Reusable solutions:

How governments can help stop single-use plastic pollution
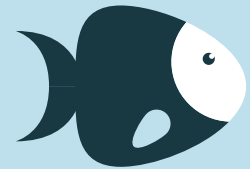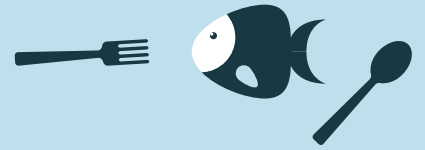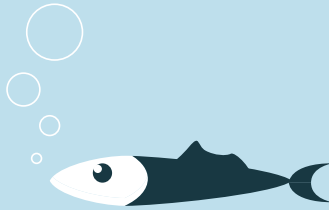
Executive Summary

The scourge of single-use plastics throughout the natural environment is increasing. We need a faster transition to new consumption systems that will stem their tide. Governments and industry can do more to address the expectations of concerned citizens.

This report outlines how the linear production, disposal and pollution of single-use plastics can become a thing of the past by facilitating the rise of modern-day, smart reusable systems that preserve our finite resources, and protect our natural environments.

Reusable items and systems have been proven to be highly effective and a key solution in shifting away from single-use plastics. The report details how the new European Union Directive on single-use plastics (SUPD) can be implemented at national level to drive down single-use plastics and increase reusables.

It shows exactly how this can be done for five of the items in the Directive - cups for beverages, food containers, beverage containers, cutlery and plates - and showcases real life case studies that are implementing the change.

The report is intended for policy makers, civil servants and other decision makers, in particular at Member State level where transposition of the SUPD will take place until July 2021.

Several conditions for effective reuse systems were identified, including:

→ **System infrastructure** - drop-off networks, return logistics, washing facilities, redistribution, item tracking, customer refunds - **and employee training**.

→ **Durable container design** - including importantly the average number of cycles that reusable containers complete, which can be enhanced by 'universal' designs that enable acceptance of containers across different reuse schemes.

→ **Systems at scale** - these are most efficient and avoid any burden shifting. Efficiencies can also be increased, for example, by using renewable electricity and electric vehicles within the reuse system to further minimise climate impacts.

→ **Addressing hygiene requirements** through high-quality washing facilities and well-designed item transportation and storage.

→ **Minimum viable population density** - reuse schemes often can rely on proximity of, and enough, users and vendors on for a relatively local scale to that provides economies of scale and ensure longevity and economic viability. Outside of this, simple 'bring your own' reuse solutions are viable in more dispersed communities.

→ **Convenient and easy-to-use** - public engagement is key to enable adoption by large proportions of the population.

Key policy recommendations include:

→ Ensure single-use plastic cutlery, plates and any other single-use plastic items under **market restrictions** are replaced with reusables and not other single-use materials (e.g. bamboo) which would maintain linear and wasteful economies and shift pressures on limited natural resources.

→ Enact a legally binding obligation for **reusable tableware for instore consumption** in all food and beverage outlets.

→ Set a legally binding 50% **consumption reduction target** of cups for beverages and food containers by 2025, and 80% by 2030, against a baseline established by 2022.

→ Set legally binding national **targets on the share of refillable beverage packaging** placed on the market of at least 70% by 2030, whilst working towards an ambitious EU-wide target.

→ Apply **deposit return scheme (DRS)** policies to other items beyond beverage bottles containers, increase ambition in terms of scale of coverage, and mandate reusable items within the scheme.

→ Place a **tax on SUPs** to quickly incentivise businesses to seek alternatives. For example, a levy (visible on payment) on single-use coffee cups to create demand for reuse systems.

→ Introduce **incentives and ensure financial support for reusable items and systems** to overcome barriers to entry, such as capital investments for collection vehicles or washing facilities.

→ Ensure **eco-modulation of fees within extended producer responsibility (EPR) schemes** established from the single-use plastics Directive with higher fees for those value chain actors whose products are more polluting, for example, single-use plastics, and lower for those that are less polluting, for example, reusables.

→ Review **public procurement** standards to incorporate bans on single-use items, and targets and incentives for reusables.

Authors

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3keel

3Keel LLP are Oxford-based sustainability advisors working with NGOs, policy-makers, and businesses on food and consumer goods supply chains. 3Keel's practice areas span climate change, product eco-design, sustainable agri-commodities and resilient agriculture. Its mission is to create a better future for people and the environment through generating ideas, collating evidence, and by bringing people together.

#break**free**fromplastic

https://www.breakfreefromplastic.org/
https://twitter.com/brkfreeplastic

Break Free From Plastic is a global movement envisioning a future free from plastic pollution. Since its launch in September 2016, nearly 1,500 organizations from across the world have joined the movement to demand massive reductions in single-use plastics and to push for lasting solutions to the plastic pollution crisis. These organizations share the common values of environmental protection and social justice, which guide their work at the community level and represent a global, unified vision.

RETH!NK PLASTIC

www.rethinkplasticalliance.eu/ twitter.com/RethinkPlasticRethink Plastic is an alliance of leading European NGOs with one common aim: a future that is free from plastic pollution. It represents thousands of active groups, supporters and citizens all across the Europe, and is part of the global Break Free From Plastic movement, consisting of over 1000 NGOs and millions of citizens worldwide.

PLASTIC SOLUTIONS FUND

life

The plastic pollution crisis

From the Amazon to the Alps, there is nowhere to hide from plastics.

Global consumption of plastics has increased more than 20 times in 50 years, and estimates predict consumption will double again by 2034 if action is not taken. Europe is one of the highest consuming regions of plastics, 40% of which is used for packaging, and less than 30% of which is recycled.

Huge amounts of plastics end up in our seas and oceans, accounting for 85% of marine litter in Europe. Plastics dramatically impact the resilience of our environments and ability to provide crucial ecosystem services. Once in the environment, plastic debris accumulates and lasts for hundreds of years. Plastics, and the toxic additives they carry, 'bioaccumulate' in fish and seafood, effectively building up in high concentrations in certain organisms, which then transfer into the human food chain. There is also growing concern over the health impacts caused by the leakage of harmful chemicals, such as endocrine disruptors, from plastics into food, beverages and the environment.

