

NOW & NEXT CIRCULARITY



The Blind Spot...

There's a large gap between successful new launches and the rest of the pack.

Across most categories, 10%-20% of innovations account for approximately 80% of new product sales.

- Top 15% of innovations
- Bottom 85% of innovations

Blind Spot

Employees

Equipment

Engagement

We are helping our customers remove 1 billion pieces of problem plastics and optimising fibre use for individual supply chains. We will continue to manufacture 100 per cent recyclable or reusable packaging and will test reuse pilots. In the future, we aim for all our packaging to be recycled or reused and zero waste sent to landfill.

In this section

- Design out waste and pollution
- Keep materials in circulation

DESIGN OUT WASTE AND POLLUTION

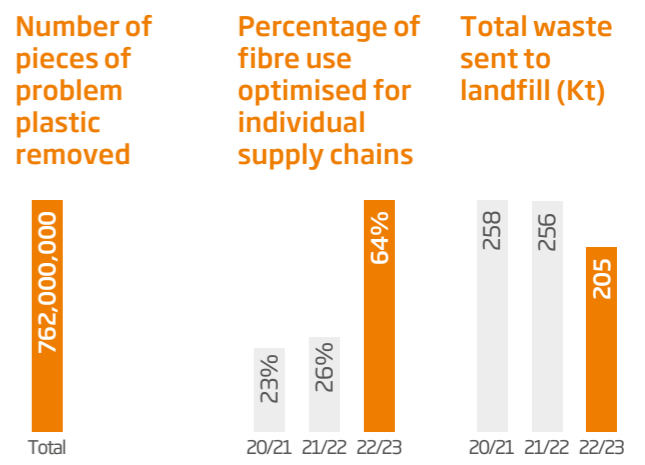


How does this enable the circular economy?
 The circular economy eliminates waste and pollution by design. We are reducing the volume of materials that go to landfill and ensuring no more material than necessary is used by helping our customers design out problem plastics that are hard to recycle, designing waste out of our operations, and optimising our packaging for individual supply chains.

Why does this matter?
 Designing out waste and pollution can limit harm to human health and the environment, reducing the impact on living natural ecosystems. Given that the majority of a product's life cycle impacts are determined at the design stage, making conscious choices to limit environmental impact is essential. Our designers and innovators work closely with our customers to ensure that waste and pollution is not created in the first place through better design.

How does this contribute to the Sustainable Development Goals?
 Designing out waste and pollution contributes to promoting sustainable consumption and production patterns.

- Now**
- By 2025, help our customers to take one billion pieces of problem plastic off supermarket shelves
 - By 2025, optimise fibre for individual supply chains in 100 per cent of new packaging solutions
- Next**
- By 2030, optimise every fibre for every supply chain
 - By 2030, send zero waste to landfill



* Cumulative total since 2020/21

DESIGN OUT WASTE AND POLLUTION

By 2025, help our customers to take one billion pieces of problem plastics off supermarket shelves

Our plastic replacement programme continued at pace during the year, with progress made towards our ambition to replace one billion units of problem plastics by 2025.

In 2022/23, we replaced 297 million units of plastic with recyclable, corrugated alternatives, bringing the cumulative figure to 762 million since we set this target in 2020/21.

Although overall packaging sales volumes are lower compared to last year against a challenging macroeconomic environment, we have continued to see strong appetite for corrugated packaging as a recyclable alternative to plastic.

Over half of respondents in our survey* said that they would purchase products containing less plastic to help improve recycling rates and businesses across the European Union. This is also a consequence of the requirement to pay plastic packaging taxes, increasing the attractiveness of corrugated packaging.

Our sales, marketing and innovation (SMI) community continue to proactively analyse the market to identify opportunities to replace plastics, entering into solution-oriented dialogue with customers to enable them to capitalise on trends.

We launched campaigns targeting common sources of plastic for our FMCG (fast moving consumer goods) customers, such as produce trays, bottle holders and takeaway food boxes. There are now more than 4,000 recyclable corrugated packaging solutions added to our portfolio for products sold by our customers, including e-commerce and retail.

We have continued to develop our data capture and reporting capabilities to react more quickly to opportunities to convert plastic-based solutions to recyclable alternatives. Our teams have focused on piloting new innovations and delivering training, including case studies, on plastic replacement opportunities.

