OliverWyman

RECYCLING IS NOT ENOUGH

Curtis Underwood
Hunter Williams

THE VARIETY OF SUSTAINABLE PACKAGING FOR CONSUMER PRODUCTS IS WIDENING

Possibly the world's most-watched turtle video was a bloody affair. In 2015, researchers off the coast of Costa Rica pulled an object out of a sea turtle's nose — causing the turtle to bleed from the nose and twitch in distress. The object turned out to be a plastic straw.

Versions of the video have been seen well over 100 million times on the Internet, and it has likely given CEOs nightmares: What if my company's logo had been on the straw? What if another piece of waste plastic gains similar notoriety — say, a plastic bag that has suffocated a baby seal — and it has my company name on it?

Sustainability has become a priority issue for manufacturers of consumer products. Over the last few years, numerous high-profile reports have highlighted the dangers of plastic waste. More than half of consumers in a global survey said they would pay more for eco-friendly products, and nearly half of consumers in the United States said they would be prepared to pay a five percent premium for products with sustainable packaging.

But consumers still expect companies to bear the burden of sustainability, according to another survey: 80 percent worldwide agree that manufacturers should be obliged to help with the recycling and reuse of packaging that they produce. Most product manufacturers are light-weighting their packaging, by designing it to use less material. But some is needed — to keep food clean, fresh, and safe; to maintain it at the right temperature; and to stop liquids leaking.

Other than reducing the amount of packaging used, there are three main solutions: recycling, reuse, and substitution with eco-friendly materials — the best of which are compostable and can quickly degrade. Recycling has become widespread, and some major brands have already taken up reusable and compostable packaging on a limited basis. Most coffee shop chains sell reusable mugs and many are now testing recyclable and compostable cups. Some major grocers have introduced compostable meat trays and salad boxes. Compostable bowls are increasingly common in fast-food chains, and compostable clamshells are being used to tote leftovers from forward-thinking establishments.

Each of the three solutions has advantages and disadvantages in cost, how effectively products are packaged, and benefit to the environment — the extent to which they are truly sustainable. Product makers and other users of packaging have to figure the best options for their purposes.

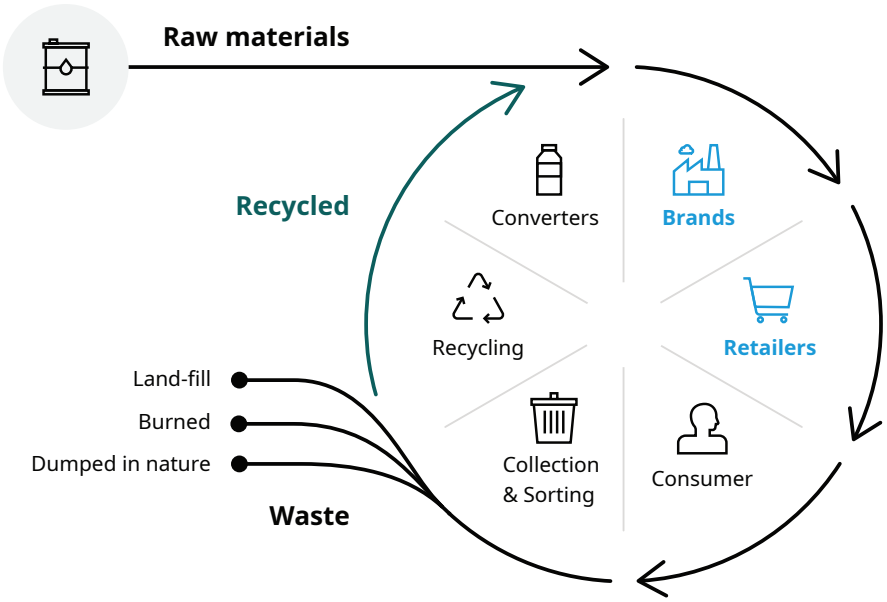
RECYCLABLES

Most CPG companies are currently improving the recyclability of their packaging, which has till now included plastics that are hard to recycle — such as polyvinyl chloride (PVC), used for electronics products; and low-density polyethylene (LDPE), the material for plastic bags. These are being replaced with plastics that are more easily recycled: polyethylene terephthalate (PET), which goes into water bottles and food packaging; and high-density polyethylene (HDPE), used for milk and detergent bottles.

