



The Future of Reusable Packaging



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Introduction



Antal Kerekes
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Today, most of our groceries are sold in single-use, disposable packaging, which all end up in the trash. However, European streets are not filled with garbage because, in practice, after collection, sorting, cleaning, some of them is recycled, incinerated, or even converted into energy, and the rest is disposed of in landfills – either at home or abroad.

But why is landfilling so bad? First, it occupies a significant amount of land, and the waste releases harmful substances, which pollute our waters and soils. From a health perspective, this is unfavourable for citizens, and in the long run, it also results in economic losses. Second, in terms of energy conservation, it would be more effective to reduce waste absolutely, rather than repeatedly producing food packaging and then recycling it at a high cost.

In our study, we aim to answer the question: Why do we continue to produce such large amounts of consumer packaging waste?

1. What are the local and international trends to reduce waste from food packaging? What is reuse?
2. What are the environmental benefits and economic rationale behind reusable packaging? And what regulations can be expected in the EU?
3. How does the consumer think about reuse? What impact do they have on the market?

Our study aims to inform retailers, city management, startups, and, last but not least, consumers, to help them navigate and provide a guide for more conscious decision-making. Our goal is to create circular operations within cities that are not only economically but also environmentally beneficial for citizens.

I wish you a great read on behalf of PwC Hungary!

01

Packaging Waste and the State of Reuse Globally



1.1 Global Waste Landscape

+81%

residential waste will be generated annually by 2050 (forecast)

According to the UNEP (United Nations Environment Programme) forecast, by 2050 globally, we will produce 3.8 billion tons of residential waste annually, which is nearly double (+81%) the 2.1 billion figure of 2023.

Some of the waste produced can be recycled, allowing us to extend the use of certain materials for one to two cycles. However, depending on the material, waste is also generated during the recycling process, which needs to be disposed of, and by-products are produced. Another possible way to handle the collected waste is incineration, which reduces the volume of waste and can even generate energy. In this case, however, toxic by-products are generated during the process, which, without proper treatment, contribute to an increase in air pollution.

The remaining waste, which we neither want to recycle nor burn, ends up in either illegal areas or landfills through organised collection. In this case, the waste pollutes these areas for decades. For synthetic materials, this means chemical pollution, which impacts the quality of the surrounding air, soil, vegetation, and our waters. In the case of bio-waste, the decomposition of organic materials significantly contributes to global warming through methane emissions.

Due to the space requirements and environmental and health impacts of waste disposal, developed countries pay special attention to processing nearly 100% of waste and minimising harmful effects, although this comes with extraordinary costs. **According to UNEP calculations, global waste management currently imposes a direct annual cost of nearly 250 billion dollars on the economy.** Adding indirect health costs, this already reaches \$ 360 billion. Considering the projected increase in waste volume, this figure could reach 640 billion dollars annually by 2050.

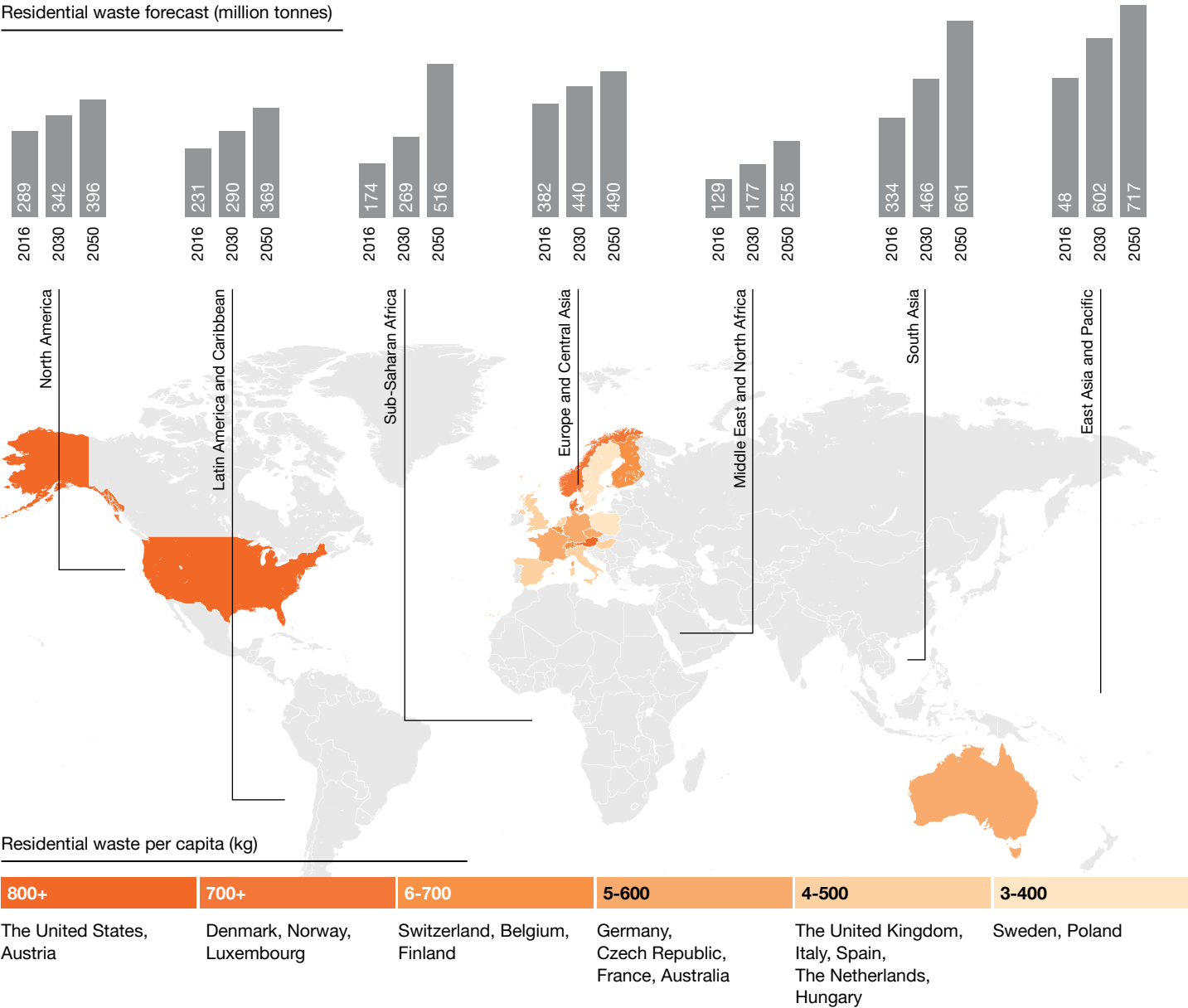
Waste management cost directly

~250

billion dollars annually to the global economy

In terms of per capita waste production, developed countries clearly play a leading role, and we see that the level of income positively correlates with the amount of waste produced. In Europe, Austria and Norway lead, while in the Americas, the United States is at the forefront. In these countries, the annual waste per capita exceeds 800 kg. In the Middle East, Bahrain stands out, while in Asia, New Zealand and Hong Kong are among the leaders. Developed countries are also outstanding in absolute terms; in the United States, the amount of waste produced in 2022 reached 265 million tons, while in Europe (including the United Kingdom), it was 244 million tons. In contrast, according to the World Bank forecast, countries in the Middle East, North Africa, and Latin America are expected to approach this amount only by 2030.

Figure 1.
Residential waste forecast for 2016, 2030, 2050 per region (kg / year / region) and the top 20 countries' waste per capita (kg / capita)

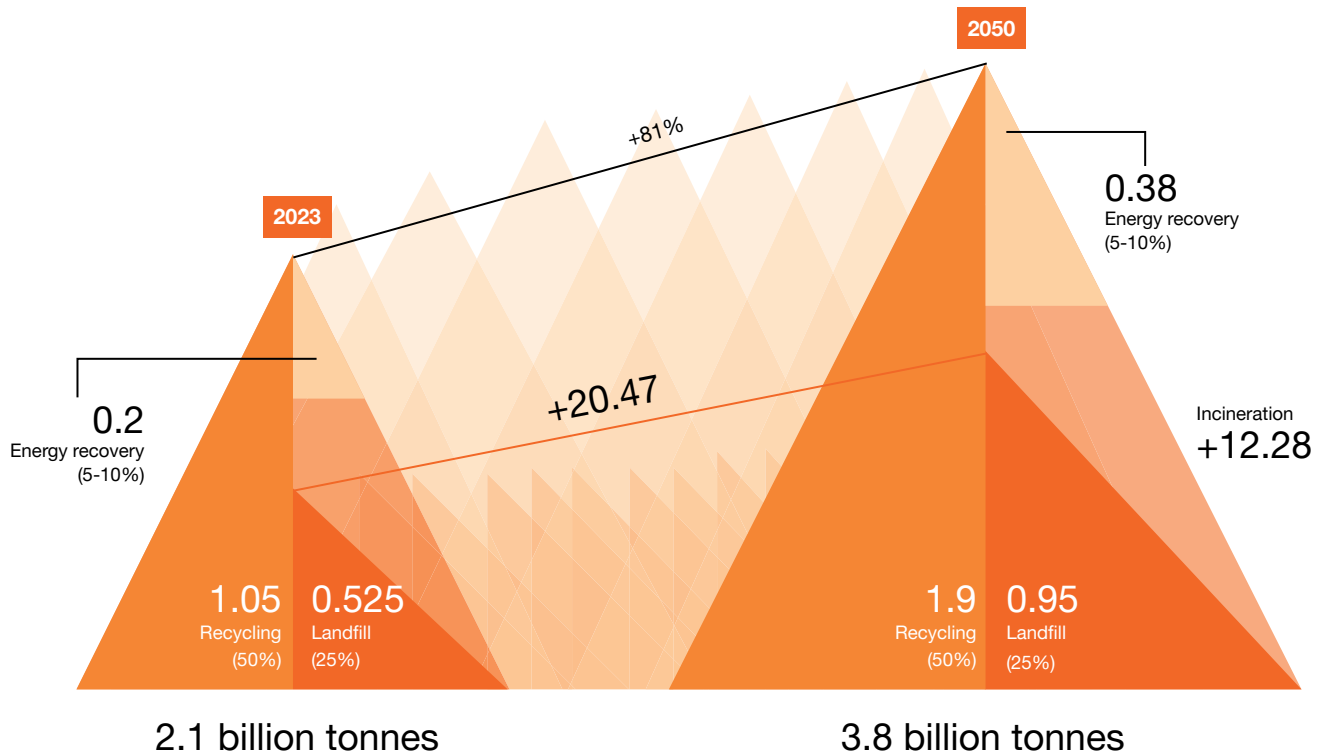


Since exporting waste often has more favourable economic conditions today, in addition to local waste management, many developed countries trade with developing countries. The largest waste-exporting countries are Germany, the United Kingdom, the Netherlands, and Japan. Each of them exported

approximately 600 thousand tons of waste in 2023. Alongside them, the United States, Belgium, and France are also significant, with each exporting 400 thousand tons. While China used to be one of the largest markets for transferred waste, in 2023, Turkey, Malaysia, and Indonesia are now the largest destinations.

Figure 2.

Global municipal solid waste generation in 2023 and forecast for 2050; illustration of potential absolute volumes by waste treatment options (billion tonnes)



Over nearly 25 years, total waste landfilled could be

411

times the waste generated in Germany in 2022

Based on UNEP's forecast, the demand for landfills is expected to increase by more than 20 billion tonnes over the next 25 years. To calculate this number, we already used the optimistic hypothesis that a 50% recycling rate is achievable in total waste management, and only 25% of the waste ends up in landfills. For illustration, 20 billion tonnes is equivalent to 411 times Germany's waste production in 2022, and this amount is hard to take lightly.

If such high rates of waste processing cannot be achieved locally, waste export will continue to exacerbate the already escalating inequalities. This is because, although developed, high-consuming countries generate more waste per capita, the costs of processing it, along with its health and environmental impacts, are realised in developing countries. However, the management of the situation should not be solely the responsibility of developing countries. Developed countries also have a stake in resolving the waste situation, as climate change and its associated economic consequences – although not to an equal extent – affect the entire global population.



1.2 Product Packaging

In Europe, approximately 25% of household waste comes from product packaging.

A distinction is made between primary packaging, which directly protects the product (e.g., foil, box), and secondary packaging, which is used for transporting products (e.g., crate, cardboard box).

While products were previously typically shipped in glass and metal containers, nowadays, in the global distribution, fibre-based packaging (paper, cardboard) accounts for 33%, flexible plastics for 26%, rigid plastics for 19%, metal packaging accounts for 12%, and glass accounts for only 6%.

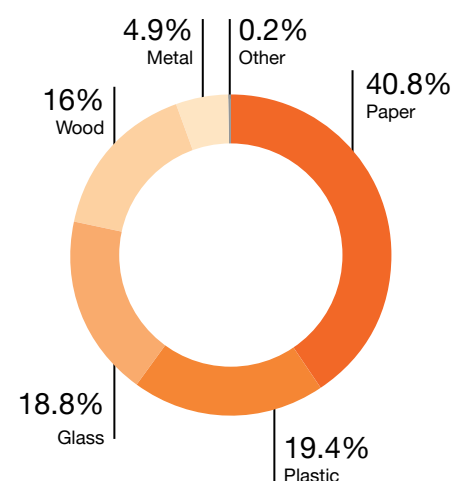
In the EU, glass packaging plays an even more significant role: compared with the global average, consumption involves roughly three times more glass, slightly less plastic, and a higher share of paper-based packaging. Here, the per capita packaging waste was 177.8 kg in 2023, equivalent to approximately 1 kg of waste per person every 2 days.

