



DESIGNING FOR SUSTAINABILITY





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The call for sustainable packaging has never been louder or more urgent. Driven by increased awareness of the global landfill crisis, marine plastics pollution, and growing consumer demand for truly sustainable products and processes, leading retailers, consumer packaged goods, and food companies have established aggressive sustainability goals for 2025 that are specifically related to packaging. Product and packaging innovation grounded in a holistic, comprehensive lifecycle approach is essential to achieving these goals, delighting consumers, and delivering successful business performance and responsibility.

SUSTAINABILITY: EVOLVING BUT HERE TO STAY

Sustainable development is [defined](#) as meeting the needs of the present without compromising the ability of future generations to meet their own needs. It includes efficient and responsible use of resources, as well as the economic, environmental, and social impacts of operating and business models. Governmental regulations, NGOs, and consumers are driving the demand for more sustainable packaging solutions.

Sustainable packaging is a key enabler of 3 consumer megatrends identified by [Euromonitor](#) that are expected to shape the world through 2030: healthy and ethical living and spending more on what matters. A [Sustainable Brands study](#) reports that 42% of consumers are willing to pay more for products and services provided by companies committed to sustainability initiatives. Millennials are leading the way and have [a greater understanding](#) of total product life cycle concepts and the role transportation plays on the overall environmental impact of specific packages:

- **37% check packaging labels for sustainability information**
- **32% are willing to pay more for products in sustainable packaging**
- **33% believe a sustainable life cycle is an important attribute of the packaging for the products they buy**
- **32% believe efficient transportation of product packaging is an important factor.**

McKinsey & Company identified sustainability as one of [five mega trends](#) impacting the packaging industry in their 2019 report, "Packaging in 2030", citing unprecedented levels of public/consumer awareness of sustainability issues, increased legislation, and increased margin pressure from retailers to make sustainable packaging more cost-effective.

A [2017 study](#) by the Sustainable Packaging Coalition and Packaging Digest shows that the packaging industry is getting the message: 92% of packaging industry respondents rate the importance of sustainability in packaging decisions as Very/Moderately High, up from 60% in 2010.

Early packaging initiatives focused on recycling and material reduction, such as light-weighting. However, recycling and other waste management infrastructures have not kept pace with the packaging implications of increasing consumer demand for e-commerce, product customization, convenience, portability, quality, freshness, and assurance of product safety. As a result, a shift from linear to circular economy philosophies, policies, and practices is rapidly occurring, with the goal of keeping all products in the economy at their highest and most valuable use for as long as possible through Reduction, Reuse, and Recycling...in that order. And that requires a new approach to packaging design and material selection.

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are willing to pay more for products and services provided by companies committed to sustainability initiatives.

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prefer packaged produce
for the convenience,
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it provides.

For produce, the sustainability story starts with growing, harvesting, and value-adding practices, and extends to the physical structure of the packaging itself and the supply chain that delivers it to the consumer. The 2019 FMI [Power of Produce](#) study found that 43% of consumers, especially Millennials with children, prefer packaged produce for the convenience, value-added prep, portability, and snack-size options it provides. Important produce packaging attributes include the ability to see the produce, extend/communicate shelf life, facilitate purchase, preparation, and consumption, and communicate important information. All while minimizing environmental impact. Packaging material choices are closely related to brand image and can make or break the perceived authenticity of the brand's sustainability story.

Sustainability impacts every aspect of a package and is an incredibly complex economic challenge. Balancing those challenges while keeping visibility to continuously evolving technical breakthroughs is important. The goal is to make incremental improvements over time in the sustainability of a package in order to reduce its overall environmental impact. Following are some factors to consider as you navigate your way towards more sustainable packaging



▲ NAVIGATING SUSTAINABLE PACKAGING DESIGN

I. TAKE A HOLISTIC VIEW.

Sustainability impacts every aspect of a package...from the source of its raw materials to transportation to the end of its useful life. It encompasses primary, secondary, and distribution packaging. When developing packaging structures and selecting materials, consider the entire supply chain and life cycle of both the product and its packaging. How does the product/package move from source to store to door? How is the product used? Is it consumed at home or on-the-go where there is less predictable access to after-use disposal of remaining packaging? How accessible and controlled is the collection and return of any reusable/recyclable packaging components?

Because of the many challenges in quantifying sustainability impacts, consider using Life-Cycle Assessment (LCA) tools to help understand and quantify the environmental impacts in the design phase, before bringing a package to market. An LCA is a method for characterizing impacts associated with the sourcing, manufacturing, distributing, using and disposing of a product or product system. The goal of LCA tools is to understand the environmental impacts of packaging selection in the design phase, so packaging designers and brands can make more informed material selections and design decisions, based on company and brand sustainability goals and package performance variables and attributes. There are many LCA tools available today. Sustainability metrics and standards are continuously evolving, so it's best to pick one program and stick with it over time.

2. LOOK FOR OPPORTUNITIES IN EVERY PACKAGING COMPONENT; PRIMARY, SECONDARY, AND DISTRIBUTION.

Innovative technologies and processes are rapidly developing in both the use of recycled materials and development of new materials. For example, P&G, Nestle Water, 7th Generation and others have recently introduced packages that use between 25% and 100% of Post-Consumer Recycled (PCR) plastics. Bio-based material, use of renewable feedstocks, and technology solutions continue to show promise and growing use. New barrier and coating technologies have the potential to make paper and board stock usable in totally new ways and categories.