Although in many solutions a complete switch to corrugated can be made, for some applications more than only fibre is required. We are addressing this challenge through R&D (see, for example page 17) so that the additional components required for some applications are recyclable.

Over the next year, we will continue to drive adoption of fibre-based replacements amongst our customers, capitalising on the strong approval rate for corrugated packaging compared to plastic amongst consumers.



Plastic replacement case study

Replacing plastic carriers for bottles with a recyclable corrugated alternative

A common source of problem plastic for our FMCG customers is the plastic rings used to hold multi-packs of beverage bottles or cans together.

These hard-to-recycle plastics have served as a packaging device for more than 50 years, despite contributing to plastic pollution in the oceans.

We have developed recyclable solutions, allowing 0.5-1.5 litre bottles to be bundled, plastic-free.

The corrugated box is a recyclable format that can be customised with a brand message.



Plastic replacement case study

Replacing plastic bags for groceries with a recyclable corrugated alternative

Another common source of problem plastic for our FMCG customers is the plastic bags and boxes used to store groceries for home delivery.

GreenTote® is a reusable, moisture-resistant modular 100 per cent recyclable container. Available in many sizes, it can hold more than three times the number of groceries than a typical plastic bag.

It is designed to interlock, ensuring safety and convenience when transporting. This solution offers a long-lasting, printable surface for branding and promotions.

We pay close attention to detail. In many cases, even a small change made to the packaging specification can have a significant impact. We are finding new opportunities to create added value for our customers.

Andreas Koch
Design & Innovation Manager, Packaging Austria

* A specially-commissioned survey of 3,395 respondents across DS Smith's key markets of Belgium, Germany, Poland and the United Kingdom that took place in July 2019 which sought to understand consumers' attitudes and habits on packaging, recycling and waste management.

DESIGN OUT WASTE AND POLLUTION CONTINUED

Circular Design Metrics

Our Circular Design Metrics make it easy for our customers to compare the sustainability performance of different packaging designs, immediately seeing the indicative impact of design decisions across eight useful metrics. Our customers are using the metrics to measure and compare the circularity of different solutions at a glance, helping them to select the best solution based on their priorities.

The metrics present an opportunity to quantify and improve the impact packaging has on the environment, including its carbon footprint*. Feeding the analysis behind the metrics is customer, operational and industry data that supports the assessment of existing and new packaging solutions.

The metrics are supported by our Circular Design Principles, utilised by our expert design and innovation community of more than 700 designers, to ensure that supply chain conditions are integrated into the design process. This results in leaner packaging that maintains properties such as strength, resilience and recyclability.

>31,000

packaging decisions influenced by our Circular Design Metrics since their launch

c. 3,000

solutions presented to customers featuring our Circular Design Metrics each month

* Carbon footprint calculation is based on industry-average data from the FEFCO cradle to grave life cycle assessment. The life cycle inventory data and methodology can be obtained from <https://www.fefco.org/lca/>.

Powerful metrics to see and compare packaging sustainability

The Circular Design Metrics are a useful tool for brands that want to drive sustainability performance through their packaging, using fewer resources and reducing emissions.

Indicates if the packaging has been designed to be used several times

We identify if the solution is designed and can be promoted for reuse.

**Measures the CO₂ impact of the packaging**

We give customers a guide on the CO₂ impact* of our and other packaging solutions.

**Provides recycled-content value for the corrugated element of the packaging design**

We identify non-compliant articles where we need to find recyclable or reusable alternatives.

**Indicates if there are non-renewable elements in the design**

We identify non-compliant articles where we need to find recyclable or renewable alternatives.

**Drives packaging optimisation for individual supply chains**

We review the level of existing supply chain data against the BSIR (Board Strength Index Requirement) pyramid.

