CONSEIL NATIONAL DE L'EMBALLAGE

DES PARTENAIRES POUR LE MEILLEUR DE L'EMBALLAGE

Packaging and reuse:

Challenges, opportunities and prospects

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1 Introduction

A word from the chairman

In a world where resources are limited, talking about "REUSE" seems perfectly sensible and desirable. An end to waste, a reduction in the use of non-renewable resources, an end to programmed obsolescence, an extension of product life, the use of second-hand products, the reuse of packaging - who can go against these wishes?

The topic of packaging reuse has been settled for many years in the B2B packaging sector. Wherever there is a dual environmental and economic benefit, reuse is used. A recent presentation by the Renault Group at our last “CNE PACK FOCUS” morning showed that 95% of spare parts deliveries to their European factories were made using reused "shuttle" packaging. I could provide more B2B examples.

The question now is how can this re-use, strongly advocated by the French public authorities, be extended to B2C packaging? Encompassing all types of household packaging, i.e. including out-of-home use.

The first reflex is to use the same criteria to tackle the problem: if there is a dual environmental and economic interest, we need to push reuse in B2C.

If only it were that simple!

Consumers don't just think in terms of impacts and costs. They've been living with their fast-moving consumer goods for years, and when they reuse them, they suddenly become part of a new value chain. Not to mention that the final consumer is not always the one who buys the product.

Reusing packaging in the B2C sector will therefore have to consider "consumer acceptability", to use the accepted term. Having taken part 25 years ago in the launch of refills which, at the time, failed to find takers. I can testify that even with a double environmental and economic gain, it was a failure. The 2024 context is obviously different, and consumers and their habits are likely to evolve.

Our working group's ambition is, therefore, to shed light on this topical issue of packaging RE-USE in all its aspects, both at B2B and B2C level.

Michel Fontaine, Chairman of the French Packaging Council

Summary

This document deals with two major modalities of reusing packaging whose packaged product is targeted for the consumer: reuse by refilling a parent packaging at home, and reuse of industrially-packaged packaging by marketers. After reviewing semantics and regulations, the French Packaging Council (CNE) suggests examples according to both methods.

The CNE then presents the environmental, economic, health and other challenges associated with reuse.

These challenges give rise to a debate on the opportunities and medium-term prospects for successful reuse within a complex ecosystem.

Legal context

Article L.541-1 I of the French Environment Code[1] stipulates that:

The national waste prevention and management policy is an essential lever in the transition to a circular economy. Its objectives, adopted in such a way as to respect the hierarchy of waste treatment methods defined in II[2] are as follows:

1° Give priority to waste prevention and reduction [...].

To this end, France has adopted a national trajectory aimed at increasing the proportion of ***reused packaging*** *placed on the market compared to single-use packaging, so as to reach a proportion of 5% of reused packaging placed on the market in France in 2023, expressed in sales units or sales unit equivalents, and* ***10% of reused packaging placed on the market in France in 2027****, expressed in sales units or sales unit equivalents. Reused packaging must be recyclable. [...]*

This applies to **all types of packaging**, whether household, industrial, commercial or other.

The European Union also defines a trajectory for packaging reuse in the Proposal Packaging and Packaging Waste Regulation (PPWR). When this new European law comes into force in 2026, the question of compatibility between the two trajectories will arise (on this question, see paragraph 5.1.2).

Goals

The goals of this document are to:

- Provide a reminder of the definitions and regulations in force, so as to provide a factual framework for the subject.
- Use examples to highlight the best practices of the stakeholders involved, including those within the ecosystem, and thus demonstrate the importance of their role.
- Describe the issues that need to be considered for successful B-to-C reuse (aimed at the consumer)
- Remind people that any project whatsoever must take both environmental and economic considerations into account.

[1] 1 Article of the Environment Code, stemming from the Royal Law of 1995 and the AGEC Law of 2020.

[2] Hierarchy from highest to lowest:

- prevention,
- preparation for reuse,
- recycling,
- any other recovery, in particular energy recovery,
- disposal.

Limits

This document is not intended to cover all aspects of reuse and cannot be exhaustive in the time allotted to the Working Group.

The understanding of the consumer (sociology) and his sense of action cannot be addressed.
The economic impact of deposits for reuse, or any other financial shape to encourage return, is addressed in the challenges at stake, but the consumer's perception is not (is he willing to leave money in deposits, especially if his shopping cart is full of reused packaging?).

The notion of the responsibility of a stakeholder in the chain regarding a defect in consumer quality is not addressed, as a legal analysis would need to be developed.

The geographical approach to reuse (facilitating the consumer's journey to return packaging) is not addressed (the environmental and sociological challenges of proximity to return points).

2 Definitions

The semantics used are of the utmost importance, as the notions of "deposit", "reuse" or "recovery" are very present in the public debate, while referring to different systems and interpretations depending on the various stakeholders.

Regulatory distinctions between reuse and recovery

Reused or recovered packaging[3]
"Packaging is the subject of at least one second use, for a use of the same kind to that for which it was designed, and of which the reuse or recovery is organized by or on behalf of the producer. A package that is the subject of at least one second use by being filled at the point of sale as part of bulk sale, or at home in the case of a refilling device organized by the producer, is deemed to be reused"

Reuse[4]
"Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived".

Recovery[5]
"Any operation by which substances, materials or products which have become waste are used again."

Preparation for reuse[6]:
"Any control, cleaning or repair operation with a view to recovery by which substances, materials or products that have become waste are prepared for reuse without further pretreatment".

Regulatory distinctions between deposit and bonus

Financial deposit[7]
Returnable packaging is packaging for which the consumer pays a deposit at the time of purchase, which is then returned to the consumer when the empty packaging is returned to a dedicated collection point. This sum of money, paid by the consumer, is added to the product's selling price.

A deposit is to be distinguished from a bonus. Under a bonus scheme, no money is paid by the consumer at the time of purchasing the product, but a sum of money (in the form of vouchers, discount coupons, donations to associations, etc.) is awarded when the empty packaging is returned to a dedicated collection point. Unlike a deposit, a bonus does not involve any additional money in the product's selling price.

In both cases, financial incentives are used to encourage consumers to return packaging, by giving it a financial value.

[3] Article R541-350 of the Environment Code.
[4] Article L. 541-1-1 of the Environment Code.
[5] Article L. 541-1-1 of the Environment Code.
[6] Article L. 541-1-1 of the Environment Code.
[7] Source ADEME (French Agency for Ecological Transition) : Consigne pour réemploi et recyclage des bouteilles de boissons- février 2021 (Deposit for reuse and recycling of beverage bottle - february of 2021).

3 Overview of the modalities of reuse

Foreword

The CNE, which does not claim to be exhaustive, provides an investigation of a number of packaging reuse methods using the following analysis filter:

- Prioritization according to packaging reuse potential, in particular by scaling up, based on ADEME[8] study of packaging reuse development potential by the business sector.

- Focus on 80/20 or the Pareto's Law: 80% of a project's consequences derive from around 20% of its causes. In other words, a small percentage of causes generates a very large effect. This is an essential concept for identifying priority actions, i.e. those which will have the greatest impact and be most useful for the assigned objective. Put another way, for reuse, the 80/20 rule makes it possible to determine where to concentrate efforts in order to maximize the results of the reuse installation.

- Investigation of fast-moving consumer goods products for which packaging reuse "seems" accessible (e.g., by duplicating an existing system in certain distribution channels or Good Practices present in certain markets).

On the following page, the CNE provides a simplified classification of reuse systems[9], bearing in mind that a complete, exhaustive description of reuse has been drawn up by ADEME (see bibliography).

[8] https://librairie.ademe.fr/dechets-economie-circulaire/6532-potentiels-de-developpement-du-reemploi-des-emballages-par-secteur.html

[9] Classification inspired by the document from the Ellen MacArthur Foundation : https://emf.thirdlight.com/file/24/_A-BkCs_aXeX02_Am1z_J7vzLt/Reuse%20%E2%80%93%20rethinking%20packaging.pdf

Simplified diagram of re-use modalities

(Source: Reuse-rethinking-packaging from the Ellen Mac Arthur Foundation)

1- Refill/reconstitution of the product at home by the consumer

For this modality, there are the notions of:

- Reuse of an original packaging to facilitate product use
- Refill-packaging pair to refill this parent packaging at home
- Reuse of a parent packaging to recreate a product from a concentrate, powder or compacted tablet.

2-Return from home

For this method, there are the notions of:

- Empty reusable packaging is picked up from the consumer's home by a collection service (e.g. a dedicated company).
- Empty packs are potentially taken back at the same time as full packs delivered (to optimize reverse logistics).
- A financial deposit is tied up to the reused packaging

For further information, please see:

- Example of Tesco's Loop[10]experiment
- Example of Le Fourgon
- Example of La Tournée

3-Refill on the go

For this method, there are the notions of:

- Users fill or have their reusable containers filled away from home
- In-store distribution systems

Method that covers all products sold in bulk (whether in solid or liquid form).

