

# CIRCULAR PACKAGING TRENDS

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**GreenBiz**  
insights

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# introduction

BY JOEL MAKOWER

Packaging has long been an issue in the environmental realm, but in recent years those issues have moved beyond litter and landfills to embody a far broader spectrum: water and air pollution, toxicity and human health, even climate change. Of course, waste issues have hardly gone away. Thanks in large part to social media and viral videos, public concern over packaging waste — especially marine plastics found in streams, rivers and oceans — has reached a fevered pitch.

For the companies behind the brands whose logos adorn some of this waste, public concern has become a significant risk and liability issue.

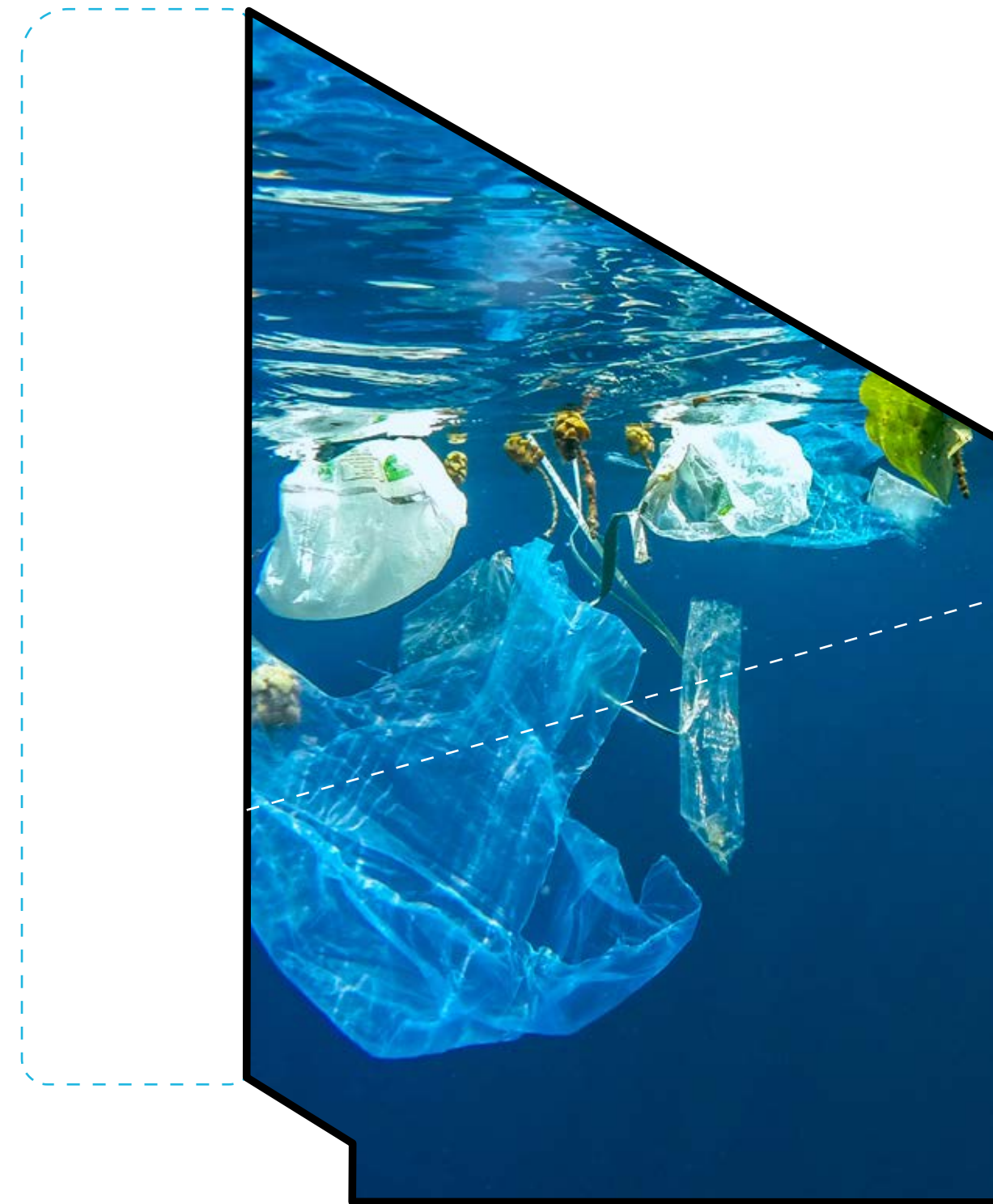


Much of this is happening amid the rise of the circular economy, the notion of transforming products and commerce from linear to closed-loop systems. That means new materials and delivery systems that keep packaging (among other things) out of landfills and return the materials, or their constituent molecules, back into productive use, without harm to the environment or human health. In some cases, it can mean switching to reusable packaging, or doing away with packaging altogether.

