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The drive toward sustainability in packaging—beyond the quick wins

February 2020



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Can system-level approaches, including collaboration along the value chain, make our approach to packaging more sustainable?

Sustainability—particularly regulatory and public concerns around single-use packaging waste—is combining with other powerful trends¹ to drive major changes in consumer packaging. Regulators are moving on the issue, and Fast-Moving Consumer Goods (FMCG) companies and retailers are proactively making bold commitments to improve both the sustainability of their packaging and to fundamentally rethink their packaging systems.

There will be significant impact on packaging converters and their value chain, which could threaten the survival of many in the industry. However, for packaging converters with the right focus and innovation capabilities, the new landscape could offer significant growth and new partnership opportunities to support customers in revising their packaging portfolios. Going forward, converters will have to proactively embrace sustainability issues as consumer demands and regulatory requirements multiply.

Consumer awareness to packaging waste in oceans and landfills is driving change

Packaging is ubiquitous in our daily lives and enables minimization of food waste and overall product breakage with advanced convenience features² at low costs. Over the past decade, the global packaging industry has enjoyed strong growth, driven by shifts in choice of substrates and expansion of new end-markets. Headline changes include the increased use of plastics to replace other substrates and accommodate consumers' demand for convenience, but also the economic boom in China and other emerging regions.³

However, widespread usage of single-use packaging containers has resulted in a heavy burden on the environment, and the management of packaging waste is facing a crisis due to two unresolved challenges:

Packaging recyclability. Large amounts of packaging produced today cannot be recycled in existing recycling systems. This is especially true for multi-material packaging, which today poses a significant and unresolved challenge in recycling.

Packaging recycling and leakage. Recycling rates for plastic packaging are relatively low. In the United States, for example, waste is generally managed with low leakage but recovery

¹ Cost pressure, e-commerce and digitization in general, and shifting consumer preferences—for details see David Feber, Daniel Nordigården, and Shekhar Varanasi, "No Ordinary Disruption: Winning with new models in packaging 2030," May 2019, McKinsey.com.

² For example, easy open and resealable closures, freshness retention, ready-to-eat/convenient foods/portability, one-hand use, and single-portion/smaller packs—for details see David Feber, Daniel Nordigården, and Shekhar Varanasi, "No Ordinary Disruption: Winning with new models in packaging 2030," May 2019, McKinsey.com.

³ See *ibid.*



rates for packaging and food-service plastics are about 28 percent.⁴ In Europe, the plastic-packaging recycling rate reported was somewhat higher at approximately 40 percent, compared to approximately 80 percent for paperboard, and 75–80 percent for metal and glass⁵ (note, however, that overall data collection quality on recycling rates is rather immature, so real-world rates may differ from reported figures). Emerging regions (Asia in particular) are under the most pressure, because packaging demand growth is outpacing global growth rates, and waste-collection systems—let alone recycling—are not in place at the required scale. Global leakage or unmanaged dumps of all plastic material flows (both durable and non-durable) is estimated to be around 19 percent, and only 16 percent of all plastic waste is re-processed to make new plastics.⁶ In fact, most of the global plastics waste goes into incineration (25%) and landfills (40%), meaning that these materials are lost forever as a resource, despite plastics' potential for reuse and recycling.⁷

This has not gone unnoticed; public awareness of packaging waste leakage, especially plastic waste, into the environment has increased significantly to an all-time high over the past 12–24 months. The visceral images of the effects of ocean plastics pollution have stirred up consumer sentiment around the world.

