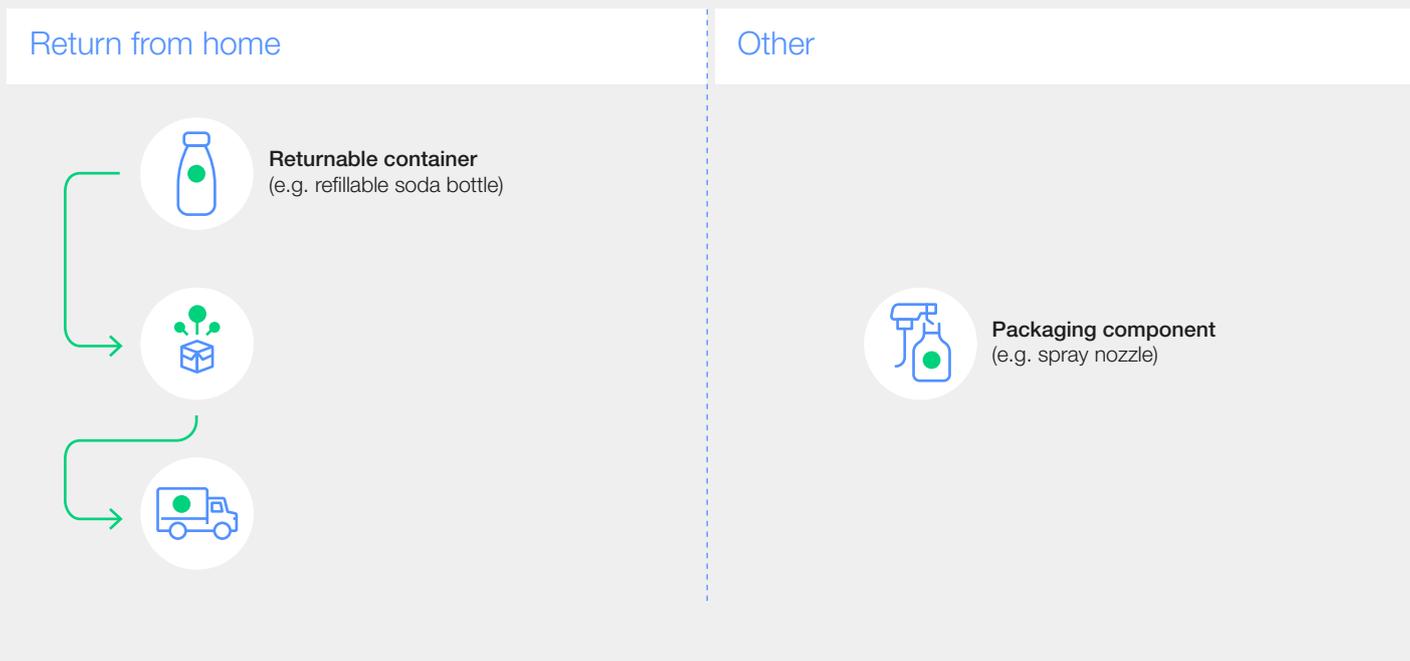


FIGURE 12

Measurement units

Measurement units

Definitions of measurement units are displayed for clarity for the remaining sections of the report.

Term	Definitions	Term	Definitions
Product portfolio	The total quantity of product produced by a company for consumption from a container . This includes items sold in bulk, fountain or alternative formats such as concentrates where the company producing and/or selling the product may not necessarily sell the container from which it is consumed.	Product unit	Specific item of package intended for use by the consumer (e.g. a can of soda, a bottle of shampoo).
Unit	A standardized measure , often convertible to a volume measure.	Unit of sale	The unit of sale can be defined using both volume and product unit . This is the number of units a company sells at the scan level (e.g. a case, a six-pack or individual item).
Functional unit	Reference unit that serves to evaluate the amount of product delivered , essentially one "serving size" of a product (e.g. number of washes a container of detergent can complete, number of brushes in a tube of toothpaste, number of servings of food or beverage in a container).	Total product volume	The total serving volume of product intended for consumption or use by a consumer . This includes the final reconstituted product volume if the only addition needed is water (e.g. in the case of concentrates and tablets intended to be mixed with water at home, the total volume should be the diluted volume but would exclude any other external ingredients).

2

Reuse measurement parameters and definitions

Leading consumer companies and NGOs convened to build seminal guidelines on reuse measurement and identified two priority metrics.