**Shows how recyclable the packaging solution is**

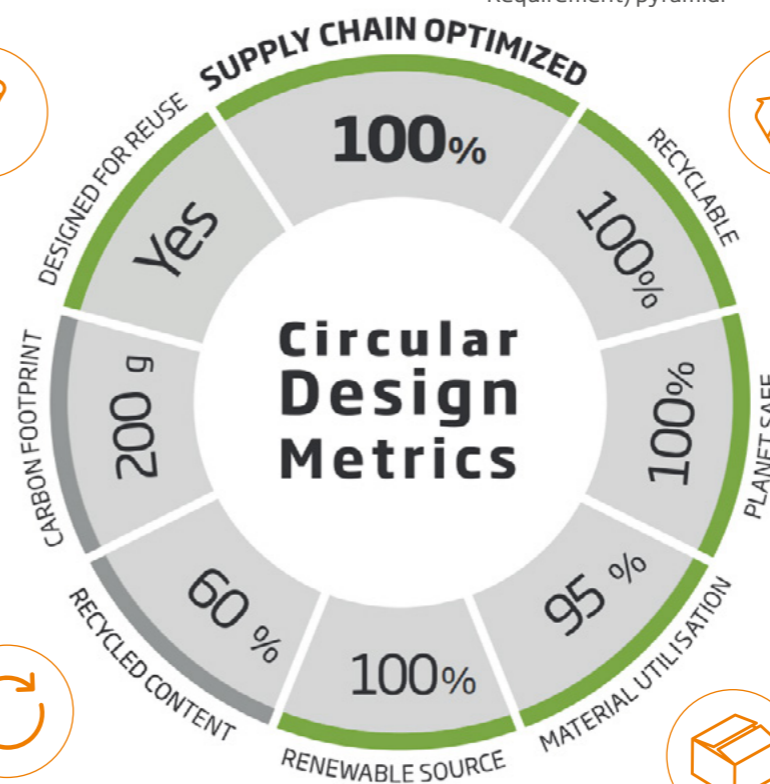
We identify non-compliant articles where we need to find recyclable or reusable alternatives.

**Shows how biodegradable / compostable the packaging solution is**

We identify non-compliant articles where we need to find safer alternatives.

**Measures how much of a design is 'wasted'**

We identify articles where there is excessive waste, to focus design on a better solution.



Watch our video to learn about how our Circular Design Metrics can help to increase the circularity of your packaging

DESIGN OUT WASTE AND POLLUTION CONTINUED

By 2025, optimise fibre for individual supply chains in 100 per cent of new packaging solutions

In 2022/23 our designers created over 42,000 Circular Design Metrics for solutions we presented to our customers, allowing us to have conversations aimed at making informed decisions around circularity and sustainability. When we analyse the rich data we are creating, we are seeing changes in behaviour, over time, which fully support the initiatives we are driving at a fundamental design level.

During 2022/23, we optimised 64 per cent of new packaging specifications for individual supply chains (2021/22: 26 per cent), driving innovation in our solutions with optimised packaging for our customers, designing out waste and pollution in the process. This involves optimising packaging for efficiency, driving savings through small improvements to the packaging's dimensions, shape and materials used that can be multiplied over thousands of units. This results in a lower environmental impact and/or financial savings across the customer's supply chain.

Our Circular Design Metric 'Supply Chain Optimised' is a fundamental metric to help drive positive change in the development of our packaging solutions. Supply chain data is an essential requirement in optimisation. To maximise this metric score, we capture high-quality data across all touch points within the supply chain to enable more precise allocation of fibre requirements and a better-specified solution.

We have further developed the methodology for analysing and assessing our customer's supply chain data and improved the tracking of design projects. By using our sophisticated packaging performance prediction software, our packaging solutions are tailored to our customer's individual supply chain conditions, including storage, assembly, filling, sealing, stacking, and all logistic parameters.

"The dedication and perseverance of our 700 strong design teams has enabled us to exceed predicted targets for supply chain optimisation during 2022/23. Our commitment to Circular Design Principles as 'a way of life' is demonstrated through these impressive [and long-lasting actions which set the tone for the new fiscal term and will enable us to bring circularity to all our design solution development."

Chris Else
Head of Design

By 2030, optimise every fibre for every supply chain

Our ambition is to optimise every fibre in every supply chain we provide packaging for. The progress delivered this year for the 'Now' (2025 target) contributes towards the 'Next' (2030 target), which is to expand beyond new packaging solutions and encompass every item we supply. This will involve scaling our practices and leveraging our strong capability. In doing so, we will be able to identify further opportunities to design out waste and pollution and keep materials in use for longer, bringing more value to our packaging solutions and customers.