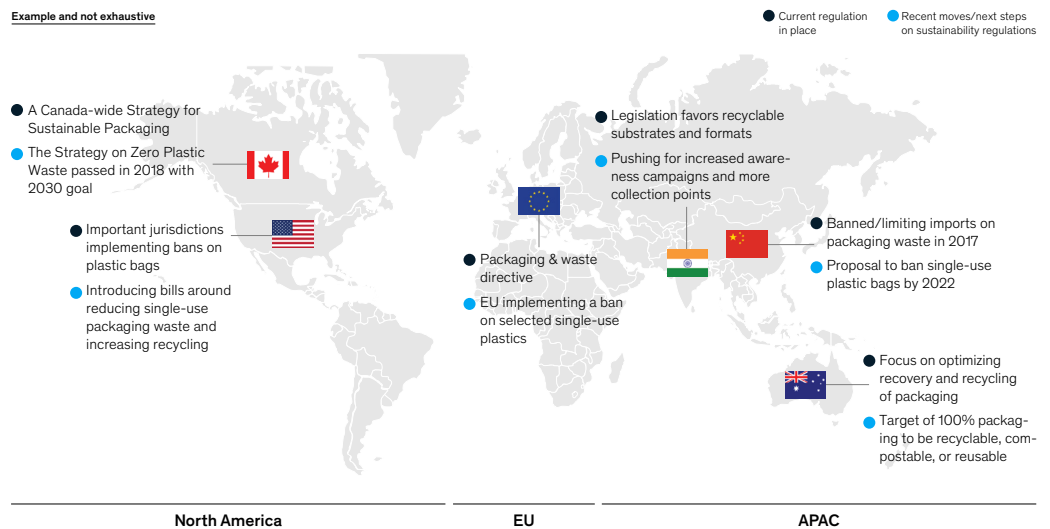
Governments have started to respond to the public outcry

Governments, on all continents, have responded to public concerns regarding packaging waste, especially single-use packaging waste, and are implementing regulations to both minimize environmental waste and improve waste-management processes (Exhibit 1).

Exhibit 1
Regulators around the world are adopting various approaches for minimizing and managing packaging waste.

Regulatory pressure is increasing across regions

Example and not exhaustive



Source: Expert interviews; press search; McKinsey Sustainability

⁴ See Thomas Hundertmark, Manuel Prieto, Andrew Ryba, Theo Jan Simons, and Jeremy Wallach, "Accelerating plastic recovery in the United States," December 2019, McKinsey.com
⁵ Eurostat.
⁶ Thomas Hundertmark, Chris McNally, Theo Jan Simons, and Helga Vanthournout, "No time to waste: What plastics recycling could offer," September 2018, McKinsey.com
⁷ Thomas Hundertmark, Mirjam Mayer, Chris McNally, Theo Jan Simons, and Christof Witte, "How plastics waste recycling could transform the chemical industry," December 2018, McKinsey.com

Some of the largest and most developed countries and regions are taking significant steps to introduce regulations to drive sustainability, while others are still operating as per the status quo, with limited or no regulations in place. For example, in the US 16 states have enacted statewide regulations around packaging waste, which tend to target single-use plastics, shopping bags, and increasing recycling targets.⁸ Several more bills are pending to be approved over the next 3 years. Meanwhile, Europe has progressed further than some other regions when it comes to sustainability. Measures announced in May 2019, under the “New EU Directive for Single-Use Plastics,” aim to reduce leakage of the ten single-use plastic products most often found on



European beaches.⁹ Additionally, some countries—in particular France,¹⁰ Germany, and the United Kingdom—are going above and beyond the already robust recycling regulations across the European Union with Extended Producer Responsibilities (EPRs). These countries are implementing even more aggressive targets, fees for introducing non-recyclable packaging, and additional legislation such as only using recyclable packaging, setting higher recycling targets, and so on.

In Asia, Thailand recently announced a nationwide ban on single-use plastic bags at major stores effective January 1, 2020, and aims for a full ban by 2021 to reduce plastic leakage into the environment.¹¹ India has shelved plans for a full ban of single-use plastics for now, but is pushing for increased awareness campaigns and more collection points to improve collection and curb waste.¹² China has banned imports of plastics waste and approved legislation to ban/reduce single-use plastics, increase recycling, recovery, and recirculation of used plastics. Latin America had relatively low commitments to sustainability

with few regulations in place through the early 2000s. However, in the past few years there has been a considerable rise in awareness: between 2016 and 2019 many local and federal bills have been approved or proposed in countries across the region. For example, Chile is banning plastic bags for business and Mexico City¹³ is banning single-use plastics.

