Recyclable single-use paper and board packaging as a leading circular and sustainable solution in a climate-neutral economy

Fibre Packaging Europe supports the EU's Green Deal ambitions and the Circular Economy Action Plan, which offer a crucial opportunity to move the EU towards a more circular and climate-neutral economy. Packaging sourced from renewable wood and recycled paper and board, generally referred to as fibre-based packaging, actively contributes to the green transition by phasing out fossil-based materials and their associated emissions. Reducing waste, increasing recyclability and recycling, and improving the overall environmental performance of products will be essential in delivering the EU's sustainability ambitions. We call on EU policymakers to ensure that the future overhaul of the regulatory framework on packaging, including the upcoming revision of the Packaging and Packaging Waste Directive as well as the Sustainable Products Initiative, is based on sound data and evidence.

Both single-use and reusable items have a role in the transition to a circular economy. Fibre-based single-use items are sustainable, as they are made from sustainably sourced, renewable and recyclable raw materials, and have a high end-of-life recycling rate. These items offer distinct advantages in terms of product protection, for example satisfying customer needs such as hygiene requirements for food products, while having an overall lower environmental impact, compared to reusable items.

Single-use fibre-based products play a critical role particularly in the health, food and food service sectors. It is crucial that the upcoming legislative initiatives impacting the paper and board packaging value chain take into account the following considerations.

1. **Fit for purpose, sustainable, and recyclable packaging is key to achieving circularity and preventing food waste**
2. **Single-use fibre-based packaging offers valuable material for recycling**
3. **Fibre-based products are a low-carbon alternative to fossil-based products**
4. **Life cycle assessments (LCA) show the superior environmental performance of single-use fibre-based packaging**
5. **Promote responsible sourcing of raw materials to improve product sustainability**
6. **Single-use fibre-based packaging is essential to provide hygiene and safety**
7. **Single-use fibre-based packaging provides resilience in the face of severe global disruptions**
8. **Single-use packaging and reusables should be recyclable and recycled to ensure a level playing field**

1. Fit for purpose, sustainable, and recyclable packaging is key to achieving circularity and preventing food waste

Packaging has a critical function preventing product and food waste[1] which contributes to resource efficiency.[2] For this reason, a holistic approach should be in place for all packaging, including reusable options, by introducing a new essential requirement that all packaging should be "fit for purpose". This closely follows the idea for optimum pack design[3] and will ensure that all packaging is designed to optimally fit the product and minimise void space, thus preventing both over-packaging and under-packaging.

[1] Helén Williams, Annika Lindström, Jakob Trischler, Fredrik Wikström, Zane Rowe, avoiding food becoming waste in households – The role of packaging in consumers' practices across different food categories, Journal of Cleaner Production, Volume 265, 2020
[2] Packagingdigest.com – How to Balance Food Waste Versus Packaging Waste
[3] "Fit for purpose" packaging is designed with the goal to optimally fit the product, per "optimum pack design" concept in ISO 18602:2013(E).

Packaging designed to effectively contain and protect food across the supply chain will minimise waste of both food and packaging. Packaging generally represents only 3–3.5% of the carbon footprint of a food or beverage product,[4] while 80% is caused by growing and preparing the food and 7.5% by transport.[5] For example, paper cups account for 4% of the carbon footprint of a take-away cafe latte. Once this paper cup is recycled at the end of its life, its carbon footprint is even smaller, further decreasing by 64%.[6]

2. Single-use fibre-based packaging offers valuable material for recycling

Paper and board packaging has the highest recycling rate in the EU, at 82%.[7] The paper industry in Europe has already developed a fibre collection and recycling system which allows valuable material to remain in the economy, and well-established market for secondary raw materials using recycled fibres to produce new packaging. In 2020 in Europe (EU27, UK, Norway and Switzerland), 49.6 million tonnes of paper for recycling were used to make new paper and board products out of 56.1 million collected.[8] In contrast, reusable packaging is often harder to recycle and lacks proper recycling systems.

3. Fibre-based products are a low-carbon alternative to fossil-based products

Fibre-based products can replace fossil-based products or products with high manufacturing phase emissions, thereby avoiding carbon emissions and advancing the low-carbon economy. In fact, fibre-based solutions already present in the market could replace at least 25% of current fossil-based plastic packaging by 2025 while offering the same functionalities.[9] More and more innovative fibre-based products are brought to market every year, further increasing the potential for substitution.[10]

4. Life cycle assessments (LCA) show the superior environmental performance of single-use fibre-based packaging

Policy that aims to facilitate the transition towards a sustainable and circular economy should be based on sound data and evidence such as life cycle assessments using realistic scenarios.