The amount of discarded packaging is increasing globally year by year. The choice of packaging material is a critical factor in determining waste management options. Let's briefly review the properties and benefits of each material.

In the EU, glass packaging plays a significant role: compared with the global average, consumption involves roughly three times more glass, slightly less plastic, and a higher share of paper-based packaging.

Figure 3.

Packaging waste by raw material (EU, 2023)





Health issues linked to plastics are estimated to have cost nearly

400

million dollars to the United States (1.37% of GDP in 2024)

1.2.1 Plastic

According to forecasts, the global packaging market is expected to reach \$ 1.69 trillion by 2034, with plastic packaging accounting for nearly 40% of this total.

When we think of food, the most common primary packaging that comes to mind is plastic. On the one hand, it is both lightweight and durable, which is advantageous in handling and transporting goods. Plastics play a significant role in extending the shelf life of food, thereby reducing waste caused by food spoilage.

Despite its advantageous properties, plastic has drawbacks: it takes centuries to decompose, and an evolving number of studies confirm that tap water, bottled soft drinks, and mineral water also contain microplastics that are harmful to health in the long term. We encounter thousands of different types of plastics, and over the past few decades, many have been banned in Europe and the United States because they have been found to be carcinogenic and contribute to the development of diseases and conditions such as diabetes, infertility, premature births, and other endocrine-related illnesses. The problem is that if plastics do not decompose, their effects can still be felt even decades after they are discarded. The PBDE plastic (used as a flame retardant) was banned in 2003. According to research published in the Journal of the Endocrine Society, the total health costs (including hospital treatments, medication costs, etc.) for the United States in 2018, due to PBDE alone, amounted to more than \$250 billion. So even 15 years later, cancer diseases, fertility difficulties, childhood and adult obesity problems were linked to this type of plastic. In the United States, the costs resulting from health issues associated with various plastics are estimated to be close to \$ 400 million (this is 1.37% of the 2024 GDP).

Globally, only about 9% of plastic waste is actually recycled. The recyclability of plastic largely depends on its composition as well as on economic viability. A bottle may be theoretically recyclable, but practically, it could be uneconomical to do so. Therefore, we are partly addressing a systemic issue, and by organised plastic collection, the recycling rate can be continuously improved. However, even if more is collected, manufacturers still need to establish a new supplier network and production process to utilise recycled plastic.

In 2023, the world's largest FMCG companies incorporated only 16% recycled plastic into the production of new plastic bottles. Although recycling is theoretically better than landfilling, **the process is energy-intensive, and the same material can only stay in the cycle for two to three times.** The remaining material ends up as waste anyway. Its handling and transportation mean additional costs compared to the production of virgin plastic. Furthermore, if we rely on fossil energy during the process, the arguments against recycling (as opposed to reducing plastic waste) only grow stronger.

Despite the disadvantages, the global plastics market is still expected to grow at a CAGR of 4.4% until 2034, while the global packaging market is forecasted to grow at a CAGR of only 3.2% during the same period. The latest innovations and investments aim to transform plastics, increasing their recyclability and reducing the energy demand required for this process.

Several global initiatives have been formed to reduce the amount of manufactured plastic. In collaboration with WRAP and the Ellen MacArthur Foundation, the UK Plastic Pact was established in 2018. It is now operating in 19 countries, with the participation of more than 900 organisations, to curb plastic waste production. In Europe, alongside the United Kingdom, France, Portugal, and Poland are also involved in the initiative.

In addition, various materials that are easier to recycle or reuse have emerged or regained focus as alternatives to plastic. According to forecasts, **by 2034, sustainable packaging is expected to account for nearly 25% of the total packaging market, valued at nearly \$400 billion.**

A large, bold, orange '9%' graphic.

of plastics is recycled globally

Plastics can only be recycled

A large, bold, orange '2-3' graphic.

times currently

1.2.2 Bioplastic

One sustainable packaging alternative is the so-called bioplastic. Bioplastics constitute only a fraction, 10%, of the entire plastic manufacturing market, and a 30.2% growth is expected over the next ten years.

Currently, 43% of the market is made up of packaging. Bioplastics differ from plastics in that their carbon content is derived from biologically renewable materials rather than crude oil. On the global market, bio-based materials currently comprise various plant sugars (29%), glycerin (27%), starch (18%), and vegetable oils unsuitable for human consumption (15%), with the remainder consisting of cellulose or edible vegetable oils.

Despite the bio label, these materials are still plastics, and their decomposition depends on their composition. Additionally, biodegradable plastics can only be composted in an industrial environment. If the bioplastic is non-biodegradable (currently accounting for 50-60% of bioplastic production), then recycling solutions are necessary, similar to those for plastic.

Within the bioplastics market, biodegradable bioplastic production reached \$6 billion in 2023, and according to forecasts, it is expected to triple over the next decade, but accounting for only 1.5% of the global packaging market value.

The disadvantages of bioplastics include that the renewable materials needed for their production also increase land use demand, which causes the largest greenhouse gas emissions within the food industry. Fertilisers used in agriculture, along with other chemical substances, all contribute to the increase in soil erosion.

1.2.3 Paper

Paper-based packaging accounts for one-third of the global packaging market, and with a growth forecast for 2034, it is expected to approach 40%.

Nearly half of the production is made up of corrugated paper (45%), followed by printed papers (18%) and cardboard boxes (12%).

The primary raw material for paper is wood, so the increase in demand also entails a growing need for the development and adoption of sustainable forestry practices. Globally, the American continent provides half of the raw materials, Asia accounts for 28%, while Europe makes up 22%. Forests are severely affected by climate change; thus, curbing reckless deforestation is becoming an increasingly urgent task. Forests play a crucial role in absorbing atmospheric carbon dioxide, and the demand for paper also underscores the need for sustainable forest management.



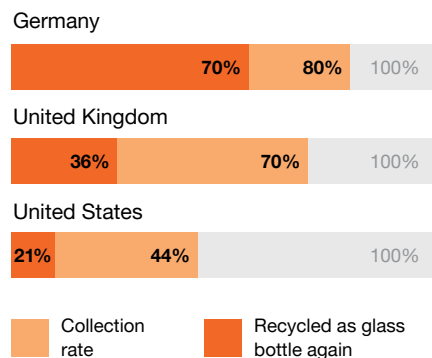
Additionally, paper solutions based on alternative natural materials that grow extremely quickly, like bamboo or hemp, are emerging. But innovations are also being developed in the market that transform food waste and produce new packaging from it (with the help of nanocellulose).

In the case of paper, we are essentially talking about a natural material that is biodegradable; however, its practical disadvantage is that it is not heat-resistant or waterproof. Therefore, a plastic coating or film is often applied to the paper for packaging purposes, to prevent it from soaking through when liquid gets inside. This way, plastic still ends up in the environment when the packaging is disposed of in landfills.

The advantages of paper include its recyclability, but since the fibres shorten with each cycle, it can only be kept in circulation to a limited extent. This is estimated to be an average of 5-7 cycles, but according to an Austrian study published in 2021, it can be as many as 25 cycles. Therefore, we encounter limitations similar to those of plastic. However, the recycling rate for paper is outstanding; in the EU, more than 80% of paper and cardboard is recycled, while for plastic, this rate is still only about 40%.

Figure 4.

Glass collection and recycling rate in 2019



1.2.4 Glass

In 2023, glass containers and bottles accounted for 6% – \$73 billion – of the global packaging market. By 2030, a 38% increase is forecasted, representing an annual growth rate of nearly 4-5%, which exceeds the overall growth of the packaging market. However, even then, glass will only make up 7-8% of the market.

Unlike plastic and paper, glass can be recycled infinitely, allowing it to remain in circulation indefinitely. Another advantage is that it contains naturally occurring, environmentally harmless materials: 71% sand, 25% soda and limestone, with dyes used for colouring. In the case of glass, there are no health risks, and the material can be recycled, with almost 100% of it being turned back into glass, and less than 2% of the material becomes waste.

However, glass manufacturing is an extremely energy-intensive process compared to the production of other packaging materials, as it requires temperatures of up to 1500 °C. Additionally, its transportation is more expensive due to its weight. Furthermore, the sand used for glass production is rapidly depleting, and if the energy-intensive glass ends up in a landfill after a single use, then all that energy is wasted, and it can almost never decompose (millions of years).

The carbon footprint of glass can be offset by accelerating the transition to renewable energy and maximising the multiple reuses of glass packaging materials. This practice is not unknown; for instance, in the 1970s, 99% of milk in the United Kingdom was available in refillable bottles. Today, however, this practice has largely faded away, accounting for only 3%.

Furthermore, consumer education and increasing the waste collection rate are also crucial for glass, because even though the material is recyclable, the bottles ultimately end up in landfills. **In Germany, the glass collection rate is outstanding, at over 80%, with 70% of the collected glass being recycled into new glass.** In contrast, in the United Kingdom, the rate is 70%, but only 36% is recycled into new glass. In the United States, the collection rate was only 44% in 2019, with 21% returned as glass bottles on the shelves. This is an important indicator because **broken glass can be recycled into glass in a more energy-efficient process.**

1.2.5 Aluminium

Aluminium is also a popular material for sustainable packaging. It is lightweight, UV and water-resistant, flexible, and its outstanding advantage is (similar to glass), that it is infinitely recyclable without losing its quality.

The market for aluminium cans is somewhat smaller than that for glass containers, amounting to 56.7 billion dollars in 2022, with an expected CAGR of 4-5% until 2034.

The production of aluminium, similar to glass, also requires more energy than plastic, yet its recycling rate is outstanding, reaching 75% in Europe and 50% in the United States. Further advantages of aluminium include that it remains after waste incineration, making it easy to collect. Additionally, during the recycling process, aluminium products achieve more than 95% energy savings compared to the production of new aluminium. **Estimates suggest that 75% of all aluminium packaging produced so far is still in circulation.**

Thanks to its advantageous properties, more and more cosmetic products are being packaged in aluminium instead of plastic.

75%

of manufactured aluminium is in circulation (estimated)

The paradox of sustainable packaging lies in the fact that, although these materials are theoretically recyclable, the recycling process itself remains highly energy-intensive. This raises a fundamental question: if they are designed for circularity, why must they be continually remanufactured rather than kept in circulation in their original form?

Reusable packaging refers to packaging that is not discarded after the product is consumed, but rather refilled. The reuse of packaging (note reuse, not recycle) as a concept was fundamental in the past. The significant increase in waste is a problem inherent in developed consumer societies, which are built on the expectations of abundance and convenience.

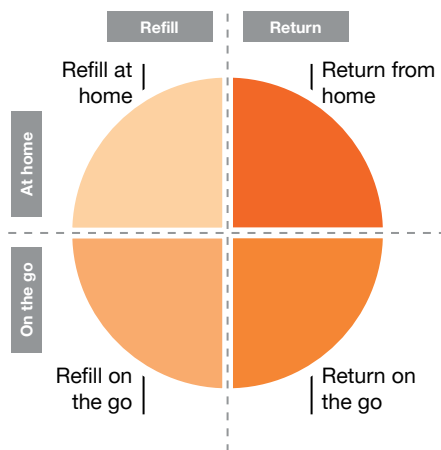
Modern systems based on reuse already consider these evolved consumer demands, enabling more sustainable consumption, often integrating the possibilities offered by technology and new business models.

We will now present these.

1.3 Existing Reuse Models

Figure 5.

Categorization of reuse models
(Source: Ellen MacArthur Foundation)



The business-to-consumer (B2C) packaging reuse models are well illustrated by the widely used framework created by the Ellen MacArthur Foundation.

The two dimensions that differentiate the various models are 1) who owns the packaging and 2) the location, meaning where we expect consumer involvement, at home or in the store/collection point.

1. Refill-at-home

The product arrives (e.g. we buy it in a larger package) and the consumer loads it into their **own dispenser or container** at home.

2. Refill-on-the-go

Consumers take **their own containers** with them and fill them at the store/refill point.

3. Return-from-home

The packaging is collected at home from the consumer post consumption; in this case, **only the product belongs to the consumer**, and the packaging was borrowed.

4. Return-on-the-go

The consumer returns the packaging to the designated collection point/store. In this case, too, **only the product belongs to them**; the packaging was received for the duration of use.

1.3.1 Refill-at-home

Refill-at-home is a common example of reuse; consider bulk products that we later dispense into our own containers at home. A 5-litre tap of apple juice saves the packaging of 5 boxes; a large refill pouch of shower gel results in 70% less plastic use. In these cases, waste is still generated, but less and over a longer period, it can also mean savings for the customer.

Another form of refill-at-home is purchasing only the concentrate, a condensed version of the product, which is then mixed with water at home (for example, buying only the soda siphon or detergent granules). There are several success stories, such as SodaStream in Hungary, or detergent-focused brands like Smol and Splosh, which

are popular in the UK. Another notable example is the OMO detergent from Unilever, which is a six-times concentrated formula for the standard 3-litre container (which needs to be purchased only once). The program started as a pilot project in Brazil and has since expanded to other South American, Middle Eastern, and European markets. The packaging uses 70% less plastic, is fully recyclable, and contains 50% recycled plastic.

Selling as a concentrate allows the manufacturer to reduce logistics costs. These products are lighter, and due to their small volume, more can be transported in one vehicle, thus they can be sold at a lower price, which is also favourable for the consumer.