Awareness of the environmental crisis from plastic pollution and the appetite for change is growing in governments, the private sector and society at large. In the EU, polls have shown 92% of citizens approve of action to reduce single-use plastic products; 87% of EU citizens are worried about the impact of plastic on the environment; and 74% are worried about the impact plastic has on their health.

The EU single-use plastics Directive and reuse systems

At the EU level, the European Commission launched the *'Strategy for Plastics in the Circular Economy'* in January 2018, which made specific intent to reduce single-use plastic pollution. Subsequently, the EU Directive on the *'Reduction of the Impact of Certain Plastic Products on the Environment'* - hereafter referred to as the single-use plastics Directive (SUPD) - was published in June 2019 and entered into force in July 2019. The Directive outlines various policy measures that EU countries must take in order to tackle the "most commonly found single-use plastic items on European beaches" - around 17 items in total.

The SUPD defines a single-use plastic product as:

'…a product wholly or partly made of plastic and that is not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned to a producer for refill or reused for the same purpose for which it was conceived.'

It applies without distinction to fossil fuel based plastics, bio-based plastics, biodegradable and compostable plastics and composite material plastics, for example paper or card items with a plastic polymer lining.

Throughout the Directive, there are calls to embrace reusable products and systems. Transitioning to reusables is one of the most efficient solutions for addressing the single-use plastics problem, providing tangible economic, environmental and social benefits. These benefits outstrip the advantages that from plastics 'light-weighting' or increased recycling rates. Reuse systems ensure that solutions do not simply replace one single-use material with another. Replacing single-use plastics with single-use bio-based, wood-derived or other single-use materials maintain linear and wasteful economies. Each type of single-use material presents different pressures on the natural environment, such as land-use change and deforestation, or the contamination of recycling streams, so cannot be the answer for a sustainable resource-saving and circular economy.

Plastic production will double by 2034 if action is not taken

Plastics account for 85% of marine litter in Europe

92% of EU citizens approve of action to reduce single-use plastics

In this light, the aim of this report is to show national policy makers the opportunities that exist to use the SUPD to swiftly transition to reusable products and systems. The report focuses on five of the single-use plastic items tackled in the SUPD that are widely used in food and beverage retail and hospitality, and are as follows:

→ **Cups for beverages**
→ **Food containers**
→ **Beverage containers**
→ **Cutlery & plates**

The general theory, principles and strategies to replace single-use plastic items covered in this report with reusables can, on the whole, be applied to other similar single-use plastic items.

It is also acknowledged that there are numerous other EU and national legislation and initiatives that directly or indirectly relate to reuse, including the revised EU Waste Framework Directives in which there is intent to develop reuse data and targets. However, this report only focuses on the SUPD and national actions relating to its implementation for the five items addressed.

Policy intervention measures to scale up reusables

There are a range of policy measures available to governments to support the transition from single-use plastics to reusables. These are briefly summarised here, with specific examples used when reviewing the five SUP items later in the report and related policy recommendations provided in the conclusion.

WHAT DO WE MEAN BY...

Cups for beverages
Single-use plastic cups, including paper cups with plastic lining, and including their lids and covers

Food containers
Single-use plastic food containers for food intended for immediate consumption

Beverage containers
Single-use plastic beverage containers up to three litres in size, including bottles, and with exemptions for glass or metal bottles with plastic lids or caps and receptacles containing food or liquid for special medical purposes

Cutlery
Single-use plastic cutlery including forks, knives, spoons, chopsticks - and single-use plastic plates

Measure	Summary
Market restrictions	Ban on the provision of particular SUP items. Direct policy to restrict availability.
Setting legally binding consumption reduction and reuse targets	SUP consumption reduction targets, and market share targets for refillables and reusables, demonstrate government commitment and priorities.
Deposit Return Schemes (DRS)	Small deposit charged to consumers when purchasing goods and services, which is refunded upon return of item (for reuse or refill) to receiving station.
Taxation / fiscal incentives	Price modulation that adjusts cost modelling by businesses or consumers to shift usage patterns.
Extended Producer Responsibility (EPR)	Financial responsibility by actors across the plastics value chain, for payment of all costs related to product use, disposal, collection (including of litter, provision of street bins and street sweeping) and processing. Effective eco-modulation of EPR costs will ensure value chains that supply more environmentally friendly products, for example, reusables, pay less.
Green Public Procurement (GPP)	Standards set for public sector procurement requiring less environmentally impactful products and services to be purchased.
Awareness raising	Communication and information programmes targeting citizens and/or businesses about changes in product design, purchasing choice and product use.
Monitoring and enforcement	Schemes introduced in/for all policy measures to accurately record and track data on consumption of products, and enforcement of value chain actors.

Cups for Beverages

Single-use plastics Directive requirements

→ Expanded polystyrene (EPS) cups to be banned by July 2021.

→ Member States must achieve ambitious and sustained reduction in consumption by 2026 compared to baseline figures in 2022, and have the option to set quantitative reduction targets for this.

→ EPR schemes, with full financial responsibility by actors across the plastics value chain for payment of litter clean up, waste management and awareness raising costs, by 2024.

→ Marking on cups on the presence of plastics and the resulting negative environmental impacts of inappropriate waste disposal, by July 2021.

→ Awareness raising measures, including on the availability of reusable alternatives and reuse systems, by July 2021.

Single-use plastic product summaries

Material Cups for hot liquids most commonly paperboard, virgin or recycled wood pulp, tightly bonded to a polyethylene lining. Alternatively made of EPS (or 'Styrofoam'). Lids typically from polystyrene or polypropylene. Cups for cold liquids most commonly polypropylene (PP). More premium formats PET or PMMA ('Perspex'), and coloured formats typically polystyrene. Bioplastics increasingly available.

Weight / Size Cups for hot liquids range in size from 118ml - 473ml, with 296ml cups most commonly weighing approximately 10g, with an EPS 296ml cup weighing approximately 1.5g. Cold drink cups range from 25ml/1g 'shot' cups, to 1 litre/18g beer cups.

Commercial cost For cups for hot liquids, an average 296ml lined paper cup costs approximately €0.05, EPS 296ml cup approximately €0.02. Cold drink cups from €0.03 for PP, up to €0.07 for PET, bioplastics and coloured polystyrene.