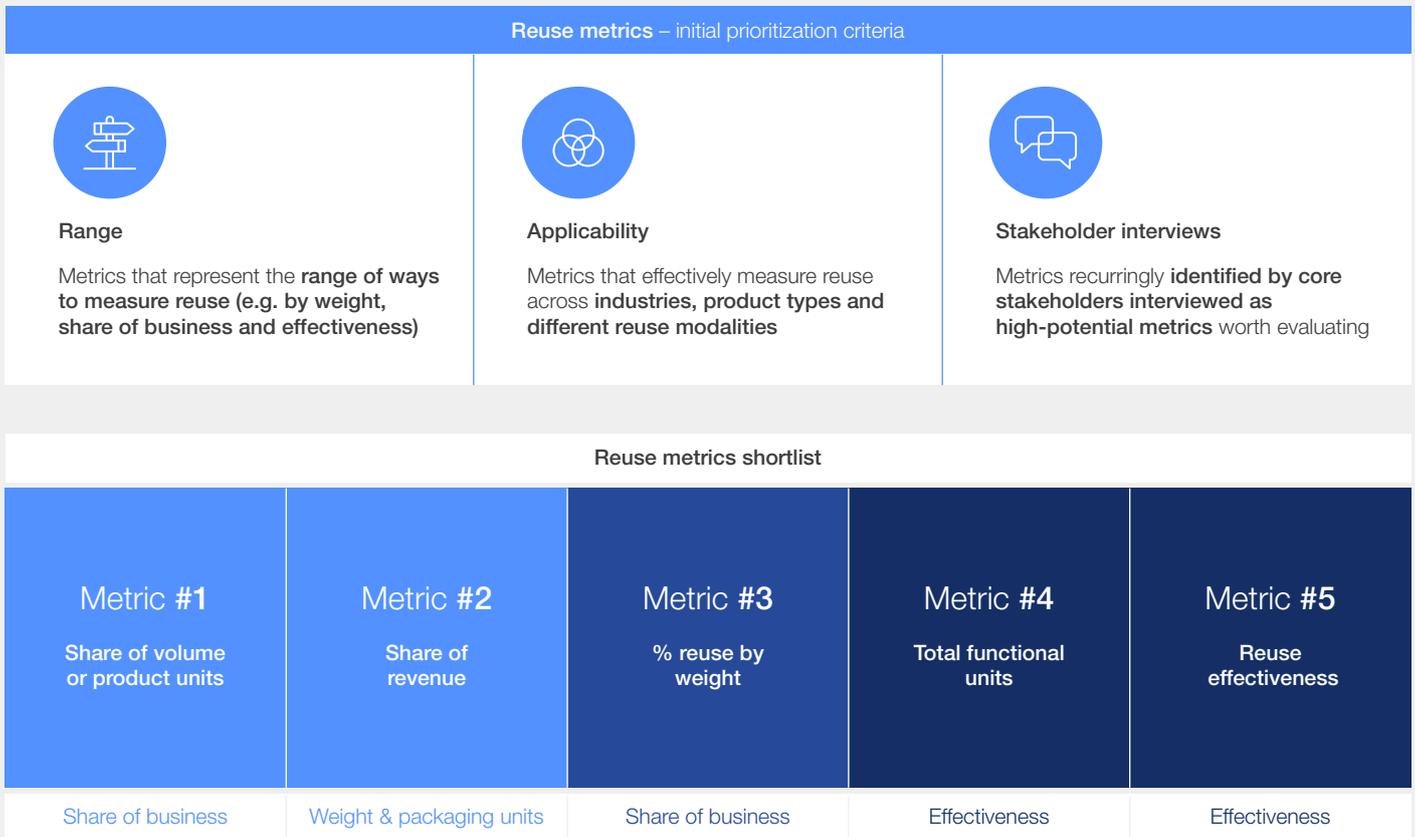
2.1 Reuse measurement guidelines journey

Metric selection approach and rationale

At the start of this effort, the group evaluated a reuse metrics longlist, categorized into four ways of measuring reuse: 1) weight/units, 2) share of business, 3) efficiency and 4) availability.

CBW conducted an initial prioritization of the longlist of 15 metrics based on three criteria: 1) range, 2) applicability and 3) stakeholder interview input. Subsequently, five reuse metrics were shortlisted for further evaluation.

