

FLEXIBLE PACKAGING:

The urgent actions needed
to deliver circular economy
solutions



Executive Summary

BACKGROUND TO THIS WORK

It is now widely recognised that a circular economy is the only solution that can match the scale of the plastic pollution problem, while capturing many other economic, environmental, and social benefits. Through the New Plastics Economy Global Commitment and the Ellen MacArthur Foundation's network of Plastics Pacts, more than 1,000 organisations have united behind one common vision of a circular economy for plastics — a vision where we eliminate the plastic we don't need, innovate towards new materials and business models, and circulate all the plastic we use. Businesses accounting for more than 20% of global plastic packaging use have set ambitious 2025 targets in line with this vision.

Flexible packaging*, the fastest growing plastic packaging category, is by far the most challenging market segment to address on this journey towards a circular economy for plastics. It is almost uniformly single-use, with very low recycling and high leakage rates.

With 2025 just around the corner, it is time to deliver solutions. This work aims to support organisations in achieving their circular economy for plastics goals by providing a practical direction forwards for flexible packaging.

With input from over 100 experts, it presents an overarching strategy for flexible packaging

and identifies 21 specific and urgent actions that are needed in order to make progress towards 2025 plastic packaging targets and beyond. It is primarily designed for businesses, collaborative cross-sector initiatives, policymakers, and other organisations that are already on their circular economy journey, and spans from high-level calls to action that will be of use to executive teams, to detailed insights that will be of use to internal R&D and technical teams.

This report is here to help. We hope you find it a useful resource during our collective journey towards a circular economy for plastics.

*The scope of this work is business-to-consumer (B2C) flexible packaging. Unless explicitly stated otherwise, whenever "flexible packaging" is mentioned, it refers to B2C flexible packaging. See [page 5](#) for the adopted definition.



This document is a short executive summary. Detailed insights, analysis, and actions are found within the deepdive documents and on the website.

WEBSITE

Easily digestible overview of the different strategies for flexible packaging, and the key insights and actions for each.

[Click here](#)

EXECUTIVE SUMMARY

Short, high-level strategy document. Doesn't contain any analysis, reasoning or details for the key actions.



STRATEGY DEEPDIVES

Detailed insights and analysis, and detailed key actions for the different strategy options.



SUPPLEMENTARY INFORMATION

Supporting data and references.



KEY MESSAGES

[Click here for the website.](#)

CONTEXT

Flexible packaging is the fastest-growing plastic packaging category. Because it is almost uniformly single-use, with very low recycling and high leakage rates, it is also by far the most challenging market segment to address on the journey towards a circular economy for plastics.

OVERARCHING STRATEGY

Eliminating and innovating away from single-use flexible packaging must be the first and foremost part of any flexible packaging strategy — because as soon as single-use flexible waste is generated, regardless of material or geography, it is very hard to deal with. Current efforts are only just scratching the surface and a step-change in the level of commitment and effort across direct elimination of unnecessary packaging and exploration of upstream innovation solutions, such as reuse, is required from ALL stakeholders.

For the single-use flexible packaging items that cannot currently be eliminated without unintended consequences, unprecedented efforts are required to ensure they can be circulated. This can include staying with a conventional plastic and scaling recycling systems, or substitution to a different material (such as paper or compostable plastics where relevant) and then scaling those systems. Either way, what is clear is that unless simultaneous, unprecedented efforts across packaging design, infrastructure, and policy are begun immediately — efforts that push far beyond the level of activity we are currently seeing — the circulation of flexible packaging in practice and at scale is unlikely to happen in the foreseeable future.

While they are currently a necessary part of the solution, the inherent quality and yield limitations of recycling and substitution strategies mean that staying with single-use flexible packaging will always present a challenge from a circular economy perspective. This is why we need to keep driving a strong upstream innovation agenda (in line with the first part of the overarching strategy) in order to find ways to eliminate ever-increasing single-use flexible packaging over time.

URGENT ACTIONS

This work has identified 21 specific and urgent actions for flexible packaging that need to be commenced immediately by businesses and policymakers in order to make significant progress towards 2025 targets and beyond.