That's no small transformation, and it's no simple switch. Making packaging circular can be a complex and potentially costly endeavor, involving risks to brand equity and integrity. It can disrupt supply chains and require new relationships with customers. And there's no guarantee that consumers will even accept it.

In the pages that follow, we've assembled a sampling of the dozens of articles we've published in recent months on circular packaging. Altogether, they provide a snapshot of some of the key issues and innovative solutions we're tracking. We hope that it provides insight and inspiration.

To be sure, it's an emerging and dynamic story, certain to evolve for years. There's lots more to unfold in the world of circular packaging.



# How to repackage packaging



| Making “reduce, reuse and recycle” reliable.

BY SCOTT CASSEL

*Adapted from “The Future of Packaging: From Linear to Circular,” by Tom Szaky and 15 industry leaders in innovation and sustainability (Berrett-Koehler Publishers, 2019).*

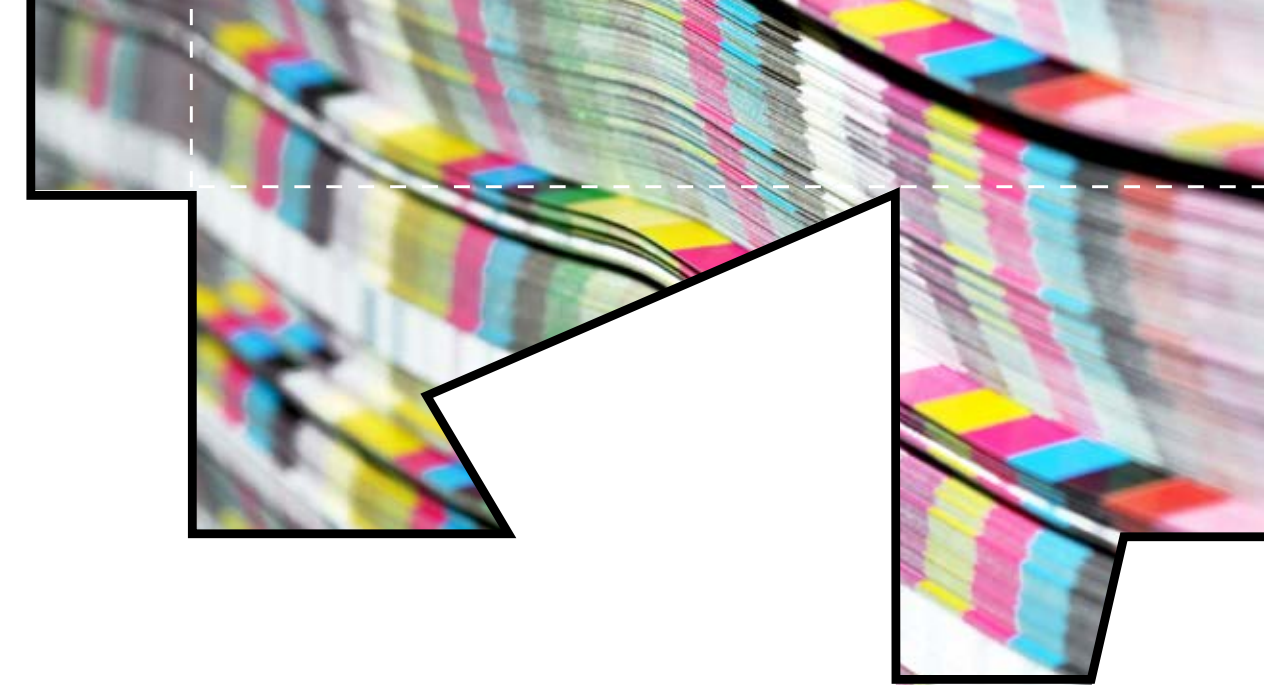
We Americans often toss packaging in the trash without much thought. As stated previously, even though we are only 4.4 percent of the world’s population, we produce 20 percent of the world’s garbage; much of it is packaging and printed paper (PPP). Proportionally, that’s a lot.