Refill-at-home could also serve as a tool to reduce inequalities between cities and disadvantaged areas. In regions with lower population density or poorer areas, the available product range is typically smaller, and delivering products also incurs higher logistics costs, resulting in relatively higher prices for consumers. Shopping options for residents are limited, and price competition among stores will also be less intense. This is also known as a poverty tax, when the population faces proportionally higher prices, even 30-35% higher (relative to their income), when they are pushed out of the city. Their situation is further exacerbated by the fact that waste collected in cities is also returned to these areas, which increases waste management and healthcare costs that they must later finance again through taxes.

The Chilean startup Algramo was originally founded to address this phenomenon. The business model was to offer basic products at lower prices to consumers in underserved areas by reducing packaging costs. Lower prices improve the livelihoods of residents, and thanks to refill, there is also less packaging waste.

Algramo utilised electric tricycles equipped with dispensers designed for refills and special packaging, featuring RFID technology. The tricycles travelled through these remote areas, allowing consumers to fill their containers with the products. During the pilots, on average, customers reused the packaging up to 15 times, thereby saving 2 kg of plastic waste per package.

(Picture: fondazionecartaeticapackaging.org/)



In addition to being favourable for consumers, the company provided FMCG companies the opportunity to increase their market share in previously inaccessible markets due to the absence of supermarkets. Algramo sold 900,000 reusable packages between 2020 and 23, which, according to their estimates, saved more than 3 million litres of water and 100 tons of plastic in just 3 years.

1.3.2 Refill-on-the-go

Refill-on-the-go is when the consumer goes to the store with their own container to refill it. The Kuha sa Tingi project in the Philippines is similar to Algramo in its social ambition. Large containers are placed in small local shops, where customers can refill their own bottles with the amount they need, saving on packaging costs. In Indonesia, several refill models are being tested using Algramo's technology (QYOS), and currently, there are more than 1,000 refill stations located at waste banks, stores, and other retail outlets. According to estimates, community refill stations in Indonesia reached over 6000 customers and saved more than 6 tons of plastic through the sale of 91,000 litres of products in 2023.

In the last 5 years, numerous supermarkets and drugstores in developed countries have launched pilot projects to test refill-on-the-go. During this period, the retail chain, in collaboration with the manufacturer and the technology provider, enabled consumers to access household products, such as detergents, shampoos, or dry groceries, in refillable packaging designed for reuse.



The supermarket chain ASDA, in collaboration with Unilever, launched such a pilot in 2020 in the UK in Middleton (Leeds), which was expanded in 2021 with additional brands and stores in Glasgow, York, and Milton Keynes. The product range included more than 50 items available in refillable dispensers: detergent, shampoo, shower gel, muesli, rice, pasta, tea, coffee, peanuts and other seeds, sugar, cat and dog food were also available in the refill zone.

(Picture: which.co.uk)

40%

growth in transactions

26%

growth in revenue

The first pilot's results were encouraging, achieving a 40% increase in transactions and a 26% increase in sales revenue for the store that launched the trial. Additionally, it resulted in capturing not only existing but also new customers in certain product categories. For example, the sales of Persil in reused form attracted 10% more new customers to this product.

However, the pilot also pointed out that for scale-up, a significant transformation is needed in both product manufacturing and logistics, as well as in the daily operation of stores. In commercial chains where these functions are concentrated in one hand, and in those product categories where brands can also influence the manufacturing process, they can scale faster and more cost-effectively.

It is also important to see that although leaving out packaging saves costs for the buyer, consistently carrying one's own container for shopping also requires extra energy and planning from the consumer. Therefore, it is critical to make the process simple and straightforward for the customer. Where this failed, and customers ultimately did not transition in their behaviours, the pilots ended without success. Changing customer habits is indeed a time-consuming process, but until all of the products are available in refillable packaging, there is an opportunity to **attract additional customers who are receptive to the value proposition to these stores and brands.**

With the help of technology, customer engagement can also be supported digitally, as packages can be tracked, and the consumer is expected to return to the store to use the refill stations again. This presents an opportunity for retailers to engage with customers through additional digital channels. In Europe, the Czech startup MiWa Technologies is achieving success. After the Czech Albert CZ, their refill technology can also be found in some stores in the Netherlands, at Albert Heijn; in Germany, at Rewe; and in the United Kingdom, at Aldi.

In Hungary

In Hungary, some refill-on-the-go examples can be found in the case of cosmetic products. The Body Shop and L'Occatane stores operate shower gel and shampoo refill stations, Rituals stores offer refillable perfume bottles, while some Rossmann stores allow us to refill our deodorants at Respray stations.

1.3.3 Return-on-the-go

In the case of return systems for reuse, consumers only need to change their habits to the extent that, post consumption, the packaging waste needs to be disposed into a specialised collection bin. It is a convenient solution, as consumers do not need to bring a container for shopping and to deal with refill stations. In this model, the manufacturer or retailer is motivated to collect the returned packaging with the highest possible collection rate.

Several financial tools are available on the market to provide this incentive. In the traditional deposit system, cashback is offered after submission, while other programs that increase engagement utilise positive reinforcement and provide additional benefits to customers.

In the United Kingdom, M&S – following successful pilots – has already made ten of its own brand products available in refillable packaging in 25 stores. During the development of their refillable packaging segment, they collaborated with Reposit.

The return process takes place in M&S stores, where customers scan the QR code found on the packaging and the collection point before handing over the product. In exchange, they receive a redeemable coupon via email, which can be used on their next purchase. In this case, the product can be purchased at a reduced price because there is no need to pay for the packaging again.

(Picture: reposit.com)





To successfully scale reusable packaging, the goal is to maximise the return rate and minimise the shipping and packaging cleansing costs. Industrial cleaning is more efficient in terms of water management than cleaning performed by consumers at home. The environmental return truly manifests when the reuse operational model is implemented on a large scale. Reposit utilises heat cleaning, a chemical-free and economically efficient method that minimises water usage. However, in their case, there is a need for excess energy that should come from green sources to offset the negative impact.

Reposit uses aluminium bottles, so even if the consumer decides not to return the bottle and it ultimately ends up in the landfill, we can still talk about an environmentally friendly concept due to the recyclability of aluminium.

(Picture: reposit.com)

Another advantage is that the marketing function of the packaging is not eliminated; it can still be used for labelling and branding, which, in the case of refill-on-the-go, is only possible at refill stations. This is especially important for new products where brand or product awareness is not yet strong, and packaging helps create visibility. Product differentiation is of paramount importance for smaller-scale start-up manufacturers.

Establishing a separate packaging return system is often a simpler and more scalable solution for those who produce in small quantities. For them, the complete transformation of manufacturing technology to large-sized containers suitable for refilling can be more costly than developing a refillable bottling system.

Several brands have begun collecting used refill packaging from consumers, which not only reduces waste but also provides operational benefits, including lower manufacturing costs and increased market share by retaining customers. Depending on the design, the collected packaging is either refilled or recycled. TerraCycle often even covers the courier fee for returns. In the UK, Splosh cleaning product refills can also be returned.



1.3.4 Return-from-home

The most convenient return solution for consumers is when the retailer or manufacturer collects the empty packaging from their homes. This model is easiest to implement for companies in the food-delivery sector, especially those operating on subscription-based business models. In this case, the buyer only needs to keep the packaging until the next purchase, when they can return the empties upon the arrival of the new package.

A great example of this model is Loop (by TerraCycle) in France, which started as an online marketplace where you can order popular products such as Nutella, Coca-Cola or Tide in refillable packaging. After the consumer returns the empty containers, Loop takes care of sorting, cleaning and returning them to the manufacturer, who then refills them. After refilling, the packaging is returned to the cycle again.

(Picture: wastedive.com)



Loop has conducted extensive pilot projects with supermarkets over the past five years in the USA, Canada, and Japan. Successful scaling has so far been achieved in France with Carrefour, which was the first globally to make reusable packaging available to its customers for 375 products in more than 300 stores.

In Hungary

A similar reuse example in Hungary is offered by kifli.hu, providing dairy products and dry goods in multi-use packaging that is then collected and returned to the producers. Another similar example in the detergent segment is provided by Biobubi.

One of the biggest challenges in scaling reuse is that the upfront investment in packaging is high, which in turn raises product prices for consumers. However, it can only attract brands and achieve economies of scale as demand from consumers increases.

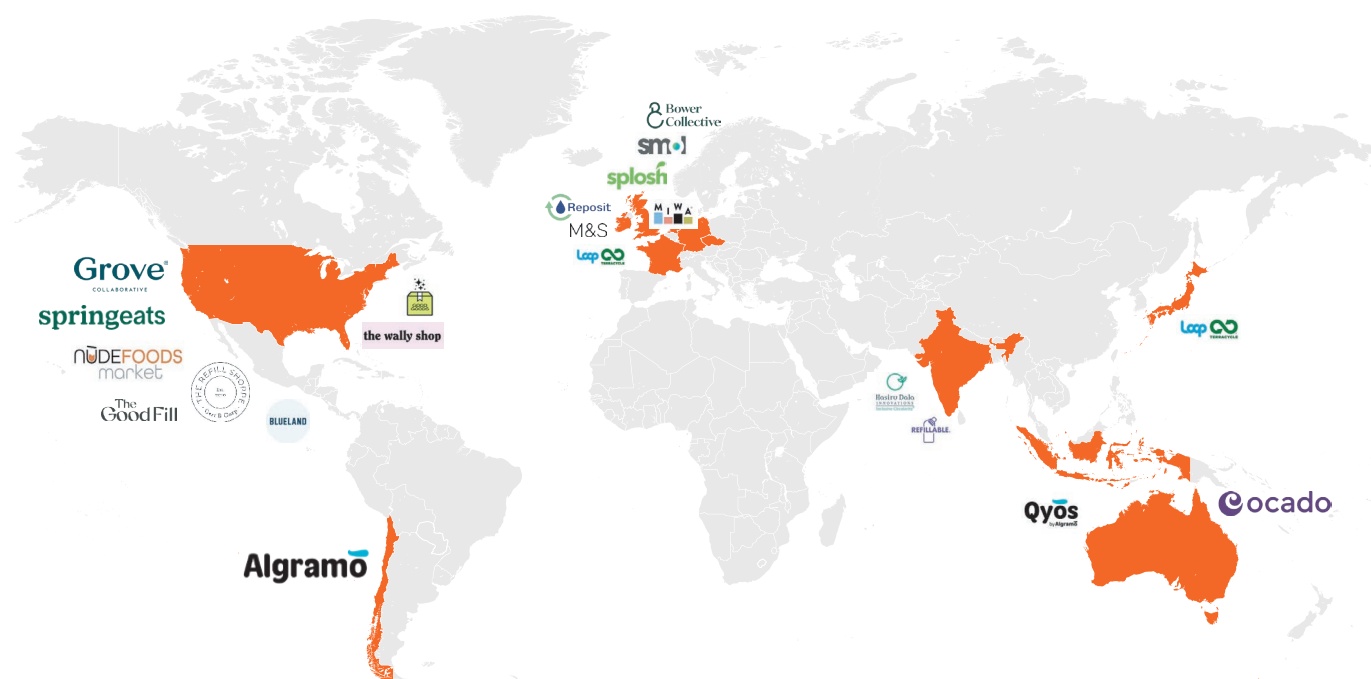
Due to the COVID-19 pandemic and the subsequent economic situation, price sensitivity among consumers has increased further, which has not aided the spread of these innovations. Although the initiatives could offer a long-term solution to the waste crisis, they are in vain if consumers do not opt for products with reusable packaging instead of single-use packaging.

However, companies that innovate with reusable packaging in delivery subscription models can reach a new, more conscious consumer group: those who are looking for reuse but have found very few opportunities to reduce packaging waste so far. These new players are stronger in the direct-to-consumer (D2C) channels because, although they can appear in retail chains with their products, they struggle to compete on price with well-established, large-scale manufacturing brands.

Several new detergent brands and cosmetics companies have begun to expand in the United States and the United Kingdom, adopting similar operational models. For instance, Grove Collaborative already operates with a 700,000-strong customer base in the United States, and its 2024 report estimates an additional 57 million customers who have purchased eco-friendly products online in the past year. In the United Kingdom, Smol and Splosh are emerging companies worth watching.

Figure 6.

Selected global commercial players already providing reusable packaging (service providers, e-shops, manufacturers)





1.4 Reusable Packaging in the Hospitality Industry

Besides food packaging, another major source of single-use packaging waste is takeaway cups and containers used in the hospitality industry.

According to estimates, **approximately 500 billion single-use coffee cups – used only for an average of 10-15 minutes – end up in the trash worldwide each year.** In a developed European country like the United Kingdom, an average of 2.5 billion end up in landfills each year, while Germany produces 4.5 billion food containers and 5.8 billion single-use beverage or coffee cups annually.

Single-use coffee and beverage cups are primarily made from plastic, and even paper cups are often coated with a thin plastic (polyethylene) layer, so they can retain the liquid without soaking through. Although this coating makes up less than 5% of the cup's material, it still significantly complicates the recycling of the cups. The decomposition of polyethylene is estimated to take 500 years, so it will be a long time before we can get rid of those that have already ended up as waste.

Compostable cups and food boxes can biodegrade, but in industrial processes. Therefore, their selective collection and transportation must be ensured; otherwise, they still end up in landfills. The same applies to PLA (Polylactic Acid) cups, which, although made from plant-based plastic, can only be decomposed through industrial composting, as the process requires special conditions.

Globally

500

billion single-use cups are thrown away annually

In response to the recycling problem, more players are emerging on the market who are thinking in terms of a “packaging-as-a-service” business model. To meet the demand, they bring along new companies providing cleaning and logistics services as supplementary providers, as well as manufacturers of reusable containers. This process is supported by the fact that in the EU, single-use plastic packaging is being increasingly restricted, and the promotion of reusable packaging has come to the forefront.