4-Return on the go

The packaging is filled by the marketer of the fast-moving consumer goods. For this method, there are the notions of:

- Sale of pre-packaged products by the marketer
- Once emptied of its product, the consumer returns the reusable packaging to the store
- Packaging washed between uses by the marketer (or a service provider)
- Financial deposit eventually tied up to the packaging

[10] https://www.tescoplc.com/media/759307/tesco-reuse-report.pdf

According to the analysis filters proposed on page 7, this document deals with :

- Modality 1
- Modality 4

Methods 2 and 3 are not covered in this document:

Modality 2 concerns specific applications with distribution methods in the making. This is a distribution system[1112] that "frees" the consumer from the obligation to return empty packaging to the store; a system that combines a reuse offer with a home-delivery offer and removes the consumer annoyances mentioned in the challenges of this document.

Method 3 generally concerns products in bulk and is widely documented (see bibliography).

[11] For more information: https://www.lefourgon.com/
[12] For more information: https://landing.la-tournee.co/

3.1. Refilling/reconstitution of product at home by the consumer

Modality 1 (see page 8) deals in particular with the notion of refill and original packaging.

- Under European regulations**, the refill is an operation:**

For PPWR, « refilling » is an operation whereby an end-user fills his own container, which acts as a packaging, with one or more products offered by the end-distributor as part of a commercial transaction.
"Refill station": a place where an end-distributor offers end-users products that can be purchased by refill.

Thus, Articles 24 and 25 of PPWR make a clear distinction between "reuse" and "refill"; refilling is not considered reuse. Moreover, a refill, as an object, is not counted towards reuse targets, whereas it is in the French framework of the Reuse Observatory

- In French regulations, **the refill is an object:**

CNE's definition of a refill[13]

"Within the framework of the 3R strategy and the AGEC law (Anti-Waste for a Circular Economy Act), objectives and conditions for reuse have been set. Refill must fit into this framework.

1. *The refill must not be designed to be used independently of the refillable packaging. The refill is not a product that can be used as is.*

2. *The refill must always be associated with a refillable package (or a parent packaging according to the ADEME terminology) and serve as an intermediate packaging to refill the refillable package available at home or at the professional's.*

3. *Most of the functionalities must be provided by the refillable package.*

4. *Refill must be a recyclable packaging.*

5. *The refill must not result in a transfer of impact to other packaging (multipack, logistics packaging, etc.) greater than the impact savings achieved by the refillable packaging solution with refill.*

6. *The environmental impact of the refillable packaging solution with refill must be less than the use of single-use recyclable packaging."*

[13] https://conseil-emballage.org/wp-content/uploads/2022/10/EN-Note-de-Position-CNE-Definition-de-la-recharge-V2.pdf

Parent packaging[14]

Parent packaging is a package associated with an intermediate package (recharge) that enables it to be refilled.
A parent package may be counted as reused when it is refilled by means of recharge if it meets the following 3 criteria:

Criterion 1: The existence of a "parent packaging and intermediate packaging" pair

- Reusable parent packaging, conceived and designed by the producer in order to be refilled and reused (a container offered for sale without containing any product inside or not intended to be filled at the point of sale is not considered to be packaging);
- Single-use intermediate packaging (recharge), conceived and designed specifically by the producer in order to fill the parent package at home.

Criterion 2: The intermediate packaging does not fulfill the same functions as its associated parent packaging and cannot be used without it.
At least one of the following conditions must be met for this criterion to be valid:

1. The intermediate packaging is not reclosable, which means that once opened, the product is no longer protected.
2. The intermediate packaging is reclosable but enables multiple filling of the parent packaging.
3. An additional component present on the parent package is necessary in order to be able to use the recharge.

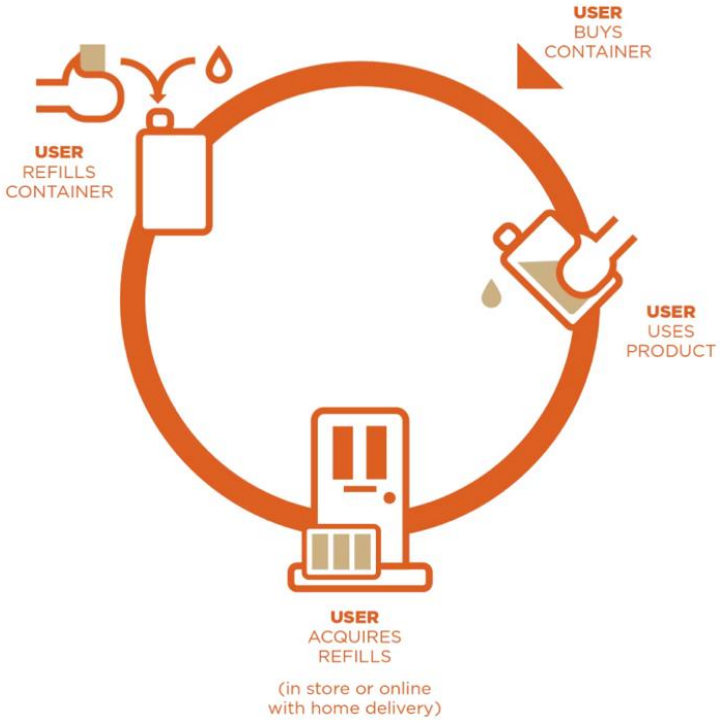
Criterion 3: The parent packaging is recyclable

[14] Source: ADEME- Counting the reuse of packaging in France
https://librairie.ademe.fr/ged/7888/comptabilisationreemploi-2023-rapport-en.pdf

3.1.1 Unit operations of the modality

The consumer buys the product packaged in reusable packaging (parent packaging). They use the product at home, and once the reusable packaging has been emptied of its contents, the consumer buys the product packaged in refills.

During refilling, the product can be poured as it is into the reusable packaging in either solid or liquid form, or it can be reconstituted by diluting with water of a refill whose product is concentrated in liquid form or compacted in solid form.



3.1.1 Examples

3.1.2.1. Cleaning Products and detergent from Hydrachim[15]

Parent packaging:

The spray bottle

Refill

An example of reuse in the BtoB detergents market is the use of a spray bottle (parent packaging) which the user buys once with the product. As soon as the bottle is emptied of its contents, simply buy refills of the concentrated product to be diluted in water[16].

These 50 ml refills can be used to refill 750 ml sprayers. These refills are fully recyclable.

They can reduce the quantity of packaging by 80% (by mass), and also save storage and transportation costs by reducing palletization.

	Spray bottle	Refills	Gain in palletizing
Palletization of empty packages	905	12 000	X 13
Palletization of finished products	432	5 544	X 12

[15] Source FHER and Hydrachim

[16] Comment reconstituer le produit ? (How to reconstitute the product ?) https://youtu.be/jQq3ONwi7Yk?si=QKyNM6vXo6noscS2

3.1.2.2. Salveco's[17]cleaning products

A range of concentrated products for dilution in water.

Parent packaging:

Spray bottle

Refill

To meet the challenges of sustainability and waste reduction associated with its packaging, Salveco has developed a solution for reusing spray bottles (parent packaging) using compact refills. Consumers will be able to reuse their empty product bottle at least 10 times (the limits of reuse being due to wear and tear on the sprayer mechanism).

The consumer can reconstitute the final product, without any direct contact with the concentrated product contained in the refill, guaranteeing optimum safety and hygiene.

[*in order: 1- fill the bottle with 450ml of water; 2- Screw refill onto bottle neck; 3- Put the spray gun back on, shake, and you're ready to go.]*

Reducing volumes per product concentration, and consequently the weight of packaging, limits the use of plastic, the volume of waste and the carbon footprint associated with transportation:

- Transportation and storage savings of around 78%, since 1 pallet of refills is equivalent to 4.5 pallets of ready-to-use products.
- 70% reduction in the weight of packaging used by reusing the same bottle with refills, compared with a conventional purchase of ready-to-use bottles (base: 10 reuses).

The 50 ml refills are made of HDPE (High Density Polyethylene) and are recyclable.

This concentrated product model is designed for both private and professional use.

[17] Source: FHER and Salveco

3.1.2.3. VICHY DERCOS©-KERASTASE© shampoo products

VICHY DERCOS© offers a 500 ml refill for its shampoo: it can be used to refill 200 ml and 400 ml bottles (parent packaging). This reduces the mass of plastic used in a 400 ml bottle (or 2 x 200 ml bottles) by over 70% with a 500 ml refill, saving 8 tonnes of plastic per year.

KERASTASE© offers a 500 ml refill to refill the bottles (parent packaging) of the six top-of-the-range KERASTASE© bath 250 ml references (Genesis, blond absolu, Nutritive, etc.). This reduces the quantity of plastic by at least 80% in mass, compared with a 500 ml soft refill with two 250 ml bottles, i.e. 7 tons of plastic saved per year.

In BtoB settings, the L'Oréal Professionnel brand offers flexible 1.5-liter shampoo packets for refilling original bottles in hair salons.

3.1.2.4. Cosmetics

L'OREAL PARIS Hair Mask

L'Oréal Paris offers a refillable hair mask for the Chinese market, with a 54% mass reduction in the quantity of plastic, i.e. 14 tons of plastic saved per year.

Prada Beauty

To reduce the use of resources for packaging, L'Oréal is marketing a growing number of refillable products. In 2023, for example, Prada launched the Prada Beauty line of refillable skin and face care products. Refills are a key lever for reducing packaging footprints.