FIGURE 13 Reuse metrics prioritization criteria



● Weight & packaging units ● Share of business ● Effectiveness ● Availability

The shortlisted metrics were then evaluated to understand trade-offs between metrics. Working group members discussed each metric and recommended if they should be deprioritized or tested in 2023.

FIGURE 14 Reuse metrics prioritization rationale

Metric	Summary	Recommendation
Reuse effectiveness	Measuring reuse by effectiveness , measuring % of portfolio that is actually reused by using loops achieved	<p>● Test</p> <p>Metric that best captures reuse effectiveness and scale, despite assumptions required</p>
Total functional units	Interim step to calculate reuse effectiveness metric – calculates the total # of loops per item across reusable items	<p>● Deprioritize</p> <p>Merged with reuse effectiveness metric, which builds on the calculation of this metric</p>
% reuse by weight	Measuring reuse by weight of packaging that is reusable	<p>● Deprioritize</p> <p>Driven by weight-based skews and inability to measure effectiveness</p>
Share of revenues	Measuring reuse by share of revenues (%) achieved from reuse models	<p>● Deprioritize</p> <p>Driven by inability to provide sense of scale and commercially sensitive data required</p>
Share of volume or units	Measuring reuse by volume or product units (e.g. litres of beverage, kilos of food or kilos of personal care/home care products)	<p>● Test</p> <p>Metric is applicable across modalities, sectors and products</p>

From this evaluation, the group prioritized a set of two metrics best representing progress on reuse.

1. **Share of volume or units:** Evaluates the share of volume or units sold through reuse models (e.g. litres of beverage, cubic metres of food, litres of personal/home care products) and can currently most feasibly be used by companies. This metric can be applied across modalities, sectors and products to capture the full range of reuse activities. It measures how much of a company's portfolio is reusable and reflects corporate efforts to offer products through reuse.
2. **Reuse effectiveness:** Assesses effectiveness by evaluating the average number of loops

achieved by reusable containers. This metric best captures reuse system effectiveness despite the need for data-based assumptions. By evaluating loops, this metric measures the portfolio that is actually reused and reflects how well a reuse system is working.

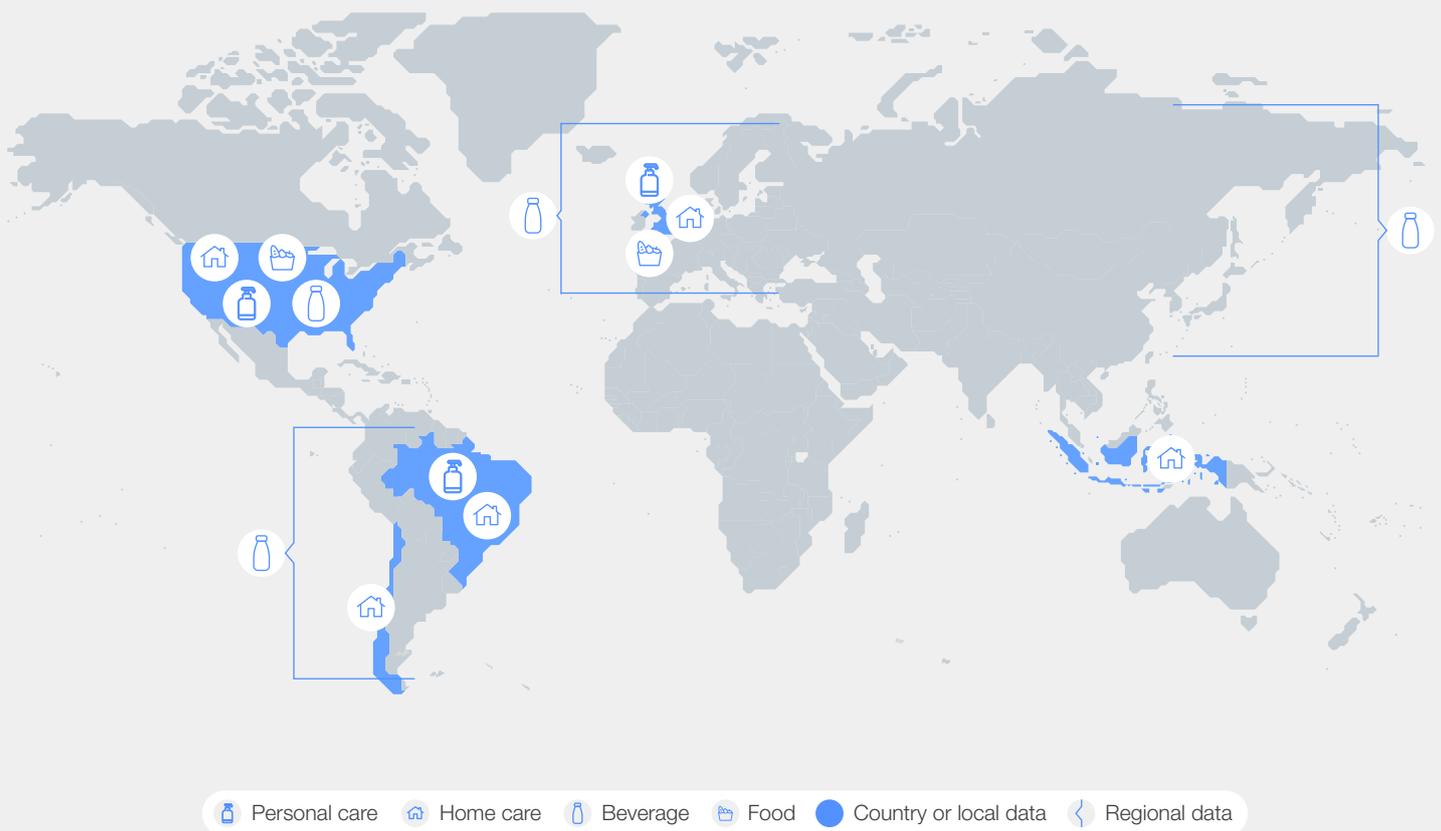
The proposed measurement approach recognizes the value in distinguishing between the share of a product portfolio that is reusable and that which is reused. There is general alignment in the group on the intent of the metrics and the need to use them together. Metric 1 is more accessible, as companies can more easily apply the metric today. Metric 2 is more challenging to implement due to a lack of data availability and visibility, and capacity building is needed.

