Pathways to Reusable Packaging: **Good Practices and Lessons from Brazil and Germany**

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Abbreviations

ABIPLAST	Brazilian Plastic Industry Association
ABRELPE	Brazilian Association of Public Cleaning and Special Waste Companies
ABREMA	Brazilian Association of Waste and Environment
ACAMAR	Association of Recyclable Material Collectors of Capão Bonito
B2B	Business-to-Business
B2C	Business-to-Consumer
DRS	Deposit-Return System
EPR	Extended Producer Responsibility
EPS	Expanded Polystyrene
EU	European Union
GACERE	Global Alliance on Circular Economy and Resource Efficiency
GIZ	German Agency for International Cooperation
HDPE	High Density Polyethylene
IBGE	Brazilian Institute of Geography and Statistics
LDPE/LLDPE	Low-Density Polyethylene/Linear Low-Density Polyethylene
NGO	Non-Governmental Organization
PET	Polyethylene Terephthalate
PICPLAST	Plastic Chain Incentive Plan
PNRS	National Solid Waste Policy
PPWR	Packaging and Packaging Waste Regulation
PS	Polystyrene
PVC	Polyvinyl chloride
SME	Small and Medium-Sized Enterprises
UNEP	United Nations Environment Programme
USD	United States Dollar
WWF	World Wildlife Fund

1 A note from the author

Dear Reader,

This Guide is the result of a year of work, but honestly, it is more than that. It is the outcome of a journey that started back in 2018, when the issue of plastic pollution first caught my attention.

I grew up in a city called Ribeirão Preto, in São Paulo State, Brazil. My hometown is not on the coast of Brazil. Actually, it is about five hours away, but I was lucky enough to have family living by the sea, in Itanhaém (also São Paulo State). Because of that, I could be next to the ocean often, and I developed a strong connection with that beautiful blue world. The ocean was, and still is, my place of peace and reconnection.

Jump to 2018: I had just started my bachelor's degree in law when everybody in Brazil was talking about plastic pollution and issues of single-use plastic straws for the turtles. That really spoke to me. Since then, I've been working with circular economy, which I believe offers a promising solution to these issues.

Time passed and in 2024 a new chapter on this journey began: the German Chancellor Fellowship. I was selected by the Alexander von Humboldt Foundation to spend over a year in Germany, working on a project about reusable packaging. I chose this topic because after years working in Brazil, whether as volunteer, researcher and/or employee with a focus on recycling, I realized that it was time to look to another "R". It was time to understand more about reuse and show its benefits.

The German Chancellor Fellowship gave me the chance to go deep into reuse and circular economy. I was also able to share experiences with 24 other fellows from Brazil, the United States of America, South Africa, India, and China, attend conferences and workshops, interview reuse stakeholders, and get to know so many wonderful initiatives. I traveled around Germany and learned more about German language and culture. And I could be part of the adelphi team, gain professional experience abroad and represent the Global South in discussions that we are not always represented.

On a personal level, I learned to find light and joy even in the dark and cold of European winter, to open my heart to the differences between Brazil and Germany without judgments, to enjoy the beauty of Berlin, to take risks, and to understand which future I aim to have.

None of this would have been possible without the people who supported me along the way, and I am deeply grateful to all of them. First, thank you to the Alexander von

Humboldt Foundation for giving me the opportunity, believing in me, and funding this project. Thank you to my host institution adelphi Research, my host by Dr. Jürgen Hannak, the PG09 Team, and especially my advisor Paolo Facco for supporting me in all stages of the project and showing me paths for the research and professional development.

I also appreciate all the reuse stakeholders for their work and for taking part in interviews that were essential to the development of this guide. Beginning with the reuse solutions, I would like to say thank you to the members of: Recup, Ebb & Flow Keg, Ravioli, SEA ME GmbH, WeCarry, City of Tübingen, Sykell, Cooperative of the German Mineral Water Companies (GDB), The Ocean Package, Nepenthes, Tiffin Loop, XPACK, and Natura Brasil. Representing the academia and the third sector, thank you to: Mariah Campos, Isabela Bonatto, Pedro Prata, Gabriela Otero, Nora Wacker, Patrícia Coelho, Nicole Seyring, Alejandra Warren, Ana Maria Castro, Marta Longhurst, and Iara Beekma Reis.

To finish this short part of the guide, I want to give my most sincere thanks to my family: my parents, Renata and Paulo, and my sister, Ana Luiza. They are my base. They are the ones that are always with me, even when we are 10,000 km apart. Every challenge here is worth it when I see their proud eyes (and sometimes tears) looking at me. The “saudades” are huge, but the certainty of our love keeps me safe. Thanks to my partner, Robert, for holding my hand in all moments and living this experience abroad with me. And to my friends, Mariana, Lívia, Emily, Luana, Erik, Ana Clara, Matheus, Mariah, and the other German Chancellor Fellows 24/25, for being by my side on this journey.

Now it is time to let you go, dear Reader. I hope you enjoy reading this Guide and that it gives you plenty of insights into how reusable packaging can help us move toward a circular economy. I would love to know your thoughts afterwards!

Enjoy the read – and let’s reuse!

Beatriz Bernardino Buccioli

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2 Introduction

The life cycle of a packaging can be linear, which means that it is produced, used, and discarded in a landfill, a dump, the natural environment, or even incinerated. However, this is not the only possible path. The concept of a circular economy has emerged to challenge this perspective and demonstrate that another life cycle should be prioritized.

In a global context where governments, companies, and civil society try to figure out how to reduce waste generation and promote a circular economy, an old solution is gaining renewed attention: reuse. Reusable packaging systems are proving to be a strategic pathway to decrease society's reliance on single-use packaging, reduce greenhouse gas emissions, save resources, and promote entrepreneurship.

Unlike single-use packaging, reusable packaging is specifically designed for multiple uses. This means it can be used, cleaned, returned or refilled, and used again, and again (WWF, 2022). Concurrently, these systems can optimize operations, enhance brand loyalty, save costs, and provide a better consumer experience (Ellen MacArthur Foundation, 2019). Good for the planet, good for consumers, and good for business.

Consequently, reuse is attracting attention from the academic community. Bradley and Corsini (2023) point out that to understand if reuse is a viable option to reduce resource consumption, it is essential to compare case studies on reusable packaging, as well as explore what needs to be adapted in different geographical contexts. Therefore, the main goal of this study is to understand how to implement better reusable packaging systems in Brazil by analyzing the reuse landscape in Germany.

While reusable packaging already has an established presence in Germany, notably in beverage and food sectors, Brazil is working to strengthen its public policies on circular economy and create spaces for more reuse initiatives. If reusable packaging is to become part of a circular future (WWF, 2022), then exchanging experiences and case studies between countries from the Global North and Global South is necessary to accelerate the development of effective solutions in a worldwide perspective.

Although, it is important to emphasize that this guide is not the result of a simplistic comparison between Brazil and Germany. That would be unfair, as these are two countries with different backgrounds, cultures, and realities. These differences must be respected and brought into consideration.

At the same time, this isn't about saying that one region's approach, whether from the Global North or South, is better than the other. Rather, it is to use Germany's experience to

show possible pathways, successes, and failures, so that Brazil and other countries can have the opportunity to adapted what have been done or create new solutions based on their own contexts. As said by Bradley and Corsini (2023, p. 138), "to avoid unwanted circular economy rebound effects, reusable packaging systems must be carefully managed and adapted according to the context".

Therefore, this guide was developed to support the implementation and improvement of reuse schemes and to offer practical recommendations based on real cases. Another important objective was to analyze the role of public policies and participation of governments that either incentivized or disincentivized reusable packaging, both on the national and international level. According to Ellen MacArthur Foundation (2023), we are now at the time that requires actions beyond voluntarism and on a global policy level.

For this reason, the target audience for this guide includes everyone working with circular economy and/or packaging projects: leaders of civil society, multinational organizations, academia, businesses, policymakers and managers. As stated by the World Economic Forum (2021, p. 7):

> *"Any shift towards reusable consumer goods will depend on the choices and actions of the three driving forces of our economy: consumers, the private sector and the public sector (including international organizations and NGOs as well as government bodies). Each of these groups has a unique role to play in making reuse a reality."*

Even though the addressed countries are Brazil and Germany, other countries with similar characteristics could be facing the same challenges. So, they can also benefit from this guide.

The study is structured into four sections. The first one explains the context of circular economy and reuse, including definitions for key terms. The second section explores the landscape of reuse in Brazil, analyzing public policies and what they bring about reusable packaging, how Brazilians perceive reuse, examples of initiatives, and how to include the waste pickers in it. The third chapter focuses on the German context, the public policies at the national and European Union levels, case studies, and lessons learned from their experiences. Finally, the last section discusses the results and recommendations for Brazil and Germany.

"Reuse offers a real solution" (UNEP, 2023, p. 1)

2.1 Methodology

This research was conducted over one year, from October 2024 to October 2025. The first step was a literature review of scientific articles1 and reports on circular economy, reuse, and reusable packaging. At the same time, interviews were conducted with stakeholders from academia and third sector organizations, aiming to understand how to produce material that could be useful and relevant for the field.

The second step involved mapping reusable packaging initiatives in Brazil and Germany based on pre-selected criteria:

- **The nature of the Business, which could be either B2C or B2B, if the consumer has direct contact with the packaging**
- **Replication potential**
- **Public authority initiative or support**
- **Involvement of materials that are relevant to Brazil**
- **Use of accessible technology**

An initiative needed to meet at least four out of five criteria to be included in the mapping. The decision to focus only on “B2C, or B2B if the consumer has direct contact with the packaging” solutions was made based on two factors: first, consumers are fundamental to this research and to the success of reuse; second, there are more studies on B2B than B2C (COELHO et al., 2020). Both B2B and B2C packaging are important, but the idea here was to highlight the latter.

The result was a table with 39 reusable packaging initiatives2 in total: 33 in Germany and 6 in Brazil, across four main sectors: beverages, takeaway food containers and cups, e-commerce, and retail for food containers, personal care and cleaning products. From this mapping, 13 interviews were conducted with members3 from each solution.

The most part of the interviews were realized with German stakeholders because of their availability. Unfortunately, the response rate to the invitation to interview Brazilian initiatives was low. Therefore, the chapter on Brazil is based mainly on literature wise, while the chapter on Germany includes an analysis of the literature and insights from the interviews.