🔗 [Read our industry report, 'Fulfilling Packaging's Potential: A holistic approach to supply chain optimisation' online at www.dssmith.com for more information on how innovative packaging can reduce complexity in logistics.](https://www.dssmith.com)

Supply chain optimisation ratings

Board Strength Index Requirement (BSIR) is a rating used to qualify supply chain information at the point of solution development. We use it in assessment of the quality and known accuracy of supply chain conditions.

BSIR 1: Specification is fully DS Smith validated

Our PackRight process has generated a comprehensive supply chain study from which DS Smith has created a design solution. Material defined in the solution has been optimised to meet the requirements of the article and its entire supply chain.

BSIR 2: Solution specifications calculated using customer data

Our PackRight process has been utilised to gather comprehensive customer supply chain data from which DS Smith has generated a design solution. Material defined in the solution has been optimised to meet the requirement of the article, its entire supply chain and customer-defined criteria.

BSIR 3: BSIR calculated using standard parameters

Our PackRight process has been utilised to gather essential customer supply chain data. Customers have supplied specific criteria that has to be met as part of the design solution e.g. performance expectations, paper colour and type. Assumptive supply chain models and experience-led reasoning are used to define material specifications.

BSIR 4: Specification identified as an opportunity for supply chain optimisation review

The specification is raised based on customer specified material formation or analysis of an existing solution. A review is undertaken, within a six month window, to assess the BSIR in accordance with the actual supply chain conditions, ensuring the article is truly optimised for its supply chain resulting in an uplift in BSIR classification to level 1, 2 or 3 (supply chain optimised).

**Why does design matter over the entire packaging value chain?**

Our customers want to tackle plastic pollution, improve recycling rates and develop circular business models that reduce carbon emissions. We are capitalising on the significant benefits of the circular economy by embedding circularity into our product development to reduce environmental impact throughout the entire life cycle. Circular design criteria are considered in the development of new specifications so that our customers can connect with the circular economy and consider the impact of their packaging choices at the point of design. When designing circular packaging, it is important to consider how the item will be manufactured and include the impact it will have after it has left our factory. In our circular business, wastepaper and corrugated materials are recycled into new paper from which new circular packaging solutions are made. We are intensely focused on resource efficiency throughout this circular life cycle. We know, therefore, that making small improvements will impact accumulatively at scale. Keeping materials in use for longer is a fundamental consideration of our Circular Design Principles. Unlike other polymer-based materials, corrugated has a long and well-established history of being returned for recycling and recycled at scale, bringing a truly sustainable material back into circulation time and time again through an internationally recognised recovery and recycling system.

DESIGN OUT WASTE AND POLLUTION CONTINUED



Case study

Cleaner waste for more efficient recycling

In an ideal world, we would only collect used paper and cardboard to recycle into paper. But the reality is that through poor-quality waste streams, other materials contaminate the used paper and cardboard we receive.

Contamination that enters our pulpers must be removed to protect the quality of the paper. These are called rejects and make up the majority of waste generated by our paper mills.

Whilst mostly plastic, the rejects can also be made up of glass, wood, metal and paper fibres that have attached themselves to the unwanted materials.

In an analysis conducted at our Kemsley Mill, we measured plastic contamination to fill c. 4.8 million bin bags, revealed by state-of-the-art infrared technology.

Paper for recycling is more likely to be contaminated by plastics in mixed recycling collections - where materials such as glass, cans, paper and plastics are collected together - as opposed to segregated collections.

By 2030, send zero waste to landfill

In 2022/23, 204,637 tonnes of waste was sent to landfill (2021/22: 255,920 tonnes), a 20 per cent reduction compared to last year, driven by reduced volumes and the implementation of several landfill diversion projects.

These include reductions made as a result of projects initiated at Kemsley Mill, Rouen Mill and Belišće Mill.

At Kemsley and Rouen, rejects that would otherwise be sent to landfill are incinerated to produce energy from the waste to power our own, and in some cases, other operations.

For example, at Kemsley, around one third of the steam supplied to the paper mill is met by the neighbouring waste-to-energy facility, where rejects are incinerated to produce steam, which means that less natural gas is required.

At Belišće, in partnership with a local factory, rejects are being used in cement production, embedding the circular economy within our own operations and local industry.