Environmental problems

2.8 billion single-use coffee cups are used in Germany per year, with an average lifespan of 15 minutes, creating 28,000 tonnes of waste, representing 10-15% of total volume of public waste bins. In Greece, there are 600 million single-use coffee cups used per year, and the UK reports less than 1% of its three billion cups are recycled due to the difficulties separating plastic lining from paper.

Based on a detailed, comparative LCA study by CupClub, the production and disposal of 1,000 single-use coffee cups (with lids) has a carbon footprint of 63kgCO2e. This is equivalent to emissions from driving 350km in an average car (350 metres per cup).

28,000 tons of waste

were created by coffee cups in Germany last year

3 billion

coffee cups are used in the UK per year. **Less than 1%** are recycled

The carbon footprint of the production and disposal of **1000 single use cups** is

63kgCO2e

That's the equivalent to **driving 350km** in an average car

REUSABLE SOLUTION

Reuse systems

DRS public / private sector schemes charging consumers a refundable deposit for a reusable cup. Schemes may be very localised (for example, within a single venue) or on a large geographical scale with multiple participating outlets. Cups are washed on return at food/beverage outlet or at central washing facility.

Permanent refill using economic and convenience incentives to encourage consumers to use their own long-term reusable cups, and enabling citizens' growing desires to use less plastic.

On-site consumption restrictions legally binding obligation for reusable tableware for instore consumption in all food and beverage outlets.

Reusable products on the market

Material - Reusable cups for hot and cold drinks are most commonly made from food grade polypropylene (PP), stainless steel, or glass. Lids and heat-proof sleeves are commonly made of silicone or cork.

Weight / Size - cup sizing typically follows single-use standard, weight is dependent on material. A 296ml 'KeepCup' polypropylene cup weighs approximately 90g.

Commercial cost - Varies depending on brand, material and size. A 296ml 'KeepCup' polypropylene cup costs approximately €13. For cold liquids, 'clear' polystyrene (suitable for up to 100 wash cycles) cost ~€0.30 per unit, polycarbonate (up to 500 wash cycles) ~€0.65 per unit.

Business models

Currently, the economics of packaging items favours single-use items. Policies are needed to 'level the playing field', which would be readily achieved by accounting for the many externalities of SUPs. Cafes and other vendors can profit from embracing reusable models for cups. For example, some reuse subscriptions cost as little as €1 per day for the vendor. With a single-use cup costing €0.05 - the break even is just 20 servings.

Another emergent business model innovation is for the cost to consumers for the initial purchase of a reusable cup to be offset by a discount offered by vendors. A three month trial at Starbucks locations across London found usage of reusable cups increased from 2.2% to 5.8% when a €0.30 discount was given to customers with reusable cups, and a €0.07 charge made on single-use cups. Similarly, the chain of sandwich shops Prêt à Manger says it has seen a tenfold increase in reusable cup use since it introduced a €0.55 discount to consumers bringing reusable cups to UK outlets.

CASE STUDIES

ReCup (Germany)

→ DRS system with over 2,700 partner vendors in over 450 cities.
→ Consumers pay a €1 deposit for a reusable polypropylene cup available in three sizes: 200ml, 300ml or 400ml. Non-returnable, reusable polypropylene lids are also available to purchase separately.
→ Consumers collect deposit on return of cups for washing to partner vendors, which are comprehensively listed on an app or through the website.

CupClub (UK)

→ CupClub™ is a returnable packaging service for drinks that uses radio-frequency identification (RFID) technology and cloud-based internet of things (IoT) software to provide cup traceability, helping brands to track products and offer an in-built loyalty scheme.
→ Cups and lids are delivered daily in cases. All products are designed for a minimum life cycle of six months. Case of fresh cups and lids are dropped off when used ones are collected for washing.
→ Life Cycle Assessment (LCA) found carbon footprint of CupClub cups is half that of single-use cups over a typical lifecycle.
→ Targeting use in offices, university campuses, airports and festivals.
→ Over 100,000 drinks served since its launch in June 2019.

Recommendation: Set national binding targets to reduce consumption of single-use plastic cups by 50% by 2025, and 80% by 2030.

Food Containers

Single-use plastics Directive requirements

→ Expanded polystyrene (EPS) food containers to be banned by July 2021.

→ Member States must achieve ambitious and sustained reduction in consumption by 2026 compared to baseline figures in 2022, and have the option to set quantitative reduction targets for this.

→ EPR schemes, with full financial responsibility by actors across the plastics value chain for payment of litter clean up, waste management and awareness raising costs, by 2024.

→ Awareness raising measures by July 2021 including on the availability of reusable alternatives and reuse systems.