To simplify recycling, product makers are increasingly using a single material per package: soda bottles and caps both made of PET; or uncoated papers, so that the paper can be recycled without any plastic coating remaining in the mix. They are eliminating additives to plastic packaging materials that make them oxo-degradable — that is, consisting of a mixture of biodegradable materials and plastics that remain in the environment. At the same time, they are using these recycled materials for packaging so as to reduce use of virgin material.

However, the current recycling system has leakages, which erode sustainability gains. China handled nearly half the world's recyclable waste until 2018, when it banned the import of most plastics and other materials. Local recycling infrastructure in the US has not yet developed sufficient capacity, and further advances in reverse logistics are still needed. As a result, 52 percent of consumer packaged goods are packaged in plastic, but less than 10 percent of these plastic packages are effectively recycled, according to the Environmental Protection Agency (EPA). Even with a leakage-free collection system, plastics can only be recycled a finite number of times, after which they end up as landfill (see Exhibit 1).

Exhibit 1: Lifecycle of packaging material



Source: SME interviews, Oliver Wyman research and analysis

REUSABLES

Reusable packaging products are, theoretically, the most sustainable option, and they are common in some parts of the world for some products. Consumers returning beer bottles can receive a small payment in exchange, and many supermarkets are encouraging the use of fabric bags.

But several barriers have limited their use. Cleaning packaging between cycles carries a cost and potential risks. It is also complex to track reusable packages, and there is a risk of loss and theft, as when beer kegs go missing. Consumers often see reusable packaging as unclean — especially during the COVID-19 pandemic because of the sanitization concerns it has raised. As a result, food industry executives are bearish on the long-term potential of reusables. “People are generally unwilling to make the necessary tradeoffs,” said the vice president of purchasing at one grocery chain.

Moreover, greenhouse gas emissions during the production of reusable packaging are typically greater than for disposable products, giving them a high “break-even” number of use cycles before they can be considered more sustainable. For ceramics, such as a coffee mug, it would take 39 uses to break even compared with a mug made from uncoated paper and more than 1,000 compared with one from expanded polystyrene foam.

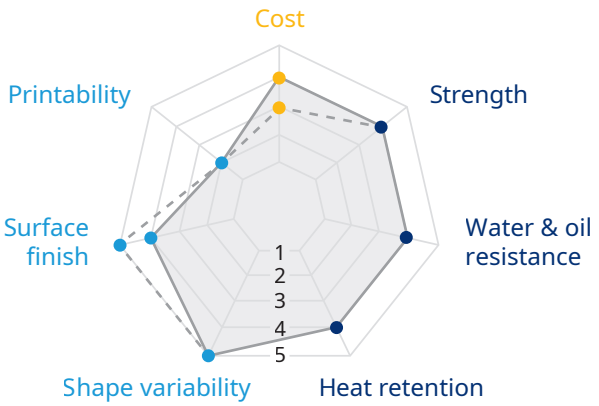
COMPOSTABLES

Compostable materials are produced from renewable organic sources, such as softwood and corn. At the end of their life, they can be processed into organic material by letting bacteria and fungi break them down over time, after which they are used to enrich soils. This process requires significant energy input but is fully circular. The primary compostable packaging materials used today are uncoated paper, bio-plastic, and molded fiber (see Exhibit 2).