- A recent LCA study conducted to ISO standards by Ramboll and peer reviewed by TÜV demonstrates that prioritising reuse is not the most sustainable choice.[11] Fibre-based single-use packaging used in quick service restaurants in Europe achieves a superior environmental performance compared to reusable systems used for the same purpose. The single-use system proved more environmentally friendly in several categories: climate change, fine particulate formation, fossil depletion, freshwater consumption, and terrestrial acidification. For instance, the reusable system generated 2.8 times more CO_2-equivalent emissions, led to 3.4 times more fossil resource depletion, consumed 3.4 times more freshwater and generated 2.2 times more fine particulate matter compared to the fibre-based single-use system.
- A recent meta-analysis[12] of relevant LCA studies and other research on dairy products and non-carbonated soft drinks such as juices in the EU assessed the environmental performance of beverage cartons compared to alternative packaging options for liquid food and beverages. The meta-analysis revealed that, in terms of global warming potential (given in gram CO_2 equivalents per litre), on average, beverage cartons yield significantly better results (median: 83 g CO_2-equivalent per litre) than PET bottles (median: 156 g CO_2-equivalent per litre) and single-use glass bottles (median: 430 g CO_2-equivalent per litre). Fibre-based beverage cartons perform better environmentally because of their superior packaging efficiency, transport efficiency, and use of renewable resources.
- The meta-analysis further showed that beverage cartons have a lower global warming potential than reusable glass bottles (100 g CO2eq). An additional evaluation of comparative LCA studies[13] also demonstrated that beverage cartons yield better environmental results than reusable glass bottles in all three reviewed studies. Altogether, research suggests that single-use fibre-based packaging has substantial environmental advantages across many uses.

[4] Food Packaging Sustainability, a guide for packaging manufacturers, food processors, retailers, political bodies & NGOs, Denkstatt (2020)
[5] Castellani, V., Fusi, A. and Sala, S., Consumer Footprint. Basket of Products indicator on Food, EUR 28764 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79- 73194-5, doi:10.2760/668763, JRC 107959
[6] Circular Analytics, Taking a closer look at paper cups for coffee (LCA study), Huhtamaki
[7] Recycling rate of packaging waste by type of packaging, EU27, Eurostat (2019)
[8] European Pulp & Paper Industry Key Statistics, 2020
[9] Sustainable Packaging: The Role of Materials Substitution, study by Material Economics
[10] A new role for forests and the forest sector in the EU, European Forest Institute (2015)
[11] EPPA, Jan 2021, "Single-Use Vs Multiple-Use: Using Science to Challenge the Misconceptions" Executive Summary of Ramboll LCA study
[12] Supporting Evidence, Environmental performance of beverage cartons, Circular Analytics, 2020
[13] Ibid.

Life cycle assessments show that reuse is not by default better for the environment, a presumption based on conditions that are often not met in real life. Policy should be based on scientific assessment to incentivise packaging solutions with the best environmental performance.

5. Promote responsible sourcing of raw materials to improve product sustainability

To be truly sustainable, products need to be sustainably sourced. EU legislation should therefore promote the use of sustainably sourced raw materials in products, including packaging.

The paper and board value chain is a major contributor to the EU's green transition. Fibre-based packaging originates from sustainably managed forests, guided by EU and national forest regulations, as well as market-based certification systems such as the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC). Sustainable forest management applied in EU forests is multifunctional and aims to maintain an equilibrium between biodiversity preservation, climate protection and economic output.

Thanks to sustainable forest management, Europe can proudly claim that it currently has more forest resources than it did a century ago, with the forest area in Europe growing by 19.3 million hectares over the last 30 years.[14] Between 2005 and 2015, European forests grew by an area bigger than Switzerland.[15] Total wood harvesting in the EU accounts for less than the annual growth rate of forests, thereby actively increasing the carbon stock of our forests and helping to preserve biodiversity.

When evaluating the environmental performance of paper and board packaging, it is therefore important to highlight that it comes from sustainably managed forests. EU forests and the forest-based sector absorb around 20% of the EU's total greenhouse gas emissions per year, contributing to the EU's climate goals.[16]

6. Single-use fibre-based packaging is essential to provide hygiene and safety

Single-use fibre-based food contact materials have proven to be essential to provide food hygiene, food safety, consumer information, and traceability requirements as set in EU legislation.