Single-use plastic product summaries

Material - Commonly plastic (polypropylene/expanded polystyrene) often with additional plastic wrap (polyvinyl chloride/low density polyethylene). Paper and paperboard with polyethylene lining is also commonly used, often as a lid for aluminium containers. More recently, bio-based and biodegradable/compostable containers have been introduced.
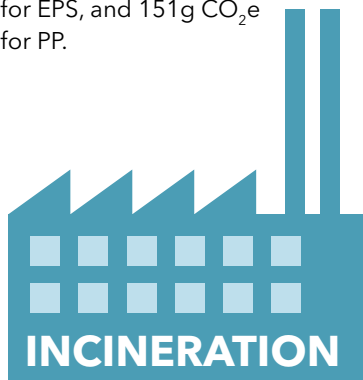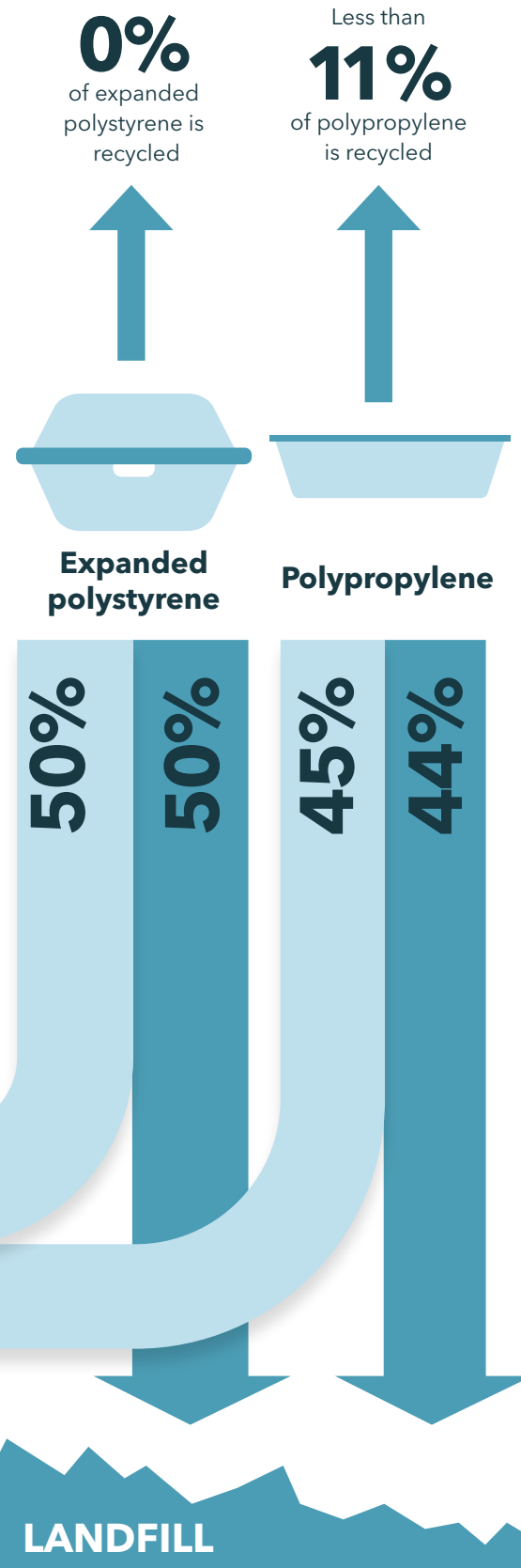
Weight / Size - Varies depending on material - an average sized (670ml) polypropylene container with lid weighs approximately 32g.

Commercial Cost - Again, varies on size and material. 682ml polypropylene container with lid costs approximately €0.20. Costs to vendor of single-use packaging per meal range from €0.25 - €0.80.

Environmental problems

The UK, Germany, France, Italy and Spain are among the top 13 world consumers of takeaway food. Researchers estimate that over 7.5 billion expanded polystyrene (EPS) containers are used annually in the USA, and more than 1.8 billion single-use aluminium containers in the UK. Taking into account their extraction and processing, this is equivalent to the emissions of 297Mt and 167Mt of CO_2e per year, respectively.

Within the EU, end of life treatment for takeaway containers varies by material type. For EPS 50% incineration and 50% landfill; for polypropylene 11% recycling, 44% landfill and 45% incineration. In short, very few of these SUPs are recycled, and the carbon footprints of 670ml single-use containers have been calculated as 51g CO_2e for EPS, and 151g CO_2e for PP.

0%
of expanded polystyrene is recycled

Less than
11%
of polypropylene is recycled

Expanded polystyrene

Polypropylene

50%

50%

45%

44%

INCINERATION

LANDFILL

REUSABLE SOLUTION
Reuse systems

DRS - public / private sector schemes charging consumers a refundable deposit for a reusable food container. Schemes may be very localised (for example, within a single venue) or on a large geographical scale with multiple participating outlets. Containers are washed on return at food/ beverage outlet or at central washing facility.

'On-the-go' - consumer visits vendor and takes food away with them either through bringing own reusable container and washing at home.

'Delivery' - food is delivered to the consumer at a different location using DRS, partnering with food delivery apps, and in turn with restaurants. Food is delivered in reusable containers, with the consumer paying a refundable deposit. Used containers are collected on following delivery, or returned by consumer.

On-site consumption restrictions - legally binding obligation for reusable tableware for instore consumption in all food and beverage outlets

Reusable products on the market

Material - Commonly durable plastic suitable for multiple life cycles. ReCircle boxes are made from Polybutylene Terephthalate (PBT) with polypropylene lids, other schemes such as O2GO and ReBowl use PP. 'Tiffin boxes' are stainless steel. Färm in Belgium uses glass.

Weight / Size - Varies depending on brand and material. ReCircle boxes come in sizes ranging from 600ml (113g) to 1200ml (160g).

Commercial Cost - Restaurants pay subscription for use of reusable system, dependent on usage volume. Consumers can pay up to €9 deposit. The best solutions - where customers bring their own containers - are free for vendors, and low cost for customers.

Business models

ReCircle has found that cost is not a barrier to consumer engagement, with restaurants charging €4 container deposits seeing similar uptake as restaurants charging €9 container deposits. With the rapid scaling of food delivery apps, major players such as Deliveroo are now trialling reuse containers. Given the reputational risk of inaction, the first major player to fully bring in a reuse solution stands to benefit in the marketplace, particularly with environmentally aware, younger consumers.

CASE STUDIES

Tiffin Boxes (India, UK and Belgium)

→ "Tiffin boxes" first started being used as the incredible Dabbawala lunch delivery/ return system in Mumbai, India - which delivers 200,000 meals in reusable stainless-steel tiffin tins each day. It has now expanded to the UK and Belgium.

→ In the UK, Dabbadrop is a 'delivery' DRS service in London. Customers pay a subscription fee depending on how many meals are purchased per month, plus an initial €17 deposit for the Tiffin box container. Set menu meals are delivered, and the empty tiffin box collected, washed and reused.

→ In Belgium, there are more than 1,000 members using "Tiffin", saving 1.5 tonnes of food packaging waste per year and €20,000 in the purchase of disposable containers.

ReCircle (Switzerland and Germany)

→ 'On-the-go' DRS with over 800 partner restaurants in Switzerland and 27 in Germany and over 70,000 reusable containers in circulation.
→ Restaurants pay €135 annual subscription, with 20 containers included.
→ Customers identify participating restaurants on the ReCircle website map, and pay a deposit of €9 for a container (€10 in Germany). The deposit is refunded when returned to the restaurant and washed on site ready for reuse.