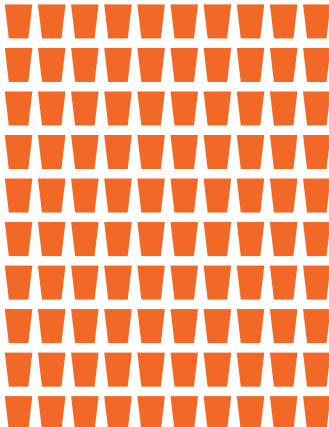
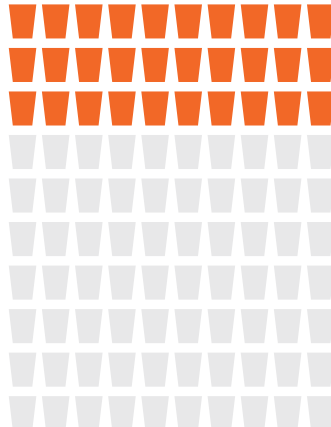
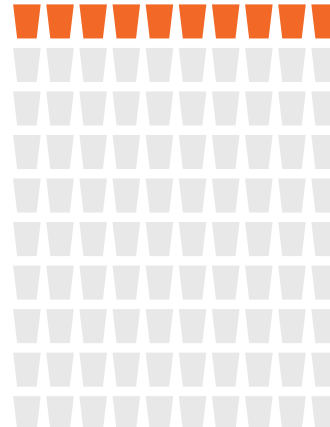
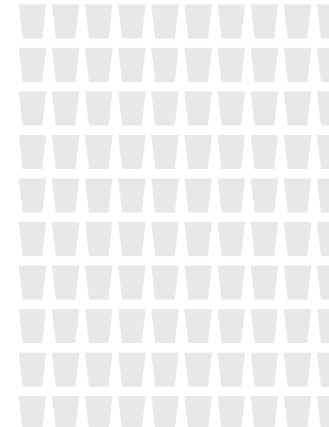
For reusable cups and food containers, models can be distinguished along two dimensions: the first is the ownership of the packaging, and the second is traceability.

According to the ownership of the packaging, there are three options:

- 1. The HoReCa company acquires the reusable containers that consumers borrow for the duration of their consumption.** When we eat on-site, plates or ceramic cups are already available, which are in fact reused. The reusable packaging option complements this by allowing customers to return takeaway cups or boxes at a later time. In this model, the responsibility for collection and cleaning falls on the venue. Depending on the price of single-use packaging, if the return rate is low, it may be more expensive than alternatives that are single-use. However, even after a few reuses, by encouraging returns, the venue can achieve cost savings. The advantage of this model is that the hospitality venue is incentivised to encourage packaging reuse, and it can also more easily attract customers back later.
- 2. The company operates as a “packaging-as-a-service” platform,** entering into agreements with hospitality venues and providing the reusable packaging. Users could also participate, for instance, through a subscription. In this model, the packaging service provider is motivated to collect the cups and manage package collection, cleaning, and redistribution. The advantage of this model lies in economies of scale during cleaning and transportation, as well as providing interoperability between different venues, which benefits the consumer.
- 3. The customer owns the packaging.** In this case, manufacturers can be creative not only in terms of design and materials, but they can also expand the functionality of the containers, for example, enable digital payments or loyalty card identification. Cafes often encourage the use of personal cups with discounts (a % discount, or in the case of loyalty cards, faster accumulation of points, such as every 5th purchase results in a free drink instead of the 10th). The initial investment is more expensive for the customer, but depending on the brand and frequency of use, it can pay off within a couple of months. This model is good from a customer experience standpoint, because the consumer can drink from their own favourite cup. And this option must be provided by every catering establishment in the EU.

Table 1.

Functionality scale of takeaway containers

→			
Recyclable cup	Reusable cup	Traceable reusable recup	Smart cup
Single-use, biodegradable	Reusable multiple times	Traceable, labeled that can be scanned	Additional features (e.g. warm-up, digital payments, loyalty program point collection, etc.)
Ownership			
Café / restaurant	Café / restaurant	Café / restaurant	Consumer
Business model			
Café / restaurant buys the cups and serves them to the consumer	- Café/restaurant buys it and lends it to consumer for a deposit fee - At the next purchase the consumer does not have to pay again, if the cup is returned	- Café/restaurant buys it and lends it to consumer for a deposit fee - If in X hours the cup is not returned, the price of the cup is deducted from the consumer, and ownership is transferred	The consumer buys his/her own smart cup, which could be linked to digital wallets, loyalty membership accounts, and to other applications
Required technology and service-level			
Industrial composting facility	Cleaning facility	- Cleaning facility - Collection point operation	IoT, Payment solutions, Loyalty applications
Illustration of waste generated per year*			
			
100 pcs per day 36,500 pcs per year	30 pcs per day 10,950 pcs per year	10 pcs per day 3,650 pcs per year	0 pcs per day 0 pcs per year

*100 consumers per day, 1 coffee per day, 70-90% collection rate

In Hungary

These services are primarily based on a deposit system, where consumers receive a reusable container for a small deposit fee, which they can redeem at any partner location. A similar example in Hungary is Boomerang, which is available in Budapest and several rural towns: the cups work in a deposit system and can be returned to all partner cafes.

For successful scaling, it is crucial to align the appropriate product development, business model, operations, and supporting digital technology. On the one hand, reusable containers must be designed to be durable, considering their regular cleaning, so that they remain suitable for the consumer even after multiple uses. To achieve a high return rate, a well-organised collection process is necessary. It is worth making the containers traceable and designing the business model in a way that it is simpler and more economical for the consumer to return the packaging rather than discard it.

In closed-loop areas, such as events, festivals, museums, schools, and university campuses, collection is easier to implement, which is why we often encounter returnable containers in these settings. One of these global success stories is Vytal, a company originating from Germany, which is now present in more than 17 countries worldwide, including the United States and Latin America. In 2023, it launched a pilot operation in Hungary in collaboration with Wolt. In 2024, the company secured an additional investment of € 6.2 million, boasting a 99% return rate and a user base exceeding 500,000.

Vytal works with containers that can be identified and tracked through RFID technology. Their business model allows consumers to access containers free of charge, and they incur a fee only if they return the packaging later than 14 days. Businesses can also interact with consumers through an application, which creates a platform for further promotion.



A similar example in the United Kingdom is Circularity Co.'s reusable coffee cup, which operates with the same business model, but with a focus on cafés. When purchasing coffee, the takeaway cup is identified, and the price of the cup is only deducted from the bank card used for the purchase if the customer does not return it within 48 hours. With appropriate pricing, the company achieved a nearly 90% return rate. For tourist attractions, this solution can be encountered, for example, in Blenheim Palace.

(Picture: circularandco.com)



Even without the technological background and digital tracking, there are well-functioning, successful reusable packaging services. The DabbaWalla system, which has been in operation in India for decades, is one such system. It delivers more than 200,000 lunches to workplaces in Mumbai every day in reusable metal containers. But we don't have to go that far. In Germany, both Recup and Rebowl became successful without digitalisation and are now available at 20,000 locations across the country. reCircle, which was launched in Switzerland, operates in smaller volumes, but already in five countries, partnering with 410 restaurants.

(Picture: Rebowl deposit fee solution, zum-alten-goten.de, recup.de)

Reusable packaging can also provide an opportunity for residential cooperation and community development within cities. In Petaluma, California, a pilot program was conducted between August and November 2024. In the town with a population of 60,000, takeaway drinks were served in special, striking purple cups at more than 30 restaurants and cafes. Used cups could be returned at collection points placed throughout the city.

Every cup had a QR code, which enabled data collection, providing a more accurate picture of which collection points are busier and when the collection boxes fill up. The expansion of the reuse model to the city also enabled an increase in residents’ openness and activation towards solving the waste problem, upon which further initiatives can be built.

(Picture: theguardian.com)



Finally, it is also increasingly common for food delivery companies to independently decide to differentiate their services by offering food and drinks in reusable packaging. Allowing customers to return their containers during their next purchase helps to achieve a higher return rate. An example of this in the UK is the DabbaDrop restaurant, or in the USA, Methodology. They deliver healthy, macro-nutrient-balanced meals in reusable glass containers to customers.

In Hungary

A similar model is also followed locally by Food Revolution in Hungary.

In this segment, new players also appear, offering healthier alternatives at workplaces or busier canteens through refrigerated vending machines that utilise reusable packaging.

(Picture: paperwhite-studio.com)



Table 2.
Evaluation of returnable packaging based on functionality and service model

Standardized cup		
Hospitality player (festival, museum, airports, café, etc.) own cups	Packaging-as-a-service	• In case of low collection rate, advantages from reuse can't prevail • Waste is generated in higher quantities
• Can be branded • Easy for the consumer to return (collection bins)	• Transferable system can be built for the consumer (wider network to return cups) • Higher collection rates	
Tracable cup (RFID / QR code)		
Hospitality player (festival, museum, airports, café, etc.) own cups	Packaging-as-a-service	• For operations digital tools and technology investment is required • More complex for the consumer
• Opportunity to analyze consumer habits digitally • Higher collection rate is achievable (financial incentives)	• With data collection habits of citizens, and urban development points could be identified • Less waste is generated (less cup per person)	

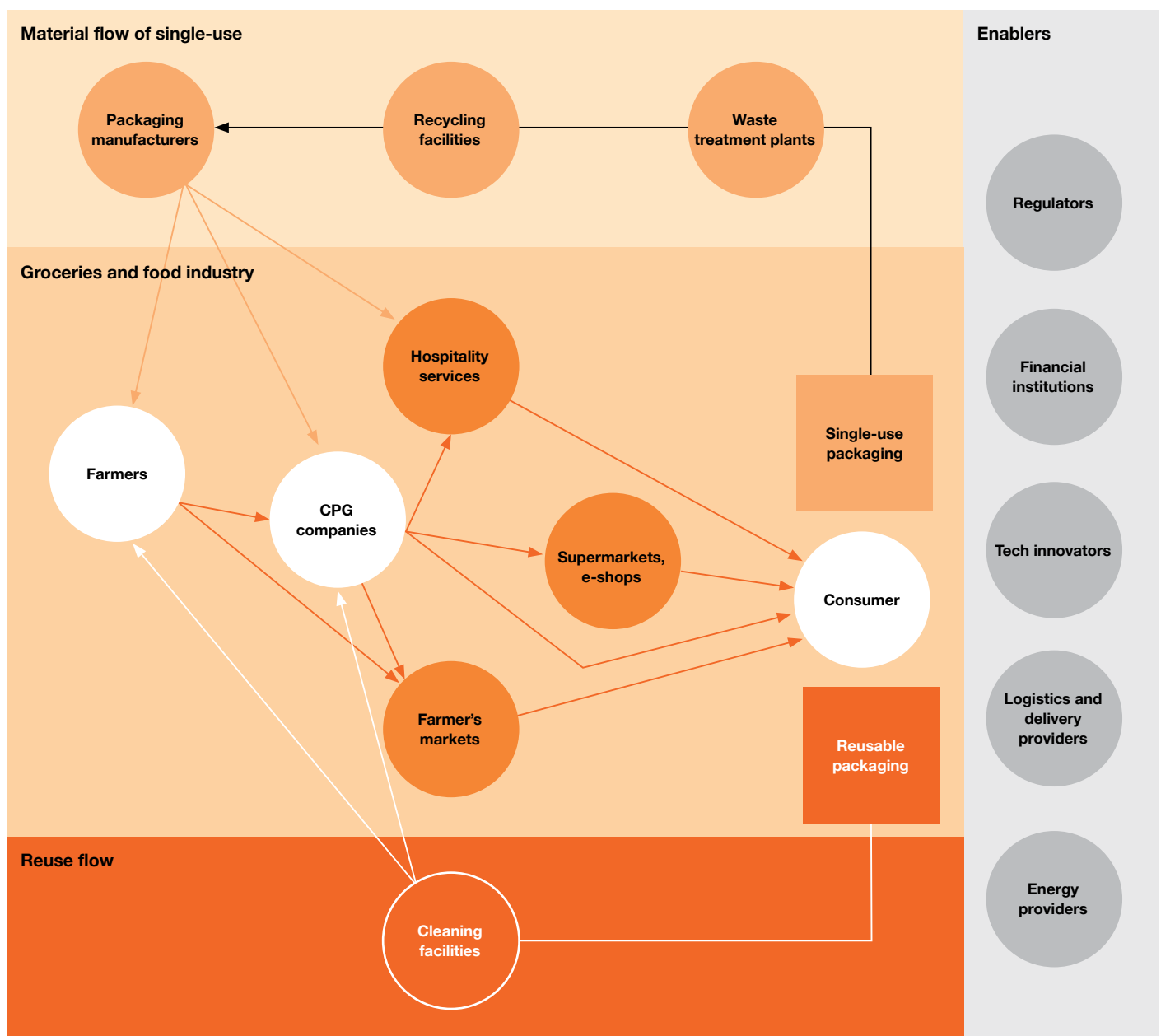
Why is it important to analyse both the economic and sustainability dimensions of reusable packaging models?

Transitioning to a circular economy and reducing packaging waste is a complex issue that can become economically viable only through the coordinated and harmonious operation of multiple stakeholders at the local level.

The real economic and sustainability benefits of reusable packaging are often questioned. In response to this, after considering the international outlook and reuse models, we examined the economic and sustainability aspects of developing a reusable packaging service model with a geographical focus on Budapest. To this end, we created and modelled a hypothetical reuse system, the results of which are now briefly discussed in this paper.