A recent study assessed the potential of cross-contamination via three different contact materials: polypropylene from reusable plastic crates; corrugated cardboard; and medium-density fibreboard (MDF) from wooden boxes.[17] The results clearly showed a higher risk of cross-contamination via reusable plastic crates than via single-use board or MDF.

In addition, single-use fibre-based packaging can help ensure that food stays fresh longer than if stored in reusable plastic crates, thus reducing food waste. Research carried out at the University of Bologna showed that fruit stays fresh for up to three days longer in corrugated trays compared to reusable plastic crates, in addition to significantly reducing contamination from microorganisms.[18]

The EU Food Contact Materials Regulation (EC) No 1935/2004 requires that food contact materials and articles are to be manufactured in accordance with good manufacturing practices (GMP) as described in Regulation (EC) No 2023/2006. Due to the lack of harmonised specific measures, the paper and board value chain has developed the broadly accepted Food Contact Guidelines,[19] which support companies in providing safe materials for food applications.

7. Single-use fibre-based packaging provides resilience even in the face of severe global disruptions

Fibre-based products are resilient, are produced mainly from European resources and sold to a high degree to European consumers, and create jobs across Europe. While secondary raw materials markets are volatile by nature, there is a healthy demand for paper for recycling in Europe and worldwide. Even in the light of severe global disruptions, the value of paper for recycling for the circular paper industry enables its collection to remain sustainable with only short-term imbalances in the supply and demand.

To sustain this resilience against major external disruptions, there is a need for separate paper collection at the source to ensure good quality paper for recycling, which will be met with demand from the European paper industry.

[14] The State of Europe's Forests, Forest Europe (2020)
[15] FAO Global Forest Resources Assessment, 2015
[16] Climate effects of the forest-based sector in the European Union, Peter Holmgren, FutureVistas AB (2020)
[17] López-Gálvez, F.; Rasines, L.; Conesa, E.; Gómez, P.A.; Artés-Hernández, F.; Aguayo, E. Reusable Plastic Crates (RPCs) for Fresh Produce (Case Study on Cauliflowers): Sustainable Packaging but Potential *Salmonella* Survival and Risk of Cross-Contamination. *Foods* 2021, *10*, 1254.
[18] Siroli L, Patrignani F, Serrazanetti DI, Chiavari C, Benevelli M, Grazia L and Lanciotti R (2017) Survival of Spoilage and Pathogenic Microorganisms on Cardboard and Plastic Packaging Materials. Front. Microbiol. 8:2606.
[19] Food Contact Guidelines for the compliance of Paper and Board Materials and Articles

8. Single-use and reusables should be recyclable and recycled to ensure a level playing field

All packaging items should be recyclable, including those that can be reused. The environmental impact of reusable packaging strongly depends on the actual use phase – e.g. the amount of use cycles the reusable packaging goes through. Therefore, their deployment should be required to demonstrate traceability – based on a robust measurement methods and calculation rules – to ensure a level playing field and avoid a negative environmental impact. Such a framework is necessary to verify how many times packaging has been reused and to ensure that their roll-out does not cause greenwashing.

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Paper and board packaging solutions are a scientifically proven sustainable alternative to many reusable and single-use fossil-based products. Through simple material substitution, they prevent substantial CO2 emissions while ensuring product and food safety for millions of European citizens. It is essential that their place in the circular economy is recognised and that EU legislation encourages their development. Policy decisions between single-use and reusable packaging should be based on scientific evidence and LCA data.

We support the development of fit for purpose packaging solutions made from renewable materials that are recyclable. Fit for purpose packaging is designed, produced, and used in an optimised way without compromising its functionality. This can be achieved by using a minimum amount of resources and having minimum impact on the environment during the production, use and end-of-life phase.

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Fibre Packaging Europe looks forward to working with policymakers to ensure that stakeholder concerns and scientific evidence are taken into consideration before the legislative proposal is released. We remain available to provide additional information, expertise and data, and would appreciate the opportunity to continue the dialogue with policymakers on this crucial topic.

About Fibre Packaging Europe

Fibre Packaging Europe is an informal coalition of eight trade associations representing industries involved in forestry, pulp, paper, board and carton production and recycling from across Europe. Our joint mission is to provide renewable, circular and sustainable fibre-based packaging solutions to European citizens to achieve the European Green Deal objectives. Together, we represent around 1500 companies and over 2200 manufacturing plants, we employ more than 365.000 people across Europe and our annual turnover is around EUR 120 billion.

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