FMCG companies and retailers are acting fast to go far beyond traditional lightweighting initiatives

Historically, actions by FMCG companies and retailers have mostly focused on quick wins such as reducing weight and materials usage to enable them to lower their packaging costs. A development that has also been enabled by strong material innovation upstream at substrate producers such as resin producers. These moves have favored substitution of rigid packaging formats with use of flexible packaging and pouches (Exhibit 2).

In the past few years, however, packaged goods manufacturers and retailers have started to make commitments to act on packaging waste. Almost all the top 100 FMCG companies (in terms of revenue) have made bold declarations and commitments to drive sustainability over the coming years. Our research shows that these commitments focus on three areas of activity

⁸ National Conference of State Legislatures and press search.

⁹ “Circular Economy: Commission welcomes Council final adoption of new rules on single-use plastics to reduce marine plastic litter,” European Commission press release, May 21, 2019, ec.europa.eu.

¹⁰ Axel Barrett, “Macron bans more plastics and sooner than the EU SUP directive,” Bioplastics News, September 6, 2019, bioplasticsnews.com.

¹¹ Prapan Chankaew, “Thailand kicks off 2020 with plastic bag ban,” Reuters, January 1, 2020, Reuters.com.

¹² Manveena Suri, “A bold plan to ban single-use plastic in nation of 1.3 billion has been shelved,” CNN, October 3, 2019, cnn.com.

¹³ Douglas Broom, “Mexico City is banning single-use plastics,” World Economic Forum, May 17, 2019, weforum.org.

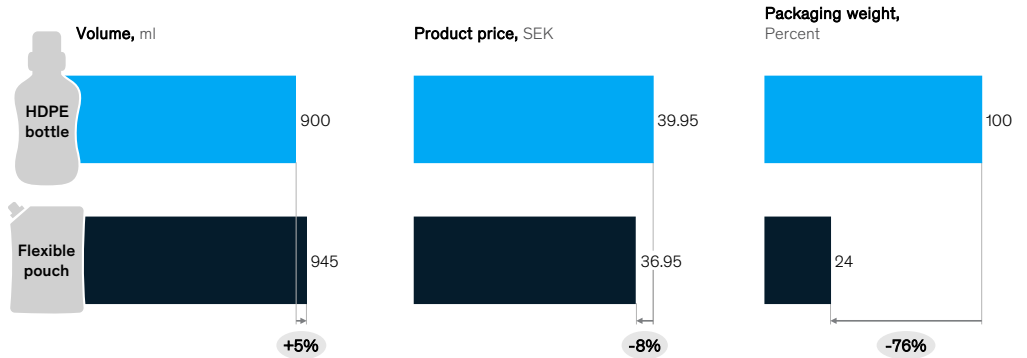
(Exhibit 3): emphasis on full recyclability and a significant higher degree of recycled content are the most widely embraced initiatives, accounting for 60 percent of commitments; this is followed by a reduction of total plastics usage (26 percent) and by the innovation and promotion of change in the use of packaging (14 percent).

Exhibit 2

Traditionally, FMCG manufacturers and retailers have focused on weight and material usage improvements to reduce packaging costs.

Substituting HDPE bottle for flexible pouch packaging for its washing liquid range

Packaging substitution case, Sweden



Source: Store visit

Exhibit 3

FMCG industry efforts to promote sustainability are led by a focus on high recyclability and recycled content.

Percent of commitments FMCGs/CPGs are making to support sustainability

n = 94 commitments (100%)



Source: Press research; McKinsey analysis

At the same time, these sustainability-focused initiatives around innovation and the need for change in the use of packaging are combining with other major industry trends affecting the packaging industry: for example, cost pressures, e-commerce and digitization (in general), and shifting consumer preferences. As a result, FMCG manufacturers and retailers are beginning to experiment with complete packaging redesigns and a fundamental rethinking of their delivery chains (including circular delivery models). They are also looking to curb plastic-waste generation by experimenting with use of metal and glass in returnable systems. In effect, major brands are starting to self-regulate.