Everyone who touches packaging has a role to play in ensuring that its value is captured and that it doesn’t add to the world’s pollution. But who should be first in line to take financial responsibility? Is it the producers who make it, the retailers who sell it, or the cities where all of this takes place? Or is it, perhaps, the consumers who choose to buy it?

Despite the global fragmentation of laws and waste management systems, government has a major role in changing consumer and industry behavior

when it comes to wasteful packaging. We see that especially when encouraged through a mode we all understand: money — in the form of fines, penalties and incentives. When such levers are put into place, people improve their behavior quickly and dramatically.

Businesses are subject to vast amounts of government regulation in the interest of protecting consumers and ensuring a level playing field. Among other things, laws today require that labels and packages provide more facts about the contents inside and aim to preserve our health. In the world of consumer packaged goods, we see this with certified-organic and organic-transitional labeling, specific ingredient bans, fair-trade sourcing conditions and acceptable levels of certain chemicals in products and packaging.





But can you think of any laws regulating the end of life of the packaging itself? Many such laws exist around the world, especially in developed countries. In the United States, some mandatory recycling laws exist at the state and local levels, but federally there are none.

### Challenges to recycling laws

Business brings tax revenue and jobs to cities, states and countries, so business interests often drive government regulations. But there are regulations that businesses don't like, mainly those that cost money and reduce the ability to maximize profits. For most businesses and entrepreneurs, regulations are often viewed as financial and legal barriers to growth, and corporations see it as an obstruction to their desire to maximize return for their shareholders.

While their member companies finance recycling and resource management systems throughout the world, trade associations such as the American Institute for Packaging and the Environment and the Grocery Manufacturers Association have opposed legislation in the United States under the philosophy that packaging disposal, recycling and litter cleanup costs should be the responsibility of government.

Thus, recycling laws get left to the states in the form of bottle bills; the banning of Styrofoam containers, plastic bags and drinking straws; and guide-



**With strong EPR laws, producers stand to gain access to greater amounts of post-consumer recycled material.**

lines for the disposal of e-waste, paint and pharmaceuticals. This means the make-use-dispose linear economy pipeline currently employed around the world becomes only more and more pronounced and entrenched as time goes on. Year after year manufacturers create new products at a fraction of the cost of their predecessors, so more people now own more and more things—things that have a shorter and shorter useful life.

Policies like bottle bills tend to get pushback from industry. Although bottle bills provide consistent, high-quality recycled material, industry often argues that such regulations are cumbersome, expensive and a logistical nightmare. As a result, they end up not being passed; in the end governments can regulate only to the point that society is willing to bear.

Even with broad availability of recycling programs in much of the United States, the recycling rate for PPP — including traditional curbside recyclables such as

aluminum, glass, plastic, paperboard, newspapers, phone books and office paper — has been stagnant for the past decade.