In 2023, Lancôme renovated the 50-ml jar, making it refillable. The company also took the opportunity to lighten the weight of the glass jar on its Renergie, Hydrazen, Genefique and Clarifique lines. This saves 142 tonnes a year.

Renergie line

For example, the Renergie Ultra line has lightened its refillable jar by 31%, with the accompanying launch of a 50 ml refill.

Refillable Albéa-Verescence jar for cosmetic cream

In line with the Ellen MacArthur Foundation's New Plastics Economy Global Commitment to make all its products recyclable or reusable, Albéa Cosmetics & Fragrance is working on innovative, low-impact packaging concepts.

Addressing the issue of reusability, the company presented TWIRL, a refillable PP and PET (Polyethylene terephthalate) cosmetic jar, at Luxe Pack Monaco 2022. This innovation, with its easy refill process, sees its environmental impact reduced by 53% after two refills, as the energy used to manufacture the packaging and the waste produced are themselves reduced.

In 2023, French world's leading glassmaker for the Perfumery and Cosmetics industry Verescence, and Albéa Cosmetics & Fragrance have combined their expertise to offer a premium version of Albéa's refillable cosmetic jar TWIRL.

The base, produced by Verescence in Spain, features their glass composition "Infinite Glass 20" integrating 20% Post-Consumer Recycled glass (PCR) and providing a tint that meets luxury brands' aesthetic demands.

The cap, inner jar and seal, all manufactured in Albéa Simandre (France), are made of polypropylene (PP), a recyclable material.

Parent packaging:

Refill:

The jar has been specially designed to offer an intuitive gesture for quick and easy refilling.

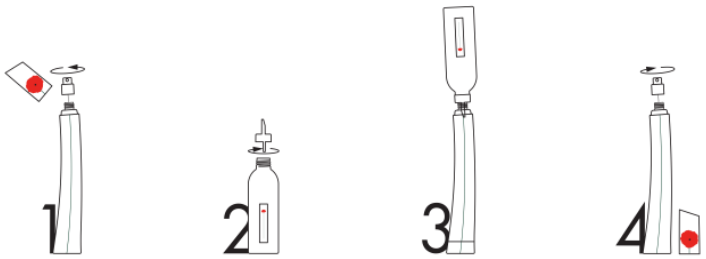
3.1.2.5. Perfumes

Yves Saint-Laurent Eau de Parfum

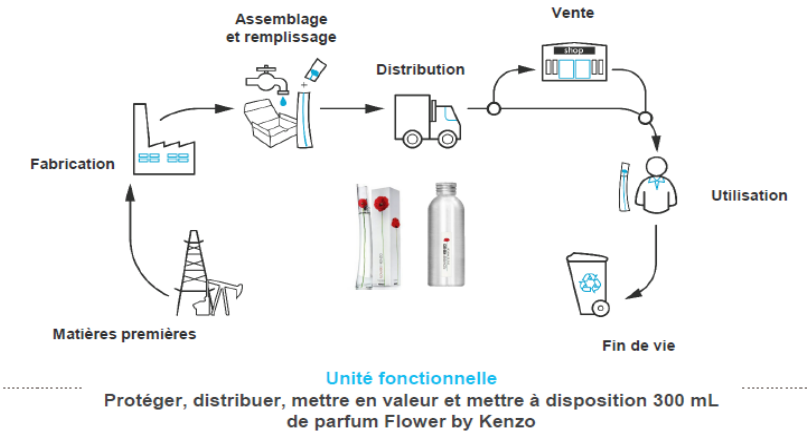
Prevention through minimization at source and use of refills
Reduction of weight of the 30, 50 and 90 ml bottles for the Yves Saint Laurent Libre eau de parfum brand saves 52 tons of glass a year.
The brand has accompanied this minimization at source by offering a 100 ml refill.

Perfume - FLOWER by KENZO LA RESSOURCE[18]

KENZO is offering its consumers the opportunity to refill their favorite Flower by KENZO fragrance, with the launch of a 200-ml refill in recycled and recyclable aluminum, for use on 100-ml and 15-ml bottles. Both bottles feature a pump that you can unscrew for easy refilling.
The separability of the pump increases the recyclability potential of the bottle, which contains 15% recycled glass (PCR). The refill, combined with a special device, enables automatic, optimal refilling of the parent packaging without spillage.

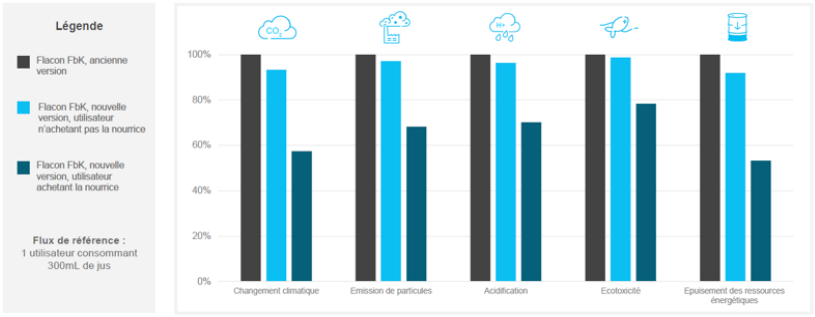


The introduction of this refill was supported by a lifecycle study, which established environmental gains of up to 39% in terms of climate change and energy resource depletion, compared with a single use (3 x 100ml bottles versus 1 x 100ml bottle and 1 x 200ml refill).



[In order: Raw material -> production -> Assembly and filling -> distribution ->selling -> utilization -> end of life]
[functional unit – protect, distribute, display and make available 300ml of Flower by Kenzo perfume]

[18] Presentation of the refillable product:
https://www.kenzoparfums.com/fr/en/fragrance/femme/flower-by-kenzo-femme/travel-set/K110340.html



[Captions: FbK bottle, old version; FbK bottle, new version, the user does not purchase the header; FbK bottle, new version, the user purchases the header. Reference flow: 1 user consuming 300mL of liquid]
[climate change, particle emissions, acidification, ecotoxicity, depletion of energy resources]

3.1.2.6. NESQUIK® launches paper refills in 2021

NESQUIK® offers its chocolate powder in 430g refill pouches made from recyclable paper. This paper pouch is poured into a "parent" container such as the iconic yellow Nesquik 300g, 500g or 1Kg box, or a hermetically sealed box. The consumer buys the product once in its rigid plastic packaging, and refills it after use, thanks to the paper refill.

Refills launched since 2021:

Reusable, refillable parent packaging (various examples of boxes offered to consumers since 2021):

This launch has, since, been accompanied by a communication campaign on NESQUIK® yellow boxes to inform consumers about the refill gesture.

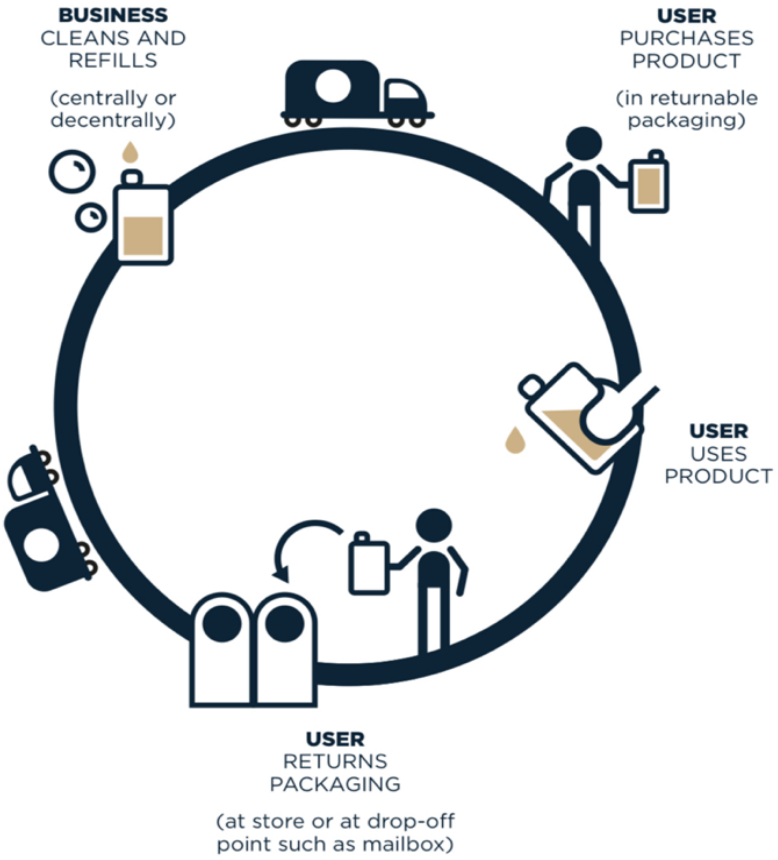
3.2. The packaging is filled by the marketer of fast-moving consumer goods

Modality 4 (see page 8) deals with products pre-packaged by the marketer with reusable packaging that is emptied of its contents by the consumer and returned to the marketer for reuse (with intermediate operations such as washing and inspection during this reuse cycle).

3.2.1 Modality unit operations

The consumer buys the product in reusable packaging. Once the reusable packaging has been emptied of its contents, the consumer returns the empty packaging to a collection point.