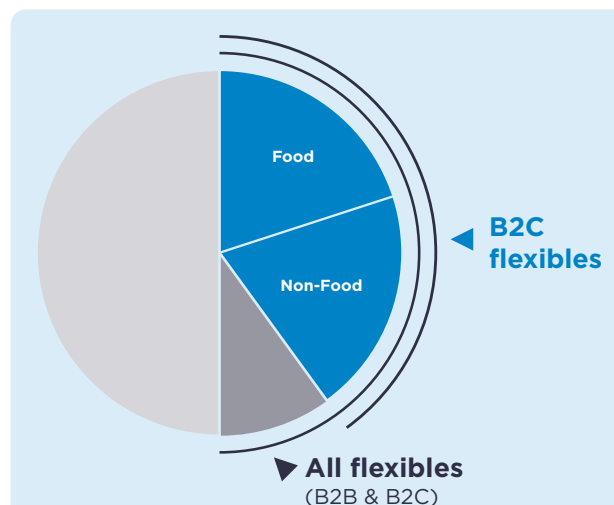
Plastic flexibles are ubiquitous and growing fast

The scope of this work is business-to-consumer (B2C) flexible packaging. This encompasses any flexible packaging that is used and disposed of by an individual either within a household or on-the-go.*

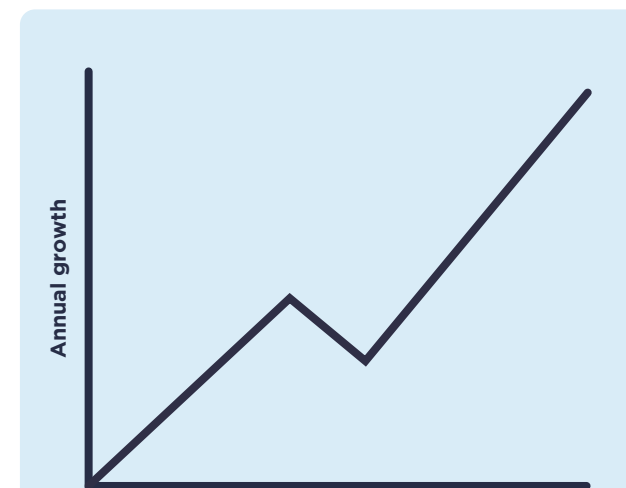


Tens of trillions of pieces of flexible packaging are used per year¹

Due to their low weight, low cost and high functionality, plastic flexible packaging is used for everything from fresh fruit, to meat, to dry food, to confectionary, to drinks, to personal care products, to stationery items, to tools, to electronics... and much more.



~50 MT produced globally per year, making up 30-40% of all plastic packaging by weight²



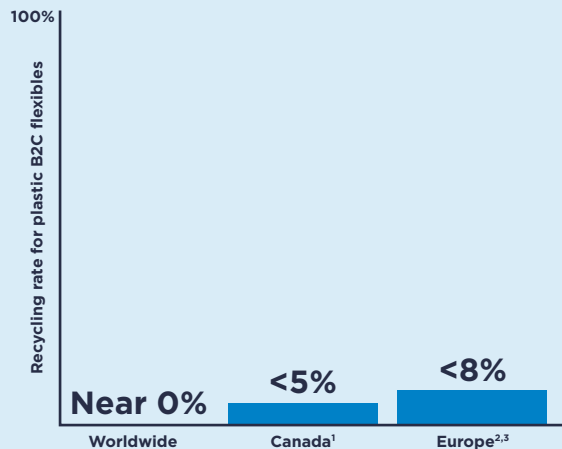
5% annual growth globally from 2019 to 2020. Making it the fastest-growing plastic packaging category²

¹ Estimated, assuming average weight of one B2C flexible as 10g with 50 MT of B2C flexibles in total;

² Based on Wood Mackenzie data

*This includes carrier bags

Flexible packaging is almost uniformly single-use, and is the most challenging market segment to address on the journey towards realising a circular economy for plastics, and related 2025 plastic packaging targets

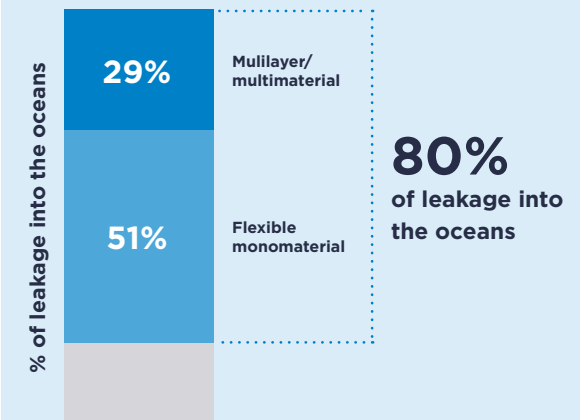


Very little plastic B2C flexibles are recycled today, anywhere in the world



Most recycling that is ongoing is limited to recycling of PE flexibles into applications of lower material quality

(such as garbage bags and rigid furniture items)



Flexibles account for a disproportionate share of leakage into the ocean worldwide⁴

¹ Expert opinion;

² PRE and Eunomia, *Flexible films market in Europe: state of play* (2020);

³ CEFLEX, 2020

⁴ The PEW Charitable Trust and Systemiq, *Breaking the plastic wave: a comprehensive assessment of pathways towards stopping ocean plastic pollution* (2020)

Eliminating and innovating away from single-use flexible packaging must be the first and foremost part of any flexible packaging strategy.