In one recent example, a US company launched laundry detergent in new packaging specifically for online orders. The detergent was reformulated to be more concentrated, and its packaging designed to reduce its overall weight to be lighter than the original version in transit. Handling has been improved with a plastic sleeve that fits snugly inside a rectangular cardboard package. In addition, this hybrid mix of substrates adds a further sustainability benefit by using 60 percent less plastic than previously, although we should note that composites can be harder to recycle. In another example, a consortium of leading brands, a logistics provider, and a recycler recently teamed up to test the concept of returnable and reusable packaging—in effect reviving the concept of a “milk man.” The pilot has been rolled out during 2019 in areas of Paris and New York; however, the jury is still out on how much potential exists to justify future scale-up.¹⁴ Meanwhile, certain brands have flagged their readiness to consider packaging innovations that incorporate increased use of fiber-based packaging instead of traditional polymer packaging.

Going forward, FMCG companies and retailers will have to become more aggressive in their approach to addressing sustainable packaging in response to growing consumer awareness and increasing regulatory requirements. It should be noted, however, that curbing use of plastic packaging and changing packaging materials comes at a cost in terms of additional complexities and tradeoffs, many of which will be far from trivial:

- FMCGs and retailers will have to face complicated trade-offs such as recyclability versus carbon footprint and food waste.
- Not all types of actions have the same impact on the different aspects of the sustainability footprint.
- Technical and economic feasibility varies by plastic type and application, as well as by geographic region, and cost implications go beyond just packaging material prices and conversion costs.¹⁵
- Any packaging material or design change has implications on overall branding strategy, and large portfolios comprised of different plastics, applications, and geographies make strategizing highly complex.

The new challenges around waste management and recyclability are taking FMCG companies and retailers into new and unfamiliar territory. In the past, these organizations have pursued a relatively narrow packaging sustainability agenda that has focused substantially on “lightweighting.” Successfully addressing the new recyclability and waste challenges is likely to stretch the capabilities of their current tools and strategies. Consequently, FMCG companies and retailers will require much closer collaboration with upstream players, packaging converters, and recyclers to successfully deal with these new challenges. One key area is the need to build infrastructure to manage increased recycling by employing more closed systems (that is, bottle-to-bottle recycling to avoid downcycling).¹⁶ Another area is to coordinate changes with film converters and recycling infrastructure to build recovery capability to accept polyolefin multi-substrate films, which could allow for a much larger amount of flexible packaging and other multi-material packaging to be recycled. This also involves developing and scaling more

¹⁴ Joel Makower, “Loop’s launch brings reusable packaging to the world’s biggest brands,” GreenBiz, January 24, 2019, [greenbiz.com](https://www.greenbiz.com).

¹⁵ See Thomas Hundertmark, Mirjam Mayer, Chris McNally, Theo Jan Simons, and Christof Witte, “How plastics waste recycling could transform the chemical industry,” December 2018, [McKinsey.com](https://www.mckinsey.com).

¹⁶ See Thomas Hundertmark, Manuel Prieto, Andrew Ryba, Theo Jan Simons, and Jeremy Wallach, “Accelerating plastic recovery in the United States,” December 2019, [McKinsey.com](https://www.mckinsey.com).

advanced recycling technologies, for example, where the packaging can be converted to liquid hydrocarbons using pyrolysis or gasification, to be used for fuels or as feedstock for producing “new” plastic with similar performance as “virgin-based.”¹⁷

These types of developments could mark a watershed in the relationship between the FMCG manufacturers and retailers on one hand and the packaging converters on the other. Traditionally, packaging converters have played the role of the compliant supplier to their larger and more powerful brand-owning customers. However, as FMCG companies and retailers discover the need to move from an arm's length relationship with suppliers to more of a partnership and collaborative approach, new opportunities could emerge for packaging converters—particularly for agile converters that are able to quickly expand their innovation capabilities.

Converters are moving forward on sustainability, but are they doing enough?