2.2 Outcomes from piloting the guidelines

In 2023, the CBW working group companies from the consumer packaged goods (CPG) and retail sector piloted the preliminary version of

the guidelines in real-world settings against their respective reuse activities.

FIGURE 15 Corporate reuse activities



Coca-Cola and **PepsiCo** set industry-leading targets in 2022 to deliver 25% and 20% reuse by 2030. Disruptive innovation will help deliver these goals, including **Coca-Cola's** universal bottle designed to be reused across multiple brands (return on the go) and **PepsiCo's** expansion of its SodaStream business, an at-home sparkling water maker (refill at home).

Unilever has partnered with digital start-up QYOS to install refill stations in Jakarta, Indonesia, across a selection of home care brands and is extending this refill programme to the communities in its ever-growing network of waste banks in the Greater Jakarta and East Java regions (refill on the go).

Walmart is piloting a home delivery service with Loop in Bentonville and Rogers, Arkansas, offering an assortment of products in reusable containers via Walmart+ InHome (return from home).

Nestlé is partnering with the start-up Circulation in Germany for a pilot that offers Nesquik in standardized, reusable containers that Circulation rents to Nestlé and for which they handle reverse logistics (return on the go).

“ A product-based approach is preferred over linking the metric directly to packaging. Additional capacity building is needed to measure actual loops in refill modalities.

The Consumers Beyond Waste initiative convened quarterly workshops for the group to refine the guidelines, share lessons learned and support companies in applying and testing metrics.

Metric 1 lessons

Lessons learned include that a product-based approach is preferred over linking the metric directly to packaging. Additionally, measuring diluted product volumes is preferred over measuring the compacted volumes for concentrated products as it is a fairer representation of reuse volumes versus single-use volumes.

Unilever applied metric 1 to its full portfolio sales volume. Coca-Cola and PepsiCo are applying it to their total beverage volumes and aligning with their reuse commitments. Lessons such as the focus on measuring product volume rather than packaging weight, coupled with alignment on metric 1, have allowed PepsiCo to better measure its refill at home and return on the go modalities.

Metric 2 lessons

Lessons include that additional capacity building is needed to measure actual loops in refill modalities, particularly for at-home behaviour and bring-your-own models as this is currently reliant on qualitative consumer research. Furthermore, loyalty schemes and technology (QR codes and apps) can help in tracking loops/return rates but their level of simplicity and convenience is key for consumer acceptance. Lastly, return modalities are easier to measure than refill modalities.

