



WASTE AND CIRCULARITY

Packaging Waste

A GETTING STARTED GUIDE

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ABOUT THIS SERIES

This guide is part of our series of Getting Started Guides that supports your company to develop an [embedded strategy](#). Each guide tackles a specific sustainability sub-issue and explores what your company needs to do to support the resilience of the environmental and social systems around you.

In each guide, we address relevant trends, system thresholds, key concepts, key actors, and key resources. We also offer guidance on how to address the impacts of your operational and value chain activities and develop credible goals as well as outlining key corporate actions and internal targets that can help to provide clarity on the work ahead.

We recommend you read the first guide in the series, *Getting Started Guides: An Introduction*, which explains our overall approach and clarifies the value of setting a clear strategy anchored in your company's most material issues. It also explains how you can leverage process-based interim targets to clearly outline the specific actions that your company needs to take to achieve its high-level goals.

A complete list of sustainability issues and sub-issues can be found in our guide [Scan: A Comprehensive List of Sustainability Issues for Companies](#).

This guidebook addresses the sub-issue of **packaging waste** as part of the broader issue topic of waste and circularity.

Zero waste can encompass a wide range of distinct activities, including operational waste, product stewardship, materials stewardship, and packaging waste. Often, the components of this work may sit within different functional teams in your organisation, but feature overlapping priorities.

This guide is focused primarily on taking action on **packaging waste** to separate out different levels of work that will be required to reach this ambition. Efforts towards reducing packaging waste are intrinsically linked and complimentary to the work outlined in the *Zero Waste: A Getting Started Guide* and *Product and Materials Stewardship: A Getting Started Guide*.

1

SETTING THE STAGE – PACKAGING WASTE

Packaging plays an important role in protecting the products we use. Yet, the quantity of packaging waste we produce, its widespread mismanagement, and a lack of effective collection and recycling options result in waste ending up in landfills or making their way into the environment with concerning impacts.

No packaging type (whether plastic, glass, metal, paper, or compostable) is a clear leader across every attribute of packaging sustainability. All types have both positive and negative features that vary in terms of application, resource use, and waste profile.

Globally, plastic waste from packaging is a looming issue. Plastics are expected to account for around [one-third of overall packaging waste](#) by 2040, an increase of 8% from 2018 levels. We currently produce [over 430 million metric tons of plastic each year](#), and over two-thirds of that is attributed to short-lived single-use products. In 2022, only around [9% of plastic was ultimately recycled](#), with 19% incinerated, nearly 50% going to sanitary landfills, and 22% disposed of in uncontrolled dumpsites, burned in open pits, or leaked into the environment. This linear economy is not sustainable.

This excess of plastic waste is also significantly harming our [land and aquatic](#) environments, with over 109 metric tons accumulating in rivers and 30 metric tons in the ocean due to waste mismanagement. Without action, [twice as much](#) virgin plastic will be created and three times more plastic could flow into our oceans by 2040. The impacts of rising plastic pollution are also very

complex – [recent research](#) shows that plastics are, direct and indirectly, altering Earth's major processes, further worsening the impacts of many global challenges such as climate change and biodiversity loss. The need for companies to take responsibility and address packaging waste, including plastics, is urgent.

Alternatives like fibre-based packaging are on the rise as they can be made from renewable materials. Many companies are beginning to ensure that this fibre is sustainably sourced, such as coming from certified forests or recycled content – however, sources for responsible fibre are limited. Globally, only around [11% of forests](#) are certified (and increasingly, sustainability certifications are facing criticism for their lack of effectiveness) and paper can only be [recycled 5 to 7 times](#) before losing integrity.

In comparison, while glass and metals can often be infinitely recycled without degrading their properties, they require an energy intensive process that can hinder their recyclability in many systems. However, [durable materials](#) such as glass and metals can be good candidates for reuse, as they can be easily cleaned and sanitised, making them well suited to applications currently dominated by plastics, such as food packaging.

There is no perfect packaging solution. Companies need to rethink their approaches to packaging to reduce material use where possible, select more durable materials to substitute, redesign packaging to keep materials in use and reuse for as long as possible, optimise packaging sizes through

practices such as lightweighting, and more. They also need to [collaborate](#) with governments and partner with organisations to scale collection, recycling, cleaning, and circular infrastructure to increase recycling and re-use rates for packaging materials around the world.