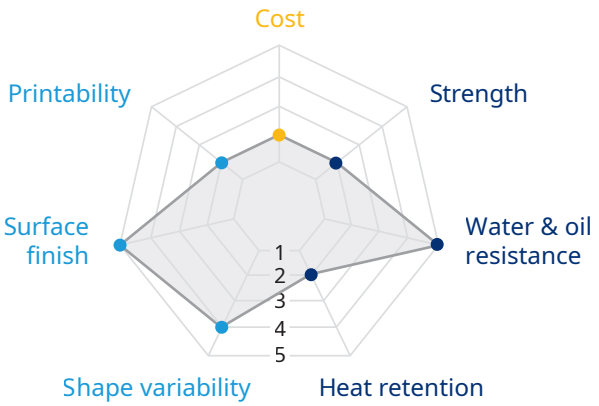
Exhibit 2: Compostable packaging material comparison
Area proportional to material favorability

Molded fiber (hot pressed)

Premium - - - - -

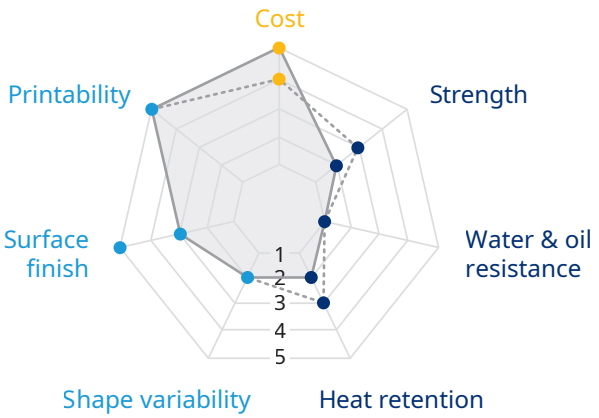


Bio-plastic



Uncoated paper

Fluted ---------



Rating: **1:** Very poor ⟶ **5:** Very favorable

Cost Performance Aesthetics

Uncoated paper has no coating of the kind sometimes used to give a glossy finish to paper-based packaging and to make it more durable. It is less smooth than coated paper and absorbs more ink. It also has poor water and oil resistance and tends to lack strength. It is low cost and typically used for basic packaging of lightweight dry goods.

Bio-plastics are made from renewable biomass sources, such as vegetable oils, straw, and recycled food waste. They have good resistance to water and oil, as well as low heat retention, which makes a cup of hot coffee easier to hold. They are typically used for applications requiring product visibility, such as wrapping for salads, flowers, or candy.

Molded fiber has been around for a long time in the form of egg cartons made from wood pulp. But it can be made from cellulose fibers from other plants, such as switchgrass and biomass sorghum. It has good resistance to water and oil, as well as high strength and heat retention, making it suitable for clamshells containing hot food. Molded fiber can be precision-manufactured to various 3D shapes. It is typically used in food applications or high-quality packaging inserts, such as for smartphones and wearables.