As with all new technologies, it's important to test for packaging functionality as well as relative sustainability and performance through post-use systems. Understand the differences between "bio-based", "biodegradable" and "compostable". Be careful to ensure proper labeling and that any packaging material claims comply with regulatory definitions and are easy for consumers to understand.

3. OPTIMIZE PRODUCT-TO-PACKAGING RATIOS.

Strike the right balance between over-packaging and under-packaging. Over packaging creates unnecessary waste and expense; eliminate any unnecessary layers or components. Underpackaging has the potential to compromise the primary functions of protecting the product through the supply chain, stimulating consumer purchase, and facilitating consumption, wasting all the natural resources consumed in bringing the product to market before it is even used.

4. INVESTIGATE ALTERNATIVE MATERIALS.

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5. KNOW THE SOURCE OF YOUR MATERIALS.

Whether you use "traditional" or new materials, it's important that all components are responsibly sourced. Retailers and consumers are increasingly looking for transparency across the entire supply chain. Establish sustainable sourcing principles to guide procurement of your packaging materials and validate compliance.

6. SAVE SPACE.

Wasted space in packaging results in excess materials, transport, handling, and storage. Look across your supply chain and distribution system, including e-commerce applications.

Design from the outside in: understand the space/size constraints of the transport mode that will be used and then minimize the pack to hold everything at the lowest possible cost while maintaining its integrity. Find and eliminate any "empty space" that can be found around components, inside boxes, and on and between pallets. Maximizing total load density is vital to minimizing environmental impact.

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7. REFORMULATE OR RECONFIGURE YOUR PRODUCT.

Product redesign can deliver on both sustainability objectives and improved product performance. Examples include concentrated formulas that reduce water usage, shipment weight and total package size, systems that combine concentrated product refills with reusable dispensers, and recipe formulations that allow smaller carton sizes.

8. DESIGN FOR CONSUMPTION.

Reducing food waste is part of a comprehensive sustainability program and is particularly relevant for fresh produce marketers. It not only has the potential to address societal issues related to hunger, it reduces the negative environmental impact of methane creation in landfills. Identify appropriate pack and serving sizes that meet the needs of today's smaller households, shopping frequency, and desire for convenience. While bulk packaging may seem a more sustainable alternative than single-serve packages because of its smaller package-to-product ratio, single-serve may ultimately prove to be a more environmentally friendly option if it encourages product consumption. Consider recloseable features for multi-use packs. Breathability, extended shelf life, and food safety are

critical factors. Active and intelligent packaging solutions, such as freshness and time-temperature indicators, modified atmosphere packaging (MAP), oxygen scavengers and other active solutions can double the effective shelf life of many perishable products and provide clear signals about the condition of the product across the entire supply chain.

9. DESIGN TO CLOSE THE LOOP...FIRST REUSE, THEN RECYCLE.

A core tenant of the circular economy is the shift in focus from waste management to waste elimination. Central to that concept is keeping products in the economy as long as possible through reuse. This can be reuse for the package's original intent, such as the CPG products that are refillable as part of the new TerraCycle® Loop™ shopping and distribution system, at-home reuse, or upcycling for use in a manner other than originally intended.

When reuse isn't an option, design for recyclability. Some materials, resins, and formats are widely recycled. More complex constructions or materials may be difficult to separate. Technology is rapidly evolving in this space, bringing new material options that deliver on both functional and recycling requirements.

Whether reusable or recyclable, packaging needs to be collectable within current and emerging collection systems. Curbside collection, deposit return programs, the WRAP Recycling Action Program, TerraCycle® LoopTM and collection programs, and Closed Loop Partners investment programs are examples of innovation accelerating and facilitating implementation of closed loop systems that support sustainable packaging initiatives.

10. COMMUNICATE PROPER DISPOSAL.

Messaging on proper packaging disposal is often confusing and difficult for consumers to follow. Of course, it is essential to adhere to federal guidelines and avoid false or confusing label copy or graphics. However, there is a need for greater consistency and clarity in definitions and labelling. Make it clear and concise. One initiative to provide clear disposal guidelines is the Sustainable Packaging Coalition's How2Recycle label, which standardizes and simplifies how a package should be handled after consumer use.

FLEXIBLE PACKAGING AND SUSTAINABILITY

Flexible Packaging represents about 19% of US packaging sales, and about 90% of those packages are for food products. It offers a number of **sustainability benefits** throughout the entire life cycle of the package, including:

- Material/Resource Efficiency
- Lightweight/Source Reduction
- Food Shelf Life Extension
- High Product-To-Package Ratio
- Transportation Benefits:
inbound format and lightweight finished goods
- Reduced Materials to Landfill
- Beneficial Life Cycle Metrics



▲ COLLABORATION & CONTINUOUS IMPROVEMENT IS ESSENTIAL

Sustainability is a journey, not a destination. The discovery, development, and commercialization of functional, safe, and environmentally friendly packaging solutions requires close collaboration with industry associations, academic institutions, material suppliers, converters, designers and brand owners. For example, Nestlé recently established the Nestlé Institute of Packaging Sciences, dedicated to delivering a pipeline of high-performing, sustainable packaging. New collection systems, consumer education, and technology will lead to continuous improvement. It's complex and it's challenging. But the time is now for a holistic approach to sustainable packaging innovation. The rewards will be great for both current and future generations.

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