Note: *In these guides, a system threshold is defined as the point at which the resilience of an environmental, social, or economic system becomes compromised. This occurs when the total impacts imposed on the system exceed its capacity to assimilate those impacts.*

SYSTEM THRESHOLD

Packaging takes a significant amount of energy, water, and resources to produce. The mismanagement of packaging waste contributes to pollution in a range of different ways, such as through landfill waste, leachate, ocean plastics, microplastics, and more. The Earth has limited capacity to handle increasing amounts of waste – landfill space is finite, and our oceans are already suffering from the impacts of waste pollution. Packaging waste also impacts humans and nature, especially where overlapping stress factors exist and amplify impacts, such as climate change and already vulnerable ecosystems. Long-term pollution is a [primary driver](#) of biodiversity loss and the burning of waste that still occurs worldwide releases “forever chemicals” that can have negative impacts on wildlife and human health. [Research](#) also shows that plastic pollution is eroding the resilience of many planetary processes that we rely upon, worsening the impacts of challenges like climate change. The transport, collection, and disposal of packaging waste also generates GHG emissions.

Companies cannot continue to rely on Earth’s or society’s capacity to assimilate the packaging waste that they produce. This means that they will need to rethink their approaches to packaging to reduce waste, from the beginning to end of the lifecycle of packaging materials.

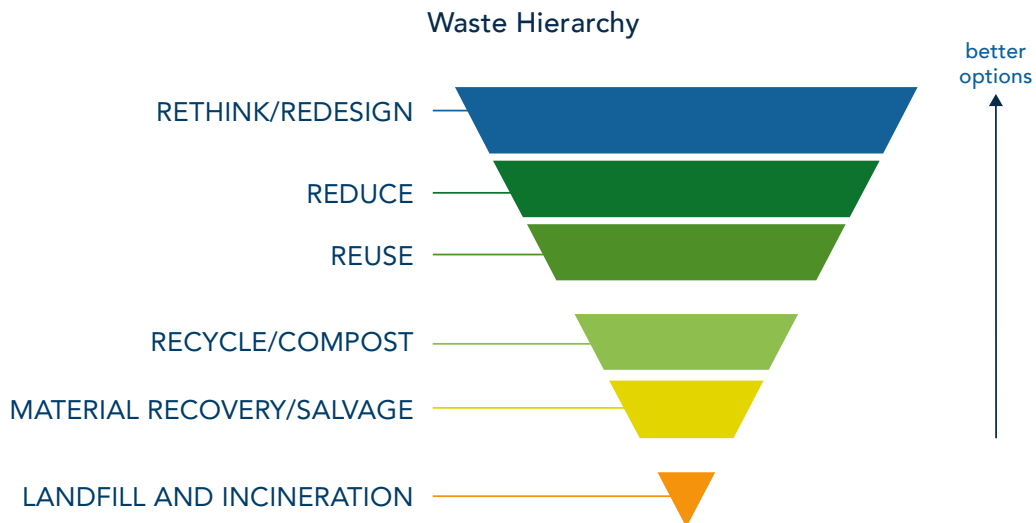
KEY TOPICS IN PACKAGING WASTE:

- Single-use and multi-material packaging
- Single-use plastics and plastic film
- Foams
- Glass, aluminium, and steel
- Paper and paper board, textiles, and other packaging waste
- Mixed materials packaging

2

KEY CONCEPTS IN PACKAGING WASTE

Waste hierarchy: The [waste hierarchy](#) can be a helpful tool to rethink relationships and priority actions in relation to packaging waste.



Adapted from [Zero Waste International Alliance](#)

Finding ways to reduce packaging is often a crucial part of the rethink and redesign phase.

Lightweighting: as defined by 3M, is the “reduction of component weight in a product [through design or material shifts], resulting in lighter overall weighting.” Minimising the weight and volume of packaging materials, using less packaging and eliminating unnecessary components or layers or material reduces the amount of raw materials required. Optimising packaging size and shapes also works to reduce transportation emissions.

Recyclable: For packaging to be [recyclable](#), there needs to be a reliable system in place for it to be collected, sorted, reprocessed, and manufactured back into a new product or packaging – at scale and economically.

Multi-layered packaging: is [packaging](#) that incorporates mixed materials such as paper, plastics, and metals in multiple layers – most of these are

not readily recyclable. An important component of packing recyclability is keeping materials separated so that current systems can easily collect and reprocess materials. For many companies, material selection is becoming a key consideration – materials like plastic and Styrofoam are being replaced by alternatives such as recycled paper and cardboard in an effort to reduce packaging waste.