Recommendation: Set national binding targets to reduce consumption of single-use plastic food containers by 50% by 2025, and 80% by 2030.

Beverage Containers

Single-use plastics Directive requirements

For all beverage containers:

→ EPR schemes, with full financial responsibility by actors across the plastics value chain for payment of litter clean up, waste management and awareness raising costs, by 2024.

→ Must have lids or caps that remain attached throughout use, by 2024.

For beverage bottles:

→ PET (Polyethylene Terephthalate) bottles must be made of at least 25% recycled plastic by 2025 and all beverage bottles must be made of at least 30% recycled plastic by 2030.

→ Member States must separately collect 77% of beverage bottles by 2025, and 90% by 2029 (based on either the weight of bottles placed on the market in a given year or the weight of waste bottles generated).

Single-use plastic product summaries

Material - Most commonly made of PET (Polyethylene Terephthalate), which combined with HDPE (High Density Polyethylene), makes up 86% of the plastic container market. Lids and caps are commonly made of HDPE.

Weight/Size - The SUPD addresses containers up to 3.0ltrs - size range usually starts at 50ml and the most commonly sold beverage containers are 500ml. An average 500ml PET bottle weighs 9.9g.

Commercial Cost - The cost of producing single-use PET bottles varies depending on global region due to raw material resin, fuel prices and bottle design manufacturing efficiencies. Production of a single PET 500ml unit in Europe is estimated at €0.04.

Environmental problems

The European Commission's impact assessment ahead of the SUPD publication found that beverage bottles, and their caps and lids, are the most commonly found items polluting Europe's beaches. It is estimated that 46 billion single-use beverage bottles are consumed annually in the EU

An estimated

46 billion

single-use beverage bottles are consumed annually in the EU

Beverage bottles, and their caps and lids, are the most commonly found items polluting Europe's beaches

REUSABLE SOLUTION

Reuse systems

Permanent Refill (at home or on-the-go) - using economic and convenience incentives to encourage consumers to use their own reusable beverage containers. For water, obligations for giving access to tap water and refill options. In many member states, new water fountains are being installed and online maps developed that list premises that will provide a tap for consumers to refill their reusable water bottles.

The SUPD recommends that one-way DRS systems are implemented at a national level to achieve the separate collection target of 90%. This is an important opportunity for national policy makers to bring in DRS for refill in parallel.

On-site consumption restrictions - legally binding obligation for reusable or refillable beverage containers and access to tap water for instore consumption in all food and beverage outlets.

Reusable products on the market

Material - Reusable DRS beverage containers are commonly made of glass, or a more durable PET. Reusable personal beverage containers are commonly made of stainless steel, glass or durable BPA/BPS-free plastic such as 'Tritan'.

Weight/Size - Reusable glass beverage containers weigh between 250g and 900g depending on design and glass density. The new 1ltr glass refillable Coca-Cola bottles on the German market weigh 800g, down from 915g, the weight of the original 1ltr bottle in the 1980s. Permanent refill reusable 500ml bottles weigh 90-450g depending on materials, which range from aluminium, to glass, to different plastic polymers.

Commercial Cost - Reusable glass bottles vary in price depending on size and grade of glass, but a minimum cost per 500ml bottle is approximately €0.50. Personal reusable bottles cost anything between €5 and €30 depending on size, material and brand.

Environmental comparison

Data from the German DRS found carbon footprints of:
→ 68.7kgCO$_2$e/1000litre for refillable PET
→ 85kgCO$_2$e/1000litre for refillable glass
→ 139kgCO$_2$e/1000litre for single-use PET

CASE STUDIES

Berglandmilch - Austria

→ Austria's biggest dairy company Berglandmilch will deliver milk in refillable 1ltr glass bottles, by the end of 2019.
→ Berglandmilch invested in new washing and filling facilities to keep supply lines short and keep costs and environmental impact down.

National DRS - Germany

→ Reusable bottles are made of glass or PET, ranging in size from 200ml - 1.5ltr.
→ The deposit on reusable bottles is usually €0.08 or €0.15.
→ 99% of bottles are returned by consumers, via machines or in stores, who are refunded their deposit. Glass bottles are cleaned and refilled up to 50 times; PET bottles around 20 times on average.
→ Most bottles are standardised size, meaning they can be used and returned by multiple participants.

Recommendation: Policies need to promote refillable beverage containers and ensure deposit return schemes are not just for recycling.

Cutlery and plates

Single-use plastics Directive requirements

→ Single-use plastic cutlery and plates will be restricted from being placed on the EU market (in other words, banned) by July 2021.

Single-use plastic product summaries

Material - Cutlery: commonly polystyrene.
Plates: commonly polymer coated paper or polystyrene.

Weight / Size - Cutlery: approx 3g-5g per piece, 15-20cm x 3-5cm.
Plates: approx 5g-10g, 14cm-25cm (diameter).

Commercial cost - Cutlery: prices vary but purchased in bulk, as low as €0.015 per item, or €0.045 for knife, fork or spoon.
Plates: prices vary but purchased in bulk, as low as €0.05 per item.

Environmental problems

In particular, SUP cutlery is a significant factor in plastic pollution. The European Commission's impact assessment ahead of the SUPD publication lists cutlery as the seventh most found single-use plastic item on Europe's beaches. The Ocean Conservancy lists cutlery as among the most deadly single-use plastic to sea birds, mammals and turtles.

SUP cutlery and plates are especially at risk of single-use substitutions. There is a large variety of single-use "compostable" cutlery available, often marketed as sustainable or eco-friendly, and fully paper plates are often used in place of reusable plate. As stated in the introduction, bio-based and biodegradable/compostable plastics are also included in the SUPD ban, however the risk remains for other single-use alternatives such a bamboo and paper. Any single-use item comes with environmental impacts from production and end-of-life.

The Ocean Conservancy lists cutlery as among the most deadly single-use plastic to sea birds, mammals and turtles.