Reducing our Scope 3 'Category 5: Waste generated in operations' emissions'

We are proactively working with our recycling customers, policy makers and trade associations to improve segregation and collection methods, whilst advocating for segregated recycling.

Unfortunately in some cases, the material we cannot use has to be sent to landfill, although we are finding uses for rejects to achieve zero waste to landfill by 2030.

Sending less waste to landfill has the added benefit of reducing the emissions generated by landfill waste as it decomposes, which is captured in our Scope 3 inventory.

As we make progress on our zero waste to landfill target, our Scope 3 emissions will reduce as alternative waste destinations, such as recycling, release fewer greenhouse gas emissions into the atmosphere compared to waste sent to decompose in landfill.



Case study

Plastic-free sites in Denmark

This year, our sites in Denmark launched a campaign to reduce and then completely remove common sources of plastic across the business.

This not only reduces plastic waste, but has also served as an opportunity to replace plastic with recyclable corrugated alternatives.

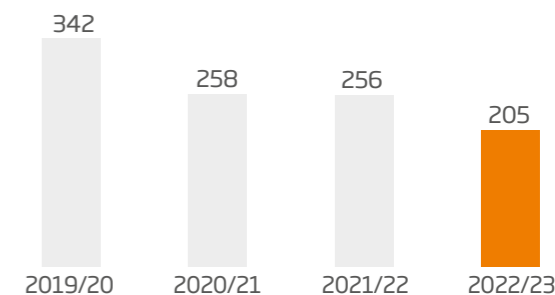
This included:

- Removing plastic wrap as a packaging transit material, replaced with paper leftover from the corrugator
- Exchanging around 40,000 plastic coffee cups and 8,000 plastic straws for paper-based alternatives
- Switching plastic cutlery to non-plastic alternatives
- Replacing plastic ID card holders with cardboard ones

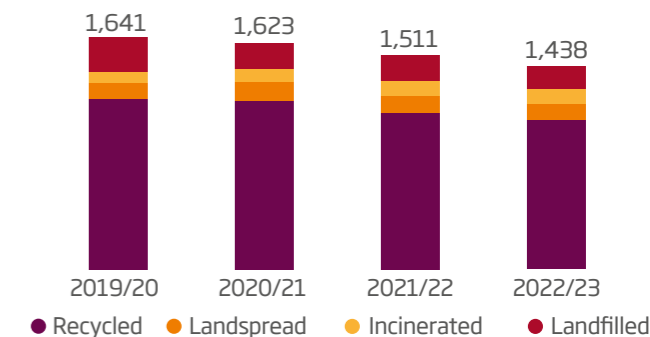
Segregated waste handling has helped our teams sort waste so that it can be disposed of to the optimal waste destination and where plastic has not yet been totally eliminated, biodegradable materials have been sourced.

The teams have begun sharing this project with other regions to identify opportunities to eliminate plastic.

Total waste sent to landfill (Kt)



Total waste by disposal destination (Kt)



20% reduction in waste sent to landfill compared to last year, owed to reduced volumes and several landfill diversion projects

Information and policies
Zero Waste to Landfill Policy

KEEP MATERIALS IN CIRCULATION



How does this enable the circular economy?

The circular economy, by design circulates products and materials at their highest value. By designing packaging using 100 per cent recyclable or reusable materials and striving for all our packaging to be recycled, we are keeping materials in circulation over and over again. This reduces the need for virgin materials and the pressure on natural resources. Launching packaging reuse pilots will help us understand the opportunity to keep our products in use for longer.

Why does this matter?

Keeping materials in circulation helps to protect natural resources by maximising the use of renewable materials and recycled inputs, which contributes to conservation of natural resources.

Materials can be kept in circulation for as long as possible by recycling them over and over again. Recycling is an important solution for environmental conservation as it helps to reduce the impact of deforestation, which can impact biodiversity.

How does this contribute to the Sustainable Development Goals?



Keeping materials in circulation contributes to substantially reducing waste generation through prevention, reduction, recycling and reuse.