The marketer recovers this packaging for washing and inspection (this can be carried out by a service provider) and refills it with the product in question. The product thus packaged in reusable packaging returns to the sales circuit.



3.2.2 Examples

3.2.2.1 Beer

The beer market in France[19]

- In France, 65% of beers are sold in supermarkets.
- France is 1st in Europe in terms of number of breweries, with 2,500 (246 in 2006).
- France is the 8th largest beer-producing country in Europe.
- Average consumption in France is 33 liters of beer per person per year.
- 70% of the beer consumed in France is produced directly in France.
- Total consumption amounted to over 23 million hectoliters.

Consumption of out-of-home beers in catering accounts for a third of all beer sold in France: the reuse of metal kegs in catering accompanies these volumes. The CNE has documented this subject in a document[20]entitled "Packaging and deposits: overview of reuse systems".

Reuse of glass bottles in the out-of-home consumption (OHC)

- Parks of approximately 60 million glass bottles[21], with an average lifespan of 5 to 10 years. Bottles are reused 4 to 5 times a year.

Weight comparison: returnable glass bottle vs. single-use glass bottle

For ranges of 25cl or 33cl glass bottles: between 12% and 24% extra weight of glass for returnable bottles, necessary to guarantee resistance to reuse.

Palletization
9% **more** product quantity (expressed in liters) on a pallet of single-use bottles vs. a pallet of bottles in returnable crates (due to the use of crates with standard dimensions).

Capital investments[22] for a returnable glass bottle line with a capacity of around 30,000 bottles/hour.

Specific machines	Amount (in millions of €) Approximation of +/- 15%.
Unpacker+packer	Between 1 et 1,4 for all
Bottle-cleaning machine	1,5 à 2
EBI[23]/ Bottle inspector	0,4
Conveying system/ Crate storage	1,5

Investment in a park of returnable crates[24]
Approximately 4 million euros (base: 1.3 million crates)

[19] https://brasseurs-de-france.com/tout-savoir-sur-la-biere/le-marche-de-la-biere/
[20] https://conseil-emballage.org/wp-content/uploads/2016/05/Packaging-and-deposit-systems-Overview-of-reuse-systems.pdf
[21] https://librairie.ademe.fr/dechets-economie-circulaire/4880-gisement-des-emballages-de-la-consommation-hors-domicile.html
[22] Source : Heineken Entreprise.
[23] EBI : Empty-Bottle Inspector.
[24] Source: Heineken Entreprise-hypothesis for 100,000 hl of beer and on the basis of two rotations per year.

3.2.2.2 Sodas

Coca-Cola EuroPacific France (CCEP)

In supermarkets, CCEP has been conducting experiments since 2019. In February 2024, CCEP is marketing its offer in over 230 points of sale, 3 regions and with 5 chains. The aim is, above all, to meet societal expectations, since 92% of consumers say they are in favor of reintroducing deposits and expect brands to make a commitment. To date, everything remains to be done in the retail sector, as reuse is not yet a reality. Three main levers are to be activated & tested:

- **The need to co-create future models with customer-distributors,** bringing out a new angle in customer-supplier collaboration. The challenge is to continue learning together. For the consumer, a broad, multi-brand territorial network will also reinforce interoperability between brands and types of point of sale (hyper and supermarkets, proxi, drive, e-commerce), and, thus, the ease of use and the consumer experience.

- **Need to test the offer:** CCEP is testing both one-liter returnable glass bottles used up to 25 times, and reusable returnable PET bottles used up to 15 times, for the Coca-Cola Gout Original and Coca-Cola Zero Sugar brands. The aim was to measure consumers' perceptions of these different proposals.

- **Need to create consumer acceptance and measure perception:**

To date, reuse is not a tangible reality for consumers in supermarkets and hypermarkets, who need to identify it and identify with reuse. We need to give meaning to the concept and be able to stand up to single-use. Reuse needs to be associated with the idea of pleasure and an attractive, positive and easy experience. The challenge is twofold:

- The challenge of communication and commitment to the approach
- The challenge of visibility at the point of sale and on the shelves, by emerging in the aisle, with the right messages, and explaining the purchase/return process.

This type of system is also a way of making the deposit gesture more widespread among consumers.

In the long term, reuse in hypermarkets and supermarkets will only be a success if it is scaled up to spread flows, create synergies between stakeholders in the value chain, and thus, create economic competitiveness vs. single-use packaging. Success will also be assessed from an environmental point of view, especially in terms of CO2 and water indicators.

3.2.2.3 Breakfast products (powdered and solid) and mineral water[25]:

NESQUIK®, RICORE® and CHOCAPIC® BIO have joined forces with VITTEL® and S.PELLEGRINO® in the Loop initiative with Carrefour to offer reusable packaging.

In 2021, following on from the VITTEL® and S. PELLEGRINO® brands, three new Nestlé France brands - NESQUIK®, RICORE® and CHOCAPIC® BIO - were offering products in returnable stainless steel packaging. Once consumed, the empty packs were collected directly from the consumer by Carrefour, or dropped off by the consumer in-store. They were then cleaned, filled and put back on sale.

After 3 years of testing, the following conclusions were reached[26]:

- The reuse business model has yet to prove itself: re-purchase and return rates remain low (24% return rate for breakfast packaging and 50% for mineral water during this experiment);
- The loop is too complicated for the consumer (return the empty packaging, scan the QR code, wait for the refund);
- The purchase price, including the deposit, is too high for single-use breakfast products (€4 deposit);
- A department dedicated to re-use makes shopping longer and requires more effort.
- Reuse is a familiar concept to French consumers, without being a priority.
- Reuse spontaneously enjoys a good image with a positive perception of the environment among consumers.

Nestlé France's future re-use experiments will take these lessons into account.

[25] Source: Nestlé
[26] Nestlé's Internal consumer study

4.Challenges-Opportunities-Prospects

4.1. Challenges

4.1.1. Environmental challenges

- As the CNE often points out, environmental performance needs to be objectively assessed, whatever the modality used - in this case, the comparative environmental assessment of re-use versus single-use, through impact studies. We need to specify the conditions and assumptions under which reuse has an advantage over single-use (and vice versa), and the levers that can be used to improve the environmental balance of re-use. Indeed, reuse is not systematically better for the environment than other circular organizations, and Life Cycle Analysis studies (LCA) should be carried out with a critical review to shed light on this subject.

- LCA is a tool that can be used to analyze a large number of impact categories, including climate change, water and air, using a variety of methods. For more details on the nature of these impacts, please refer to the CNE document[27]: "Packaging and environmental impact: facts and figures".

- ADEME's 2022 LCA literature review (see bibliography) about studies carried out between 2010 and 2020 with an international scope, reveals some major trends. However, given the very broad scope of the studies, these results should be analyzed with caution, taking into account any differences between studies (methodological choices, key parameters, indicators studied, etc.). This work should also be seen in the context of the recent studies carried out on the French perimeter mentioned in the next section.

- The 2022 study indicates that the results of comparative LCAs between reuse and single-use are highly dependent on key parameters, such as:
    - The number of reuses.
    - The distance between the place of distribution and the place of washing for reusable packaging.
    - The efficiency and parameters of washing for reusable packaging.
    - The recycling rate and/or rate of incorporation of recycled materials for single-use packaging.
    - The relative mass of the packaging being compared.

  It comes to the conclusion that, given the diversity of the comparisons analyzed, the results cannot be definite or generalized, and are highly dependent on the values of the key parameters cited.
  In particular, it notes that certain parameters could be better studied:

    - Special attention should be paid to the last few kilometers of transportation, which are often not studied in LCAs.
    - Packaging format, which is little studied, has an influence in terms of the quantity of packaging per unit of product, but also in terms of the quantity of product that can be transported.

  With regard to the categories of impact analyzed, ADEME notes that the impact on biodiversity is very rarely addressed, even though it is a major environmental issue, due to the lack of methodological consensus on this point.

  Finally, ADEME points out that the introduction of certain packaging systems on a large scale could modify current logistical organizations, market mechanisms, supply chains, and so on. Taking into account the impacts of these large-scale changes may, in the future, also require consequential LCAs.

[27] https://conseil-emballage.org/wp-content/uploads/2022/04/Packaging-and-environmental-impact-final_compressed.pdf

Following this study, ADEME produced a methodological reference framework to guide stakeholders in carrying out comparative LCAs of different packaging solutions, with a view to put together the findings. The first goal is to support companies in their work by providing educational and technical support to clients and practitioners in carrying out comparative environmental assessment studies between several packaging solutions. The second goal is to promote harmonization of environmental assessment work through recommendations on method elements, conventions to be applied and reference data to be used.

- The French Environment and Energy Management Agency (ADEME) has carried out a study on the environmental assessment of a deposit system for the reuse of glass packaging in France. Its aim is to cover a wide range of real-life cases by studying different scenarios corresponding to several product sectors and logistics realities, to which various stakeholders can relate to guide them in their decision-making.
  The study identifies the conditions (return rate, packaging mass, transportation distances, recycling rate, etc.) and possible tipping points at which a returnable packaging solution is more environmentally advantageous than a comparable single-use solution, and vice versa.