Replacing conventional single-use plastic items with bio-based or compostable plastics is not a solution to the plastic pollution crisis
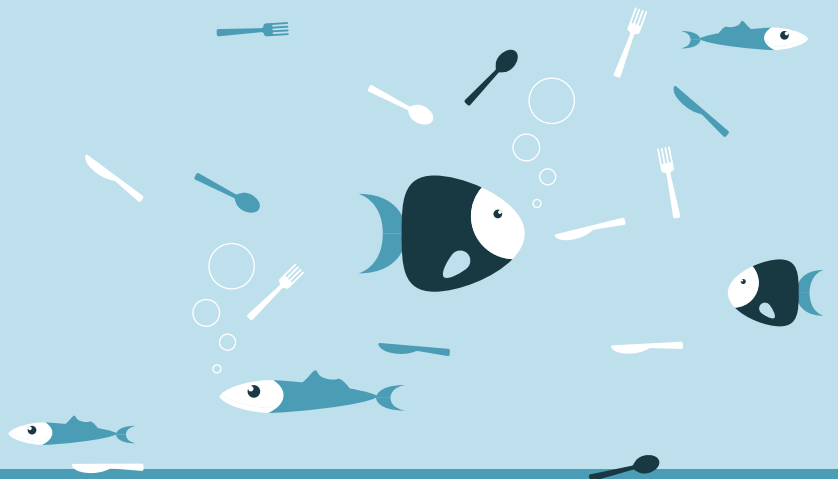
REUSABLE SOLUTION

Reuse systems

As 'service-ware', cutlery and plates have a very similar functionality profile in the context of on-site dining, they are therefore covered in tandem in this section. Food to be consumed on-the-go is less likely to be plated, and more likely to be served in food containers.

Traditional reuse systems - provide a straightforward solution with single-use cutlery and plates replaced with familiar reusables - commonly stainless steel cutlery and ceramic plates.

DRS - for outdoor events and festivals, there are third party DRS that have proved successful reusable solutions. There are examples and greater potential for reusable cutlery to be provided with reusable food containers in DRS systems for takeaway food.

'On-the-go' - the established market for personal reusable cutlery for people to carry on-the-go has spawned 'Bring Your Own Cutlery' and 'Bring Your Own Chopsticks' movements. Due to the small size and ease of transportation, like personal reusable cups, this is a viable solution.

Reusable products on the market

Material - Cutlery: Stainless steel or the Recircle Spork 'Tritan' (a spoon, knife and fork in one utensil) is categorised as 'other plastic' (#7) and BPA- and BPS-free. Plates: Ceramic or polypropylene.

Weight / Size - Recircle Spork: 9g and 17cm x 3.8cm. Bamboo cutlery set: 70g (including hemp carry case) and 23cm x 7cm x 1cm.

Commercial cost - Recircle Spork: €1.50. Bamboo cutlery set: €8-€10.

Business models

Globally, plastic cutlery is a $2.6 billion business. The relative simplicity and low weight of SUP plates and cutlery mean unit cost is low. However, even at €0.10 for a cutlery set and single-use plate, if these are eliminated the vendor saves €1 for every 10 customers served. Cumulatively this can add up for vendors. Deliveroo's 'opt-in' button for plastic cutlery has reportedly seen a 90% drop globally in customers using plastic cutlery.

CASE STUDIES

LessMess (UK)

→ Trialled a third-party DRS in the UK, providing reusable plates and cutlery at one-off events and festivals.
→ Reusable plates are rented to all caterers at the event. People pay a deposit for the plate/cutlery when buying their meal, and they are refunded when they return them to a centralised washing facility on-site.
→ Once clean, the facility returns plates to the caterers for reuse.

ReCircle (Germany)

→ Have introduced two cutlery options alongside their reusable food containers.
→ Single 'spork' and 'Smart To Go' a polypropylene set of knife, fork and spoon which click together, making them easier to carry.

Recommendation: Simple solutions such as onsite bans of single-use cutlery and plates, or 'opt-in' buttons for food delivery, can go a long way.

Product comparisons

Item	Cups for beverages (including lids and covers)	Food containers (single serving, for food intended for immediate consumption)	Beverage containers (with a capacity of up to 3 litres, including bottles)	Cutlery & Plates (forks, knives, spoons, chopsticks)
Synopsis of SUPD requirements see item pages for detail.	2021: EPS ban; awareness raising and labelling 2024: EPR. 2026: ambitious and sustained reduction in consumption achieved	2021: EPS ban; awareness raising 2024: EPR 2026: ambitious and sustained reduction in consumption achieved	2024: EPR; attached lids 2025: 25% recycled plastic in PET bottles; 77% separate collection bottles 2029: 90% separate collection bottles 2030: 30% recycled plastic in all bottles	2021: Market restrictions (bans)
Composition of single-use items	Cup: Polymer coated card; EPS; PP; some PET / PMMA Lid: PS, PP	Container: PP; EPS; bio-based/ compostable plastic Wrap: PVC, PE	PET; HDPE	Cutlery: PS Plate: Polymer coated card; PS
Consumer use	Hospitality, on-the-go and events	Hospitality, on-the-go, events and home delivery	Hospitality, on-the-go, retail and home delivery	Hospitality, on-the-go and events
Reuse systems	DRS; Consumer owned (bring-your-own); Location/event-specific market restrictions	DRS including for home delivery systems; Consumer owned (bring-your-own); Location/event-specific market restrictions	Consumer owned (bring-your-own); DRS	DRS; Consumer owned (bring-your-own)
Composition of reusable materials currently on the market	Cup: PP; stainless steel; glass Lid: silicone; cork	PP; PBT; stainless steel; glass	Glass; PET; BPA/BPS-free polymers; stainless steel	Cutlery: stainless steel; BPA/BPS-free polymers. Plates: ceramic; PP
Case studies	ReCup and CupClub	ReCircle and Tiffin Boxes	Berglandmilch and German DRS system	LessMess and ReCircle
Maturity of reuse systems	Proven and expanding coverage	Early stage innovations	Proven and expanding coverage	Immature

Conclusions

The EU single-use plastics Directive requires Member States to move away from polluting single-use plastics. This report highlights the many opportunities to shift to reusable systems. Reuse systems enable a rapid move away from disposable plastics. This transition would bring significant environmental benefits and can also offer economic rewards.