Figure 7.

Single-use and reusable grocery packaging ecosystem players



02

Environmental and Economic Benefits of Reuse





Among the reuse models, the one that requires the least time and effort from the consumer is when the packaging is collected from home.

If we envision a forward-looking operational model popular at the residential level, when products become widely available in reusable packaging in stores, then alongside curbside recycling bins, a bin for collecting reusable packaging could also be introduced. These would be collected at regular intervals, and then the packaging could be cleaned, sorted and returned to the manufacturers.

But how economical could the establishment of a similar operational model be? What are the sustainability advantages, if any? We seek to answer these questions in the following chapters.

2.1 Methodology Overview

We simulated the operations of a hypothetical company that delivers food to residential addresses (similar to kifli.hu in Budapest). The company regularly collects the packaging and then cleans it for reuse.

In our model we simulated the delivery and collection tasks of such a company in Budapest, distinguishing between a **downtown area with high population density** and a **suburban area** with low population density but larger distances in a green zone. With this, we examined how much operating costs increase due to the decrease in population density and the increase in distances. For these zones, we looked at how costs and environmental gains develop under different market penetrations:

- 10% penetration – in line with the EU’s packaging waste reduction* directive,
- 50% penetration – industry cooperation, with commitments from several major players,
- 70% penetration – in case of a unified legal requirement to limit single-use packaging.

In the hypothetical operational model, the key cornerstones are as follows**:

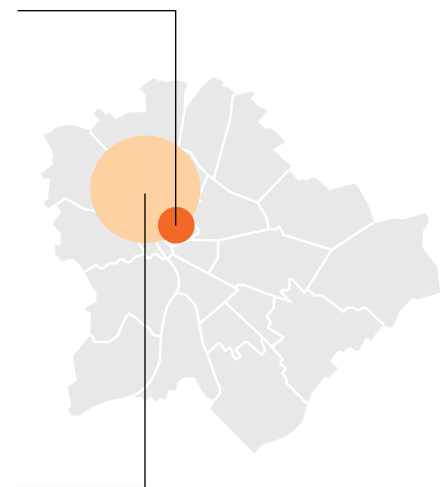
- An electric fleet is available for delivery and collection.
- The reusable packages are designed to withstand 50+ cycles, standardized, and consumers receive dry ingredients in aluminium (100% recycled) and liquids in glass (40% recycled) containers.
- Delivery to a household occurs twice a week, and collection happens simultaneously with delivery.
- Home delivery is available on workdays and 1 day on weekends.
- Central cleaning facilities operate, where all packaging is uniformly washed. From here, the already cleaned containers could be collected by the manufacturers (the manufacturer-side section is no longer part of the model).
- The cleaning facilities also serve as storage spaces, from where the food is delivered.
- In the case of glass containers, there is a weekly 3% churn due to breakage.
- Both consumers and manufacturers are already familiar with the system and are cooperative, achieving a high, 98% packaging return rate.

Downtown

Downtown of Budapest (area bordered by Hungária Boulevard - Margit Boulevard - Petőfi Bridge). **Higher population density.**

Number of households:

~80,000



Suburbs

Suburban area, **lower population density, higher distances.**

Number of households:

~50,000

* See “Future legislative environment and expectations in the EU” section on page 44. for further information about PPWR.

** For detailed technical specifications of the model, please contact us.



2.2 Results

2.2.1 Environmental Returns

We aim to present a study that helps illustrate the results comprehensible even to lay readers. A highly detailed, full-life-cycle analysis (LCA) could be daunting. Therefore, when examining environmental impacts, we employed simplification, presenting only:

- (1) the carbon footprint (CO₂e),
- (2) the water demand,
- (3) the electricity demand and
- (4) the amount of waste produced.

We sought to answer the question of what benefits could be realised if we switch from single-use (mostly plastic) packaging to glass and aluminium packaging (in proportions of 10%, 50%, and 70%). Consequently, every chart in this part of the study should be interpreted as depicting the benefit that would result if the switch or transformation were to occur. All our calculations pertain to the delivery and collection-based model detailed in the ‘methodology overview’ chapter. The environmental data points were sourced from the Ecoinvent database.

We calculated with 40% recycling for PET and glass packaging and 50% for aluminium. The rest of the packaging waste is handled according to the local waste treatment rates (cradle-to-grave approach).

1. Footprint Comparison

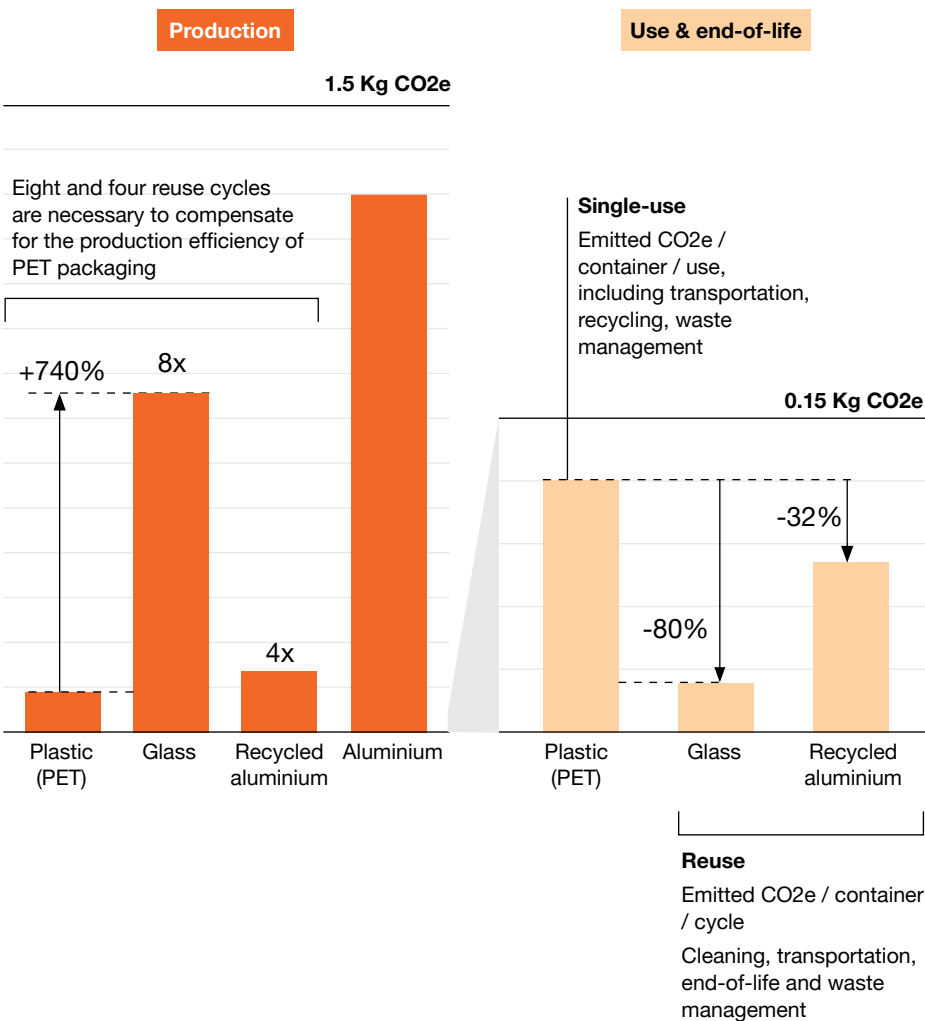
The metric used for comparing the carbon footprint in our study is defined in CO₂e (equivalent) kg, which consolidates the impact of greenhouse gases into a single indicator.

Depending on the number of cycles the packaging completes, packaging kept in circulation can be more favourable in terms of CO₂e emissions.

The CO₂e emission per container of a PET bottle, considering only the production of packaging, thanks to manufacturing efficiency, is indeed significantly more favourable compared to glass and aluminium packaging. However, if we also consider the emissions from the waste management and recycling of single-use plastic packaging and compare this to glass and aluminium packaging kept in circulation, the latter only accounts for 20% and 68% of the PET bottle emissions in every cycle. For glass packaging, eight cycles are required; for recycled aluminium, only four.

Figure 8.

Comparison of average CO₂e emissions per container per cycle, for plastic, glass and aluminium packaging, split into two phases – production and use & end-of-life (PwC model)



In each cycle CO₂ emissions from glass and recycled aluminium packaging is only 20% and 68% of the CO₂e emissions of PET packaging.

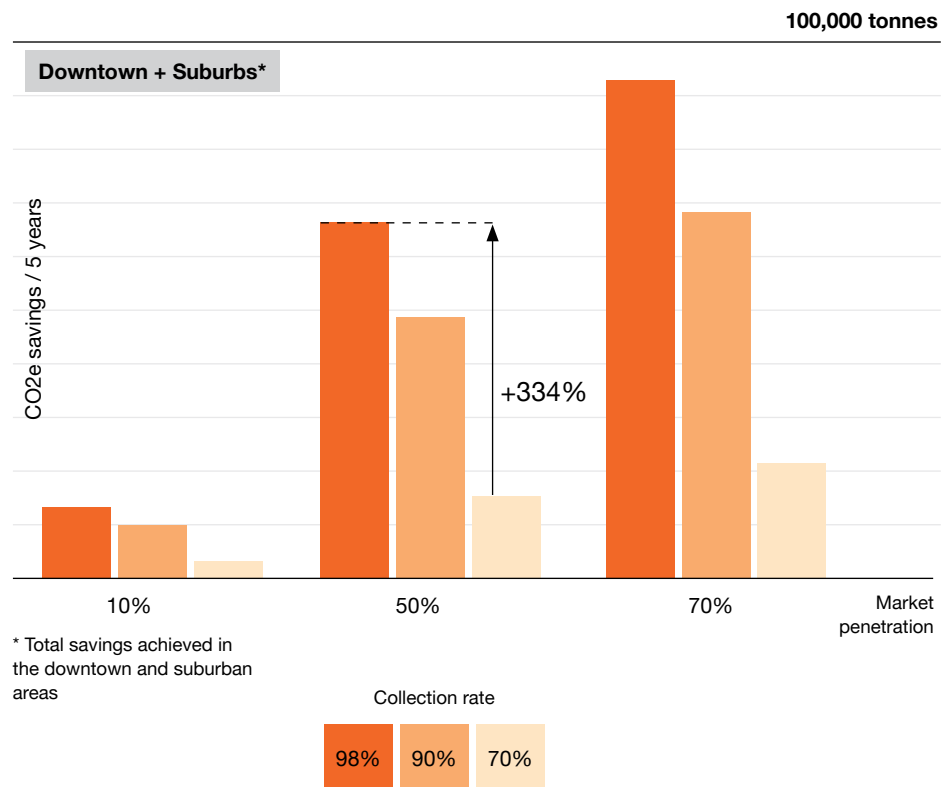
If we examine the CO₂e payback cumulatively over five years, we see that even with a 10% market penetration, the balance is positive compared to single-use plastic. The results improve significantly with an increase in the packaging return rate.

With advanced collection practices, a CO₂e recovery that is 2-3 times higher can be achieved. If we convert this CO₂e amount, the savings roughly correspond to the annual emissions of 2,000 to 11,000 vehicles (only in Budapest's city centre). As a reminder, in our model, we examined the residential home delivery and collection scenario. With a more efficient network featuring retailer collection points, even greater savings can be achieved.

Figure 9.

Potential CO₂e savings in 5 years at different market penetration and collection rates (PwC model)

Even with lower collection rates, at high market penetration the annual emissions of 11,000 cars could be saved only in downtown Budapest.

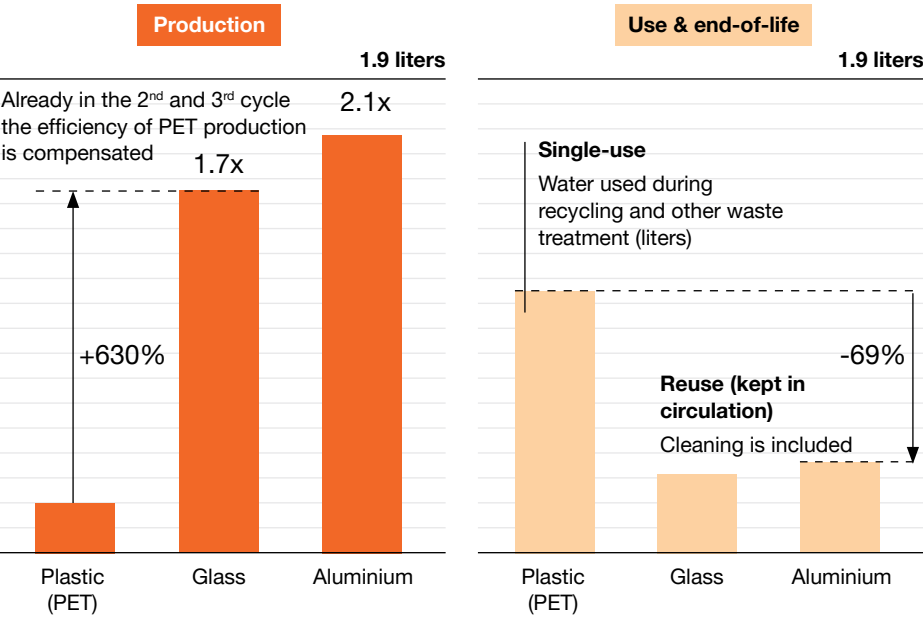


2. Water Demand Comparison

If we compare the packaging types from the perspective of water usage, aluminium and glass packaging are more favourable than plastic, even after just two cycles. This is because both recycling PET bottles and incineration are water-intensive processes. In the case of reusable glass and aluminium packaging, water is also used for cleaning the packaging, but recycling the residual waste requires mainly heat; water is needed for cooling. Overall, the cleaning and recycling of reusables in our model together require nearly 70% less water than recycling PET bottles.