### Extended producer responsibility

One solution may be to shift the responsibility from taxpayers and governments to product manufacturers, as they have the distinct ability to choose what package forms they use for their products. With this in mind, should they be the primary responsible party to pay for the proper end-of-life management of their products and packages, even if this cost finds its way to the consumer in the end?

Extended producer responsibility (EPR) is the policy concept that extends a manufacturer's responsibility for reducing upstream product and packaging impacts to the downstream stage, when consumers are done with them. There are more than 110 EPR laws currently in place for over 13 product categories in more than 30 U.S. states. The United States, however, is currently one of only three nations of the 35-member Organization for Economic Co-operation and Development that does not have an EPR system specifically for packaging in place or under development.

EPR packaging laws have been in place for up to 30 years in 11 countries in Asia, South America and Africa, as well as in Australia, 34 European nations and five Canadian provinces. While not all EPR programs are alike, the best ones

are not voluntary in nature and produce recycling rates far higher than what we have experienced in the United States. British Columbia and Belgium, both of which have EPR packaging laws in place, have attained nearly 80 percent PPP recovery.

Voluntary industry-led programs, while laying a foundation for collection and recycling systems, rarely lead to systemic changes that significantly increase the quantity and value of the materials collected, and they do not provide a sustainable funding source across all producers in a certain category. For instance, although voluntary initiatives to collect plastic films at retail outlets have helped reduce contamination of plastic bags in the recycling stream, many U.S. municipalities deem this effort insufficient, resulting in a flurry of bag bans and fees seeking to significantly change consumer behavior and decrease the use of plastic shopping bags.

EPR laws that require brand owners to cover the cost of recycling post-consumer PPP provide an incentive to producers to reduce the amount of packaging they use, incorporate environmentally preferable materials into their packaging, and maximize material recovery and quality. In contrast to the fragmented municipal programs currently in place, well-designed EPR systems provide consistency by establishing statewide producer-funded programs that accept the same materials in all cities and towns and convey the same educational messaging.



Such policies also help meet the supply needs of industry. Today many brand owners that pledge to incorporate recycled content into their products often cannot procure enough recycled material to meet their needs. With strong EPR laws, producers stand to gain access to greater amounts of post-consumer recycled material. These programs also offer financial incentives that encourage manufacturers to design their packaging to be more recyclable.

EPR packaging laws are spreading globally and growing in viability partly because the recycling or disposal cost is typically paid by manufacturers and their consumers, not taxpayers and government agencies, freeing up millions of dollars for other municipal services. In addition, these programs provide a direct financial incentive for manufacturers to use materials that are less expensive to recycle, increasing their value and opportunity to be brought back into the circular economy.

EPR packaging systems are continually evolving. The most innovative are those that charge a fee to manufacturers for each packaging material type based on its cost to recycle or dispose of. One such system charges manufacturers less for producing glass than plastics, as well as less for PET and HDPE containers, compared with films, polystyrene and other plastics that are not easily recycled. This closed-loop recycling system provides a direct financial incentive for manufacturers to choose environmentally preferable (often more highly recyclable) materials in their packaging.

To be clear, all of this extra cost does directly end up in the price of the product a consumer pays in the end. But perhaps this cost is better incurred at checkout than in negative externalities — like greenhouse gas emissions, marine debris, resource scarcity, toxicity, and food and drinking-water pollution — and continuing the burden on municipalities and taxpayers to subsidize waste.

*Scott Cassel is founder and Chief Executive Officer of the Product Stewardship Institute.*



# How do plastics impact waste? The answer might surprise you



*In a world of knee-jerk reactions, banning plastic packaging requires careful thinking, especially as it relates to climate impacts.*