The main finding of the first part of this study[28]:

For five of the impact categories studied in depth (climate change, particle emissions, photochemical ozone formation, acidification, depletion of fossil resources), **a systematic advantage is observed from the 4th use of returnable glass containers for reuse**, compared with single-use glass containers. **This is true for all average transport distances modeled** (covering most of the distances observed in France) and for a wide range of products marketed: still and sparkling water, wine, beer, soft drinks, juices and soups, preserved products, dairy products.

For the other two impact categories evaluated, water resource depletion and freshwater eutrophication, the results do not allow us to conclude that one option is more advantageous than the other in the ranges of values studied.

Between now and the summer of 2024, work will continue to provide additional answers to the environmental assessment of the deposit for reuse of packaging in France, with the analysis of the scenarios below:

- Returnable glass bottle for reuse vs. single-use PET bottle
- Returnable glass jar for reuse vs. single-use polystyrene jar
- Returnable glass catering tray for reuse (washed in-house by caterers and outsourced) vs. single-use polypropylene tray
- Returnable glass bottle for reuse vs. single-use aluminum can
- Returnable glass jar for reuse vs. single-use steel can
- Returnable PET bottle for reuse vs. single-use PET bottle
- Returnable fountain-filled bottle for reuse vs. single-use PET bottle

The CNE encourages readers to stay up to date of future ADEME study results.

[28] Source: ADEME

4.1.2. Economic challenges

- For economic stakeholders
    - The entire value chain (marketers, packaging producers, reuse and recycling stakeholders) needs clear guidelines to ensure coherence between the organization of the packaging, bottling, reuse and recycling industries. The aim is to provide medium-term visibility needed to ensure balanced investment in reuse and recycling capacities.

    - The above examples illustrate some of the elements of these investments:
        - ✓ the stock of reusable packaging, which must be sized according to the needs of the supply-chain stakeholders, and which must take into account the seasonal nature of the products in order to supply them during consumption peaks. These include both primary and tertiary packaging (e.g. reusable transport crates)
        - ✓ storage facilities,
        - ✓ washing tunnel,
        - ✓ control station,
        - ✓ etc.

Feedback from stakeholders practicing reuse and its propagation are important in order to know, in particular, the return on investment before having a go.

Consideration needs to be given to the economic aspects of switching to reuse: fixed costs to be optimized, logistical actions to be implemented, pooling of packaging park between stakeholders…

For any company, the cost of this model must be reasonable for reusable formats, particularly in relation to the profitability of the product marketed.

- For consumers
    - The question of the relative selling price of products (excluding deposits) compared to a product in single-use packaging is essential for consumers if we want to generate support, especially in an inflationary context.

    - The challenge of the financial deposit and its cost is important in order to maximize the return of packaging. As the updating of the deposit amount is a complex subject, it would be interesting for the commission in charge of updating the financial deposit amounts to be proactive on the subject.

    - Obstacle to overcome: depending on the number of products under financial deposit in the consumer's shopping basket, this can represent a substantial sum for the consumer.

For information, Citeo is carrying out economic modeling work for the marketer as part of the ReUse project[29].

This project is based on three fundamental principles:

- national coverage and geographical expansion;
- the establishment of a shared system coexisting with external initiatives;
- the existence of a compromise between economic and environmental models.

This model offers a three-stage vision:

- Activation stage (launch; first volumes): ~10 million CSUs, 42% of which are standard (50% return rate);
- 1st stage (estimation of model when reaching maturity): ~ 300 million CSUs, 67% of which are standard (75% return rate);
- Maturity (AGEC law objectives achieved): > 2 billion CSUs, 67% of which are standard (85% return rate).

4.1.3 Sanitary challenges[30]

Washing the materials lies at the heart of the packaging reuse model. This process is studied and managed as part of the Citeo ReUse project, and it will be defined by manufacturers in a mission statement centered on standardizing cleaning, thus meeting the standards set by the food industry (food safety regulations, safety and consumption). It is set out as follows:

- Consultation on the audit chart, followed by testing and validation of the audit chart and control plans.
- Audit of washing facilities (upon request) to assess the compliance gaps between the requirements and the actual operational reality.
- Selection of cleanrooms that will benefit from the compliance funding, through calls for tenders.

Aside from the various initiatives and experiments, how can one be certain that the reused packaging complies with safety regulations in response to the application of current regulations or Good Manufacturing Practice?

The safety challenges arising from reused materials intended for household packaging (whether it is single-use or reusable packaging), particularly in contact with foodstuffs, cosmetics and organic products, are major, and need to be identified and controlled before the packaged products are sold.

[29] https://www.citeo.com/le-mag/reuse-imaginer-aujourdhui-le-dispositif-de-reemploi-de-demain
[30] With the support of LNE ADRIA French labs of Quimper

These challenges cover various aspects such as regulatory measures, functional properties, risks of contamination (chemical, physical, allergenic, toxicological, microbiological), hygiene, misuse, etc.

The use of re-used household packaging by industry or consumers requires prior treatment according to defined processes covering the key stages necessary to guarantee health for the personnel concerned, distributors and consumers. These stages can be summarized by collection and sorting, washing, drying, inspection, transportation and filling, and are carried out entirely or partly depending on the use of the product.

As for containers designed for products which will be packaged in a protective atmosphere or under vacuum, it is recommended to use appropriate testing devices to ensure that the seal on the lid is in good condition. The integrity and strength of the seal should not be damaged as the container wears down due to its life of operation and the number of rotation/washing cycles.

Regulatory limits:

In France, the Decree n°2022-507 of 8 April 2022 defined the minimum proportion of reused packaging to be placed on the market annually:

"[…] III.- The provisions of this sub-section shall not apply to[31]:

1°Product packaging for which a legal, national regulatory or community proportion whose reuse is prohibited for health or safety reasons for the consumer.

2 *°* Product packaging whose place on the market requires an authorization which does not allow their reuse or recycling, or requires the disposal of used products and their container.

For example: some products that comply with the specification of registered PDO such as packaging, liquid eggs, frozen products, cells and batteries, etc.

Among the areas of applications of in-contact materials, only the materials intended for contact with foodstuffs (Translator's note: FCM: food contact material) are subject to a regulation[32] (Regulation (EC) No 1935/2004) that establishes the principle of inertia (to preclude harmful or toxic substances from being transferred to food) in Article 3 for any- one-time or repeated- use of the material/object. However, the specific regulations/directives relating to this framework regulation do not generally state a potential loss of the initial functional properties of the material or object after several rotation cycles linked to its re-use. Indeed, they can generate systemic health issues for human health if the risk assessment is not sufficiently exhaustive as done through checking the stability and chemical degradation of the material over time when exposed to high temperatures, light, acid or basic conditions, etc. It is noted that the Commission regulation No 10/2011 on plastic materials and articles intended to come into contact with food, states the assessment of the repeated use on 3 cycles through successive repeated tests.

To assess the safety of reusable and reused packaging, an accelerated ageing methodology needs to be implemented. The objective is to take into account, during the risk assessment, the material and the changes in its physico-chemical and surface properties that it would exhibit throughout its various usage cycles.

[31] Extract of Article 541-350

[32] https://eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:32004R1935&from=EN

Chemical challenges

It is important to control content-container interactions regarding the product's normal intended use, regardless of the nature of the packaging. Migration phenomena affect intentionally added substances (IAS) and non-intentionally added substances (NIAS[33]): substances from degradation, cross-contamination, product residues, by other products in contact, etc. These principles equally apply to one-way and reusable packaging; the latter must take account of the specific features of reuse stages such as washing, which must both eliminate residues of the product contained when it was first placed on the market and leave no problematic traces of detergents when it is refilled.

Studies on NIAS require knowledge and expertise, as the nature of NIAS can vary according to conditions of use and the product in contact and call for appropriate analytical and data processing methods.

Materials/objects intended for household packaging, when reused, can release degradation, reaction, formulation, or cross-contamination chemical substances into the products in contact (food, cosmetics, biological, etc.).

Both one-way-use and reusable packaging must ensure consumer safety. For this purpose, several assessments and measures must be taken:

- Identify the chemical composition of the materials used in the packaging to determine whether they contain substances which can migrate. This includes substances in inks and adhesives, as well as any other material in direct or indirect contact with the packaged product (food, cosmetics, biological, etc.).

- Carry out migration tests to assess the quantity of substances likely to migrate from packaging to packaged products under different conditions (temperature, storage time, product type, number of rotations, cleaning conditions, etc.).

- Define clear procedures for the re-use of packaging, including cleaning, disinfection, and checking the integrity of the packaging (to ensure there are no cracks, cuts, or other defects that could help the migration of chemical substances).

- Check compliance with international, European and national regulations concerning the intended application (e.g., EU regulation 10/2011 for FCM).

Allergens

Given the diversity of food products that can be contained in reusable packaging, the container washing shall necessarily be qualified to ensure the absence of residual allergens, regardless of the material.

Allergens are likely to be retained by microbial biofilms (see below, microbiological issues), by the asperities of the material or even by the porosity of the material itself.

Therefore, each type of reusable container must be washed according to a protocol designed to reproduce the conditions of wear of the container, and of adherence of various representative food residues.