The new pressures to reduce the environmental impact of packaging, comply with regulations, and satisfy consumer preferences are going to require packaging converters to make new investments and undertake major scale-up of their innovation capacity.

This will be an important adjustment in innovation. Apart from light-weighting/downgauging, currently many packaging companies have their sustainability efforts primarily focused internally on improving energy efficiency and waste reduction, with some limited work starting on applications innovation for sustainable packaging solutions across substrates. This inevitably implies a gap between the need to support the sustainable packaging aspirations of the FMCG companies and retailers, and the range of development initiatives being undertaken by the packaging converters.



Examples of this gap include the fact that innovative application solutions that offer higher recyclability today are far from being as cost- and as barrier-efficient as incumbent solutions. Successful sustainability innovations will need to be at a neutral or affordable cost tradeoff to gain scale. Equally, many application innovations seem to be difficult to scale up beyond the smaller initiatives currently in place; this is partly due to the fact they are often at an early stage in the research process and use costly materials.

Today, it is upstream substrate producers that appear to be taking the innovation lead in sustainable packaging. These players are working on top-priority areas such as mono-materials¹⁸ with “high-barrier” properties that can also offer high recyclability, or incorporate recycled content. Among paper and board producers, there is innovation work under way on high-barrier materials

¹⁷ Ibid.

¹⁸ Mono-materials are those incorporating only one resin such as polyethylene (PE) or polypropylene (PP) in order to create plastic films with high recyclability (given the single raw material used). This is in contrast to multi-layer packaging that uses a combination of different plastic types to create a barrier with high “sealability” as well as “printability.”

to replace plastics using bio-derived products, most of which are recyclable, compostable, or both. For example, several specialty paper producers are developing flexible paper-based packaging with water-based coatings that can act as barriers for vapor, oxygen, and oil, and can therefore replace plastic/aluminum laminate packages, among other types of laminates. Others are working on creating lighter and stronger packaging board that offers lower carbon footprint while providing sufficient barrier properties. For example, one producer is including Micro-Fibrillated Cellulose (MFC) in its paper board to create lighter, stronger packaging board that also uses less virgin material.

Plastic film producers, meanwhile, are pushing hard to develop mono-material (such as all-polyethylene) packaging solutions, which are fully recyclable at the end of their lifecycle and can replace today's multi-material flexible plastic packaging that cannot be recycled with today's processing technology. There is also substantial work under way to develop more food-safe-grade plastic films incorporating recycled content. This development will increase the use of recycled materials in the large quantities of flexible packaging that are used today for food.

At the same time, a number of producers of virgin plastic resin have acquired plastics recycling processors, which is giving them the potential to add recycled plastic to their portfolio of resin offerings. Having these products available would make it much easier for converters that want to include recycled content in their products. Similarly, resin producers are developing polymers based on feedstock made from chemical recycling of plastic waste; this feedstock can replace oil- and gas-based feedstock in manufacturing plastic substrates used for packaging materials, and packaging end-products can then be tagged as made from "recycled" plastic.

Approach to target opportunities in sustainable packaging

Converters can strategically best position themselves to support FMCG companies and retailers on sustainable packaging by recognizing that:

- FMCG manufacturers will continue to need to manage cost efficiency of packaging solutions and a high degree of customer convenience—for example, easy-opening products and packaging designed for on-the-go consumption.
- Not all types of actions will have the same impact on the various aspects of the sustainability footprint (for example, low food waste versus recyclability—using a high-barrier packaging material or multilayer film can significantly increase shelf- life and minimize the amount of food waste along the chain, but the packaging itself may be less recyclable).
- Different end-product segments will have varying sensitivity to sustainability.
- Technical and economic feasibility varies by application as well as geographic region, and cost implications go beyond just packaging material prices and conversion costs.
- Any change of packaging material or design has implications on overall branding strategy.

There is no one-size-fits-all solution that converters can embrace as they work on strategies for sustainable packaging with their FMCG and retailer customers. There are complexities and trade-offs to consider if they are to navigate through these sustainability challenges in order to find the most effective route to growing and preserving value with application innovations. To chart their course, we suggest that converters consider a three-part approach to help them identify opportunities.