To facilitate this shift, policymakers need to create the conditions that enable a 'level the playing field' by fully accounting for the externalities of single-use plastics. This final section summarises the benefits of reuse systems, conditions for effective systems, and policy recommendations for implementation.

Benefits of reuse systems

The overviews and case studies above provide specific examples of the benefits of the five items examined. Across the range of items, a number of common benefits have been identified:

Human health

There is growing concern over the health impacts caused by the leakage of harmful chemicals such as endocrine disruptors from plastics into food, beverages and the environment. More inert reusable materials like unlined stainless steel and glass greatly reduce the exposure to substances of concern from the item. Reuse also reduces the health impacts from virgin materials' production and emissions from incineration at end-of-life.

Cost savings for municipalities

SUPs impose significant costs to municipalities in terms of waste management and litter collection. Dutch and Belgian authorities report a cost of €34,000 per km of beach cleaned, with much of that litter being SUPs, and a study in Ireland found €1,500 cost per tonne of litter cleaned, of which half was packaging. Replacement of SUPs with reusables lower these costs, whereas a shift to alternative single-use materials would reduce these costs.

Environmental

The environmental impacts, or externalities, of SUPs have been detailed for the five items examined. These range from marine pollution (macro and micro plastics) to greenhouse gas emissions to the negative aesthetic impact of litter. Reuse systems introduce a dematerialised, circular model and dramatically reduce plastics entering the environment.

Multiple advantages for retail and hospitality businesses

Reduction in costs per serving for established reuse system compared to single-use. This is significantly amplified when externalities are accounted for. Customisation opportunity of reusables to better meet customer needs, improving customer experience. Building loyalty with DRS locations linked to vendor. The potential to gather intelligence and identify consumer trends with smart systems within reusables.

Creation of local jobs

Reuse systems are labour-intensive on a local scale due to the return and washing of items, whereas single-use systems are resource-intensive, and production and jobs are generally non-local.

Conclusions

Conditions for effective reuse systems

Successful introduction of reuse systems, particularly at scale, is not always straightforward, so recognition of dependencies for effective systems is vital. Sound planning of the system, with learning from the many established systems now in place, should provide the basis for establishing successful new systems.

System infrastructure and employee training

Infrastructure requirements vary by scheme, but typically include drop-off networks, return logistics, washing facilities, redistribution, item tracking, and customer refunds. Some of these are IT dependent, while others rely on labour or physical space (for example, for storage and washing). For infrastructure developments, upfront capital investment is required which may require novel funding mechanisms. Trained employees are needed to ensure smooth-running.

Reusable container design

One of the key determinants of environmental performance for reuse systems is the durability of containers and the number of cycles that they can complete. These features can be enhanced by 'universal' designs that enable acceptance of containers across different reuse schemes. Other design considerations are the embodied impacts of manufacturing; wherever possible enabling recycling at end-of-life; and ensuring the product development process and end product is free from harmful chemicals for food safety.
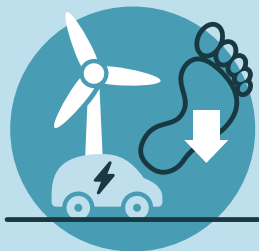
Avoiding burden shifting

One common question of reuse systems is the risk of environmental 'burden shifting'. For example, there is potential for poorly designed reuse systems to have higher water demands, a larger carbon footprint, or increase local traffic. Scheme efficiencies increase with scale, and higher durability of reuse containers improves their overall environmental balance. Climate impacts can be further minimised by using renewable electricity and electric vehicles within the reuse system.

Hygiene requirements

The combination of customer perceptions and realities of addressing health risks must be addressed for reuse schemes. High-quality washing facilities and well-designed item transportation and storage meet these requirements, and are proven for many of the established reuse systems in place including for high risk products such as milk. Of course, reusable cutlery and crockery is normalised for customers in restaurants and other hospitality, without hygiene concerns.

Minimum viable population density

Reuse schemes can rely on proximity of enough users and vendors for a relatively local scale that provides economies of scale. As such, urban populations and specific sites such as festivals are key targets for a first shift to fully reusables and of greatest priority because of the prevalence for on-the-go consumption in these areas, and volume of items used. However, simple 'bring your own' reuse solutions will still be viable in more dispersed communities with low investment costs (for example, water fountains).

Public engagement

Convenience is king for mainstream retail and hospitality consumers, with green behaviours in practice typically lagging significantly behind stated preferences. As well as being easy to use, schemes require information to enable adoption by large proportions of the population, beyond the smaller community of committed 'eco' consumers. Policy makers need to facilitate adoption, and the policy recommendations below present options for doing so.

Policy recommendations

This report has presented evidence of the benefits - environmental, social and economic - of reusable items compared to single-use, as well as the required conditions for the implementation and operation of successful reuse systems. The SUPD provides the impetus for change, and an enabling policy environment is vital.

The recommendations below call for complementary policies to illustrate how member states can use the SUPD to facilitate the development of reuse models. Note that the geographical scale for implementation is an important consideration, and assessments should identify when to delegate decision making to regional or municipal authorities. Factors such as socio economics, industry profiles, transport infrastructure and local geography will all have a bearing on reuse systems, and in many cases will be best understood by more localised policy makers.

Market restrictions
Introducing market restrictions - or 'bans' - is one simple method to stop SUPs being placed on the market. The SUPD mandates market restrictions on SUP cutlery and plates, and expanded polystyrene (EPS) beverage cups and food containers, by July 2021.

Member States, regions and local governments are encouraged to ensure reusables are the main replacement, and to be more ambitious regarding markets restrictions. Recommendations:

→ Ensure the single-use plastic items banned are not replaced with other single-use material items (for example, bamboo) which would maintain linear and wasteful economies and shift pressures onto limited natural resources. Reusable alternatives are necessary.

→ Ban more items beyond cutlery, plates and the other items already banned in the SUPD, in particular looking at banning single-use plastic cups.

→ Place bans on single-use plastics in specific locations or at specific events. For example:

• Enact a legally binding obligation for reusable tableware for instore consumption in all food and beverage outlets (as introduced in Taiwan and Berkeley, California).

• Ban all single-use drinks items at public events (ranging from school parties to festivals), including single-use cups, plastic bottles and cans (as introduced into legislation in the region of Flanders in Belgium for 2020) and use Green Public Procurement to place bans on single-use items in public institutions and more (see below).