[33] NIAS : non intentionally added substances-Substances

Toxicological challenges

The toxicological risks related to reused materials are mainly associated with the potential presence of critical chemical substances (CMRs, SVHCs, etc.) during material transfers from materials to products in contact. This migration can potentially expose consumers to harmful levels of chemicals. The re-use of materials can increase the risk of migration, if the materials were not initially designed for repeated contact, or if their structural integrity is compromised due to wear or damage. Materials may contain contaminants due to previous use or manufacturing process. These contaminants (heavy metals, polycyclic aromatic hydrocarbons (PAHs), bisphenols, phthalates, PFASs...) and other non-intentionally added substances (NIAS) such as endocrine-disrupting chemicals are hazards to human health. It should be noted that cumulative low-dose exposures to these chemicals through reused materials can lead to bioaccumulation and possible harmful long-term effects on health.

The toxicological risks related to packaging materials must be managed, as the basis of regulations and practices throughout the production value chain. The potential presence of hazardous chemical substances (CMR, SVHC, etc.) is particularly closely managed in the event of material transfer from materials to products in contact with them. Materials cannot be reused if reusable packaging is not initially designed for repeated contact, or if its structural integrity is compromised by wear or degradation associated with reuse loops. The composition of materials must control contamination issues linked to previous uses or to the initial manufacturing or reuse process. These hazardous compounds (heavy metals, polycyclic aromatic hydrocarbons (PAHs), bisphenols, phthalates, PFAS, etc.) and other non-intentionally added substances (NIAS) must continue to be monitored by the production value chain to ensure there is no risk to human health, while always taking into account the intended uses of the products.

The introduction of regulations at European level on the use of reused materials (traceability of materials, TTC, etc.), combined with the implementation of validated tests to assess the migration of chemical substances under the intended conditions of use, could help harmonize practices across Europe regarding the management of toxicological risks. In addition to these provisions, communication channels should be set up to disseminate clear information to consumers.

Microbiological challenges

Washing reusable containers aims to ensure consumer protection through the microbiological decontamination of the packaging before refilling.

Cleaning qualification will focus on checking the washing conditions (temperature, mechanical aspects, concentration of caustic products) that ensure the removal of the most resistant micro-organisms in terms of adhesion, in other words, those inducing biofilms, as well as those with the greatest thermal resistance, via spores.

A biofilm is an assemblage of surface-associated microbial cells that is enclosed in an extracellular polymeric substance matrix. Biofilms can be formed on various types of packaging surfaces, and present food safety risks by inducing microorganism resistance to various cleaning treatments.

After one or more washing cycles, container wear also needs to be qualified, to eliminate rough, porous, scratched or cracked containers, as they increase the development of micro-organisms on surfaces.

Physical issues (extraneous matter)

The presence of extraneous matter in packaging can be food or not have food origins.

Examples may include:

- Non-consumed food residues in a bottle,
- Debris deliberately placed by the consumer, such as cigarette butts or non-food liquids in food packaging
- Broken glass in a bottle
- Presence of particles due to wear or degradation of the packaging material, or from an external source

These extraneous matters are sources of contamination. They must either be treated or discarded during waste sorting.

Microparticles

Microparticles are particles that are formed and released into the products in contact with packaging during washing and/or use (material degradation due to repeated mechanical and physical stress (friction, abrasion, UV, etc.), that end up being released into the atmosphere. This phenomenon shall be managed in order to limit the related risks of exposure.

Hygiene (consumers, employees, manufacturers, distributors)

Throughout the production value chain, good food hygiene practices, grouped together under the term Food Safety Culture, must be followed to comply with standards and ensure food safety[34].

This new circular economy raises several practical questions about the balance between circular, economic and sanitary aspects, such as optimized logistics, which could mix up dirty and clean containers during transportation.

Return inspection of washed empty containers, or those to be washed and refilled.

Optical inspection, assisted by a sighting device, helps to eliminate containers with impacts, cracks, chips, etc., or with visible food residues.

In the industrial sector, the containers are turned upside down with an air jet and dust extraction system, to ensure glass risk control prior to filling.

Inspection and control of re-used packaging is an absolute necessity, particularly functionality and safety wise. Particular attention must be paid to the capping system (checking the ring) used by the consumer each time it is used/re-used and opened.

For further information, please refer to Citeo's *Guide du réemploi-lavage* (see bibliography).

[34] (Reusable packaging system design – Specifications and recommendations Part 7: Third-party washing, sanitization & handling of foodware)

Misuse in the consumer's home

Consumers should be informed of the risks related to the misuse of reused containers (risks of substance migration when a food container is used in a different way than its original intended role when first placed on the market.

Examples:

- Using a consumed water bottle and then re-using it with a "bleach" or "acid/base" type detergent, increases the risk of intaking and burning accidents at home.
- Inappropriate use of trays for microwave heating, causing physical deformation and degradation of the material (craters caused by the waves, migration of chemical substances, etc.).[35]
- Storage of reusable food packaging with other non-food and potentially hazardous products (phytosanitary, detergent, etc.), and then reused can cause NIAS during the next use.

Anses recommendations[36]:

- The Agency recommends consumers to follow manufacturers' food packaging recommendations (cooking power and duration), as reheating at exceedingly high temperatures increases the risk of substance migration.
- Avoid using damaged or worn-out packaging.
- Do not re-use one-way-use packaging as microwaveable containers.

How to limit misuse:

- Inform consumers of the dangers of misuse through product labeling.
- Educate consumers about good practices.

4.1.4 Legal responsibilities

Responsibilities related to the product:

The responsibility of a supplier imposing standardized packaging on its suppliers, which is unsuitable for certain products, and which could deteriorate in the chosen material or logistical solution. Refusal by the supplier refuses creates a dispute.

In the event of food poisoning, for example, who is to be held responsible: the manufacturer of the new packaging, the packer, the retailer, the user of the packaged product, the collector of the empty packaging, the cleaner, the filler of the cleaned packaging, the shipper of the new packaged product or the new seller and the new user?

4.1.5 Technique

Example of a brewery:

- a deposit line means managing very specific plastic crates at the beginning. Specific industrial unpacking equipment and reuse crates are therefore required (see investment costs in the Beers example).
- A multi-purpose packaging line (single-use packaging AND reused packaging): this requires the empties to be palletized on glass pallets (VMF pallets were created in France for the glass industry, especially for bottle transportation) for the glass bottles example, given the packaging speed.

[35] ANSES/INC/LNE 2012: Microwaves and chemical substances of food packaging
[36] ANSES is the French Agency for Food, Environmental and Occupational Health & Safety.

4.1.6 Consumer acceptance and appropriation of reuse

- Reuse is part of an ecosystem in which the consumer, aside from the mass retailer, is a priority: we need to make reused products stand out at the point of sale (easy to find on the shelves, easy to read on the shelves, price positioning, understanding the consumer's intentions and explaining the Sustainable Development and CSR issues).

- The re-use gesture must be virtually unique and uniform, regardless of the product or distribution method, and must be easy, accessible and possible anywhere and everywhere.

- Consumers are over-solicited and are facing multiple options to get their packaging into a circular organization (recycling, reuse, etc.), so the challenge is to implement a method that can be easily remembered.

- The purchase and return process must be straightforward for the consumer: we need to identify the obstacles through the various summaries of experiments (such as Tesco's experimentation) and the desirability of reuse (Léko study). For these summaries, see the bibliography.

- Consumer/Actor:
    - Studies have shown that some consumers mistake reuse for recycling, so we need to explain the notion of reuse beforehand, as consumers do not know what we are talking about.
    - Raising consumer awareness about the benefits of reuse.
    - Raising awareness about the consequences of packaging damage and theft.

4.2 Opportunities

4.2.1 Standardization

The draft European regulation on packaging and packaging waste (see chapter 5.1) states that to develop reusable packaging, it is necessary to use the European standardization tool, the European Committee for Standardization (ECS). Thus, packaging meeting the detailed technical specifications, criteria and formats for reusable packaging defined by ECS comply with European regulations (in recital No 43 of the project).

Standardization is therefore considered at the level of all European Union member states to "ensure the absence of barriers to trade on the European internal market" (in recital No 76 of the draft).

The implementation of standardized models concerns the major brands of consumption goods, because they have been investing, for some of them for over a century in original packaging:

- Marketing: iconic vs. standard packaging: the standardization of reusable packaging poses counterfeiting threats.

- The use of standard packaging from eco-organizations can benefit from a bonus system.

- Partnerships: sharing "proprietary" packaging with other marketers (e.g. sharing reusable bottles between Kronenbourg and Météor for beer), depending on distribution channels.

- Pooling can help limit investments: for example, a shared washing center between several stakeholders, cost reduction across the entire production value chain (logistics optimization, shorter transport distances, etc.).

- Definition of standard specifications for reusable packaging (mechanical and chemical resistance, barrier and sanitary properties, etc.) in consultation with all stakeholders.

It is also important to note that standardization, depending on the degree to which it can reach, and the types of products covered by the same standard, can generate additional costs due to sub-optimization of the packaging in relation to the product being transported. Standardization therefore needs to be sized depending on the costs.