Unilever tested metric 2 on select reuse projects. These include Omo Dilute at Home in Brazil and Dove Bodywash in the US to explore visibility into at-home consumer behaviour, Alner and QYOS in Indonesia exploring packaging QR codes and apps to understand refills/returns on the go, and a return-on-the-go pilot with ASDA and Co-Op in the United Kingdom to track return rates.



3

Calculation models and measurement approaches

The two metrics most accurately and holistically represent progress on reuse models when used in combination.

3.1 Metric 1 calculation approach

Metric 1 captures the share of a product portfolio that is reusable. It measures how much of a company’s portfolio is reusable and reflects the scale of a company’s efforts to offer products through reuse models.

FIGURE 16 Metric 1 summary and calculation

<p>Metric #1: Share of volume or units Measuring the portfolio that is reusable</p>	Summary	Volume calculation
	<p>Measuring reuse by volume* (e.g. litres of beverage, cubic meters of food, or litres of personal care/home care products) or units** (e.g. number of soap dispensers sold, servings of beverage)</p>	$\frac{\text{[Volume or units of product delivered*** through reuse models]}}{\text{[Total volume or units of product delivered*** across all formats (reuse and non-reuse models)']}}$

***Volume** shall include the final diluted volume intended for consumer use (e.g. for concentrates or tablets). Please see "volume" definition.
 ****Units:** Companies may opt to use the unit that best represents their business activity and most accurately captures their reuse activities (e.g. functional unit, unit of sale).
 *****Delivered:** Quantity of product made available for use by a consumer (e.g. quantity of product produced and sold by a CPG company, product sold by a retailer).

Metric 1 is measured against the entire portfolio to ensure the inclusion of product sold through reuse modalities and alternative formats in measurement and allows for business innovation rather than anchoring calculations to traditional packaging formats.

Measurement granularity

The volume baseline for reporting is ideally at a global category level. For companies that have more diverse product ranges, it may be necessary to segment reporting further by product type or to narrow reuse reporting to specific category types, provided companies are transparent about the scope of their reporting. Though reporting at the global, category level is desirable, transparency below this level will be crucial to understanding reuse successes and opportunities.

Additional transparency

First-fill

To guard against unintended consequences, companies should be transparent on progress by reporting the percentage of “first-fill” product volume or units sold through reuse. First-fill volume can be captured for pre-filled keeper containers or returnable bottles. Understanding the relative volume sold through first fill and refill, especially as measurement capacity for metric 2 is built, will offer insight into operational reuse success.

Reuse and refill

Companies should be transparent about the % volume sold through return and refill modalities respectively. While return and refill modalities both count towards broader reuse, visibility on this alongside information on first fill and refill volume will be useful in monitoring and promoting learning.

Recyclability

To guard against unintended increases in plastic waste, companies should be transparent about their progress by reporting the percentage of products in their reusable portfolio sold in containers that do and do not meet the recyclable in practice and at scale criteria.

Unit versus volume

The option to use units or product volume is given to capture ample data and enable broader company participation. While measurement comparability is pivotal, the main objective currently is to drive progress on reuse. Measurement in units that most accurately represent a company's reuse activities will offer a key window into this.

The Forum recognizes the working group's concern about data inconsistencies that may arise from using units other than functional units (e.g. unit of sales). The Forum acknowledges the need to refine this approach and will support capacity building to ensure comparability across companies when units are used.

Ideally, companies will be able to use both volume and units to measure reuse to shed as much light as possible on activities; however, this may not always be possible. Below are considerations for what product portfolio or corporate conditions may dictate the use of one or the other. Companies should provide transparency about the units they are using for measurement and articulate the reason for the selection.

Volume

Refers to the volume of product sold through reuse. This should be reported in cubic metres or litres to support product comparison. Using volume enables easier comparison across companies and product types regardless of the type of packaging used. Companies suited to volume measurement include a) companies with homogenous product portfolios and b) CPG companies and producers.

Unit

Companies may opt to use the unit that best represents their business activity and most accurately captures their reuse activities. The two most applicable unit types are:

- Functional unit, which captures the servings of product and allows for accurate comparison across product types, formats and modalities.
- Unit of sale, which captures the number of items sold and is more readily available data for many companies today, particularly retailers.