Step 1 Low- hanging fruit

The “low-hanging fruit” group of opportunities offers packaging converters some no-regret moves, where they can double down on product segments where barriers to switch are low, and most of the work can be done by the individual converter and FMCG company without broader value chain coordination. These opportunities will typically be product segments where all of the actions can be taken with close to zero impact on operating cost or capital expenditure needs, functionality, or attractiveness of the packaging, including:

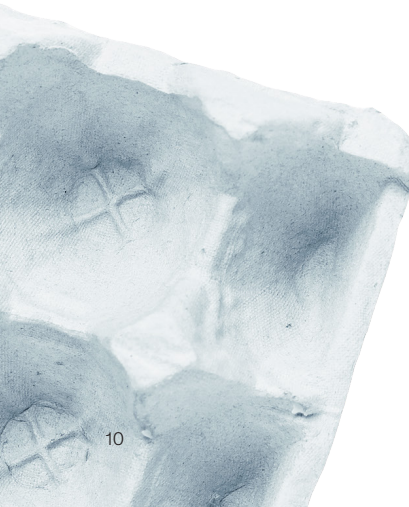
- Removing unnecessary use of packaging. While lightweighting has been ongoing for a long time, there are still plenty of applications where packaging can be replaced with lighter-weight materials.
- Developing existing packaging. Increase usage of recycled content in less sensitive applications (for instance, non-food), while also considering different types of plastic that could improve the product’s sustainability profile. This also should include packaging design for easy use and recycling (e.g., clarity for consumers on how packaging should be collected and sorted at recycling stations)
- Material substitution. Introduce more mono-materials and decrease the complexity of the combinations of different materials used, while retaining the ability to produce the same type of packaging and requiring no change in its structural design.
- Communicating the sustainability narrative of your current products better.

Step 2 Harder but doable

In contrast, the “harder but doable” group of applications requires building an approach from the ground up, which will also require collaboration with upstream and downstream partners. One recent example of such a collaboration involved a dairy customer partnering with a packaging converter and upstream suppliers of raw material to fully redesign its packaging. The new design uses liquid carton board and recycled plastics that are claimed to have a 50 percent lower environmental impact than polystyrene-based packaging. The important lesson learned here was to think through what partnerships would be needed to innovate “game-changing” packaging solutions that are truly designed for sustainability.

Step 3 System-level changes

The third group of initiatives falls under the heading of “System-level changes.” To truly achieve significant progress toward sustainable packaging, changes to the broader packaging and recycling system will be required where development and implementation costs are also much higher—and will be difficult to achieve by individual stakeholders. This is what our colleagues refer to as “concerting effort around improving coordination across the value chain” . Some examples of these kinds of changes include improving existing recycling infrastructure, recycling technologies, and circular value chains, alongside initiatives to increase consumer awareness and drive community support for behavioral change around recycling, but also availability. Another example entails developing new types of materials; involving fundamental scientific research and requiring collaboration with players in the substrate-making industries. There are already several examples of such initiatives, but so far these have mainly been driven by brand owners rather than packaging companies.



Three critical elements to have in place to get started on the change journey

Going forward, packaging converters need to have the following three things in place as they seek to help customers innovate and capture opportunities to bridge current sustainability shortfalls:

- 1** A clear methodology on how to truly benchmark your packaging products in terms of sustainability, cost, and convenience
- 2** An understanding of the full opportunity and value at stake across your product portfolio resulting from increasing sustainability requirements
- 3** Clarity and innovation in your packaging and technology roadmap, along with having the right partnerships in place to respond to consumer and customer packaging demands going forward.

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The authors wish to thank Stephan Görner, Thomas Hundertmark, Greg Kudar, Jörn Küppers, Oskar Lingqvist, Claisse Magnin, Jukka Maksimainen, Dickon Pinner, Sarah Paleg, Oliver Ramsbottom, Jeremy Wallach, Theo Jan Simons, Daniel Eriksson, and Matt Rogers for their contributions to this article.

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