The interviews were held remotely via Teams using the same template, recorded, and managed in English. Lastly, the interview content was systematized into categories and analyzed. The result of this process, together with the literature review, is this guide, which aims to provide practical recommendations and insights to support the development and scaling of reusable packaging systems in Brazil and beyond.Brazil and beyond.

3 Understanding Reusable Packaging Systems

3.1 Definition of circular economy

To understand reusable packaging systems, it is essential to first understand the concept behind it: the circular economy. However, this is not an easy task, as various definitions have emerged in recent years. Additionally, some misconceptions can be confusing for the general public, for example, when circular economy is associated with waste management.

To avoid further misunderstandings, this Guide adopts the following definition of the circular economy:

"A circular economy describes an economic system that is based on business models which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, thus operating at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations." (Kirchherr et al., 2017, p. 225)

3.2 Definition of reuse

Another important concept to clarify before defining reusable packaging is the proper definition of reuse. As will be seen in the next chapter, in practice this definition can have different meanings in different contexts. The base definition for this guide will be the one from the Secretariat of the Basel Convention (2017, p. 18), which established reuse as "the using again of a product, object or substance that is not waste for the same purpose for which it was conceived, possibly after repair or refurbishment."

Here, it is important to distinguish between direct and indirect reuse. In direct reuse, the object or product is designed to be used again in its original form, without necessarily being repaired or refurbished (Secretariat of the Basel Convention, 2017). In indirect reuse, repair or refurbishment is required.

3.3 Key topics about reusable packaging

3.3.1 Definition

As with the previous concepts, reusable packaging can be defined in multiple ways. For this Guide, the following definition is considered most appropriate:

> *Reusable Packaging is a packaging designed and placed on the market with the intention of being used multiple times. This type of packaging can be emptied, unloaded, refilled, or reloaded while maintaining its ability to perform its intended function. (New Reuse Alliance, 2024a)*

A key point in this definition is that reusable packaging must be designed and marketed with the intention of being reused. This means that simply giving a second life to single-use packaging at home does not qualify as reusable packaging. Reusable packaging is specifically made to be reused.

3.3.2 Systems

The reuse of packaging can occur in two distinct ways: **refilling or returning.**

In the **refill system,** the end user (i.e. consumer) owns the container. Once the content of the packaging is finished, the end user refills it with new content. The refilling can be done at home (refill at home), for example when the end user acquires refills or inserts to refill the container, or on the go (refill on the go), where the refilling can be done through a dispenser system (Ellen MacArthur Foundation, 2019; European Union, 2025).

In contrast, in the **return system,** the end user doesn't own the packaging. Instead, the owners could be the reuse system operator, a pool system, or the producer. The end user buys the product in returnable packaging, and once the content is finished, the user returns the empty packaging at a collection point (return on the go), such as a store and a drop-off station, or the business picks it up (return from home). The packaging is then cleaned and put back into circulation. Return systems typically include a deposit-refund or other incentive mechanism (Ellen MacArthur Foundation, 2019; European Union, 2025; GIZ, 2024).

The PPWR also distinguishes between closed loop and open loop systems. While definitions may vary by context and country, it is important to be aware of the legal definitions:

Closed loop system	Open loop system
"Reuse system in which reusable packaging is circulated by a system operator or a co-operating group of system participants without the change of the ownership of packaging". (European Union, 2025)	*"Reuse system in which reusable packaging circulates amongst an unspecified number of system participants, and the ownership of the packaging changes at one or more points in the re-use process." (European Union, 2025)*

3.3.3 Features

3.3.3.1 Benefits

Reusable packaging is not a new idea (Coelho et al., 2020), but it was set aside by the single-use revolution. In recent years, reusable packaging has re-emerged as a solution aligned with the circular economy, especially due to its environmental benefits, such as reducing plastic pollution and greenhouse gas emissions (UNEP, 2023).

For example, if the use of reusable cups in Brazil increases by 10 percentage points from 2023 to 2030, it is estimated that 8,753 million single-use plastic cups (250 ml equivalents) could be prevented from entering aquatic systems. In Germany, the figure is 8,679 million (Oceana, 2023).

Similarly, Reloop & Zero Waste Europe (2020) reviewed 32 studies published after 2000 and found that 72% indicated reusable packaging systems have a lower environmental impact than single-use systems. While reusable packaging has a higher environmental impact during production, this impact decreases with each reuse cycle. Therefore, achieving a high return rate is essential.

From a social and economic perspective, as stated by the Ellen MacArthur Foundation (2019), reusable packaging represents a USD 10+ billion innovation opportunity. It can also cut costs, optimize operations, build brand loyalty, and improve user experience (Ellen MacArthur Foundation, 2019)

The business case is reinforced by studies showing that, with the right infrastructure, reuse systems can be financially viable, even in determined contexts. Shared infrastructure for

logistics and cleaning, for example, can accelerate the return on investment and expand economic benefits (Zero Waste Europe, 2023).

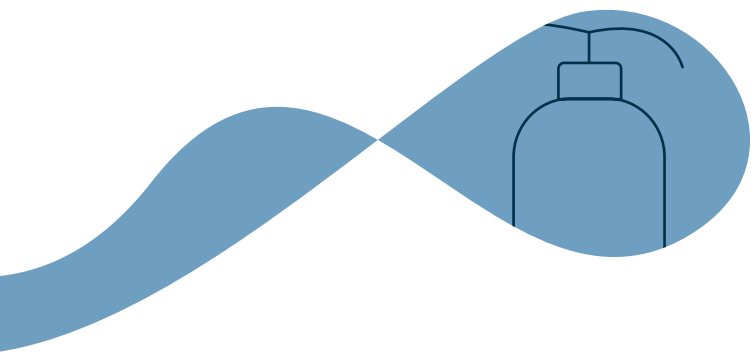
Other social and economic benefits include job creation, stimulation of local economies (Unpackaged, 2022), and collaboration with the informal sector and micro, small, and medium-sized businesses (WWF & Ellen MacArthur Foundation, 2025).

3.3.3.2 Barriers

Despite these benefits, reusable packaging is not automatically sustainable or feasible in every context (Coelho et al., 2020), and there is no one-size-fits-all solution for every category (Sustainable Packaging Coalition, 2022).

Another barrier is incentivizing consumers to be part of the reuse system. Even though environmentally conscious consumers are more likely to adopt reusable packaging, challenges remain, such as skepticism about environmental impact, concerns about product quality and safety, and lack of availability (Miao et al., 2023).

In addition, businesses in the Global South have troubles trying to expand reuse initiatives, such as difficulties in securing the necessary funding for initial infrastructure and facing regulatory limitations that restrict the use of reusable packaging for certain products, as well as the absence of unified guidelines and standards (WWF & Ellen MacArthur Foundation, 2025).



3.3.3.3 So, what could be done?

According to the literature, there are some factors that will influence the sustainability of a reusable packaging are: the amount of recycled content, material type, energy and water used, distance and transportation, impacts from manufacturing, return rate, loss rate, usage volume, disposal alternatives, and end-of-life management (Bradley & Corsini, 2023) (Coelho et al., 2020) (Sustainable Packaging Coalition, 2022).

It is also important to consider the sector in which the packaging will be used, because some sectors are more conducive to reuse than others. For example, food service, online purchases with return options, frequently consumed items (such as personal care products), and sectors with established closed-loop systems are particularly suitable for reusable packaging (Sustainable Packaging Coalition, 2022).

Design is a key factor. Reusable packaging needs to be designed to be reused. This means that the appearance should be considered to last longer, since Greenwood et al. (2021, p. 1700) point out that the appearance of the packaging can determine how many times the consumer will be willing to use it again. The design must encourage and create awareness for the consumers as

well (UNEP, 2019). And consumer engagement is another main point.

As highlighted by Licciardello (2024), plastic reusable packaging should be made to this purpose to avoid contamination, such as chemical and microbial contamination, and not compromises the quality of the material and/or release microplastics during the cleaning process.

From a policy perspective, implementing reusable packaging requires collaboration between businesses and local governments (European Investment Bank, 2024). Governments at all levels can also implement regulations on single-use packaging in high-impact sectors (such as tourism), support pilot projects, use Extended Producer Responsibility (EPR) policies to finance reuse infrastructure, establish standard designs, and help remove market barriers (European Investment Bank, 2024) (Unpackaged, 2022) (UNEP, 2023).

Finally, as said by the WWF and the Ellen MacArthur Foundation (2025, p. 5):

"To be most effective, reuse systems must be tailored to the local context, however certain universal enabling conditions can support the transition and enable countries to reap the other economic and environmental benefits associated with reuse."

This highlights the importance of understanding the specific context in which reuse systems are implemented, while also recognizing that global experiences can offer valuable insights. Therefore, the next step in this Guide is to explore what is being put into practice in Brazil and Germany.

Reuse and the UN Plastic Treaty:

At the time of writing this Guide, negotiations on the UN Plastic Treaty are ongoing. Hopefully, the final agreement will include ambitious measures to combat plastic pollution. Although, to achieve this goal it will be fundamental to consider moving from single-use to reuse, since reuse offers an approach at the upstream, and not only regarding waste management (Ellen MacArthur Foundation, 2023).

While the Treaty stands to benefit from reuse, reuse itself can also benefit from the Treaty. It will be an opportunity to put reuse an even more in the spotlight and provide support to countries to work on it from the global to the national level.

According to the New Reuse Alliance (2024b), the UN Plastic Treaty can also support reuse by setting clear targets, definitions, and supportive policies, as well as enabling international cooperation. As said by GACERE (2024, p. 14), "individual countries and businesses alone cannot realize the shift to reuse systems at a global scale without supportive legislation applied consistently across markets".

4 Unpackaging Reuse in Brazil

As reported by the Brazilian Institute of Geography and Statistics (IBGE), Brazil has approximately 212.6 million inhabitants (Government of Brazil, 2024). It is the largest country in South America and the fifth largest in the world, with an area of 8,515,767.049 square kilometers (Government of Brazil, 2022). These figures are important to keep in mind when considering the implementation of circular economy measures in a country of that size and with a colonial past. Implementing circular economy in this scenario is a challenging task that demands efforts from all the actors involved: businesses, civil society, and governments in the municipal, state, national, and international levels.