Setting legally binding national consumption reduction and refill targets
Legally binding targets are a tool to set clear ambition and direction. The introduction of national consumption reduction targets for cups for beverages and food containers (already highlighted as an option to achieve measures outlined in Article 4 of the SUPD) in combination with refill targets for beverage packaging would enable a massive shift towards reuse systems. Recommendations:

→ Set a legally binding target to reduce the consumption of cups for beverages and food containers by 50% by 2025, and 80% by 2030, against a baseline established by 2022. These were the targets already outlined in the European Commission's impact assessment for the SUPD.

→ Set legally binding national targets on the share of refillable beverage packaging placed on the market of at least 70% by 2030, whilst working towards an ambitious EU-wide target.

> "Ensure single-use plastics banned are replaced with reusables, not with other single-use materials such as bamboo or paper"

Deposit Return Schemes (DRS)

DRS are an established tool to change business and consumer behaviours. Member States are encouraged to go beyond DRS for recycling, as already outlined in the SUPD to reach the 90% bottle collection target. If reusable systems are truly to be implemented on a large scale, DRS for reuse must be a key part of the solution. Recommendations:

→ Encourage and implement DRS for different types of reusables (not just beverage containers) to increase efficiency and convenience for both vendors and consumers.

→ Policies for DRS should mandate reusable items within the scheme, and be ambitious in terms of scale. A large number of reusable DRS are already in place for cups, beverage containers and food containers and these need to be supported and scaled up by Member States.

A joint NGO initiative has published a DRS Manifesto which details the benefits of DRS, and call to action for policy makers.

Taxation / Fiscal Incentives

Businesses and consumers need financial 'carrot or stick', or both, to support the move to reuse systems by creating a level playing field, in which single-use plastic externalities are accounted for, and making reuse the 'easy' option. Put simply, taxes on SUP items, and fiscal incentives on their reusable alternatives, will make a big differencel to vendors and customers. Combined, they can drive innovation and behaviour changes towards reusables. Recommendations:

→ Place a tax on SUPs - this can quickly direct businesses to seek alternatives, for example a levy (visible on payment) on single-use coffee cups to create demand for reuse systems - an approach with proven effectiveness for single-use plastic bags and increasingly for cups.

→ Introduce incentives for reusable items and systems to overcome barriers to entry, such as capital investments for collection vehicles or washing facilities.

→ Fund or create other financial support for research and development activities to support businesses in initial hurdles to shifting from the entrenched linear systems, to reusable circular systems.

Extended Producer Responsibility (EPR) schemes

EPR is a vital policy and economic tool to actualise the 'polluters pay principle' and incentivise better waste management and redesign towards more reusable products. The SUPD states that actors across the plastics value chain face full financial responsibility for litter clean up, waste management and awareness raising of single-use plastic beverage cups, and food and beverage containers.

However, to truly use EPR as a tool to shift to reusables, it is vital that fee modulation is included within these schemes. Recommendations:

→ Ensure eco-modulation of fees within EPR schemes established from the SUPD - this means imposing higher fees for those value chain actors whose products are more polluting, for example, single-use plastics, and lower for those that are less polluting, for example, reusables. Modulation criteria must look at durability, reusability, absence of hazardous chemicals, among other aspects, and be large enough to have a real impact.

→ Ensure costs from producers towards awareness raising within the schemes promote and incentivise reusable alternatives, and any revenues generated from EPR schemes prioritise prevention and reuse.

→ Ensure these EPR schemes are implemented with an earlier deadline of the end of 2021, rather than the end of 2024.

"DRS should mandate reusable items within the scheme, and be ambitious in terms of scale"

Green Public Procurement (GPP)

Member States spend around €200 billion annually on catering services. There is a huge opportunity to lead by example and apply higher standards to purchasing decisions that incentivise a shift from single-use to reusables, create a road map for other public policies and the private sector to follow, and a platform for the circular economy. Recommendations:

→ Public procurement standards should be reviewed to incorporate bans on single-use items, as well as targets and incentives for reusables, enabling procurement teams to incorporate reusable products for suitable venues.

→ Show leadership to other procurement functions on the opportunity to replace SUPs purchasing with reuse systems.

→ Use GPP to stimulate suppliers to innovate to provide reusable solutions and incentivise safer reusable materials such as inert ones.

For example, in 2016, the City of Hamburg introduced GPP rules which banned municipal use of items including coffee capsules, single-use bottles and utensils, and introduced reusable cups to several public institutions, including cafeterias of public administration and the police academy. The move stopped the use of up to 675,000 single-use cups each year.

Awareness raising

The SUPD has explicit requirements for cups for beverages, food containers, beverage containers and more, to introduce 'awareness raising' programmes, including on the availability of reusable alternatives and reuse systems. The nature of these could range from on-pack labelling to mass consumer campaigns to the engagement of local businesses. This report can also serve as an ideal starting point to promote and learn from best practices. Some recommendations for successful awareness raising programmes:

→ Awareness raising should be used as an essential tool in combination with the other policy levers to incentivise the shift from SUPs to reusables.

→ Given the significant consumer attention on SUPs, and the network of active NGOs and other organisations focussed on this issue, government campaigns should recognise and capitalise on existing awareness when launching communication campaigns.

Monitoring and enforcement

To demonstrate adherence to the SUPD, Member States need to implement assessment, monitoring and enforcement regimes that supplement and hold governments accountable for the policy instruments introduced. For the introduction and evidence of the effectiveness of new reusable systems, particular recommendations include:

→ From the beginning of SUPD transposition and policy development, identifying the key performance indicators (KPIs) that will demonstrate progress towards reduction in SUPs and uptake of reusables, including initial baselines of consumption data for reusables in addition to SUPs. These should be transparently disclosed, and updated and reported upon each year.

→ Ensuring independent governance, and creating bodies for monitoring and assessment that are independent of the industry.

→ Clarity over - and visibility of - the methods of enforcement for businesses captured within implementation schemes.

"Public procurement standards should be reviewed to incorporate bans on single-use items, as well as targets and incentives for reusable"

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