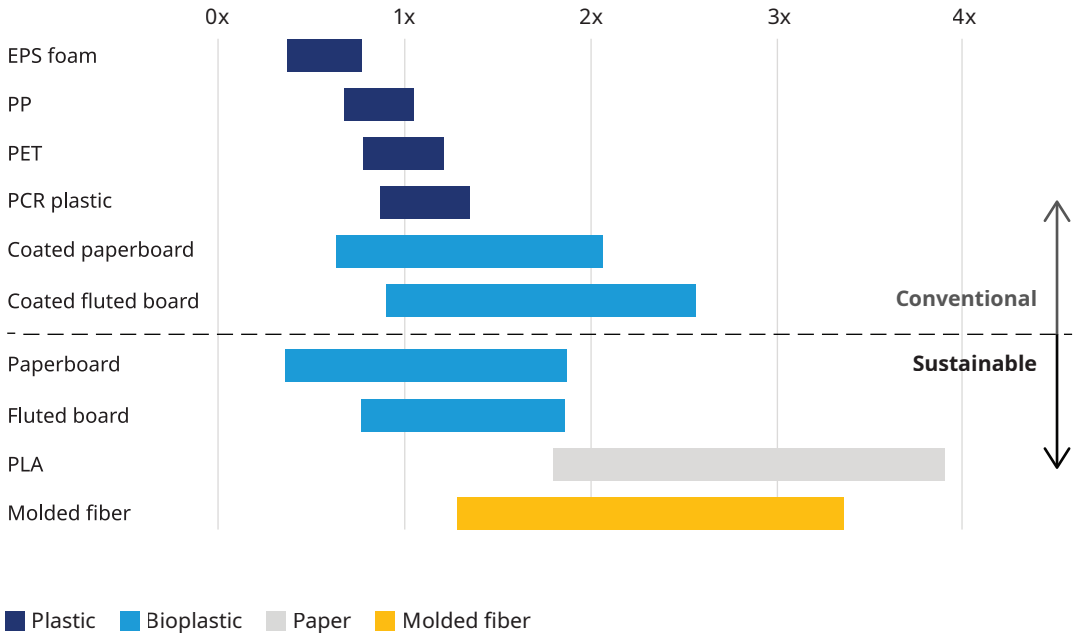
There are several barriers to widespread adoption of compostable packaging materials, some the result their small current scale. First, commercial composting infrastructure is not present in all markets, and there is a lower density of collection points than for landfill and recycling waste. Also, consumers are generally not aware that materials can be compostable, particularly bio-plastics. This results in significant leakage. To overcome these challenges, government investment, municipal guidelines, and consumer education campaigns are needed, as are incentives and regulations such as extended producer responsibility.

Compost can also be contaminated by per- and polyfluoroalkyl substances (PFAS), which are thought to be carcinogenic and do not break down in natural conditions — they have been dubbed “forever chemicals”. One solution would be to adopt PFAS alternatives, which have been developed by some sustainable packaging players.

Compostable materials are currently more expensive than comparable conventional materials such as PET and expanded polystyrene (EPS) (see Exhibit 3). This premium may be overcome by consumer demand, especially given people’s recent willingness to pay a small premium for eco-friendly products.

Exhibit 3: Packaging price benchmarking

Price relative to PET (across a basket of products, including bowls, plates, 9x9x1" clamshells, and 6x6x3" clamshells)



Source: supplier websites, SME interviews, Oliver Wyman analysis

CONCLUSION

Incidents over the decades show that it only takes one viral news story to tarnish the image of a brand or product — and packaging is highly visible. However, for profit-strapped businesses, meeting environmental commitments can be more challenging than making them. Companies need a plan to achieve packaging sustainability without excessive cost and in a way that catches the attention of sustainability-minded consumers. Incremental steps towards sustainability, such as improving recyclability, may not be enough to stand out from the crowd or prevent a future marine-life branding disaster from damaging a business. Rather, consumer goods manufacturers should make choices based on what their packaging needs to achieve for their products, how easy it will be to process after use, and the potential for other environmental impact.

Oliver Wyman is a global leader in management consulting that combines deep industry knowledge with specialized expertise in strategy, operations, risk management, and organization transformation.

In the Retail & Consumer Goods Practice, we draw on unrivaled customer and strategic insight and state-of-the-art analytical techniques to deliver better results for our clients. We understand what it takes to win in retail: An obsession with serving the customer, constant dedication to better execution, and a relentless drive to improve capabilities. We believe our hands on approach to making change happen is truly unique — and over the past 20 years, we've built our business by helping retailers build theirs.

For more information, please contact the marketing department by phone at one of the following locations:

Americas
+1 212 541 8100

EMEA
+44 20 7333 8333

Asia Pacific
+65 6510 9700

retailandconsumergoods@oliverwyman.com

Sirko Siemssen

Global Retail & Consumer Goods Practice Leader
Germany
sirko.siemssen@oliverwyman.com

AUTHOR CONTACTS

Curtis Underwood

Partner
curtis.underwood@oliverwyman.com

Hunter Williams

Partner
hunter.williams@oliverwyman.com