4.1 Overview of waste generation in Brazil

In terms of waste management, around 81 million tons of municipal solid waste were generated in 2023, which represents an average of 1.047 kg per capita per day (ABREMA, 2024). However, this number varies by region. The Southeast, where São Paulo and Rio de Janeiro are located, generated the highest amount, at 1.2 kg per capita per day (ABREMA, 2024).

The most recent data on waste composition in Brazil comes from 2019, based on an analysis of 186 Brazilian cities. The results showed that, of the total waste generated that year, 45.3% was organic material, 16.8% plastics, 14.1% reject waste, 10.4% paper and cardboard, 5.6% textiles, leather, and rubber, 2.7% glass, 2.3% metals, 1.4% multilayer packaging, and 1.4% other materials (including waste that should not be in the municipal stream, such as batteries, electronics, and hazardous waste) (ABRELPE, 2020).

These numbers show that packaging materials (plastic, paper and cardboard, glass, and metals) make up a significant portion of Brazil's waste, with plastics being the most prominent.

According to the Oceana Brasil (Iwanick & Zamboni, 2020), Brazil's annual domestic production of plastics is 6.67 million tons, of which 2.95 million tons are single-use plastics. Plastic bags account for the largest volume consumed, followed by cups, plates, cutlery, straws, and beverage mixers. On the other hand, the Plastic Chain Incentive Plan (PICPLAST, 2024), developed by the Brazilian Plastic Industry Association (ABIPLAST) and Braskem, estimates that in 2023, Brazil generated 4,548 thousand tons of plastic waste. Of this, 33% was LDPE/LLDPE, 20% was PP, and 18% was PET bottles, followed by HDPE, PS, PVC, other plastics, and EPS (PICPLAST, 2024). The recycling rate for the total amount produced was 20.6% (PICPLAST, 2024).

4.2 Waste pickers and Just Transition

Given this scenario, it is important to recognize the key actors involved in managing such a large and diverse waste stream. In Brazil, waste pickers play a central role regarding the success rate of any initiative related to circular economy and waste management. While numbers are not precise, estimates suggest that there are about 700,000 autonomous (informal sector) waste pickers in Brazil (ABREMA, 2024). There are also waste pickers organized in recycling cooperatives around the country.

Waste pickers are responsible for collecting a significant portion of the recyclable waste produced in Brazil, as well as sorting, processing, and commercializing it (Government of Brazil, 2025). This means that they play a crucial role in the circularity of packaging and must be included in measures related to reusable packaging as well.

Including waste pickers in reuse systems not only improves these systems, but it is also part of the concept of "Just Transition". According to the Unpackaged (2022, p.7),

Just Transitions embrace the pillars of sustainable development - generating wealth, lifting people out of poverty, improving quality of life and protecting the environment, all without compromising future generations.

Although the concept originated in the context of clean energy, it can also be applied to the circular economy and reusable packaging sectors. Workers such as waste pickers, who are already in a vulnerable position, must be included and cannot be left behind (Unpackaged, 2022).

4.3 Reuse vs "reutilização"

In Brazil, it's common to find everyday examples of "reuse", but these refer to other categories, such as repurposing and upcycling. This may be because the term "reuse" in the international sense is different than the Portuguese term "reutilização", which is associated with reuse in Brazil.

The term "reutilização", as defined by the National Solid Waste Policy (PNRS), refers to the practice of giving a new use to materials after they have already been discarded as waste (Federative Republic of Brazil, 2010). Consequently, this use is normally different than the original purpose of the material.

However, in this Guide, we focus on "reuse" in the international sense: using a product or packaging multiple times for its original purpose, without being discarded. The object does not become waste; it simply returns to the cycle of use. This distinction is important because reuse systems keep products and packaging in circulation for as long as possible, maintaining their value and reducing the generation of waste.

Here are some examples:

Recycling cooperatives and upcycling:

Some recycling cooperatives, such as Associação dos Catadores de Materiais Recicláveis de Capão Bonito - ACAMAR, transform waste into new products, adding value to it, but only after disposal. This is a way to generate extra income for the cooperative and keep materials out of landfills.

© Ateliê ACAMAR, n.d.

© Ateliê ACAMAR, n.d.

#ReuseQualy and repurposing:

The margarine brand Qualy launched an advertisement campaign incentivizing consumers to reuse their collectible packaging, but to another purpose, such as saving food at the fridge, planting, or packing snacks to take to work (Qualy, 2025).

© Screenshot from Qualy, 2025

While campaigns like the one from Qualy encourage repurposing of packaging at home, and recycling cooperatives often engage in upcycling, these practices differ from reuse systems where the same packaging is collected, cleaned, and refilled for repeated use.

4.4 Legal framework

In terms of legislation, Brazil's Federal Constitution (1988) establishes the constitutional right to environmental protection. This is provided by more than one article, but especially by Article 225 which states, among other things, that:

"All have the right to an ecologically balanced environment, which is an asset of common use and essential to a healthy quality of life, and both the Government and the community shall have the duty to defend and preserve it for present and future generations". (Federative Republic of Brazil, 1988)

Based on the constitutional dispositive, other environmental protection and waste management laws have been approved. The National Solid Waste Policy (2010), mentioned above, is one example. Even though this Policy can be used as a legal basis for circular economy, the term "circular economy" itself is not mentioned. However, some important principles of circular economy for the Brazilian context are there, such as polluter pays, respect for local and regional diversity, shared responsibility for the life cycle of products, and support and integration of waste pickers (Federative Republic of Brazil, 2010).

Currently, there are two important legislations directly related to circular economy: the National Strategy of Circular Economy, already approved, and the National Circular Economy Policy, which is in the process of being approved.

National Strategy of Circular Economy (Federative Republic of Brazil, 2024a)	**National Circular Economy Policy (Federative Republic of Brazil, 2024b)**
Approved in June 2024	Waiting to be voted on by the Congress[4]
Focuses on creating regulatory and institutional space for the circular economy and promoting strategies and measures related to it	Among other things, it aims to encourage the conscious use of resources and the prioritization of durable, recyclable, and renewable products
It is part of a program of neo-industrialization	Establishes a "Just Transition Mechanism"
It addresses reuse in its objectives by establishing the development of markets for reusable products as one of them	Defines reuse as the use of a product or material for the same purpose for which it was created for or not, and in its original form and composition. That is, without undergoing repair or refurbishment
	Prioritizes reuse as a sector to receive research and development incentives

Circular economy is becoming part of Brazilian law. However, the same thing cannot be said for reusable packaging. Although existing public policies can support reuse measures, the lack of specific policies on this topic presents a challenge for innovation.

4.5 Brazilian cases

Despite all of the challenges, reusable packaging is not new to Brazilians and some of the examples below are well-known in daily life, especially in the beverages sector. Here are the mapped study cases of reusable packaging in Brazil:

Natura

Starting year[5]: 1983

Reuse model: Refill at home

Sector: Retail - Cosmetics

© Natura, n.d.

How it works: Natura's refill system is a pioneer in the Brazilian cosmetic industry and operates by offering consumers the option to purchase refill packs for an extensive list of products such as shampoos, conditioners, body lotions, and liquid soaps. Customers are encouraged to retain the original packaging that is more durable and fill it up using the refill packs, which use significantly less material than the standard bottles. The refill products are widely available through Natura's direct sales channels and retail stores, and are usually cheaper than buying a new product, making it accessible and convenient for consumers.

© Natura, n.d.

Coca-Cola

Starting year: 1959

Reuse model: Return on the go

Sector: Beverage

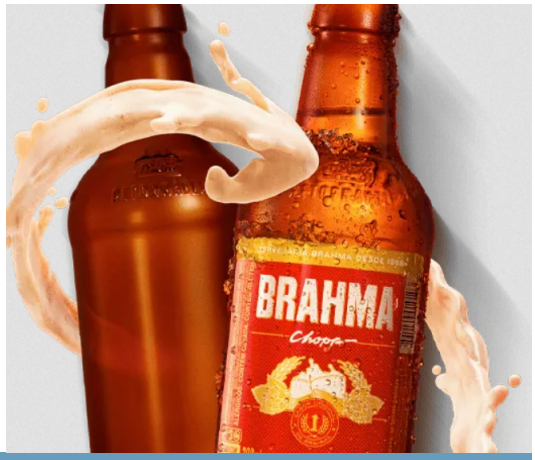
How it works: Coca-Cola offers a universal PET bottle to all their brands in Brazil (Coca-Cola, Fanta, and Sprite). After consumption, customers can return the empty bottle in retail stores all over the country, usually at the cashier, and receive a new bottle while only paying for the liquid. The empty bottle returns to the company facilities, where it is cleaned, refilled, and rebranded.

Ambev

Starting year: 1999

Reuse model: Return on the go

Sector: Beverage



How it works: Ambev's returnable packaging is shared by their beer brands (Brahma, Skol, and Antarctica). When a glass bottle is empty, the consumer returns it to one of the points of sale available in the country, such as supermarkets, bars, or convenience stores, and receives a full, new bottle while only paying for the liquid. The returned bottles are then collected and sent back to Ambev's facilities to be cleaned and refilled. Recently, they invested in partnerships and digital solutions to make the return process more convenient and accessible for consumers.

Meu Copo ECO

Starting year: 2011

Reuse model: Return on the go

Sector: Takeaway - Cups

© Copo Eco, n.d.

How it works: Meu Copo ECO's reusable packaging solution is based on either renting or implementing deposit-return schemes, depending on the client's needs. Their clients are typically events and festivals organizers, as well as companies looking to reduce their single-use packaging. They also manage the logistics for collecting and washing the used cups, ensuring safe reuse for future use.

MEU COPO ECO

Positiv.a

Starting year: around 2016

Reuse model: Refill at home

Sector: Retail – Cleaning

© positiv.a, 2025

How it works: Positiv.a offers reusable packaging mainly for cleaning products such as detergents, liquid soap, and multipurpose cleaners. The system works through refills that the consumer can purchase from Positiv.a's website or third-party resellers and then can refill their reusable packaging at home.

positiv.a

Desembala

Starting year: 2021

Reuse model: Refill at home

Sector: Retail - Cleaning

How it works: The company's model is based on providing concentrated cleaning products refills in water-soluble sachets, which are designed to be diluted by the consumer at home using reusable bottles. When a consumer makes their first purchase, they receive a reusable plastic bottle along with the concentrate. After using it, the consumer purchases refills through their online store.