Figure 10.
Comparison of average water use per container per cycle, for plastic, glass and aluminium packaging, split into two phases – production and use & end-of-life (PwC model)



Due to the high water demand for PET recycling and other waste treatments, reusable glass and aluminium packaging are more beneficial already after two and three cycles.

Annually

1.5

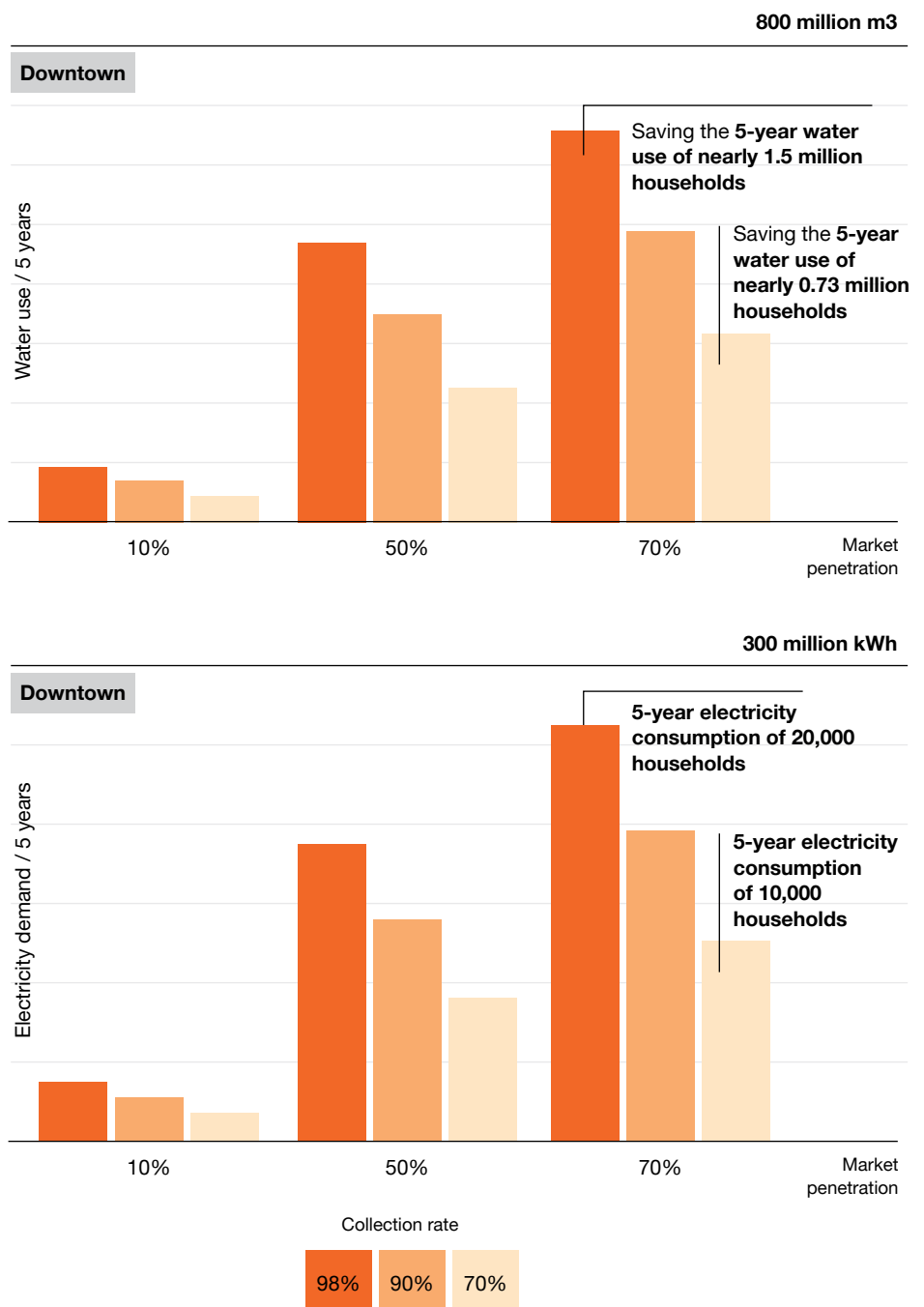
million household's annual water consumption could be saved by implementing the model downtown

When we cumulate the amount of water that can be saved, the difference becomes even more striking. With high market penetration and collection efficiency, the annual water demand of up to 1.5 million households can be saved just in this downtown area each year. Even with lower collection efficiency, the 5-year water consumption of Budapest's population could be reduced by 70% at 70% market penetration. If we convert this to the energy required for tap water production, then with the same market penetration, we could save the annual electricity consumption of 10,000-20,000 households in the city centre, depending on the collection rate.

Figure 11.

Potential water consumption savings in 5 years at different market penetration and collection rates (PwC model)

At high market penetration each year we could save the two-year water use of citizens in Budapest (786,400 households in 2022).

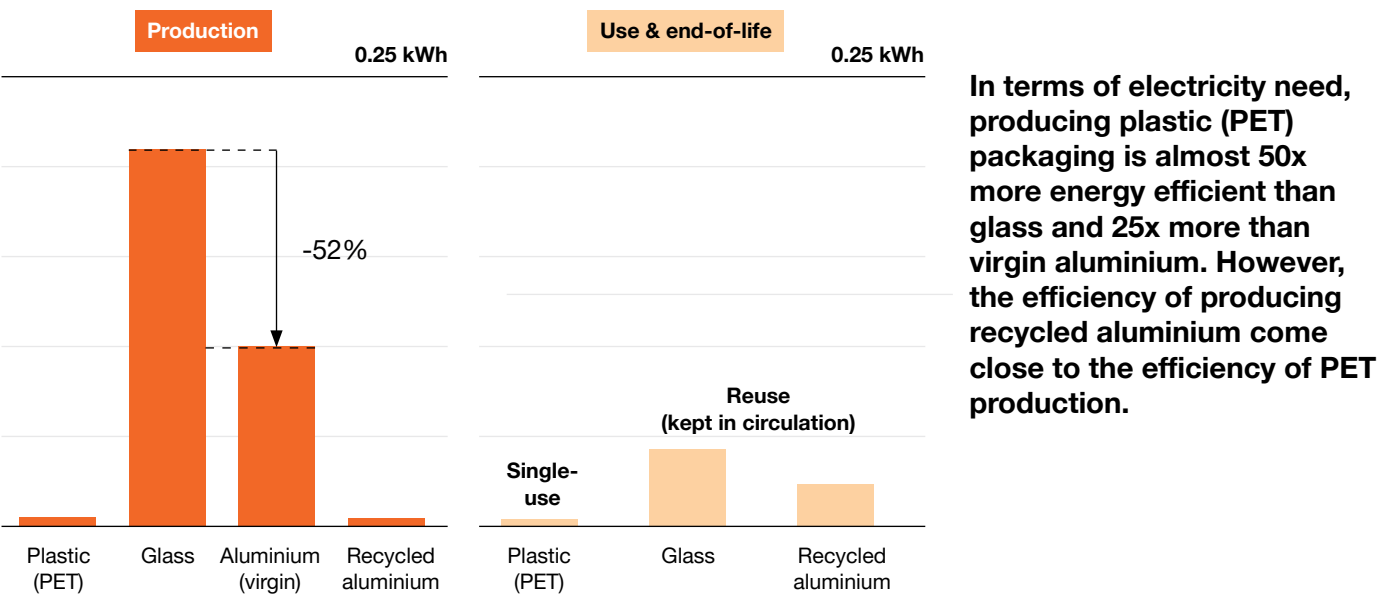


3. Comparison of Electricity Demand

When comparing the electricity demand of production, we see that a PET bottle can currently be produced up to 20-50 times more efficiently compared to glass and aluminium packaging production, and although to a lesser extent, the electricity demand per cycle during consumption is also more favourable. We note here that our model accounts for higher energy demand resulting from home delivery and cleaning, compared to single-use glass and aluminium packaging. This is precisely why reuse would be important for these two types of packaging.

Figure 12.

Comparison of average electricity need per container per cycle for plastic, glass and aluminium packaging, split into two phases – production and use & end-of-life (PwC model)



Annually

4-500

thousand trash bins (240 l) of packaging waste could be avoided downtown

4. Comparison of waste generated

(Re)Introducing reusable packaging in the city centre could significantly reduce the amount of single-use (typically plastic) packaging waste. If we convert these volumes into 240-litre trash bins, depending on the market penetration scenario and the collection rate efficiency, between 55,000 and 400-500,000 trash bins worth of packaging waste could be avoided annually in the city centre of Budapest. This could significantly ease the burden on the network, which deals with the annually increasing amount of waste.

Figure 13. Amount of packaging waste generated per year, comparing single-use and reusable packaging at different market penetrations and collection rates (PwC model)



Overall, we can conclude that even in the model most convenient for the consumer (home delivery and collection), environmental savings can be achieved, notably in terms of emissions, but especially in terms of water usage.

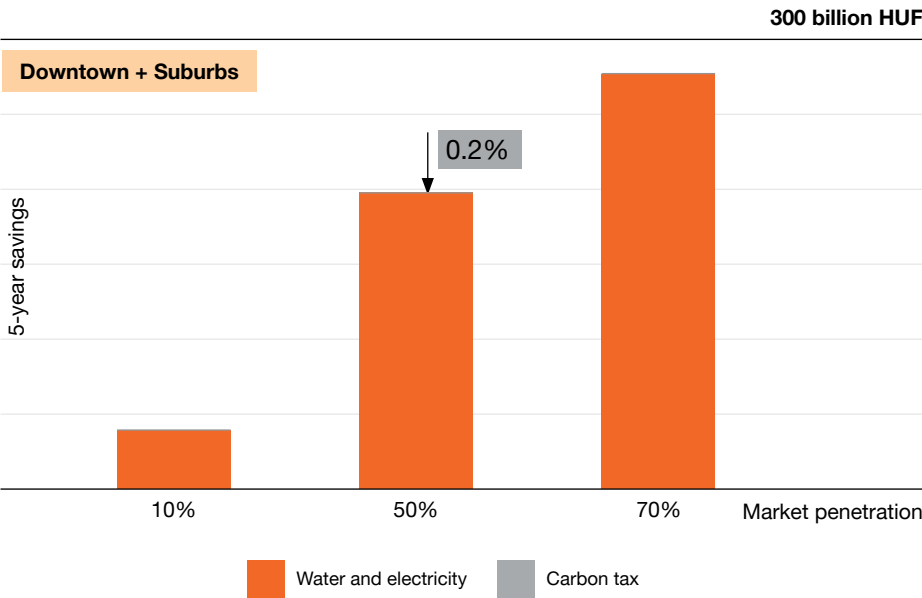
If we convert environmental savings into financial terms and calculate the rate of carbon tax currently paid on the CO2e saved, as well as the utility fees for water and electricity, then with a 90% collection rate, the reduction of environmental resource consumption can account for over HUF 2-300 billion savings (hypothetical) in five years.

The reduction of environmental resource consumption can account for over HUF

2-300
billion (for the city centre alone)
in five years

Figure 14.

5-year economic savings at 10%, 50% and 70% of market penetrations (billion HUF)





2.2.2 Evaluation of Economic Considerations

After examining the environmental returns, we considered the economic aspects of the model and sought answers to questions such as how much it would approximately cost per household per month to finance such a service. To what extent would costs be reduced if the network were expanded?

During the modelling, we considered Budapest's city logistics plans and designed an operational model that would not flood the downtown area with masses of delivery trucks. We modelled a fleet primarily based on electric-powered tricycles and used electric vans only when necessary, due to elevation or increased delivery volumes, where it was cost-effective. Since the consumption of electric tricycles is significantly lower compared to a motor vehicle, they are a preferred vehicle alternative in the city centre from both cost and environmental perspectives.

According to our modelling, the network effect is significant in terms of both kilometres travelled and the size of the vehicle fleet. The degree of network effect is interesting from the perspective that if the market is shared among multiple players, certain cost items double, and overall, expenses multiply. However, if an overlapping, optimal network is created, significant cost savings can be achieved. With high market penetration (50-70%), this can result in up to 65% savings in kilometres travelled within the network, and the network can be serviced with a fleet nearly 40% smaller. We also examined the effect of extended distances to the suburbs and found that larger distances reduced the achievable savings by only 5-7%.

Figure 15.