WHY

As soon as flexible packaging waste is generated it is incredibly hard to deal with, regardless of the material it is made from or the geography it is used in.

Current efforts to move away from single-use flexibles through elimination and reuse are only just scratching the surface — leaving millions of tonnes of reduction potential (incl. associated reductions in waste and pollution) on the table, even by 2025.

HOW

From the design stage, significantly more effort needs to be directed towards moving away from a packaging model based on single-use flexible packaging (plastic, paper or compostable materials) that require a collection, sorting, and recycling/composting system.

DIRECT ELIMINATION of unnecessary flexible packaging (i.e. immediate elimination of packaging that can be avoided without unintended consequences and with minimal effect on product or supply chain design).

UPSTREAM INNOVATION to identify and scale ways of delivering products without single-use flexibles (i.e. rethinking the packaging, the product, and the business model to create innovative elimination and reuse opportunities).

A step-change in the level of commitment and effort is required from ALL stakeholders across ALL of the following

DIRECT ELIMINATION

Businesses to:

- 1** Exhaustively identify and action opportunities for direct elimination (on average estimated at ~5-10% of flexibles portfolios), taking inspiration from existing case examples.
- 2** Embed a critical assessment of the need for flexible packaging in all new product development processes (~5-10% of those considered are likely to be unnecessary).

Policymakers, collaborative cross-sector initiatives, and businesses (through advocacy) to:

- 3** Align on priority items to eliminate within sectors (e.g. personal care, clothing, and fruit and vegetables) to drive up the ambition level across the entire industry.

&

UPSTREAM INNOVATION

Businesses to:

- 4** Introduce a high-priority and well-resourced R&D agenda to make upstream innovation THE major component of every flexibles strategy — acknowledging that existing efforts are well below where they can and need to be (e.g. currently less than 0.001% of sachets used for personal and home care products in SE Asia are displaced per year through reuse efforts).
- 5** Set up sector-specific collaborative initiatives with specific objectives (such as facilitating rollout of an existing innovation or answering key questions for a more nascent solution).

Policymakers, collaborative cross-sector initiatives, and businesses (through advocacy) to:

- 6** Create a supportive policy landscape for innovation (e.g. introduce subsidies, bans, EPR).

For more detail and specificity for the key actions, as well as the full insights and analysis that underpin them, see the deepdive documents

For the single-use flexible packaging that cannot currently be eliminated, unprecedented efforts are required to ensure it can be circulated.

WHY

It is currently not possible to completely move away from single-use flexible packaging without negative unintended consequences.

Circulation of flexible packaging in practice and at scale is unlikely to happen in the foreseeable future unless focused action is undertaken and simultaneous, unprecedented efforts across packaging design, infrastructure, and policy are commenced immediately.

HOW

For all single-use flexibles remaining, businesses will need to make a decision on which material to use (incorporating a consideration of sourcing implications and current and future availability of after-use systems during decision-making).

ALL stakeholders then need to engage in undertaking unprecedented action to ensure any flexible packaging that is used can be circulated.

STAYING WITH PLASTIC FLEXIBLES —

designing them for recycling, and then either scaling formal collection, sorting and recycling systems or, in geographies currently serviced by an informal sector, establishing an inclusive waste management system.

SUBSTITUTION TO ANOTHER MATERIAL SYSTEM —

substituting from plastic flexibles to paper-based flexibles or compostable plastic flexibles, designing them appropriately, and then either scaling formal collection, sorting and recycling/composting systems or, in geographies currently serviced by an informal sector, establishing an inclusive waste management system.

Where plastic flexibles are retained: **Simultaneous, unprecedented efforts across packaging design, infrastructure, and policy need to begin immediately**

FOR FORMAL RECYCLING SYSTEMS

Businesses to:

- 7** Radically improve packaging design, in particular, shift to mono-materials for the >40% of flexibles that are currently multi-material.

Policymakers, collaborative cross-sector initiatives, and businesses (through advocacy) to:

- 8** Set separate recycling targets for flexibles (e.g. in Europe the 2030 targets need to be revisited).
- 9** Increase EPR fees for flexibles (e.g. in Europe, fees of ~EUR 1,100 are a good estimate of what may be required).
- 10** Expand collection of flexibles for recycling (e.g. in Europe >40% of the population do not have access to separate collection for flexibles).
- 11** Invest in infrastructure (e.g. >EUR 2 billion in the case of Europe).

FOR INFORMAL RECYCLING SYSTEMS

Businesses to:

- 7** Radically improve packaging design, in particular, shift to mono-materials for the >40% of flexibles that are currently multi-material.