Desembala

The list presented here is by no means exhaustive, and it is likely that even more initiatives exist in local contexts. However, the six examples highlighted above demonstrate that, so far, reusable packaging in Brazil is primarily driven by companies developing returnable or refillable packaging for their own products.

5 Inside the German Reusable Packaging Ecosystem

Germany is home to approximately 83 million inhabitants and covers an area of 357,569 square kilometers (Eurostat, 2025a; Eurostat, 2025b). As the most populous country in the European Union, Germany stands out not only for its demographic and territorial dimensions but also for its significant economic influence, being one of the largest economies in both Europe and the world.

5.1 What is inside the bin?

Although Germany is known for its comprehensive waste collection and recycling systems, the amount of waste generated remains considerable. The most recent data, from 2022, shows that typical household waste reached 43.7 million tons. This is equivalent to 518 kg per capita per year, or about 1.4 kg per person per day (Umweltbundesamt, 2024).

The composition of this typical household waste was: 32.4% household-like commercial waste collect by public waste collection, 15% paper and cardboard, 11.9% of organic waste from garden and park, 11.5% mixed packaging (plastic and metal), 10.7% organic waste from bins, 6% glass, 5.8% bulky waste, 5.2% others (including textiles), and 1.7% electrical appliances (Umweltbundesamt, 2024).

Once again, packaging waste is a significant portion of the total waste generated. Specifically, it's estimated that 19 million tons of packaging waste were generated in 2022, led by paper and cardboard, followed by wood, plastic, and glass. Of this, 68% was recycled (Umweltbundesamt, 2025).

Regarding plastic, WWF Deutschland (2021, p. 13) notes:

> *In 2019, Germany processed 14.2 mt of plastic, of which 12.1 mt were consumed domestically. Of the domestic consumption, 3.2 mt were packaging and other single-use products (SUP). Although packaging and SUP represent only 27% of domestic consumption, they contribute 59% to plastic waste. Moreover, over the last 25 years, Germany's plastic waste has more than doubled, growing from 1.5 mt in 2004 to 3.2 mt in 2019.*

5.2 Leading reuse in Europe

A key point about reusable packaging in Germany is its deposit-return system (DRS), considered "the world's largest and highest-performing deposit return scheme" (TOMRA, 2023) and implemented since the early 2000s. This system and the infrastructure it provides have opened the way for the development of reusable packaging initiatives not only in the beverage sector, but also for food containers, cups, and even personal care products, as we will see in the following sections.

© Beatriz Buccioli, 2025

© Beatriz Buccioli, Edeka, Berlin, 2025

Germany's DRS operates with a deposit fee that ranges from €0.08 to €0.25 for individual bottles, and €0.75 or €1.50 for half or full crates (TOMRA, 2023). However, the system is not only for reusable packaging, which means that single-use bottles can also be deposited and, after collection, are sent for recycling. Because of this, it is important not to mistake DRSs for a reusable packaging initiative. It is an infrastructure that enables the return of reusable packaging for reuse but also facilitates the collection of single-use packaging for recycling.

The deposit-return system is just one of the reasons why Germany appears to be leading reuse in Europe. As will be discussed in the next sections, there are at least 33 reusable packaging initiatives happening in the country and on private and public levels. As said by Beswick-Parsons et al. (2023), Germany's advantages go beyond environmental awareness of consumers. They combine this with commercial drivers, regulatory factors, and supply systems, as well as sector-wide alliances such as "Pro Mehrweg," which advocate for reuse.

However, this promising outlook does not mean that Germany has achieved its reuse targets or reached an ideal scenario. There is still room for improvement. As stated by WWF Deutschland (2021, p. 12), "Germany is one of the leading plastic waste exporters, has low recycled content use in packaging, and even lower like-to-like recycling rates."

5.3 Legal framework

5.3.1 Germany

The legal framework for reusable packaging in Germany has a strong foundation: the Packaging Act (VerpackG). Published in 2017 and in force since 2019, the Packaging Act introduced new obligations for producers, importers, and distributors of packaging in Germany. Its aims are to increase recycling rates and transparency in the packaging waste management system, while decreasing the use of single-use packaging.

In terms of reuse, the Packaging Act established in Article 33 states that, from 1 January 2023, companies offering takeaway food and drinks must provide reusable packaging options. There is an exception for small businesses, but these cannot refuse customers who wish to use their own reusable containers. Additionally, companies must clearly inform consumers about the availability of reusable packaging, and the reusable option cannot be offered at a higher price or under less favorable conditions than single-use packaging (Federal Republic of Germany, 2017).

5.3.2 Europe

The Packaging Act is not the only regulation incentivizing reuse in Germany. As a member of the European Union, Germany is also subject to the PPWR (Packaging and Packaging Waste Regulation, Regulation 2025/40), established in 2024 by the European Parliament. The PPWR aims to reduce the environmental impact of packaging and to standardize packaging across the EU, facilitating the free movement of goods.

Previously, this subject was governed by a Directive, which allowed each country to address the issue internally as they saw fit. With the PPWR, it has become a Regulation, meaning it must be applied more uniformly across all countries, with some adaptations for internal markets. It is also part of the new Circular Economy Action Plan (European Commission, 2020) from Europe.

Here are some topics covered by the PPWR (European Union, 2025):

- Reduction in per capita packaging waste volume in 2030, 2035, and 2040.
- Information requirements for labelling and claims, such as material composition, sorting instructions, and reuse instructions.
- Ban, especially from 2030 onwards, on certain single-use packaging, such as sauce and sugar sachets, very light bags, and packaging for fresh fruit and vegetables weighing less than 1.5 kg (with some exceptions).
- By 2030, all packaging must be recyclable, and plastic packaging must contain

recycled content (the amount will depend on the type of packaging).

- By 2030, packaging must be minimized as a rule. In addition, it cannot mislead consumers regarding the size of the product, and for grouped, transport, and e-commerce packaging, the maximum proportion of empty space is 50%.
- Producers (manufacturers, suppliers, importers, and distributors) must submit a declaration of conformity.
- Packaging that does not comply with the provisions of the Regulation may not be placed on the market.

When it comes to reuse, at least four articles regulate it: Articles 11, 29, 32 and 33. Article 11 provides the definition of reusable packaging as considered by the PPWR:

"Packaging placed on the market from 11 February 2025 shall be considered to be reusable where it fulfils all of the following requirements:

a. it has been conceived, designed and placed on the market with the objective to be re-used multiple times;

b. it has been conceived and designed to accomplish as many rotations as possible under normally predictable conditions of use;

c. It fulfils applicable requirements regarding consumer health, safety and hygiene;

d. it can be emptied or unloaded without being damaged in a way that would prevent its further function and re-use;

e. it is capable of being emptied, unloaded, refilled or reloaded while maintaining the quality and safety of the packaged product and ensuring compliance with the applicable safety and hygiene requirements, including those on food safety;

f. it is capable of being reconditioned in accordance with Part B of Annex VI, while maintaining its ability to perform its intended function;

g. it allows for affixing of labels and the provision of information on the properties of that product and on the packaging itself, including any relevant instructions and information for ensuring safety, adequate use, traceability and shelf-life of the product;

h. it can be emptied, unloaded, refilled or reloaded without risk to the health and safety of those responsible for doing so; and

i. it fulfils the requirements specific to recyclable packaging set out in Article 6, so that it can be recycled when it becomes waste." (European Union, 2024)

The definition of reusable packaging established by the PPWR provides a comprehensive and practical framework for both businesses and regulators. By setting clear and detailed criteria, it works as a standard for the development and evaluation of reusable packaging solutions in the European market. However, this can also be an issue if the particularities of internal markets are not addressed.

Articles 29, 32, and 33 provide, respectively, reuse targets, refill obligations, and reuse offer obligations for the takeaway sector. Here are some highlights from these articles:

Article 29	***Article 32***	***Article 33***
From 2030: • Beverages in general (with the exception of milk, wine, and some spirits) must have at least 10% reusable packaging, rising to 40% in 2040. • At least 10% of grouped packaging must be reusable, rising to 25% in 2040. • Only reusable packaging may be used for transport between different facilities belonging to the same company or between different companies in the same EU country. • At least 40% of transport packaging must be reusable, rising to 70% by 2040.	• From 12.02.2027, companies in the HORECA sector must offer customers the option of bringing their own containers to carry cold/hot drinks and ready-to-eat food at no additional cost.	• From 12.02.2028, companies in the HORECA sector must offer reusable packaging as a takeaway option for their customers, and from 2030, 10% of products for sale must be in reusable packaging.

Although it will take some time to see the results of the PPWR's implementation and what problems may arise along the way, the fact that Germany has ambitious domestic legislation and now a continental-level apparatus already shows how much more promising the public policy environment for reusable packaging is than in Brazil. Even though it could be even more progressive (In-Off Plastic, 2024).

5.4 German cases

After presenting the landscape and public policies shaping reusable packaging in Germany, it is important to understand how these frameworks translate into real-world action. The following case studies illustrate a variety of approaches currently implemented in the country. Nevertheless, this list is not exhaustive, and the initiatives here were selected based on the criteria described in the methodology section. Both public and private initiatives are included, while pilot projects were excluded to focus on consolidated or ongoing systems.

City of Tübingen

Starting year: 2022

Reuse model: Return on the go

Sector: Takeaway

© Westend61/Getty Images, n.d.

How it works: Since January 1st, 2022, the City of Tübingen has implemented a packaging tax on disposable items such as packaging, plates, cutlery, and straws. This local policy has significantly encouraged the adoption of returnable packaging solutions among businesses and consumers. The case gained national attention when the Federal Constitutional Court ruled in January 2025 that the tax is legal, setting an important precedent for similar initiatives in Germany.

Tübingen
Universitätsstadt

Ebb & Flow Keg

Starting year: 2021

Reuse model: Return from home

Sector: Takeaway – Wine containers

© Ebb & Flow Keg, 2025

How it works: Ebb & Flow Keg is a reusable system provider for organic wine in Germany. The company supplies winegrowers with stainless steel kegs, which are then connected to standard tap stations at venues such as restaurants, bars, and events. After the wine is served, Ebb & Flow Keg collects the empty kegs, professionally cleans them, and returns them to the cycle for reuse.