Fleet size at various market penetrations and potential savings from network effect

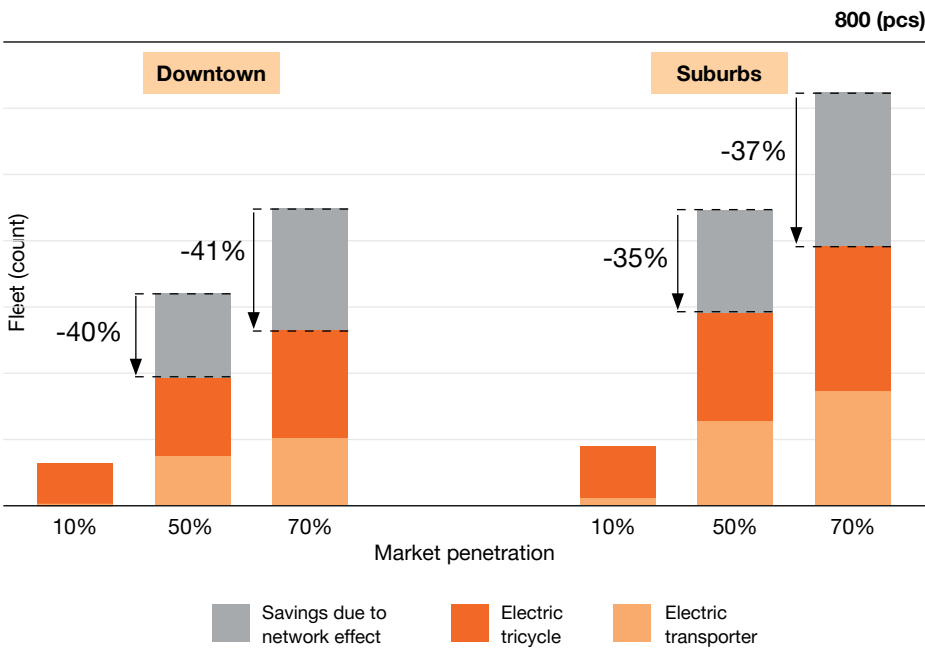
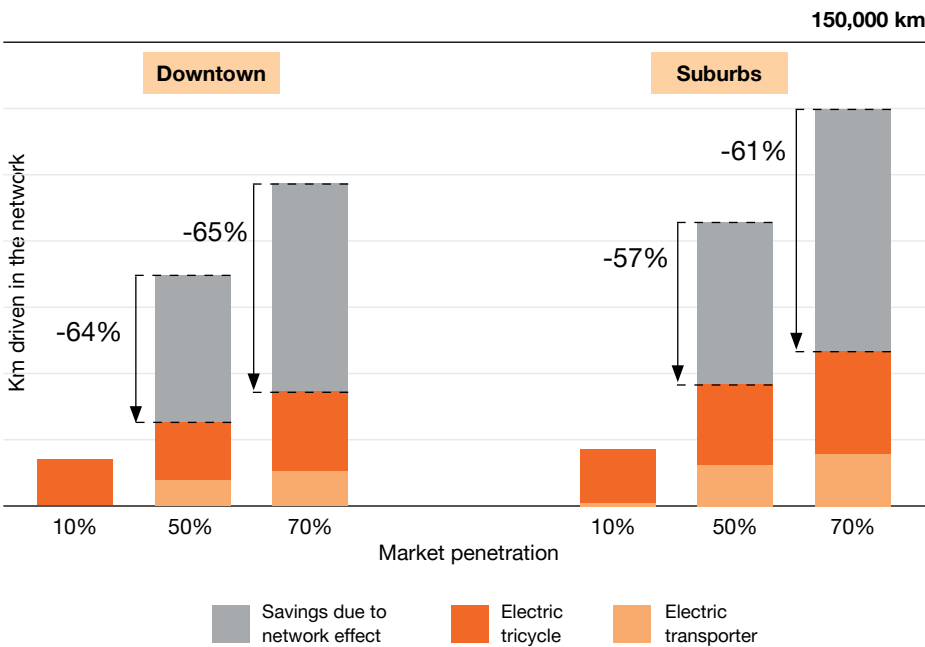


Figure 16.

Km driven in the network at various market penetrations and potential savings from network effect

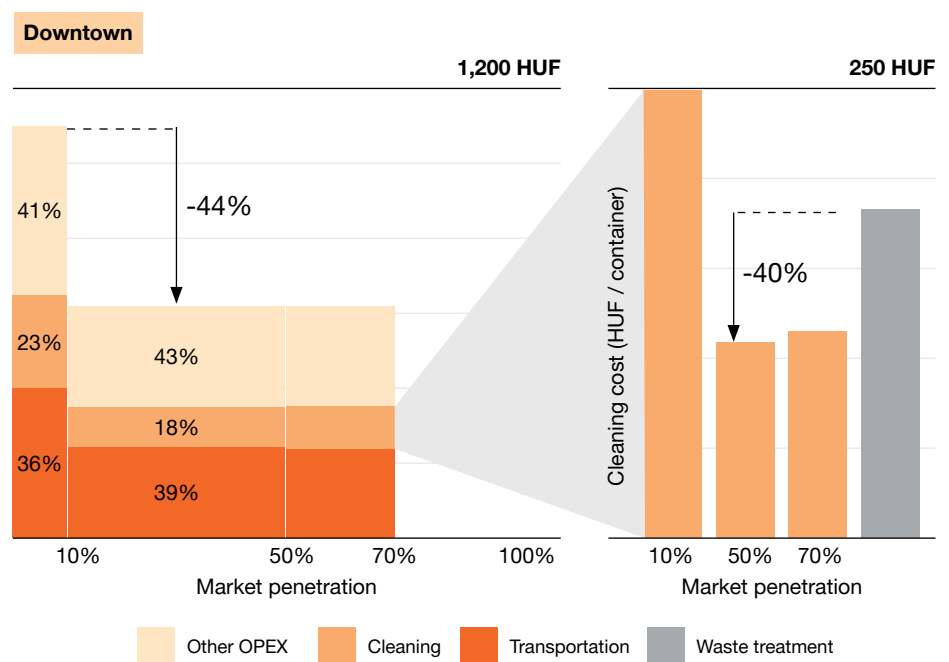


A common counterargument to reusable packaging is the additional resource costs associated with transportation and cleaning. To address this dilemma, we compared the relative costs of managing waste versus reusing packaging.

For the calculation, we used residential waste management prices valid for 2025. According to our calculations, with lower market penetration, the cost of cleaning is indeed higher per container, roughly by 25%. However, in a more widely available reuse model (50% or more), the cost of cleaning can be up to 40% lower than waste management. This does not include the savings in packaging production costs, which, although low in the case of plastic, are also significant for glass and aluminium packaging.

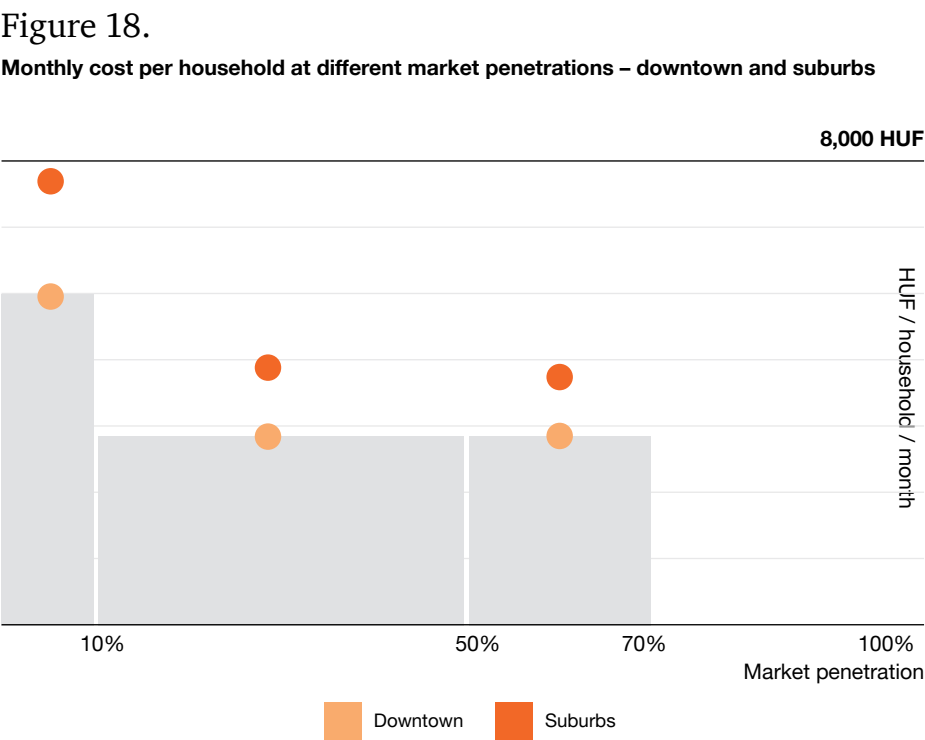
Figure 17.

Unit cost (OPEX) at various market penetrations (left), the unit cost of cleaning compared to the waste treatment (right)



Finally, we also estimated the cost of a similar service (collection and delivery of packaging to a central cleaning facility twice a week) per household in downtown Budapest and a suburban area. We draw attention to the fact that these values only include the costs resulting from the implementation of additional services, specifically delivery, collection, and cleaning, but do not include business profits or other related expenses.

According to our calculations, a similar service could be covered in the city centre for approximately HUF 5,000-6,000 per month in the case of lower market participation, and even for as little as HUF 3,000 per month in the case of a more widespread operation. This is an amount close to residential waste management fees or the monthly fee of a streaming service. In the suburbs, we can expect a slightly higher amount due to lower population density and longer distances, with the cost per household ranging between 4,500 and 8,000 HUF.



The transition to the reuse model also enables investments, including cleaning plants and machinery, as well as the creation of new tasks and responsibilities, which generate additional job positions. Covering only the downtown area of Budapest, with couriers and operating cleaning facilities, this operational model can generate 300-500 new jobs.

Future legislative environment and expectations in the EU

In response to the increasing amount of waste, the European Union is also encouraging companies in the consumer market sector to shift their mindset. The PPWR (Packaging and Packaging Waste Regulation) came into effect at the beginning of 2025 and for the following years sets increasingly ambitious targets to be achieved by 2030 and 2040.

This legislation also addresses reusable packaging, which, by definition, must be designed with the aim of being reusable on multiple occasions and capable of completing a number of rotation cycles (the minimum rotation cycle will also be determined).

The packaging must meet the requirements prescribed for consumer health and safety. Additionally, the packaging is expected to be reusable without deterioration, and it should be possible to place a label or QR code on it so that it can be easily identified and recycled when it becomes waste.

Without aiming for completeness, the most important rules regarding reuse are:

- By 2030, 40% of the packaging used for logistics operations (e.g., pallets, foldable plastic crates, trays) must be reusable, and by 2040, this expectation will increase to 70%.
- In the case of bulk packaging, the expected proportion of reusable packaging is initially 10% and later 25%.
- For consumers, both alcoholic and non-alcoholic beverage packaging must be made available in reusable form, initially at a rate of 10%, but by 2040, the expectation is 40%. In this case, there are certain exceptions, such as dairy products.

Additionally, according to the PPWR, consumers should be allowed to purchase products without packaging, highlighting the importance of refill stations. As of January 1, 2030, supermarkets larger than 400 square meters should operate refill stations on their premises, covering at least 10% of the total area. At these stations, the measurement of products and the purchase of the desired quantity must be ensured using measuring devices. Additionally, it is stipulated that the product price may not include the weight of the containers.

The regulation also addresses the recyclability of packaging, requiring that the material of new packaging comprise at least 55% recycled material and that all newly marketed packaging be economically recyclable.

Clearly, the regulatory environment increasingly encourages reuse. But how do consumers feel about this? In the final chapter of our study, we seek to answer this question.

A person wearing a white apron is standing behind a wooden crate filled with ripe, yellow-orange oranges. The person's arm is visible on the right side of the frame. The background is slightly blurred, showing more of the crate and the person's torso.

03

Consumer Attitudes Towards Reusable Packaging

Without successfully engaging consumers and capturing their interest, scaling the use of reusable packaging cannot be achieved effectively. In this concluding chapter, we will examine the success factors that enable consumers to adapt to reuse systems.

To assess this, a representative study involving 1,800 participants was conducted, focusing specifically on Hungarian consumers' attitudes toward reuse. Additionally, we conducted interviews with executives of companies that manufacture reusable packaging and are already successful in both the domestic and international markets.



The profile of an average Hungarian shopper in 2025

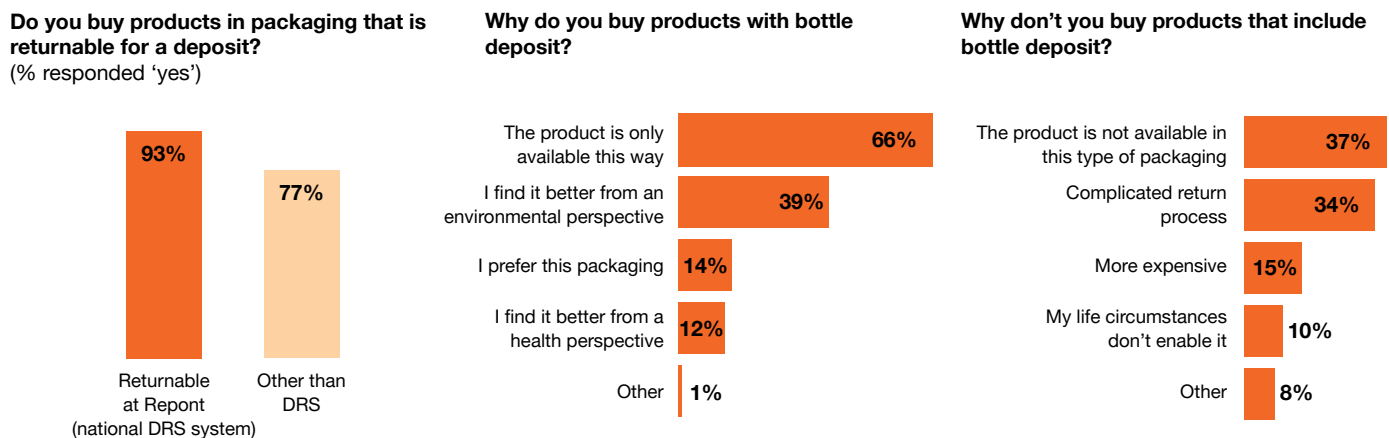
The digital affinity of Hungarian shoppers is continuously growing; today, more than 60% use some kind of loyalty app during their shopping; 45% of consumers are eager to use and seek digital solutions.