Reusable: For packaging to be [reusable](#), as defined by UNEP, it needs to be “conceived and designed to accomplish within its life cycle a minimum number of uses for the same (or similar) purpose for which it was conceived.” This also relies on the existence of a system for collection, cleaning, and sanitisation. For many companies, this will mean transitioning to more durable materials that can be reused several times rather than traditional single-use materials.

Compostable: For packaging to be [compostable](#), materials, including compostable plastic and non-plastic materials, need to be recovered through a process of organic recovery. Yet, this process is often only possible at an industrial scale under specific and favourable conditions.

Additional terms and definitions:

Circular economy: “The circular economy is a [proposed economic] system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting.” [Ellen MacArthur Foundation](#)

Circular infrastructure: “Circular infrastructure is understood as that which contributes to circularity, e.g., collection and reverse logistics schemes, washing systems for reuse schemes, recycling infrastructure, etc. Infrastructure for end disposal (e.g., landfills and incineration with or without energy recovery) are excluded from this working definition.” [UNEP](#)

Extended Producer Responsibility (EPR): “An environmental policy approach in which a producer’s responsibility for a product is extended to the waste stage of that product’s life cycle. In practice, EPR involves producers taking responsibility for the management of products after they become waste, including: collection; pre-treatment, e.g., sorting, dismantling or depollution; (preparation for) reuse; recovery (including recycling and energy recovery); or final disposal. EPR systems can allow producers to exercise their responsibility by providing the financial resources required and/or by taking over the operational aspects of the process from municipalities. They assume the responsibility voluntarily or mandatorily; EPR systems can be implemented individually or collectively.” [UNEP](#)

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KEY PLAYERS IN PACKAGING WASTE

ELLEN MACARTHUR FOUNDATION

The [Ellen MacArthur Foundation](#) creates original research and resources to support the transition to a circular economy. They are well-known for their work on eliminating plastic pollution which has brought together more than 1,000 public and private organisations.

SUSTAINABLE PACKAGING COALITION

The [Sustainable Packaging Coalition](#) is a membership-based organisation that believes in the power of industry to advance sustainable packaging, through education, collaboration and action.

FAIR CIRCULARITY INITIATIVE

The [Fair Circularity Initiative](#) aims to ensure the human rights of workers within informal waste sectors and uplifts their crucial role within circular value chains. They have created the Fair Circularity Principles that company members must align with and act on.

UNITED NATIONS PLASTICS TREATY

The [United Nations Plastics Treaty](#) aims to provide tangible steps towards how we produce and consume plastics. It will present a crucial opportunity hold countries accountable to a common standard for plastic consumption and to incentivise action on plastic pollution at a national level – with cascading implications for businesses that operate around the world and their role in tackling the plastic crisis. Discussions to develop the treaty are currently ongoing.

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COMMITTING TO TAKE ACTION – MID- AND LONG-TERM GOALS

Committing to take action on packaging waste can include addressing many of the key topics listed above. The mid- and long-term commitments that your organisation elects to make will be based on your identified priorities, areas of greatest impact, and your capacity to undertake the work required. It is important to note that this section does not provide all possible mid- and long-term

goals related to this issue. Below, we share our understanding of current corporate action and goals by offering a sample of the goals that were most frequently adopted by organisations in our research.

Common mid- and long-term goals and/or commitments on **packaging waste** include variations of the following:

Long-term goals: Zero packaging waste to landfill by 20[XX] and/or 100% sustainable packaging by 20[XX]

- Reduce materials used within packaging by [X]% and circulate materials to prevent packaging waste from entering the natural environment, landfills, and being incinerated by 20[XX]
- Redesign non-reusable packaging to be 100% recyclable, reusable, or compostable by 20[XX]
- Take responsibility for ensuring the collection of packaging to enable intended material loops (avoiding landfill and incineration)

Are you setting new goals or interested in benchmarking your goals against leading practice? To help advance progress in credible corporate sustainability goals, we maintain a public goals database containing leading sustainability goals and commitments set by large companies globally. Explore our [Sustainability Goals Database](#) for more mid- and long-term goals on packaging waste.

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HOW TO GET THERE – PROCESS-BASED INTERIM TARGETS

Note: The following proposed timelines are only for guidance and are based on the pace outlined by other companies. The timeframe for actions and work for each step needs to be embedded in your organisational context, which may require different time allocations.

YEAR 1: Determine your materials use (by type and tonnage) to establish a packaging baseline and understand current approaches to packaging sustainability

Collect data to understand your current material types and establish a baseline to set up for the work ahead. Use this to understand current approaches to packaging sustainability that align with your product offerings, such as the [SPHERE framework](#) by the WBCSD. You should also aim to identify current EPR laws that may apply to your organisation to ensure that you are up to date with current and upcoming packaging policies.