EINFACH MEHRWEG
by sykell

Starting year: 2021

Reuse model: Return on the go

Sector: Takeaway – Food containers and cups

© sykell, 2024

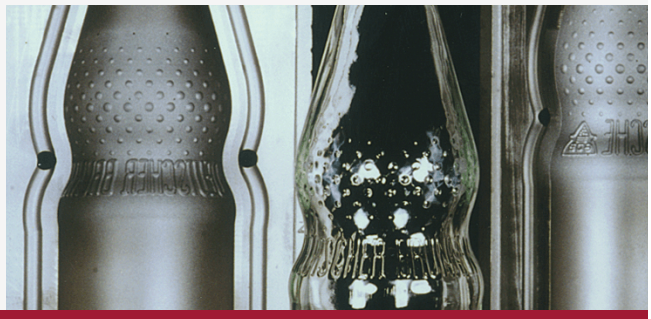
How it works: EINFACH MEHRWEG, developed by sykell, is a reusable packaging solution designed for food and drinks to go. Customers receive their items in reusable containers, which can be returned at partner locations, including deposit-return machines in participating supermarkets.

Genossenschaft Deutscher Brunnen eG (GDB)

Starting year: over 50 years

Reuse model: Return on the go

Sector: Beverage



How it works: GDB is a cooperative that manages one of Germany's largest reusable bottle systems for mineral water. About one-third of all German mineral water is bottled using GDB's standardized returnable glass bottles. After use, consumers return the bottles to retailers through deposit-return machines, and they are collected, cleaned, and refilled by member companies of GDB.

GDB Genossenschaft Deutscher Brunnen eG

Nepenthes

Starting year: 2019

Reuse model: Refill at home

Sector: Retail - Personal care

How it works: Nepenthes offers a refillable bottle inspired by nature, designed for personal care products. The company focuses exclusively on the packaging, allowing consumers to refill the bottle with any product of their choice.

nepenthes®

Ravioli

Starting year: 2021

Reuse model: Return on the go

Sector: Ecommerce – Delivery packaging

How it works: Ravioli offers reusable packaging-as-a-service for online businesses in Germany. Customers receive their orders in Ravioli's reusable packaging and, after use, can return the packaging at any DHL station nationwide. The returned packaging is then cleaned and then it is ready for a new cycle.

Recup

Starting year: 2016

Reuse model: Return on the go

Sector: Takeaway – Food containers and cups

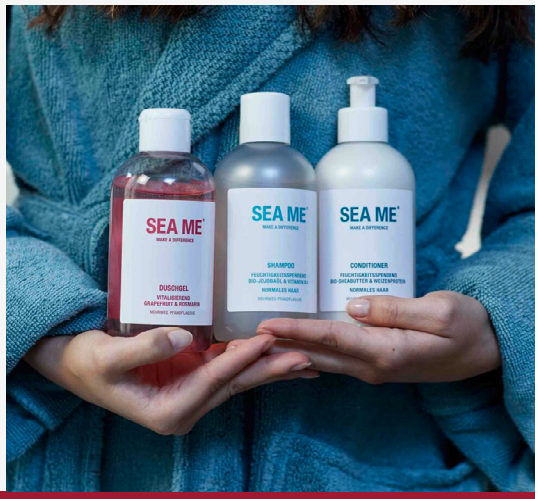
How it works: RECUP has a reusable packaging system for the food service sector, offering cups (RECUP) and bowls (REBOWL) for takeaway drinks and meals. Customers pay a deposit of 1 or 5 euros when receiving the packaging and can return it to any of the partner locations nationwide to get their deposit back. After return, the packaging is cleaned by the restaurants following instructions and put back into circulation.

SEA ME

Starting year: 2019

Reuse model: Return on the go

Sector: Retail – Personal care



© SEA ME GmbH, n.d.

How it works: SEA ME GmbH provides reusable packaging solutions for cosmetics and operates the "zerooo" system, a reusable packaging network for cosmetics and drugstores in Germany. Customers can purchase products in reusable containers and return them at participating partner locations. The returned packaging is then collected and sent back to SEA ME to be cleaned and prepared for reuse.

SEA ME®
MAKE A DIFFERENCE

The Ocean Package

Starting year: 2021

Reuse model: Return on the go

Sector: Ecommerce - Delivery packaging

© The Ocean Package, 2025

How it works: The Ocean Package provides reusable shipping boxes for businesses, focusing especially on subscription and rental services. After use, customers return the boxes, which are then collected, cleaned, and reused by the company itself.

ocean package

Tiffin Loop

Starting year: 2015

Reuse model: Return on the go

Sector: Takeaway – Food containers and cup

© Tiffin Loop GmbH, n.d.

How it works: Tiffin Loop offers a reusable food container system for takeaway meals in Germany, using containers that are not made from plastic. Customers can use the Tiffin Loop app to find participating partner restaurants, borrow containers for their orders, and return them to any partner location. The restaurants are responsible for cleaning the containers before they are put back into circulation.

WeCarry

Starting year: 2023

Reuse model: Return on the go

Sector: Retail – Bags for baked goods

© WECARRY GmbH, n.d.

How it works: WeCarry is replacing single-use paper bags with reusable textile bags. Customers can use these durable bags when purchasing baked goods and return them to any participating bakery. WeCarry also manages the process, including the collection and cleaning of the bags, ensuring they are in the condition to be reused.

xpack

Starting year: 2017

Reuse model: Return on the go

Sector: Ecommerce - Delivery packaging

© xpack green logistics GmbH & Co. KG, n.d.

How it works: xpack offers a reusable packaging system for e-commerce, allowing retailers to either clean and reuse the packaging themselves or send it back to xpack for processing. Customers receive their orders in xpack's reusable packaging and can return it at any parcel shop after use.

xpack green logistics

5.4.1 Other examples

Blaue Helden

Reuse model: Refill at home

Sector: Retail – Cleaning and hygiene products

© Blaue Helden GmbH, n.d.

Boomerang

Reuse model: Return on the go

Sector: Ecommerce – Delivery packaging

© Boomerang Systems UG, 2024

Circujar

Reuse model: Return on the go

Sector: Retail - Food containers

© Circujar GmbH, n.d.

Circolution

Reuse model: Return on the go

Sector: Retail – Food containers

© circolution, 2025

CU Mehrweg

Reuse model: Return on the go

Sector: Retail – Food containers

© CU Mehrweg GmbH, 2025

Dotch

Reuse model: Return on the go

Sector: Retail – Food containers

© dotch, 2025

Everdrop

Reuse model: Refill at home

Sector: Retail – Cleaning and hygiene

© everdrop GmbH, n.d.

Faircup

Reuse model: Return on the go

Sector: Takeaway – Food containers and cups

© FairCup GmbH, 2023

Fairfood

Reuse model: Return on the go

Sector: Retail - Food containers

© fairfood Freiburg GmbH, n.d.

Fritz-Kola

Reuse model: Return on the go

Sector: Beverage

© fritz-kola GmbH, 2025

Future Stories

Reuse model: Refill at home

Sector: Retail – Cleaning and hygiene products

© FUTURE STORIES, 2025

Hannocino

Reuse model: Return on the go

Sector: Return – Cups

Municipality: Hannover

© aha - Zweckverband Abfallwirtschaft Region Hannover, n.d.

Hey Circle

Reuse model: Return on the go

Sector: Ecommerce – Delivery packaging

© hey circle, 2025

MainMehrweg

Reuse model: Return on the go

Sector: Takeaway – Food containers and cups

Municipality: Frankfurt am Main

© FES Frankfurter Entsorgung- und Service GmbH, 2022

MealGood

Reuse model: Return on the go

Sector: Takeaway - Food containers

© mealgood, 2023

MMP

Reuse model: Return on the go

Sector: Retail – Bottles and food containers

© Mach Mehrweg Pool e.V., 2025

PFABO

Reuse model: Return on the go

Sector: Takeaway – Food containers

© PFABO, 2025

Relevo

Reuse model: Return on the go

Sector: Takeaway – Food containers and cups

© Relevo GmbH, 2024

reuse.me

Reuse model: Return on the go

Sector: Ecommerce – Delivery packaging

© reuse.me, 2024

Unverpackt für Alle

Reuse model: Return on the go

Sector: Retail - Food containers

© Unverpackt für Alle, 2025

Vytal

Reuse model: Return on the go

Sector: Takeaway – Food containers and cups

© VYTAL Global GmbH, n.d.

5.5 Insights from the German cases

The interviews with stakeholders from the German case studies were essential to provide practical insights into the current landscape of reusable packaging. These actors not only experience the day-to-day challenges of implementing and scaling such systems but also identify the key factors for success. By bringing together their perspectives, it is possible to go beyond the theoretical and regulatory frameworks, highlighting what truly drives or hinders reuse initiatives in practice.

5.5.1 Evaluating the landscape in Germany

Stakeholders involved in reusable packaging in Germany generally view the reuse landscape as advanced compared to other countries. However, they also identify several barriers to further scaling and improvement. The key points are as follows:

Culture and tradition

There is recognition that Germany has a well-established culture of reuse, especially in the beverage sector, with deposit and return systems (Pfand) that are widely known and accepted by the public. This facilitates the adoption of new reuse models, as consumers are already accustomed to returning packaging. However, this culture is stronger in some categories (such as beverages) than in others (such as wine or cosmetics), where acceptance remains limited.

Pioneer and leader

Germany is seen as one of the most advanced countries in Europe in terms of reuse systems, particularly in cities like Berlin, which are considered hubs for innovation in this field. There is also acknowledgment of the role of startups and innovative companies in developing solutions, but a perception remains that greater openness and engagement from large companies and the public sector are needed for these solutions to scale and become mainstream.

Infrastructure and Scaling

There is consensus that infrastructure and collaboration are still lacking for reuse systems to be scaled nationally and across sectors. The challenge of creating efficient collection, cleaning, and logistics networks is frequently cited, as is the need for cooperation between companies, retailers, and government.