4.2.2 Traceability [37]

The regulations state reuse targets for 2023 and 2027, imposing an obligation to achieve results and not necessarily the means to achieve them. In France, for example, there are several reuse initiatives; these initiatives are quite unequal, given the different stakeholders involved (marketers, distributors, consumers, etc.). They differ according to the inner nature of the products, with the possibility of finding "standard" packaging and "iconic" packaging that can be shared between stakeholders.

All these reuse loops have variable geometry when it comes to traceability, yet the success of reuse will undoubtedly depend on the harmonization of practices.

In order to ensure the traceability of reused packaging, it is time to move towards a harmonized national system, to keep track of data and simplify the reuse process for all stakeholders.

It is important to acquire traceability information in order to manage to:

- Identify the type of packaging and identify its life cycle within the production supply chain
- allocate any amount of deposit to a stakeholder (marketer, distributor, consumer)
- anticipate the restocking of new reusable packaging to offset the losses
- avoid misuse by matching packaging with products

Such a traceability system is essential. It must incorporate the following qualitative elements:

- simplicity, to avoid irritants related to consumer acceptability
- accessibility anywhere and everywhere, without having to ask: where do I take my packaging?
- fluidity at all stages to ensure safety for all (marketers, distributors, washers, consumers)
- cross-functionality: all stakeholders adopt the same "vocabulary"
- information to identify the geography of packaging (dormant stocks and stocks in circulation)
- ethical from an environmental and economical point of view.

4.2.3 Key performance indicators

The traceability described above helps collecting information and data as it is necessary to manage to measure at any moment, according to the needs of the stakeholders involved. The key performance indicators should include:

- Packaging turnover: speed at which reused packaging returns to the loop (tool stock, product seasonality, etc.).
- Rate of return
- Mapping of dormant stocks and stocks in circulation at any given time.

[37] With the support of GS1 France

4.2.4 Washing optimization

As experiments are carried out on different containers and qualifications are obtained in the absence of residual allergens or resistant micro-organisms, it will be possible to optimize washing cycles, whether it is in terms of water consumption, temperature or concentration of washing products.

Adaptation of detergent and disinfectant products according to the type of product in contact (alkaline, neutral, peroxide, quaternary ammonium, tertiary amine, etc.).

Optimization of water use:

- Minimization of drinking water use
- Wastewater recycling
- Wastewater treatment

4.3 Perspectives

Below you will find some perspectives that should be taken into consideration for effective packaging reuse.

- Help the consumer understand: the return of packaging can be irritating, and the role of the consumer in the process of packaging reuse should be clearly exposed.
- Simplify the deposit: in the case of a financial deposit, all initiatives aimed at simplifying the return of this deposit to the consumer should be taken into consideration.
- Reuse mainly depends on glass packaging or via refill systems, as well as in developing in bulk sales related to reuse (see the various ADEME studies in the bibliography). The valid question would be to ask what can be imagined for other materials (in particular those that are already being reused in other countries, or which are undergoing LCA studies by ADEME).
- New washing technologies to investigated in(beyond immersion or spraying)
- New disinfection technologies (range-gated illuminators, UV, etc.)

4.4 Key factors of success

By studying the different existing methods, some key factors of success can be identified:

1. a specific design of the reused packaging, which must be robust enough to resist the rotations related to the reuse process
2. a design that facilitates return for reuse (standardization, compactness, easy cleaning, etc.)
3. the cost of the deposit (for certain types of packaging) for an effective return
4. return logistics generally using the same packaging (e.g. crates) as outbound logistics
5. Places of storage and stocks of empty packaging in excess compared to packaging requirements, in other words, ensure capital expenditure to respect the product seasonality and cleaning requirements prior to reuse (for example beverages and plastic crates used in supermarkets)
6. stakeholders involved in a high-performance logistics system with a territorial network as close as possible to the point of consumption
7. a robust, controlled system to ensure full traceability of packaging, particularly at the end of its life cycle and product safety
8. Consumer acceptability (cost, reverse logistics, deposit simplicity, etc.)

5. Regulations

5.1 European Union

5.1.1 European legislation in force

- **European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste**

  Lays down the eco-design requirements and particularly the measures regarding the reuse of packaging that were complemented by the directive 2018/852 of the European Parliament and of the council of 30 May 2018. This directive should be replaced in the short term by an EU regulation (see § 5.1.2).

- **Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives**

  Article 4 lays out the following hierarchy about prevention and waste management:
  - Prevention
  - Preparation for reuse
  - Recycling
  - Any other evaluation such as energetic evaluation
  - Disposal

- **Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment**

  (Known as SUP directive – Single Use Plastic)

  Article 10 to Member States shall take measures to inform consumers and to incentivize responsible consumer behavior, in order to reduce litter from products covered by this Directive, and shall take measures to inform consumers of the single-use plastic products : immediate consumption, either on-the-spot or take-away, food consumed from the receptacle (such as cereal bars or candies etc.), beverage containers with a capacity of up to three liters, lightweight plastic carrier bags, etc. (for further details, see Annex G of the directive).

  This information can apply to the availability of alternative products that can be used again, the systems of deposits, etc.

5.1.2 Environmental European legislation under discussion in the European bodies

The draft European regulation on packaging (PPWR)

In the early 2020s, the European Commission undertook discussion to reform Directive 94/62 of December 20, 1994 on packaging and packaging waste, in order to redefine the environmental regulations applicable to packaging and packaging waste.

In March 2024, the European Council of the Environment Ministers and the European Parliament reached a compromise. That compromise aims to fight the increase in packaging waste produced in the European Union by harmonizing the regulations applicable in the internal market in the member states. It also entails stimulating the circular economy with programmed reduction and reuse targets, an obligation for all packaging to be recyclable by 2030 and systematically recycled by 2035, restrictions on certain hazardous

substances (in particular PFAS), harmonized environmental labeling requirements, and a broad ban on single-use plastic packaging, with numerous derogations and special cases.

This agreement between two of the European Union bodies must be accepted by the Brussels Commission before the European Parliament elections in June 2024.

Once the new European regulation is definitively adopted and published in the Official Journal of the European Union, the question in France will be how French legislation (see § 5.2.1) will relate to the new European legislation. The CNE advises stakeholders to follow the legal news on its website and, in particular, those of the Ministry of the Environment and the European Commission.

Draft European directives on environmental claims

In January and March 2024, the European Parliament voted in favor of two draft directives to regulate, or even prohibit vague, unverifiable or misleading environmental claims, which could include claims about the reusability of packaging.

As it is the case with the PPWR, these drafts need to be accepted by the three European bodies before June 2024.

5.1.3 European legislation on food safety in France

Regulation No 10/2011 of 14 January 2011 on plastic materials and articles intended to come into contact with food

This regulation expressly states that packaging containing pre-packaged food products to be "reusable", which is to be understood as repeated use by users, who often use a package several times, for example, to reheat leftovers in the microwave (see § 5.2.3 below). Regulation 10/2011 forecasts this practice and therefore states specific "repeated contact" test protocols to ensure suitability for food contact (Annex V on conformity testing, chapter 2 on specific migration testing, § 2.1.9, and chapter 3 on overall migration testing, § 3.3.2).

5.2 France

Note: All regulations stated below refer to the French legislation.

5.2.1 Environment code

The main rules applicable to the reuse practice in France are laid out in the French Environment Code, which includes:

- National provisions that stem from the three directives listed in § 5.1.1 above;
- The provisions laid down by law 2020-105 of February 10, 2020 on the fight against waste and the circular economy (known as the AGEC law) and 2021-1014 of August 22, 2021 on fighting climate change and resilience building to its effects (known as the Climate & Resilience law).
- The implementing decrees.

5.2.2 Quantitative inspection

Decree no. 2021-517 of April 29, 2021 introduces a reduction target set for all marketers of single-use plastic packaging, at 20%, of which at least 50% obtained through recourse to reuse and reemployment of packaging (Article 7 of AGEC Law).

Decree 2022-507 of April 8, 2022 lays out, for the years 2023 to 2027, the minimum proportion of reused packaging to be marketed annually in France in order to achieve the reuse targets set by Article L.541-1 of the Environment Code, i.e. 5% in 2023 and 10% in 2027.

The decree applies to all suppliers who market the products at least ten thousand units of packaged products per year, and according to a gradual timetable:

1° For producers with annual sales of less than €20 million:
- 5% in 2026
-10% in 2027.

2° For producers with annual sales of between €20 and €50 million:
- 5% in 2025
- 7% in 2026
-10% in 2027

3° For producers with annual sales in excess of 50 million euros:
- 5% in 2023
- 6% in 2024
- 7% in 2025
- 8% in 2026
-10% in 2027.

The producers concerned fulfill their obligations either individually, or by participating in a collective structure whose annual obligation equals the sum of the minimum obligations incumbent on each of its members.

Producers who have joined an eco-organization fulfill their obligations through this eco-organization, which in this case acts as a collective structure.

Exemptions:

The decree does not apply to packaging that is subject to a prohibition on reuse for health or safety reasons, or to an authorization that prohibits reuse.

5.2.3 Special regulations

- Regulations governing aerosol dispensers

Decree 2022-507 of April 8, 2022 on the minimum proportion of reused packaging to be placed on the market each year (see § 5.2.2 above), excludes from the calculation the packaging of products whose placing on the market requires an authorization that prohibits their reuse or reutilization, or imposes an obligation to dispose of the used product with its container (article R.541-350 of the Environment Code).