- **10% of shoppers stated that their decisions are fundamentally influenced by environmental awareness, and for an additional 60%, it is important, and they regularly inform themselves about the topic.**
- Purchasing used products is not yet very popular; 11% of buyers regularly purchase used products, while 68% do so only occasionally or rarely. The most popular product categories are clothes, electronics, and DIY tools.
- **48% of consumers consider plastic waste management extremely important, and another 40% view it as a serious issue** that requires attention. While among younger age groups, this issue is less likely to come up in discussions with family and friends (30%), it is already a common topic among those over 50 (more than 50%).
- Nearly 70% of consumers collect waste selectively, return refundable bottles, and carry their own shopping bags. However, other waste reduction activities are not yet as widespread (collecting organic waste separately, reuse, etc.).

The popularity of recyclable and reusable packaging in the Hungarian market

According to our representative research conducted among Hungarian consumers, 77% of consumers purchase groceries in packaging that is part of DSR (deposit return scheme). One of the main reasons cited for this is that the product is only available in this packaging (66%), indicating that retailers and manufacturers play a significant role in making this operational model available. Most consumers who do not purchase products do so due to a lack of availability, followed by the complexity of the return process. 39% of consumers consider groceries in DSR packaging to be more environmentally friendly.

Figure 19.

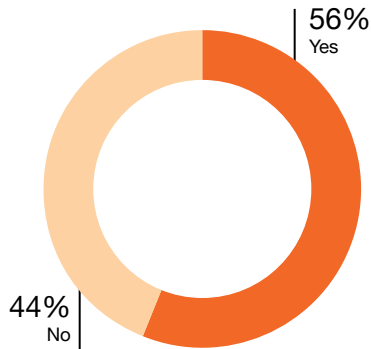


The availability and, therefore, the awareness of reusable packaging is currently limited in the Hungarian market, despite the fact that 88% of consumers consider the management of plastic waste a critical or important issue. More than half of buyers would be willing to pay 5-15% more for sustainable products.

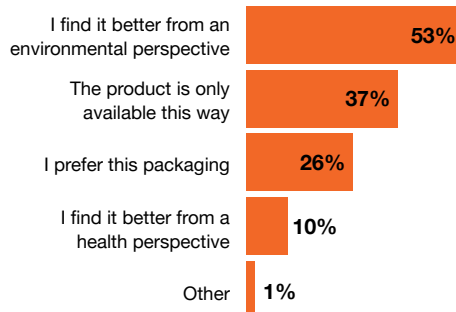
56% of consumers purchase products in refillable packaging. Among those who do not buy such packaging, the majority (60%) have not yet encountered this option. Among the motivations for purchasing reusable packaging, environmental considerations were mentioned at a striking rate (53%).

Figure 20.

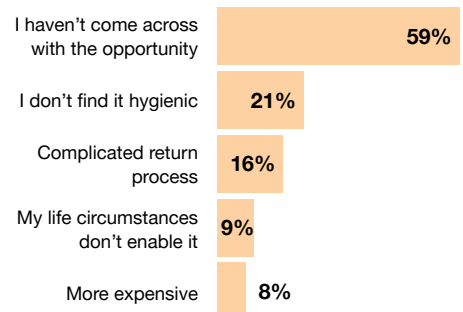
Do you buy products in reusable packaging? (with or without deposit)



Why do you buy products in reusable packaging?



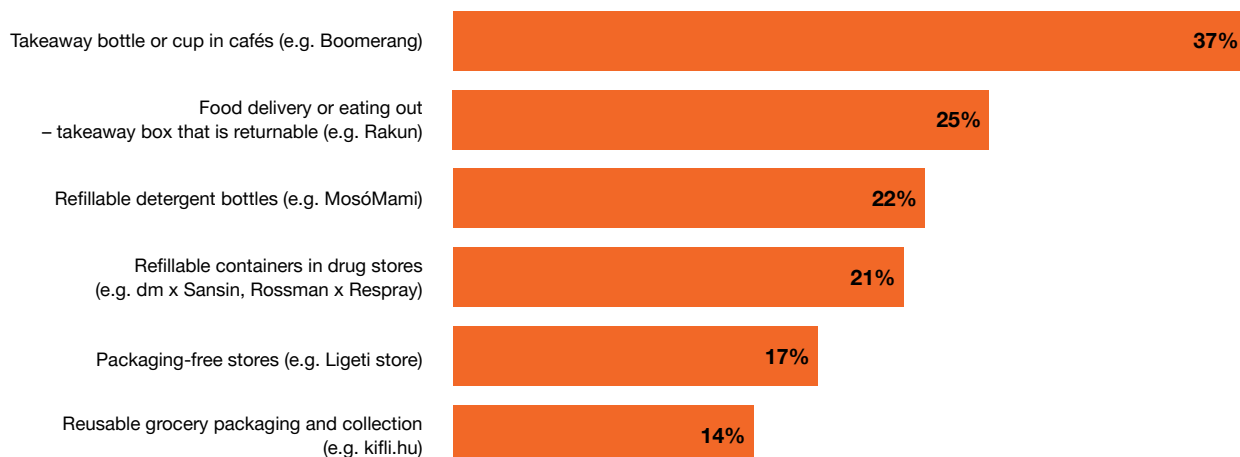
Why don't you buy product in reusable packaging?



Among Hungarian consumers, the most well-known solution is the recup, yet only 37% of consumers have encountered it. In the case of refillable packaging, only 20-25% of consumers are aware of the options for take-away food boxes, detergent cans, and other bottle refills. Even fewer consumers have taken advantage of the possibilities of reusable packaging and packaging-free stores.

Figure 21.

Which one of the following initiatives have you come across already in Hungary (or globally)?



Consumer attitudes towards reusable packaging

Although consumers claim to be increasingly environmentally conscious, their purchasing decisions are also influenced by other factors. They choose more sustainable products only if that is less effort and price competitive. This also highlights the complexity of scaling reusable packaging, as even if it is possible to save money through multiple uses, consumers must also change their habits.

Below, we have gathered the consumer dimensions that should be considered when designing a reuse-based system:

1. **Convenience:** how can we ensure that the sustainable solution is the easier choice?

If we expect consumers to significantly change their previous purchasing habits, such as shopping at new locations or always carrying containers that can only be returned at designated places, then reuse solutions can only be scaled among a narrow, already committed group. For broader adaptation, innovations must be tailored to existing habits and urban spaces, which can vary by location.

2. **Intuitive, simple use:** how do we minimise the energy required to master the new habit, and what makes the process self-evident for the customer?

In today's information overload, it is difficult to seamlessly integrate a new, multi-step digital process into our everyday lives. For widespread adoption, it is essential that the process be intuitive and engaging, making it enjoyable for customers to discover and participate in. Spectacular solutions, colours, and design play a significant role in this. In Hungary, the Respray refill stations at Rossman draw attention with their innovative, futuristic design. Furthermore, in the Petaluma project in California, bright purple cups and bins made the process eye-catching and clear to city residents.

3. **Economics:** why does it make sense for the consumer to use packaging multiple times?

The majority of consumers' decisions are still primarily determined by the price of products. One of the competitive advantages of reusable packaging is that, in terms of pricing, only the product content needs to be paid for repeatedly; thus, the buyer ultimately achieves savings. From a marketing perspective, transparent communication of this saving opportunity is important for consumers to factor this into their decisions.

4. **Credibility and transparency:** how can it be substantiated that the expected effort is indeed environmentally conscious? What ensures credibility for the consumer?

Products that claim to be sustainable are often met with scepticism, and it is indeed difficult to discern which ones are more sustainable and support widespread consumption. It is essential for sellers to convincingly communicate to customers that this is not just a marketing ploy, but that their purchases genuinely contribute to reducing pollution and waste production. This necessitates consumer education and transparent communication from the retailers. Price comparisons, source of ingredients, type of packaging, and digital display of expiration dates (via QR codes or interactive displays) can all help customers make informed decisions.

5. **Product range, sustained product quality:** how do we ensure the consumer has uninterrupted access to the product range and quality?

One of the biggest obstacles to successful scaling is when the preferred product of a customer who is willing to switch is not yet available in reusable packaging. The transition is easier for both the customer and the manufacturer when there is some level of standardisation, and there is no need to design, produce, and collect packaging separately for each product. **The transition can only be achieved gradually, and it is also a strategic question:** which products are worth starting with? Additionally, for widespread adoption, it is essential to consciously design packaging within the product group, considering the choice of materials and incorporating additional aspects, such as wear from reuse and efficient cleanability.

Cooperation between consumers and retailers can result in a win-win situation

Consumers demand opportunities that enable them to make a positive contribution to the environment. In our representative consumer research, 40% of respondents stated that it gives them a particularly good feeling, knowing that their purchase contributed positively to the environment. Even more people think that if there were an eco-friendly option at a similar price for their favourite products, they would buy that.

However, according to our survey, fewer than a third of Hungarian consumers believe that their purchasing decisions in fact influence retailers' decisions. For example, 30% of respondents would welcome the introduction of more packaging-free products and refill stations in larger retail chains. These are all missed opportunities for retailers that could increase their market share in certain segments, as reuse also entails a commitment to specific products for a couple of cycles.



Why bother with this? Do our individual decisions really have an impact?

- Gábor and Lilla work in an office, and every weekday, they drink two coffees in disposable cups and have lunch in a takeaway paper box.
- As a New Year's resolution, they decide to try for a year to have the same only in their own cups and boxes. Would their environmental impact really be negligible?

	Cups and boxes (pcs)	CO2	Water use	Costs
Single-use	1,500 of trash / year	603 kg / year	1,230 liters / year	175,000 HUF / year
Own	4 pcs	34 kg / year	650 liters / year	34,000 HUF once
				141,000 HUF savings / year

Consumption frequency:
2 cups / workday / person whole year
1 meal / workday / person whole year

Reference materials and prices:
single-use cup (PE layer, PS top) price for consumer: 50 HUF / pc.
single-use food container (paper) price for consumer: 250 HUF / pc.
Own cup price (steel + PP, 24 Bottle): 12 000 HUF / pc.
Own food container price (glass + bamboo top, IKEA): 2500 HUF / pc.
1 glass set replacement per year

Apart from the environmental impact, the two of them produced above 1,500 fewer packaging waste items in a year, which was also beneficial for their wallets, as **they managed to save together more than 140,000 HUF.**

Conclusion

Implementing a system-wide transformation of this scale is a significant challenge, and considering regulatory and consumer expectations, the world's eyes will be on manufacturers and retailers in the years to come.

Transitioning to reusable packaging is an obvious solution among sustainability efforts to curb the waste generated by continuously increasing consumption and to manage resources more efficiently. Reusing induces new activities, attracts new investments, and creates new jobs in the economy. Additionally, its positive environmental impact is not only evident through the reduction of waste, but also significant savings can be achieved in terms of carbon footprint and water use.

According to our research, there is demand and interest from consumers for refillable and reusable packaging. To counterbalance the potential negative experiences of previous generations, today, thanks to digital technologies, the collection, tracking, and identification of packaging also hold exceptional innovation opportunities. New players can easily enter the value chain, and retailers can provide smoother processes and a better customer experience for consumers. Reusable packaging can also strengthen consumers' commitment to a particular product or brand, thereby bringing further business advantages.

However, there are still only a few opportunities for consumers in the Hungarian market. For new entrants, reusable packaging represents a high initial cost, while for current players, the transition from single-use to reusable packaging poses a significant financial burden. In recent decades, manufacturers have settled into an extremely economical model optimised for small packaging sizes. The technological transition requires significant resources, and today's domestic regulatory and funding environment does not favour the development of reusable glass and aluminium packaging. **To achieve significant change, it is necessary to establish effective incentive systems and foster close cooperation between retailers and manufacturers.**

The success of circular models, particularly reuse, depends on how well participants can cooperate and make decisions based on shared values. Each participant has a unique responsibility in this. The consumer takes responsibility for selecting the product and returning the packaging, the courier company is responsible for safe transportation, the manufacturer is responsible for refilling the packaging, and the retailer makes the products available to the consumer. If any element in this ecosystem is missing from the chain, the model is unprofitable, and the environmental benefits cannot be adequately realised.

Because...

- ...if the manufacturer does not produce the product for reuse, the retailer cannot make it available.
- ...if the retailer does not make the product available on the shelves, then consumers cannot choose it, and it will never become economical.
- ...if the consumer does not purchase the product in reusable packaging, then there is no demand to sustain the business.
- ...if the packaging is not returned, then the manufacturer cannot refill it, and thus waste is generated.

The key question is what kind of cities and environments we want to live in in the future. It is certain that the Earth's current resources are finite, and we cannot postpone transforming our current resource-wasting systems into more sustainable operations.

We hope that by providing international and local perspectives, showcasing various reuse models, reviewing economic and environmental considerations, and presenting the regulatory environment and consumer expectations, we have successfully highlighted the most important issues related to reusable packaging.

In a circular economy, responsibility is shared by all of us. With every decision, we contribute to the amount of waste generated. Let's not wait for change – let us be the initiators and make reusable packaging an integrated part of the solution!



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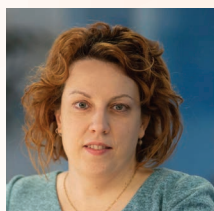
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