Public policies

German and European legislation are seen as an important driver for reuse, but also as a source of complexity and, at times, frustration. There is recognition of progress, such as the legal confirmation of the tax on disposable takeaway packaging, which has encouraged the adoption of reusable systems in some cities. On the other hand, there is criticism of the lack of more ambitious policies and the exclusion of certain types of packaging from mandatory reuse targets, which may limit the impact of regulations.

5.5.2 Challenges for implementing reusable packaging solution

Although the reuse scenario in Germany is seen as advanced and a benchmark, reusable packaging initiatives still face significant challenges. The main ones are listed below:

Change in mindset and cultural acceptance:

While the culture of reuse is strong in sectors like beverages, there are frequent mentions of resistance in other segments, such as cosmetics, and the need for awareness and education campaigns to broaden acceptance. Acceptance of new concepts can be slow, both among consumers and businesses. Also, there is still resistance to changing single-use packaging to reusable packaging.

Engagement and adherence of partners (retailers, brands, restaurants):

Convincing strategic partners to join and actively participate in the reuse system, especially large brands and retail chains, can be difficult. For example, some restaurants only join reuse systems when there is a legal obligation or penalty, as many owners are resistant to change and concerned about additional costs. Even those who participate do not always incentivize consumers to use the system. However, their involvement is crucial to scale reuse, increase profitability, and ensure the system works—especially for takeaway packaging. Some interviewees reported that while they could test innovative reuse models, they struggled to scale due to lack of access to large retail chains and capital.

Financial sustainability and upfront costs:

Achieving financial sustainability is a challenge, as operating costs can be high, especially at the outset, and the model needs to be competitive with disposable packaging. This can be a barrier, particularly for startups and small businesses, which often have trouble accessing financing or government support.

Packaging lifecycle management:

There are two aspects to this challenge: managing the packaging lifecycle to minimize damage and loss during circulation and disposal, and ensuring a positive environmental impact throughout the logistics process.

Convenience and consumer participation:

Consumer involvement is essential for the system to function properly, especially to ensure high reuse rates. For this to happen, the system must be convenient, with accessible return points, reasonable prices, and straightforward processes. If consumers have to travel long distances to return packaging, or if the process is complicated or expensive, adoption will be hindered. One interviewee mentioned that return rates for their reusable packaging only increased when the deposit amount became sufficiently attractive and the number of return points was expanded. Ensuring the system is convenient and user-friendly remains a constant challenge, even for established companies.

Regulatory complexity and public policies:

Legislation can be both a facilitator and a barrier. Some of the difficulties involve complex, unclear, or insufficiently ambitious public policies, as well as challenges in adapting to new rules. For example, one report noted that legislation on reusable packaging is confusing, with rules that change depending on the contents of the packaging (e.g., for takeaway food). This creates uncertainty among partners, such as bakeries, who are unsure how to comply. Additionally, some sectors without a tradition of reuse are not covered by stricter regulations, which hinders innovation and the adoption of reusable systems. Although German legislation is considered advanced, there is criticism of its complexity in some cases and its insufficiency in others.

Reverse logistics and cleaning infrastructure:

Establishing and maintaining an efficient infrastructure for collecting, transporting, cleaning, and redistributing packaging is seen as one of the biggest challenges, especially for small and medium-sized companies. For example, smaller or early-stage companies struggle to manage all the logistics, particularly when it involves transporting packaging between different municipalities. There are also difficulties in adapting reusable packaging to production lines, vending machines, or established logistics systems.

Scalability:

All the challenges mentioned here make it difficult to scale initiatives. Most notably, the lack of infrastructure and partners means that initiatives that work well locally struggle to expand nationally. One company reported that, despite its success in Berlin, it was unable to replicate the model in other regions due to a lack of collection points and logistical support. Moving from pilot projects or regional operations to national solutions is a challenge, both because of the need for infrastructure and the complexity of coordinating multiple actors and ensuring economic viability in different regions.

Standardization and interoperability:

The lack of standardization between systems and packaging is cited as a barrier to scalability and logistical efficiency. Systems with different packaging formats complicate logistics and increase costs. For example, companies that use exclusive packaging for branding do not participate in shared pools, preventing the use of common infrastructure and reducing system efficiency. Another challenge is that creating shared systems requires cooperation between companies that are normally competitors, which can be difficult to achieve.

5.5.3 Factors of success for reusable packaging

The challenges of implementing reusable packaging systems are generally complex, ranging from logistical issues to cultural and regulatory barriers. However, the interviews show that, despite these difficulties, there are well-defined success factors that help overcome these obstacles and enable reusable packaging solutions.

High level of consumer engagement and convenience: High return rates depend on user-friendly systems, with accessible return points, simple processes, and integration into consumers' daily routines. Financial incentives (deposits, discounts, rewards) and clear communication about the benefits of reuse increase participation. The deposit amount should be tested locally: if it is too low, it does not motivate returns; if it is too high, it discourages use. Balance is key.

Example: One interviewee reported that, to increase packaging return rates, they tested different deposit amounts and simplified the return process, allowing consumers to return packaging at any partner location without bureaucracy. The digital packaging rental system also eliminated the need for an initial deposit, making it more convenient for customers.

Standardization and collaboration between companies: Standardized systems (such as shared pools) facilitate logistics, reduce costs, and increase efficiency. Collaboration between companies, including competitors, is seen as key to scaling and making the system economically viable.

Example: Cooperative systems where several companies share standardized packaging and logistics and washing infrastructure. This collaboration between competitors allows small and large companies to participate in the system, reducing costs and increasing efficiency.

Robust and efficient infrastructure: Accessible collection and refill points, efficient reverse logistics, and washing centers are essential to ensure the circulation of packaging and the viability of the system. The initial investment is high, but scale and standardization help to dilute costs over time.

Example: One initiative highlighted that it structured its operation by taking advantage of the existing network of supermarkets and points of sale for packaging collection, in addition to investing in its own washing centers. This ensured efficient reverse logistics and facilitated the return of packaging by consumers.

Clear public policies and regulatory incentives: Clear legislation, reuse targets, and tax incentives are indicated to engaging major brands and retailers and expanding the system beyond traditional sectors. Fragmented or unambitious public policies hinder the expansion of reuse.

Example: Legal requirement to offer reusable packaging in certain sectors, as well as the possibility of taxes on disposables, forced restaurants and retailers to adopt reuse systems, accelerating the expansion of these solutions.

Sustainable and adaptable business model: The system must be financially viable for all actors in the chain, with models such as pay-per-use, leasing, or shared pools. Profitability depends on scale, operational efficiency, and partner engagement.

Example: Initiatives that have adopted pay-per-use or packaging rental models, charging only for actual use, have managed to attract small establishments that would not be able to afford high initial investments.

Adaptation to the local context: Reuse solutions must be adapted to the infrastructure, culture, and economic reality of each country or region. This does not mean that international standards cannot be used, but rather that adaptations must be possible to enable better functioning.

Example: Taking advantage of the already established culture of the deposit system (Pfand) in Germany for beverages. When designing their systems, reuse initiatives incorporated return points in supermarkets and convenience stores, places where German consumers are already accustomed to returning bottles and receiving the deposit value back.

Simplicity, communication, and user experience: Intuitive, simple systems that are integrated into consumers' daily lives are more likely to succeed. Clear communication about how to return, find refills, and refill, as well as the environmental benefits and advantages of reuse, is essential for engagement.

Example: Systems that offer clear instructions on how to return or refill packaging and communicate environmental benefits in a simple way achieve greater consumer engagement. One interviewee reported that educational campaigns and direct communication at points of sale significantly increased participation.

Flexibility and experimentation: Successful initiatives start small, test different approaches (such as deposit amounts), learn from feedback, and adapt the model before scaling up. Flexibility to adjust processes and products according to context and market response.

Example: Companies that started with small pilots, testing different deposit and refill amounts, and adjusting the model based on user feedback, were able to quickly find the optimal balance to maximize returns and customer satisfaction.

Technological trends and innovation: The use of technology (tracking, digitization, automation) is identified as a trend for optimizing logistics, material lifecycle, and consumer engagement.

Example: Some companies have implemented digital QR code tracking systems, allowing them to monitor the life cycle of packaging and facilitate logistics control, as well as providing consumers with information on the status of returns.

5.5.4 Lessons from the German experience

Having outlined the context, challenges, and success factors resulting from the analysis of interviews conducted with stakeholders in reusable packaging in Germany, here are the lessons learned from the German experience:

Lesson	Brief explanation
Convenience and accessibility are essential	Consumers will only participate if the system is convenient, with accessible return points and quick processes. The closer it is to consumers' daily lives (for example, returning packaging to the supermarket where they already shop), the greater the participation.
Cultural change takes time	Even in countries with a tradition of reuse, such as Germany, changing habits and broadening acceptance for new product categories requires time, education, and awareness campaigns.
Flexibility and continuous learning	Testing, adapting, and learning from mistakes is part of the process. Starting small, adjusting the model based on feedback from users and partners, and only then scaling up is a recommended approach.
Incentives work, but they need to be well calculated	Financial incentives, such as deposits, are effective in ensuring the return of packaging. However, the amount needs to be sufficient to motivate, but not so high as to create barriers to entry or social exclusion.
Infrastructure and reverse logistics are central challenges	The existence (or construction) of an efficient collection, cleaning, and redistribution infrastructure is one of the biggest challenges and differentiators for success. Systems that leverage existing structures (such as deposit machines) have advantages.
Partnerships and collaboration are essential	Success depends on collaboration between different actors: companies, retailers, logistics operators, government, and even competitors. Strategic partnerships help give the system scale, credibility, and financial viability.
Simplicity is key	Solutions that are easy to understand and use are more likely to be adopted by both consumers and partner companies. Systems that are too complex or have too many requirements tend to generate resistance and hinder scalability.

Lesson	Brief explanation
Standardization and interoperability help scale	Standardized and interoperable systems across different brands and sectors facilitate logistics, reduce costs, and increase scalability.
The business model must be sustainable	It is essential that the system be financially viable for all involved. Leasing, pay-per-use, or per-cycle billing models may be alternatives, but the cost cannot be much higher than that of disposable packaging.
The role of public policy	Clear public policies and regulatory incentives (or disincentives for disposable products) are major facilitators. However, overly complex or unclear legislation can hinder adoption and create uncertainty.
Value the local context	Solutions need to be adapted to local realities, considering infrastructure, culture, consumption habits, and the waste management scenario.