YEAR 1: Establish priority areas to rethink or design out packaging waste from existing product lines such as by conducting eco-design or portfolio analyses

As defined by WBCSD, an [eco-design analysis](#) enables the comparison of packaging options for a single product, and a portfolio analysis enables the screening of packaging from a company-level perspective. Consider which approach suits your organisation best and establish relevant metrics to guide the desired change you want to see.

Examples of process-based targets for Year 1:

- By 20[XX], we will establish a materials use baseline.
- By 20[XX], we will identify current approaches to packaging sustainability for our product offerings.
- By 20[XX], we will identify and understand EPR legislations that apply to our organisation.
- By 20[XX], we will analyse our existing product lines to understand opportunities to eliminate, lightweight, or reduce packaging waste.

YEAR 2: Set quantitative goals that support the transition to a circular economy

Many companies are aiming to have 100% reusable, recyclable, or compostable packaging by 2030. This is paired with actions by leading companies to reduce the use of virgin plastic by one third or even one half within the same timeframe. Consider what this means for your packaging. It may involve

rethinking your packaging design, employing different materials, or finding ways to reduce, lightweight, and streamline the packaging material needed throughout the product's life. You will also need to balance your packaging waste reduction goals with other sustainability targets such as protecting the product (for instance, to reduce food waste) or achieving net-zero.

CASE STUDY:**Walmart's sustainable packaging goals**

[Walmart](#) uses a three-pronged approach to reducing packaging waste across their private brands, encompassed simply as: use less plastic, recycle more, and support system-wide improvements. Their overarching goal is to achieve 100% recyclable, reusable, or industrially compostable packaging for their private brands by 2025, with further commitments under each prong of their strategy that offer specific and measurable progress that will contribute towards their sustainable packaging goals.

YEAR 2: Create a roadmap to establish and reach long-term goals on packaging

Understand and clarify the work that is required to achieve your goals. This can include shifting packaging for identified product lines from plastics to materials with higher recyclability or feasible compostability in your region or reducing the impact of packaging materials through product innovation such as lightweight designs. Create plans to phase out or minimise single-use plastics and consider whether reusable models can be piloted

within certain product lines. Also, consider if there are opportunities to make alternative packaging models more sustainable, such as through sourcing recycled paper or exploring whether sustainability certifications for other materials can be a credible step forward. For consumer facing packaging, such as coffee cups, consider making reuse the default option rather than an opt-in to encourage uptake.

CASE STUDY: Henkel's actions for sustainable packaging design

Recognising that sustainable packaging design was crucial to meet their goals, [Henkel](#) employed a lightweighting strategy to reduce the thickness of the metal container used for their hairsprays. This saved over 15% of material and water used at the production stage and is estimated to save nearly 3,500 metric tonnes of CO2 emissions every year.

The company also developed a software tool called EasyD4R to embed recyclability considerations into packaging design. The tool is quick to use, specifies how the selected packaging can be recycled, and exactly which components can be recycled, easily displaying options for packaging design.

Examples of process-based targets for Year 2:

- By 20[XX], we will set quantitative goals for sustainable packaging design.
- By 20[XX], [X%] of our products will have responsible packaging design.
- By 20[XX], we will reduce the use of virgin plastics by [X%].
- By 20[XX], we will develop a responsible packaging strategy and associated policies to increase the sustainability of our packaging.

YEAR 3: Extend your learnings to your value chain

Collaborate with suppliers and customers to gain an understanding of the drivers of packaging waste in their context and how to reduce packaging waste throughout the value chain. Consider how your organisation can encourage and support suppliers to create waste reduction plans that include addressing packaging waste. Work with customers to minimise the need for excess packaging. Share insights from your journey and collaborate with others in your industry to transition to practices that reduce packaging waste at, and in-between, production stages and across the product life cycle.

YEAR 3: Support system-wide changes

Consider how your organisation can support systems-level change. Identify industry collaborations or local and/or international organisations working to address packaging waste that can help you to improve your own strategy and push for broader systemic change. Collaborate with local governments, suppliers, customers, and other organisations to improve circular infrastructure such as improving collections systems and recycling and composting facilities. Additionally, educate consumers on where and how they can recycle or reuse certain materials to ensure that end-markets remain viable. Ensure that efforts to transition value chains to reduce packaging waste account for possible social impacts on communities and informal waste sectors.