To support the accurate application of unit measures, standardization steps should be taken when possible to ensure like-for-like comparisons. This can include standardizing serving size or proxying volume sold using the volume of the most popular products. Companies that may prefer to measure in units include a) those with a diverse product mix, b) those with diverse product formats and c) retailers, for whom volume may be difficult to calculate.

A company selling a product across more than one reuse modality would ideally report in a way that distinguishes total volume sold through refill vis-à-vis total volume sold through return formats. The total volume sold via each modality may be added to understand reuse success across the portfolio.

3.2 Metric 2 calculation approach

Metric 2 captures the effectiveness of a company's reuse models by evaluating how often a container is reused (loops). By measuring loops, this metric reflects how well a reuse system is working. This metric is critical to avoiding unintended environmental consequences (e.g. a large quantity of product is *offered* through reuse but in practice containers are treated by consumers as single-use).

Today, many companies have limited visibility into and the ability to measure loops. The working group proposes a staggered approach to help companies build capacity and gather required data to utilize this metric.

Metric 2 was refined to increase its measurability and application. Phase 1 focuses on collecting information on reuse effectiveness. Phase 2 of the metric will include the addition of minimum targets by category to ensure the environmental performance of reuse activity is better than for single-use containers. These targets will be informed by industry data and environmental break-even analysis, and nuanced across category, material and geography. As data, technology and infrastructure improve, these targets can be adjusted while the primary metric of average number of loops remains unchanged.

Measurement granularity

Reuse effectiveness will, by necessity of the calculation, need to be measured by reuse modality to provide relevant insights. Where metric 1 can more easily be measured across modalities, metric 2 is closely linked to the delivery method. Where possible, measurement of reuse effectiveness at the category level by modality for reporting purposes is needed but additional granularity is encouraged.

Metric 2 archetypes

The visibility required to measure metric 2 varies across reuse systems and modalities. There are five archetypes for reuse modalities to approach metric 2 calculations. These archetypes are based on data availability – differences in whether containers are individually identifiable.

When containers are *not* individually identifiable, proposed approaches are applicable only to containers that are owned and/or operated by a single company to enable an understanding of the total population of containers. While metric 1 may capture the volume of product sold to consumers who bring their own BYO container, there is no accurate method to proxy the loops accomplished by BYO containers in a way that is individually identifiable.

Across the calculation approaches in the annex document, the metric 2 output (average number of loops achieved) should be very similar with similar system conditions. Individually identifiable containers do provide the further benefit of providing additional informative metrics – for instance, the average lifetime of a container or the maximum number of loops achievable – which can inform the reuse system and container design.

FIGURE 17 Metric 2 summary and calculation

	Phase 1	Phase 2
Metric #2: Reuse effectiveness Measuring the portfolio that is reused	[Average number of loops achieved]	[Average number of loops achieved] Minimum target: Standardized number of loops by category*
	<ul style="list-style-type: none"> – Initial focus on how to measure loops across reuse systems and modalities to help companies build capacity – Gather loop data to better understand how many loops are being achieved 	<ul style="list-style-type: none"> – Gather additional data and input from across the industry to inform loop targets – Explore nuance by category and geography

*Standardized loop number is informed by environmental break-even analysis data, differing by category/geography as needed.

FIGURE 18 Metric 2 archetypes

Return	Refill
Return from home/Return on the go	Refill on the go
1. Container is individually identifiable	3. Container is individually identifiable
2. Container is not individually identifiable	4. Container is not individually identifiable
	Refill at home
	5. Container is not individually identifiable; refilled with auxiliary product

Metric 2 term and calculation discussion

Time period

The expected lifetime of a reusable product will vary by product type. Ideally, containers go through loops over the course of many years depending on product type and category dynamic. However, to bound measurement of this metric to support company progress and learning, loops accomplished within a set timeframe will still provide valuable information. For reporting purposes, measurement will need to be taken on an annual basis. To support learning about reuse system effectiveness and product design, measuring loops over more time periods is encouraged.

Number of returnable containers in circulation

To bound assumptions of the total returnable containers in circulation for the purposes of loop

calculation, the number of returnable containers in circulation at the start of the time period should be proxied by using *the number of new returnable containers previously sold over the designed life of the container under conditions of normal use*. This will vary depending on the expected average container lifetime and the expected time between refills.