Now

- By 2025, test up to five reuse pilots and continue to manufacture 100 per cent recyclable and reusable packaging

Next

- By 2030, aim for all our packaging to be recycled or reused

Percentage of packaging that is reusable or recyclable¹

2022/23	100%
2021/22	100%
2020/21	99%

1. Packaging or a component of a packaging solution that has been conceived and designed to accomplish within its life cycle (a minimum of two trips or rotations) or recycled (recycled in practice and at scale, equal to or greater than ≥95% of the total pack weight is recyclable as this pack would be accepted by and processed in paper mills as per CPI recyclability guidelines) by the end consumer.

KEEP MATERIALS IN CIRCULATION

Continue to manufacture 100 per cent recyclable and reusable packaging

In 2022/23, over 99.7 per cent of our manufactured packaging continued to be either reusable or recyclable, a target that we achieved last year ahead of our 2025 deadline¹.

Through better design for recyclability, more materials can be kept in circulation as a result of our extensive work to reduce the non-fibre materials in our packaging solutions such as wax, barriers and laminate. This enables our packaging to be recycled at scale.

Alternatives to hard-to-recycle materials

Our use of alternative materials, including barriers, has increased significantly in 2022/23. Barriers can, for instance, protect products from moisture, water vapour, fat and grease, or scratches. Some of the hard-to-recycle packaging products include heavy coated wax products. Responding to this problem, we have used our Greencoat[®] water resistant packaging solution that provides the same performance properties as wax coated boxes, but is 100 per cent recyclable.

Very minor volumes of foams and miscellaneous plastics, manufactured by others remain a challenge, predominantly due to lack of third-party alternatives on the market, customer resistance and/or supplier delays in the provision of alternative materials.

Recyclability Technical Forum

We committed to closing the 0.3 per cent gap, with trials commenced to run new barrier solutions and through our Group-wide Recyclability Technical Forum. This forum brings together experts from Group Research & Development, Recycling, Paper and Packaging to enable a consistent approach to recyclability, addressing issues such as the legislation concerning hard-to-recycle plastics.

This group is actively engaged with external packaging producers, legislators and trade associations to help recycle more and waste less, with active participation in technical working groups such as 4evergreen[®], CPI, CEPI and FEFCO to progress the dialogue on innovation that extends the useful life of material.

This year, the introduction of any new non-fibre materials into business is now considered from the outset by our innovation stage gate process. This ensures that new materials are compliant with our standard (meaning that the material can be recycled at scale and in line with any legislative requirements). As a result, we will be in a stronger position to drive recyclable solutions and address the opportunities facing our industry.

By 2025, test up to five reuse pilots

This year, as part of our Now & Next refresh, we set a new target to launch up to five reuse pilots by 2025. Although recycling is an established, tested and scaled means of processing waste, and a necessary component of the circular economy, reuse is an opportunity to extend the life of the original raw material in its primary form and is an important part of our ambition for all our packaging to be recycled or reused by 2030.

Our reuse pilots will help us to understand how to support our customers in reaching the reuse targets proposed in the draft EU Packaging and Packaging Waste Regulation. We will pilot reusable packaging solutions with customers and partners as they progress through our innovation stage gate process.

We look forward to scaling the pilots where packaging reuse best complements recycling systems, reduces materials and keeps them in use for as long as possible, delivering a better outcome for the planet, our customers and our business as we redefine packaging for a changing world.

1. We now consider this target 'achieved' because greater than 99.7% of our packaging volume meets this standard, enabling recyclability in practice and at scale. For the remaining less than 0.3% volume that is presently not either recyclable in practice or at scale, such as some barrier coatings and foam, we continue to push for circular alternatives.



Supply chain optimisation for e-commerce case study

Practical recyclable packaging for Reckitt

We joined forces with Reckitt to innovate the traditional plastic jar of Vanish powder into a Vanish Multipower tabs box that is one piece, simple to use and easy to recycle.

The box is designed to optimally use available space, with convenient handling and ease of opening and closing.

There is no over-packaging and the unpacking experience for the customer is improved, with double-sided print allowing for distinctive branding on the inside and the outside.

This new release signals a shift towards embracing e-commerce and developing the brand's appeal among a younger, more time-strapped audience.



Recyclable packaging for e-commerce case study

Fun recyclable packaging for PLAYMOBIL

We worked with PLAYMOBIL to develop an innovative and sustainable e-commerce packaging solution.