Examples of process-based targets for Year 3:

- By 20[XX], we will work with our suppliers to support waste reduction across our value chain.
- By 20[XX], we will empower and train suppliers on practices to reduce waste in the production stage.
- By 20[XX], we will work with suppliers to encourage the recovery and re-use or recycling of packaging waste.
- By 20[XX], we will identify industry and/or local partners with whom we can collaborate to support systemic change to address packaging waste.

GUIDANCE

SUSTAINABLE PACKAGING DESIGN

[Definition of Sustainable Packaging Design](#) offers five principles for sustainable packaging design that consider the impacts of sourcing, manufacturing, and disposing of materials for packaging.

[Scaling Returnable Packaging](#) is a study from EMF that models four returnable packaging applications and their performance across three scenarios. The practical insights garnered highlight the need for shared infrastructure, packaging standardisation, and collaboration to achieve high return rates.

[Understanding the Role of Compostable Packaging in North America](#), by the Sustainable Packaging Coalition, aims to provide a framework for understanding where compostable packaging fits into company sustainable packaging strategies. While aimed at the North American context, the insights can be adapted to a wide range of contexts and organisations.

[Guidance for Reusable Packaging](#), by the Sustainable Packaging Coalition, fosters an understanding of goals and assumptions to build successful reusable packaging programs. It offers many insights, such as considerations for designing reusable packaging and best practices for successful systems.

[Reusable Packaging Business Models](#) is a short primer by the Ellen MacArthur Foundation that outlines four different business-to-consumer reuse models and examples for business-to-business reuse models to help you understand key models for reusable packaging.

[Designing Packaging to Prevent and Divert Food Waste](#), by GreenBlue and the Sustainable Packaging Coalition, aims to help companies reduce food waste happening downstream in their supply chain, at the consumer and retailer levels, by prioritising food waste prevention and deploying the right packaging designs, formats, and technologies.

ADDRESSING PLASTIC WASTE IN PACKAGING

The report [Turning off the Tap: How the world can end plastic pollution and create a circular economy](#), from the UN Environment Programme, examines the economic and business models needed to address the impacts of the plastics economy. The report is divided into four parts, highlighting: the case for ending plastic pollution and pursuing a better plastics future; the need and pathways for a marketplace transformation to create a new circular plastics economy; the legacy of plastic waste and pollution; and the changes in policy and legislation required to credibly address the global plastics problem.

[UNEP Circularity Platform](#) provides an understanding of the circularity concept, its scope, and how it contributes to promoting sustainable consumption and production patterns.

[Plastic-Free Packaging Design Guide](#), from Google, can help you to transition towards plastic-free packaging. It features insights from Google's design, engineering, and operations efforts to create plastic-free packaging that is more easily recycled. The guide highlights the key challenges of moving away from plastic packaging and provides comprehensive information on replacements that Google has developed and implemented.

This report from Ellen MacArthur Foundation & UNEP outlines criteria for [setting a credible plastic packaging reduction target](#) that aligns with circular economy principles. See the table on page 39 of the appendix.

DISCLOSURE

The white paper [Enabling Corporate Plastics Disclosure: Building a Corporate Accountability System for Plastic Pollution](#), from WBCSD, proposes an accountability system that can help your company comply with future regulation on plastic pollution.

TOOLS

[SPHERE: the packaging sustainability framework](#), from WBCSD, can help you to take a more rigorous approach to implementing sustainable packaging solutions, either at the company-level or for a specific product. The framework provides a holistic definition of packaging sustainability that is founded on six guiding principles: minimise the drivers of climate change; optimise efficiency; optimise circularity; optimise end of life design; avoid harmful substances; and minimise the drivers of biodiversity loss.

[The Global Plastic Watch](#) digital platform maps and monitors plastic pollution in near-real-time through satellite imagery and artificial intelligence. This tool can help you to make evidence-based decisions on how to support global efforts to manage and mitigate plastic pollution.

[How to Know if Your Paper Packaging is Recyclable](#), by GreenBlue and the Sustainable Packaging Coalition, offers an introduction to paper packaging recyclability test methods. Recyclability testing is a tool that helps the traditional recycling stream connect the dots from packaging design to processing, and ultimately end markets.

[The Plastic Leak Project Guidelines](#) provides a science-based methodology that can help you to map and measure plastic leakage across your value chain. It features a framework for understanding where leaks occur and assessing their significance. It also provides a foundation for creating strategies and implementing actions that effectively address plastic pollution.

Explore more resources on packaging waste [here](#).

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