Packaging as an "aerosol dispenser" is defined in the Decree as "an assemblage consisting of a non-reusable metal, glass or plastic container containing a compressed, liquefied or dissolved gas under pressure, with or without liquid, paste or powder, and equipped with a sampling device enabling the contents to be discharged in the form of solid or liquid particles suspended in a gas, or in the form of foam, paste or powder, or in a liquid state".

(Decree 2010-323 of March 23, 2010 on the prevention of risks arising from the use of aerosol dispensers).

- Microwave packaging regulations

On its website, the DGCCRF (French Consumer Affairs and Prevention of Fraud) focuses on packaging in contact with foodstuffs, with an annex on assessing the microwaveability of containers, boxes, plates, bowls and cups in which consumers put foodstuffs in order to store them and then heat them in the microwave (Annex 1:).

This document makes the assumption that the consumer can use such packaging several times, and provides manufacturers with a normative reference for assessing their suitability for such use, in compliance with the safety requirements of European regulations on packaging in contact with foodstuffs (in particular framework regulation 1935-2004).

- Regulations on Catering

As of January 1, 2022, cups, cutlery, plates and containers used as part of a daily home-delivery meal service are reusable and collected (article 77 of the AGEC law, set out in article L.541-15-10 III paragraph 19 of the Environment Code). This applies to home catering that offer home-delivery subscriptions at least four times a week (decree 2020-1724 of December 28, 2020, set out in article D.541-341 of the Environment Code).

As of January 1, 2023, some restaurants are to serve meals and beverages consumed in the restaurant in reusable cups, including their lids, plates and containers, as well as with reusable cutlery (article 77 of the AGEC law, set out in article L.541-15-10 III paragraph 18 of the Environmental Code). This regulation applies to all 20 and over people-capacity professional restaurants, whether it is their main activity or not, and whether they are indoors or outdoors (decree 2020-1724 of December 28, 2020, set out in article D.541-341 of the Environment Code).

6. Annex

6.1 Regulatory definition of packaging

The Environment Code defines packaging in Article R543-43[38] as follows:

"I. - For the purposes of this section, "packaging" shall mean all products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer. "Non-returnable" items used for the same purposes shall also be considered to constitute packaging.

The definition of "packaging" shall be further based on the criteria set out below :

Items shall be considered to be packaging if they fulfill the abovementioned definition without prejudice to other functions which the packaging might also perform, unless the item is an integral part of a product and it is necessary to contain, support or preserve that product throughout its lifetime and all elements are intended to be used, consumed or disposed of together.

2) Items designed and intended to be filled at the point of sale and "disposable" items sold, filled or designed and intended to be filled at the point of sale shall be considered to be packaging provided they fulfil a packaging function.

3) Packaging components and ancillary elements integrated into packaging shall be considered to be part of the packaging into which they are integrated. Ancillary elements hung directly on, or attached to, a product and which perform a packaging function shall be considered to be packaging unless they are an integral part of this product and all elements are intended to be consumed or disposed of together.

Orders of the French Environment Ministry are illustrative examples of the application of these criteria.

II. - "Packaging" consists only of:

1° sales packaging or primary packaging, i.e. packaging conceived so as to constitute a sales unit to the final user or consumer at the point of purchase;

2° grouped packaging or secondary packaging, i.e. packaging conceived so as to constitute at the point of purchase a grouping of a certain number of sales units whether the latter is sold as such to the final user or consumer or whether it serves only as a means to replenish the shelves at the point of sale; it can be removed from the product without affecting its characteristics;

3° transport packaging or tertiary packaging, i.e. packaging conceived so as to facilitate handling and transport of a number of sales units or grouped packagings in order to prevent physical handling and transport damage. Transport packaging does not include road, rail, ship and air containers."

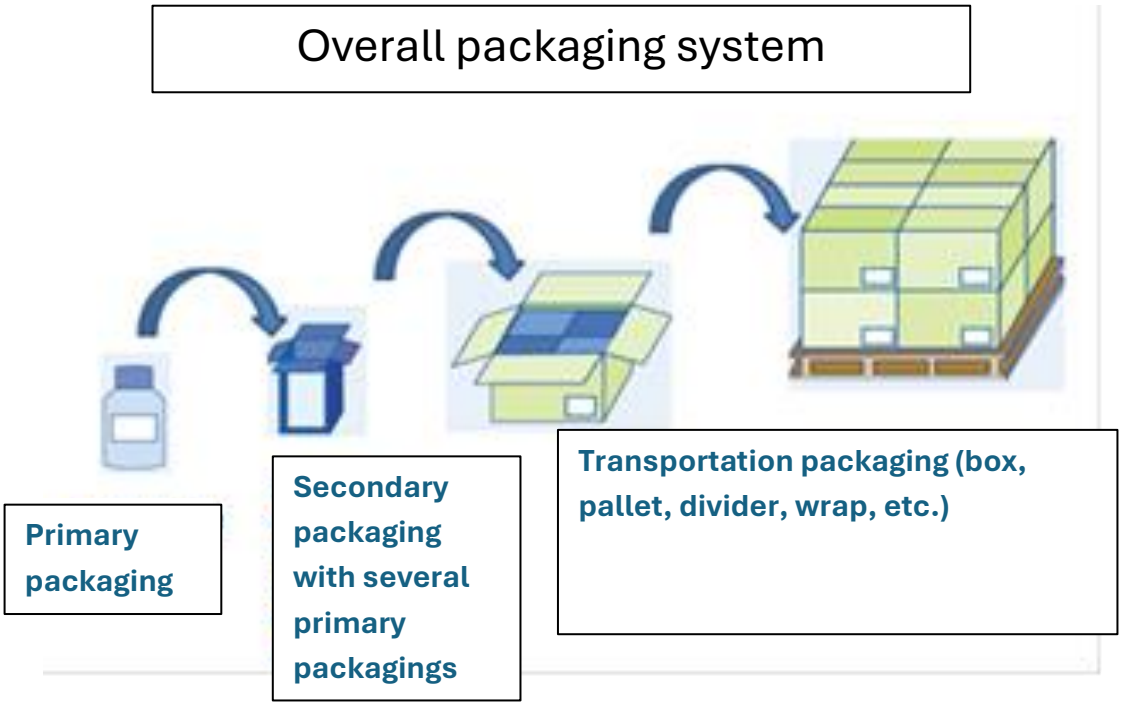
For further information, you may refer to directive 2013/2/UE. [39]

[38] Environnement Code (Livre V, titre IV, chapitre III, section 5, Article R543-43).

[39] Directive 2013/2/UE of the Commission of February, 7 2013 modifying annex 1 of directive 94/62/CE

Editor's note :

- Primary packaging can be made from different constituents. It protects the product and its characteristics all along the supply chain until consumption (ie. Sachet packaging, box, shrink wrap).
- The item is a sample unit or consumption unit.
- The group of items is the grouping of several primary sample units.



The packaging system[40] generally combines all types of packaging, but in some cases the primary packaging may fulfill the functions of the other two types. The packaging system should meet all the operating characteristics of these subsystems.

Packaging can also be different according to the final consumer. The end of packaging life can either be:

Household and similar packaging (municipal circuit)

This corresponds to all packaging that, once unpacked and used, households throw away.

Non-household packaging

This refers to all packaging that is not household: packaging related to industrial activities (B-to-B packaging, grouping and transport packaging, packaging used in collective catering circuits or by traditional cafés, hotels and restaurants).

[40]Packaging system: it is composed of primary, secondary et tertiary packaging. CNE-december 2010.

6.2 Definition of reuse by PPWR

According to PPWR, reuse is an "operation by which products or product components that are not waste, are re-used with the same use for which they were designed."

According to PPWR, reusable packaging includes those packages designed to be reused or refilled. This means they should be able to undergo as many cycles as possible under normal usage conditions.

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Acknowledgements

3M France	BEYSECKER Gilles
ADEME- OBSERVATOIRE DU RÉEMPLOI	GUIOT Marianne
ADRIA	DOUAY Emeline
ALBEA	SWYNGEDAUW Gilles
AMETEK DANSENSOR (Secimep)	FELK Alexandre
AVOCAT	MARTIN Sylvain
BEL GROUPE	DELAGE Delphine
BIC	ALAUX Céline
CARTON ONDULÉ DE FRANCE	DESBOUIS Kareen
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GOGLIO FRANCE (Secimep)	TINAZZI Alessandra
GROUPE GUILLIN	RICARD Sebastien
HEINEKEN	BATAILLARD Pierre-Alain
IMA ILAPAK FRANCE (Secimep)	DUVOT Grégoire
IN SPIRIT DESIGN	BLIN Christophe
ITM AI	PRITULIN Agnès
L'ORÉAL	BONNINGUE Philippe
L'ORÉAL	VALENTIN Marie
LÉKO	CRAPLET Maud
LNE	VINCELOT Thierry
LVMH FRAGRANCES BRANDS	YVER Armel
LVMH FRAGRANCES BRANDS	VALLON Christophe
MASSILLY (SNFBM)	BINDSCHEDLER Valérie
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