Policymakers, collaborative cross-sector initiatives, and businesses (through advocacy) to:

- 12** Establish an inclusive process, gathering data on existing structures and processes and identifying informal sector organisations to work with.
- 13** Finance improvements in infrastructure, tech, and tools through large infrastructure investments and microfinancing for the informal sector.
- 14** Roll out holistic waste management legislation, including inclusive EPR legislation.

For more detail and specificity for the key actions, as well as the full insights and analysis that underpin them, see the deepdive documents

Where substitution to other material systems is pursued: **Similarly requires simultaneous, unprecedented efforts across packaging design, infrastructure, and policy**

FOR PAPER RECYCLING SYSTEMS

Potentially applicable for ~15% of flexibles

Businesses to:

- 15** For your organisation's entire paper-based packaging portfolio, put in place a robust reduction, virgin reduction, and regenerative sourcing strategy — to ensure that substitution from plastic to paper flexibles does not increase demand for virgin paper.
- 16** Improve paper packaging design so that all paper-based packaging fits into both recycling and composting systems.

Policymakers, collaborative cross-sector initiatives, and businesses (through advocacy) to:

- 17** Increase collection and recycling rates for paper-based flexibles.

FOR PLASTIC COMPOSTING SYSTEMS

Potentially applicable for up to 20% of flexibles

Businesses to:

- 18** For applications supporting the collection of food waste or addressing existing contamination in composting systems: implement compostable materials.
- 19** *Before* pursuing compostables as a broader strategy for flexibles: demonstrate the mechanisms that would need to be in place to prevent contamination of both the composting and recycling systems.

Policymakers, collaborative cross-sector initiatives, and businesses (through advocacy) to:

- 20** Define and implement best practices for composting of food waste and align compostable packaging standards with this.
- 21** Roll out collection and composting infrastructure for food and organics.

For more detail and specificity for the key actions, as well as the full insights and analysis that underpin them, see the deepdive documents

While they are currently a necessary part of the solution, the inherent limitations of recycling and substitution strategies mean that staying with single-use flexible packaging will always present challenges from a circular economy perspective.

WHY

On top of the major challenges and efforts required to make these systems work:

- **Recycling of plastic flexibles** has significant and inherent quality (mechanical recycling) or yield (chemical recycling) losses ([see here on p13](#)).
- **Recycling of paper flexibles** has significant and inherent quality losses ([see here on p20](#)).
- **Composting of paper or compostable plastics** by definition means that the materials are lost from the packaging system driving virgin input requirements ([see here on p20](#)).

HOW

This is why we need to continue driving a strong upstream innovation agenda (in line with the first part of the overarching strategy) in order to find ways to move away from ever-increasing single-use flexible packaging over time.

This work has been developed in collaboration with an expert panel consisting of more than **100 organisations** including relevant expert organisations and NGOs, [Plastics Pact](#) lead organisations, and members of the [New Plastics Economy](#) initiative (which includes many of the leading producers of packaged goods, and many of the largest retailers and packaging producers).

We are deeply grateful to all collaborators and contributors for the time and expertise they have dedicated to this project.

These organisations are not responsible for any of the recommendations presented in this work. This report is the work of, and solely reflects the views of, the Ellen MacArthur Foundation. The Foundation's views have been formed on the bases of existing literature, expert interviews, workshops with the expert panel, and in-house analysis.

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ABOUT THE ELLEN MACARTHUR FOUNDATION

The Ellen MacArthur Foundation develops and promotes the idea of a circular economy.

The Ellen MacArthur Foundation is committed to the creation of a circular economy that tackles global challenges, such as climate change, biodiversity loss, waste, and pollution.

The Ellen MacArthur Foundation is an international charity that develops and promotes the circular economy in order to tackle some of the biggest challenges of our time, such as climate change, biodiversity loss, waste, and pollution. We work with our network of private and public sector decision-makers, as well as academia, to build capacity, explore collaborative opportunities, and design and develop circular economy initiatives and solutions. Increasingly based on renewable energy, a circular economy is driven by design to eliminate waste, circulate products and materials, and regenerate nature, to create resilience and prosperity for business, the environment, and society.

Further information:

www.ellenmacarthurfoundation.org | [@circulareconomy](https://twitter.com/circulareconomy)

ABOUT THE PLASTICS INITIATIVE

Since 2016, the Ellen MacArthur Foundation's New Plastics Economy initiative has rallied businesses, governments, and other organisations behind the vision of a circular economy for plastic, in which it never becomes waste or pollution.

Focused on ambitious targets for 2025, the Global Commitment addresses plastic waste and pollution at its source, beginning with plastic packaging, while the Plastics Pact network of local and regional (cross-border) initiatives, endorses and implements circular economy solutions that work towards the vision.

Further information:

www.emf.org/plastics | [@circulareconomy](https://twitter.com/circulareconomy)
[Explore the vision for a circular economy for plastic](#)



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