Uses and loops

In some modalities, “uses” may be counted to approximate loops. For purposes of calculation, 2 uses are equivalent to 1 loop. Over the lifetime of a container, loops achieved can be approximated by the total number of uses minus 1 ($n-1$).

Calculation examples for metrics 1 and 2

Detailed calculation examples for metrics 1 and 2 (including the archetypes for metric 2) are included in a separate annex document.⁷

Conclusion

The measurement guidelines allow organizations to track progress on reuse in a harmonized manner that supports target-setting.

The guidelines aim to ensure progress on reuse is measured in a consistent way, which will enable target-setting at scale. The guidelines must be continually refined to create an accepted standard that can be used across industries and organizations. To this end, the Consumers Beyond Waste initiative is seeking engagement from companies and policy-makers in advancing this strategic effort.

Metric 1 should be implementable for most companies today. Broad stakeholder adoption of this metric is needed to strengthen visibility into reuse activities and progress. Metric 2 requires capacity building to achieve its full utility. Measuring the effectiveness of reuse activities across modalities ranges from relatively easy to more challenging. For these more complex reuse applications, there remains limited visibility into the actual adoption rate. The initiative will support companies in measuring metric 2 by exploring ways to enhance data gathering and reuse implementation.

The collective aim is to support organizations in achieving more holistic and robust measurement via the implementation of technology solutions and the use of proxy datasets. This includes promoting the broad application of existing solutions and imagining new ways to capture at-home refill behaviour. Furthermore, enhanced data-sharing capabilities across companies will support the capturing of the true effectiveness of reuse systems, particularly for modalities where multiple companies provide components of a reuse system.

Finally, the initiative will continue to work with a wide range of public sector actors to promote the widescale adoption of reuse and inform measurement approaches. A broad network of organizations is working to enable the expansion of reuse activities, including the creation of enabling technology, the development of reuse infrastructure and the provision of reporting mechanisms. New policy frameworks such as the EU's Packaging and Packaging Waste Regulation will offer the needed tailwinds to accelerate the harmonization of reuse measurement and target-setting at scale.

Contributors

World Economic Forum

Thom Almeida

Lead, Circular Economic Systems,
World Economic Forum

Hannah Davin

Early Career Programme Trainee,
World Economic Forum

Kearney

Beth Bovis

Partner, Kearney, USA

Christina Carlson

Manager, Kearney; Project Fellow, World Economic
Forum, USA

Rajeev Prabhakar

Partner, Kearney, USA

Production

Laurence Denmark

Creative Director, Studio Miko

Xander Harper

Designer, Studio Miko

Danielle Carpenter

Editor

Endnotes

1. Organisation for Economic Co-operation and Development, *Global Plastics Outlook: Economic Drivers, Environmental Impacts and Policy Options*, 2022, https://www.oecd-ilibrary.org/environment/global-plastics-outlook_de747aef-en.
2. World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company, *The New Plastics Economy: Rethinking the Future of Plastics*, 2016, <https://www.ellenmacarthurfoundation.org/the-new-plastics-economy-rethinking-the-future-of-plastics>.
3. World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company, *The New Plastics Economy: Rethinking the Future of Plastics*, 2016, <https://www.ellenmacarthurfoundation.org/the-new-plastics-economy-rethinking-the-future-of-plastics>.
4. Ellen MacArthur Foundation, *The New Plastics Economy: Catalysing action*, 2017, <https://www.ellenmacarthurfoundation.org/the-new-plastics-economy-catalysing-action>.
5. Ellen MacArthur Foundation, *The Plastics Initiative: Global Commitment – Reporting Guidelines April 2023*, <https://emf.thirdlight.com/file/24/P-UF11YP-rBDj4ZP-wlEPnCi/2023%20-%20Global%20Commitment%20Reporting%20guidelines%20for%20business%20signatories.pdf>.
6. Ellen MacArthur Foundation, *The Plastics Initiative: Global Commitment – Reporting Guidelines April 2023*, 2023, <https://emf.thirdlight.com/file/24/P-UF11YP-rBDj4ZP-wlEPnCi/2023%20-%20Global%20Commitment%20Reporting%20guidelines%20for%20business%20signatories.pdf>.
7. The calculation examples for metrics 1 and 2 can be found at https://www3.weforum.org/docs/WEF_CBW_Annex_Calculation_examples_for_metrics_1_and_2_2023.pdf.



COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

World Economic Forum
91–93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744
contact@weforum.org
www.weforum.org