The solution depicts the contained play world printed in colour on one side and the shipping package on the other side, which makes additional outer packaging for shipping unnecessary.

The box can be turned over in a few simple steps to reveal the transition; colourful PLAYMOBIL packaging to give the toy set as a gift.

Despite external impacts from transportation and shipping labels, the flawless packaging is appropriate for giving away, collecting or storing. It is designed for reuse (in storing the product) and is 100 per cent recyclable.

KEEP MATERIALS IN CIRCULATION CONTINUED

By 2030, aim for all our packaging to be recycled or reused

Paper and cardboard packaging enjoys one of the highest recycling rates of any material, at up to c. 85 per cent as a European average according to industry studies. The industry is working hard to develop solutions that extend the packaging life cycle, eliminating the use of non-recyclable and single-use plastic packaging.

Owing to this high recycling rate, we are able to use an exceptional amount of recycled content in our products, protecting finite natural resources and enabling the circular economy. Although the 2030 target is still some time away, we have begun the journey towards aiming for all of our packaging to be recycled or reused, as part of our recyclability and reuse workstreams.

By 2030, we are aiming for all our packaging to be recycled or reused, validated through downstream traceability of all our packaging. We have developed a calculation tool to map out the journey of our packaging to understand its life and end destination, drawing on a variety of data sources. With the methodology for measuring our recycling rate established and a baseline rate calculated, we will begin to pilot operational, technological and circular economy projects to improve the recycling rate towards 100 per cent.

Establishing a DS Smith recycling rate

This year, we worked with an agency of researchers, engineers and technologists to produce a recycling rate calculation tool for our packaging, enabling us to gain visibility over what happens to our packaging in practice, throughout its full life cycle.

We have now trialled this process for four countries and we are excited about where this work could lead us - from piloting new business models to increase the recycling rate to targeting our campaigning and lobbying efforts to improve collection systems in specific regions.



Working towards a 100 per cent recycling rate target by 2030 will keep components in circulation, whilst reducing emissions from the end-of-life treatment of fibre-based materials that, although being recyclable, are not always recycled at scale in some countries.

This is because paper left to degrade in landfill produces methane that is significantly more harmful to the atmosphere than the relatively smaller volumes of carbon dioxide generated in the recycling process.

Tackling the c. 15 per cent presently not recycled will therefore help to reduce our Scope 3 greenhouse gas emissions for Category 12: End-of-Life Treatment of Sold Products.

We aim to reduce Scope 1, 2 and 3 GHG emissions by 46 per cent by 2030, compared to 2019, on the way to reaching Net Zero GHG emissions by 2050.



Case study

Increasing the circularity of corrugated

We are a member of the cross-industry 4evergreen® alliance, who have an objective of achieving a 90 per cent recycling rate for paper-based packaging by 2030. The alliance collaborates with organisations from across the entire value chain including packaging producers, brand owners, recyclers, paper makers and research institutes.

Across 4evergreen® we take a leading role through our active participation in the Steering Group and the four key workstreams that develop the tools and guidance for different aspects of fibre-based packaging sustainability and circularity. These workstreams are focused on development of a Recyclability Evaluation Protocol, Design Guidelines, Collection & Sorting Guidelines and Innovation.

Our work with the alliance supports DS Smith's position on the manufacturing of sustainable and fully recyclable packaging, as well as our campaigning for improved quality and recycling rates for paper for recycling (PfR) across Europe.

Circular Design Principles

As over 80 per cent of a product's environmental impact is determined at the design stage, enabling circularity through design is essential.

Our Circular Design Principles, launched in 2020 in collaboration with the Ellen MacArthur Foundation, provide a framework to stimulate circular design innovation, ensuring that packaging is designed to meet its purpose with minimal environmental impact.

**We protect brands and products**

Designers must always ensure that packaging successfully protects its product. Damaged products from poor packaging have a negative economic and environmental impact

**We use no more materials than necessary**

Optimised use of packaging materials saves resources and reduces waste

**We design for supply cycle efficiency**

Our designers drive efficiency by changing the layout of products within boxes for stacking in delivery vehicles

**We keep packaging materials in use**

We eliminate waste by keeping packaging products in use for as long as possible, recycling material again and again

**We find a better way**

We empower our designers to challenge the status quo and support customers in the drive for a circular economy