6 Cross-Country Reflections and Recommendations

The data presented in previous chapters demonstrates that Germany and Brazil are both implementing reusable packaging solutions, though in different ways and at different scales. This chapter offers a comparative analysis of both countries and provides recommendations for enhancing their reusable packaging systems across various sectors.

6.1 Comparative reflections between Brazil and Germany

	Brazil	Germany
Relevance of packaging in Municipal Solid Waste	In Brazil, packaging accounts for a significant portion of municipal solid waste, underscoring the need for preventive measures like reusable packaging	Similarly, in Germany, packaging makes up a substantial share of household waste, reinforcing the importance of adopting reusable packaging wherever possible
Reusable Packaging System maturity	Despite having consolidated initiatives in the beverage sector, the Brazilian scenario is less structured and diversified. Therefore, the overall level of maturity is not high	A mature system with years of tradition and diversity, although there is room for improvement
Sectors included	Beverages, retail (cosmetics and cleaning products) and takeaway for events	Beverages, takeaway (cups and food containers), retail (food containers, cosmetics, and cleaning products) and ecommerce
Infrastructure	Lack of automation, limited and sporadic logistics	Robust network, automation, standardization, integrated logistics
Public policies and regulations	Legislation focuses on solid waste management, addressing reuse when packaging has already become waste and not before. In addition, recent public policies address the circular economy, but not directly reusable packaging or clear targets for reuse	National and continental legislation, with targets directly related to reusable packaging and tax incentives, which strengthens support for initiatives, even if they are not considered so ambitious in practice

	Brazil	Germany
Main challenges	Expansion into new sectors, logistics, and scalability, considering that the country has a large territory and regional and access differences, automation, social inclusion, financial incentives, and consumer participation	Expansion into new sectors, engagement with partners, consumer participation, sustainable finance, and scalability

6.2 Recommendations

Identifying the current scenarios and challenges is essential for understanding how to enhance reusable packaging systems. However, highlighting these issues without proposing actionable measures would be insufficient. Therefore, below are recommendations for both countries, Brazil and Germany, divided into public policy and governance, business and industry, and consumers, civil society, and workers. These recommendations were also developed considering the context and level of maturity of reuse systems in each country, and possibilities for collaboration between them.

6.2.1 Brazil

6.2.1.1 Public Policy and Governance

1 Creation of specific legislation for reuse

- Develop or improve existing regulatory frameworks to include clear provisions on reuse, establishing specific definitions, obligations, and incentives for reusable packaging.
- Establish progressive targets and performance indicators for the use of reusable packaging in priority sectors (beverages, food, delivery, cosmetics, e-commerce), with public and transparent monitoring.
- Include reuse as a priority before packaging becomes waste.
- Encourage the use of existing structures and logistics, such as in the beverage sector.

2 Implement tax and financial incentives

- Offer tax benefits, subsidies, or lines of credit to companies and cooperatives that invest in reuse systems, especially small and medium-sized companies and startups, and for solutions that involve materials with no market value in the recycling chain so as not to compete with the work done by cooperatives and waste pickers.
- Prioritize suppliers that use or promote reusable packaging in government tenders and purchases.

3 Integration and formalization of the informal sector

- Include cooperatives, waste pickers, and recyclers as strategic partners, with fair remuneration, training, and formal recognition in the reuse system.
- Provide social inclusion mechanisms in public reuse policies, promoting income generation and social justice.

4 Educational and engagement campaigns

- Develop national and local campaigns to raise awareness among consumers, retailers, and public managers about the benefits of reuse and how to participate in the systems.

5 Flexibility for local adaptations

- Allow municipalities to adapt policies according to their realities, within clear national guidelines.
- Encourage municipal or regional pilot projects, with continuous evaluation and the possibility of replication.

6 Monitoring, evaluation, and transparency

- Require periodic reports from companies on the volume of reusable packaging placed on the market and return rates, with public oversight and auditing.
- Adjust policies and processes based on data, promoting continuous improvement and adaptation to market changes and consumer behavior.

6.2.1.2 Businesses and Industry

1 Promote flexible and adapted business models

- Encourage experimentation with different models (deposit and return, refill, shared pools, packaging rental, subscription), adjusting them to local realities and the profile of Brazilian consumers.
- Value simple and intuitive solutions, such as manual exchange at points of sale, clear labels, and direct communication.

2 Develop partnerships and sector collaboration

- Encourage the creation of associations, consortia, or cooperatives of companies to share infrastructure, logistics, and collection points, reducing costs and increasing scale.
- Promote collaboration between competing companies, with clear rules and trust building.

3 Support small businesses and innovative startups

- Facilitate access to credit, incubation, and acceleration for reuse businesses, with technical and institutional support to overcome barriers to entry and scale solutions.
- Support the development of standardized designs that are adaptable to local realities.

4 Invest in cleaning and sorting infrastructure

- Create regional packaging cleaning and sorting centers, preferably in partnership with local cooperatives and companies, ensuring standardization, quality, and scale.
- Take advantage of and expand existing logistics infrastructure, integrating packaging distribution and collection routes.

5 Regional and sectoral pilots

- Launch pilot projects in specific cities, neighborhoods, or sectors (bakeries, fairs, local markets, food delivery, events), with continuous evaluation and the possibility of replication.
- Take advantage of the network of supermarkets, grocery stores, markets, and points of sale as locations for manual packaging exchange, replicating and expanding models already used for returnable bottles.

6 Monitor and adjust consumer incentives

- Test different deposit amounts, discounts, and rewards, adjusting according to consumer behavior and the results obtained.

6.2.1.2 Consumers, Civil Society Organizations and Workers

1 Education, communication, and encouraging participation

- Invest in clear point-of-sale communication, employee training, and educational materials to engage consumers and ensure high packaging return rates.
- Use posters, labels, and employee training to reinforce the importance of returning packaging.

2 Consumer engagement with incentives and communication

- Set deposit amounts that are affordable but sufficient to encourage returns, taking advantage of existing models.
- Implement deposit systems, discounts, rewards, or loyalty programs to encourage packaging returns.

3 Social inclusion and income generation

- Formalize partnerships with cooperatives and waste pickers, offering fair remuneration and training, promoting income generation and social inclusion. An example of how to integrate existing recycling cooperative structures into reuse systems would be to use them to clean packaging.
- It is essential to make it clear that the idea is not for reuse to compete with recycling, but rather to generate new jobs.

4 Assess the actual environmental and social impact

- Monitor indicators such as return rate, life cycles, job creation, and waste reduction, adjusting processes to maximize environmental and social benefits.
- Implement tools to assess the life cycle of reusable packaging, considering job creation, social inclusion, and environmental benefits.

5 Ease of return and convenience

- Ensure multiple accessible return points, taking advantage of existing infrastructure and integrating the system into the consumer's routine.
- Prioritize short collection and washing routes, taking advantage of existing infrastructure.
- Avoid requiring complex digital applications or processes in regions where access to technology is limited, prioritizing intuitive and accessible solutions.

6.2.1.2 Practical Roadmap to improve Reusable Packaging Systems in Brazil

Step 1
Mapping and Initial Diagnosis

- Identify priority sectors: Start with segments where reuse is already more feasible (beverages, cosmetics, food, e-commerce). Map actors and flows: Identify who the main producers, distributors, retailers, coowwperatives, and consumers are, and how packaging flows.
- Assess existing infrastructure: Analyze reverse logistics, collection points, cleaning centers, and possible bottlenecks.

Step 2
Engagement and Partnerships

- Form multisectoral working groups: Include industry, retail, cooperatives, the public sector, startups, and NGOs.
- Include cooperatives and waste pickers: Ensure the active participation of the informal sector, promoting social inclusion and income generation.
- Seek support from major brands and retail chains: They are essential to give scale and standardization to the system.

Step 3
Regulatory and Political Support

- Propose public incentive policies: Tax support, reuse targets, penalties for single use, and integration with the National Solid Waste Policy and the National Circular Economy Policy.
- Promote social inclusion: Ensure that cooperatives and waste pickers are recognized and remunerated for their role in the reuse system.

Step 4
Packaging Development and Standardization

- Develop standardized and robust packaging: Facilitate reuse, cleaning, and logistics, reducing costs and increasing efficiency.
- Adopt shared systems: Create packaging pools for different brands, drawing inspiration from successful cooperative models.

Step 5
Structuring the Return System

- Implement a deposit and return system: Set a deposit amount that is sufficient to encourage returns but affordable for consumers.
- Establish accessible collection points: Use supermarkets, pharmacies, convenience stores, and other high-traffic locations.
- Take advantage of existing reverse logistics: Use trucks and routes already in operation to collect returnable packaging.

- Create regional cleaning centers: Preferably in partnership with cooperatives to ensure scale and quality.
- Standardize cleaning processes: Follow health and quality standards, adapting procedures according to the type of packaging and product.

Step 6
Cleaning and Reprocessing Infrastructure

Step 7
Local Pilots and Gradual Expansion

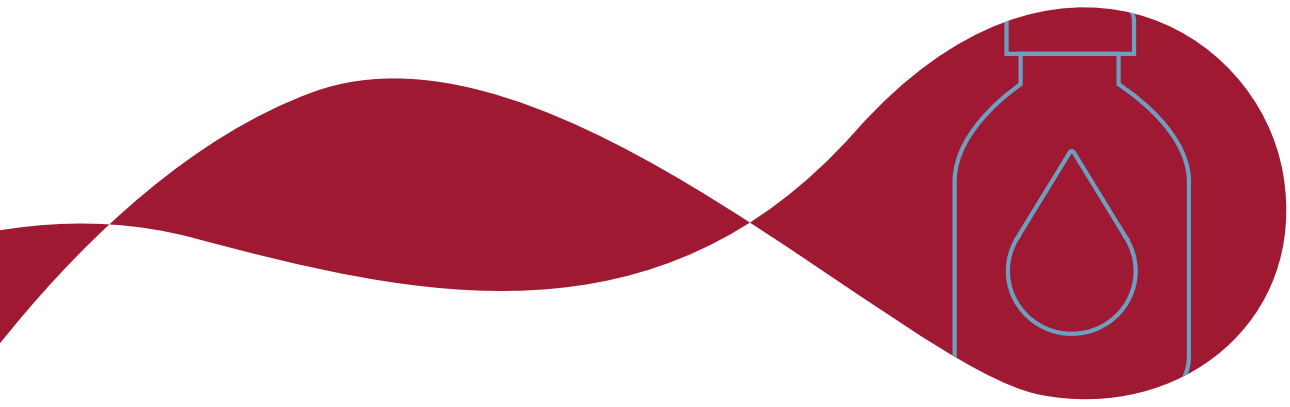
- Launch pilot projects in cities or neighborhoods: Choose regions with greater infrastructure and engagement, demonstrating feasibility before expanding.
- Monitor results and adjust processes: Evaluate return rates, costs, consumer acceptance, and environmental impacts.

- Conduct educational campaigns: Explain how the reuse system works, its benefits, and how to participate.
- Offer incentives to consumers and businesses: Discounts, rewards, or tax benefits for those who join the system.
- Transparency: Publicize results and impacts to engage more participants.

Step 8
Education, Communication, and Incentives

Step 9
Monitoring, Evaluation, and Continuous Improvement

- Monitor results and adjust processes by evaluating return rates, costs, consumer acceptance, and environmental impacts.
- Adjust the system as needed: Improve processes, expand collection points, and adapt incentives.
- Plan for expansion: After validating the model, expand to new regions and sectors.



6.2.2 Germany

6.2.2.1 Public Policy and Governance

1 Update and expand legislation to new sectors and targets

- Extend the scope of reuse policies beyond the beverage sector to include cosmetics, fresh food, delivery, and e-commerce.
- Adapt legislation to allow and encourage shared pools and interoperability between sectors.
- Update and make reuse targets more ambitious, aligning them with the country's potential and global environmental demands.

2 Simplify and harmonize legislation

- Reduce regulatory complexity by making rules clearer and more applicable to companies of all sizes, especially SMEs.
- Harmonize fees and incentives to avoid distortions between different types of packaging and sectors.

3 Continuously monitor and adjust policies

- Periodically review targets and indicators, adjusting policies in line with market and technological developments.
- Ensure transparency and social participation in monitoring results.

4 Strengthen economic and fiscal incentives

- Offer tax incentives and subsidies to companies that invest in innovation, digitization, and expansion of reuse systems, especially SMEs and startups.

5 Facilitate international interoperability

- Harmonize standards and practices with other European countries, facilitating the expansion of cross-border reuse systems, while respecting local particularities.
- Participate in international networks and associations, sharing experiences and influencing European policies.

6 Promote collaborative governance

- The government can encourage the creation of forums, associations, and consortia to facilitate collaboration between companies and act as a mediator, facilitating agreements and ensuring clear rules for shared pools.

6.2.2.2 Businesses and Industry

1 Develop collaborative and innovative business models

- Encourage business models that enable infrastructure and cost sharing, such as shared pools and partnerships between large companies, startups, and retailers.
- Encourage experimentation with new models (pay-per-use, leasing, subscription) and the digitization of processes, always offering simple alternatives for less digitized contexts.

2 Invest in infrastructure and technology

- Support the development of technological solutions for tracking, reverse logistics automation, and packaging life cycle monitoring, without creating barriers for small businesses.
- Encourage the digitization of processes but always offer accessible alternatives.

3 Support small businesses and startups

- Facilitate access to credit, financing, and technical support for small businesses and innovative startups in the field of reuse.
- Create acceleration and incubation programs specifically for reuse solutions.

4 Standardization and shared pools

- Advance the standardization of reusable packaging to facilitate logistics, cleaning, and return, without compromising brand differentiation where necessary.
- Encourage interoperability between systems and shared pools, including across different sectors.

6.2.2.3 Consumers, Civil Society Organizations and Workers

1 Strengthen communication and consumer engagement

- Develop ongoing educational campaigns on the environmental and economic benefits of reuse.
- Improve communication at the point of sale with clear labels, reminders, and employee training.

2 Expand education, communication, and engagement

- Invest in educational campaigns for consumers and businesses, reinforcing environmental, economic, and social benefits.

3 Promote social inclusion

- Consider job creation, inclusion of minorities, and integration of migrants in reuse programs, contributing to social justice and positive impact.

4 Expand return and cleaning infrastructure

- Increase the density and accessibility of return points, especially outside large urban centers.
- Invest in regional cleaning and sorting centers.

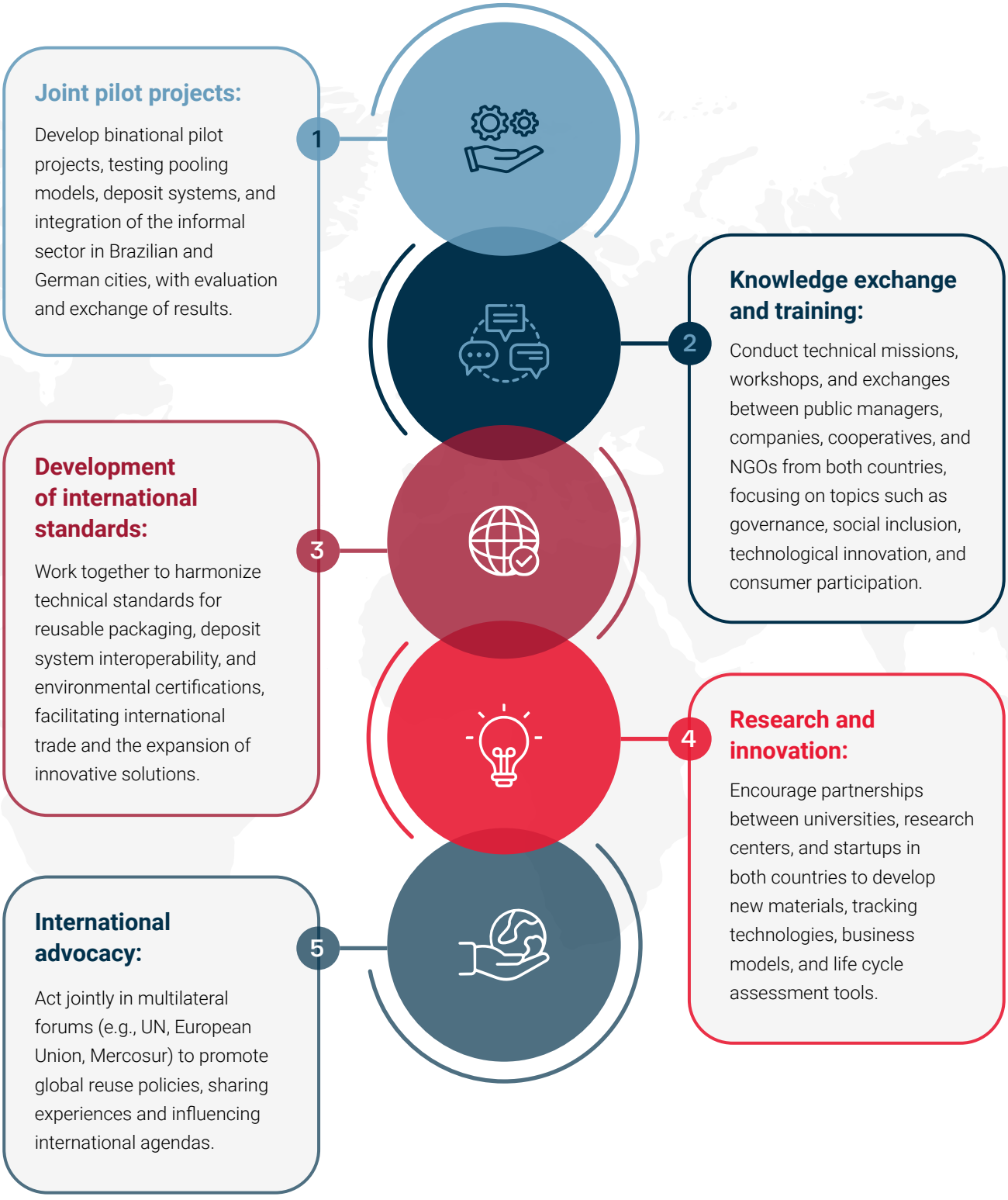
5 Continuously assess environmental and social impact

- Implement tools to assess the life cycle of reusable packaging, considering environmental and social indicators.

6 Continuously monitor, evaluate, and adjust

- Improve monitoring and transparency systems by publishing data on returns, usage cycles, environmental impact, and user satisfaction.
- Adjust policies and processes based on data, promoting continuous improvement.

6.3 Opportunities for collaboration between Brazil and Germany



7 Conclusion

This Guide set out to understand how to improve reusable packaging systems in Brazil by analyzing the landscape in Germany, a country widely recognized as a leader in this field. Despite certain limitations in conducting interviews with stakeholders in Brazil, this objective was successfully achieved.

In addition to the recommendations already outlined for advancing reuse systems in both Brazil and Germany, it became clear that reuse is just one among several circular solutions: it is not the only answer. Therefore, it is essential to understand the specific context to ensure that implementing reusable packaging truly delivers environmental benefits, rather than causing additional impacts.

Another key takeaway is that, while reusable packaging solutions must be adapted to local realities to be most effective, this does not exclude international cooperation. Countries can still collaborate, exchange experiences, develop international standards, and create replicable technologies. There is no single global model, but rather a set of principles and lessons learned that can be adapted to different contexts.

Public policies also play a crucial role in driving initiatives and fostering a more favorable environment for reuse. Even when not perfect, the mere presence of supportive policies already helps to advance the sector and encourage new solutions.

It is also evident that isolated initiatives will struggle to thrive. Effective reuse measures require the engagement of all actors: government, private sector, and civil society. Mutual support and collaboration are therefore fundamental to success.

Finally, developing reuse systems is a continuous process of testing, learning, and adaptation. Starting small, running pilot projects, collecting data, and adjusting models as needed, while prioritizing clear communication and convenient systems for all involved, are essential steps for progress.

For future research, it is recommended to deepen the analysis of the Brazilian scenario through more interviews with stakeholders, on-site visits, pilot project testing, and careful consideration of the hygiene standards required by Brazilian health authorities.

We hope this Guide not only contributes to improving reuse systems in Brazil and Germany but also serves as an inspiration for other countries seeking to advance circular solutions. The path to effective reuse is built on collaboration, openness to learning, and the shared commitment to a more sustainable future.

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