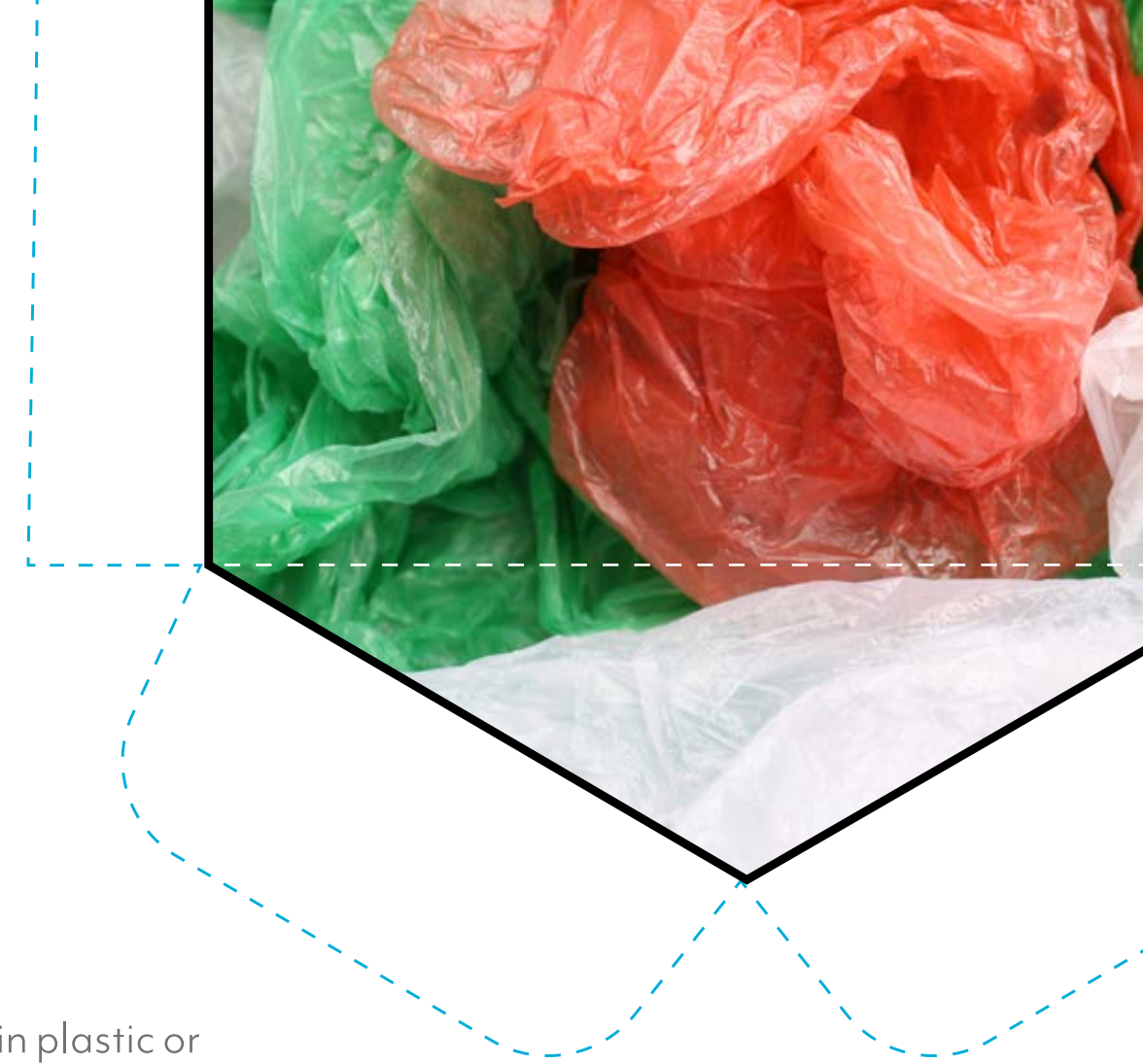
BY TONY KINGSBURY

Have you ever stopped to ask, why do we use so much plastic, especially in packaging? The answer depends on the type of packaging, but one overriding answer is that plastic is more resource-efficient than its competing materials. In other words, it takes less energy and materials to do the job. Less energy means less money, and less money means that it is often the desired choice for a given package or consumer good.

I remember as a kid getting potato chips in a box, with a bag inside, and getting deodorant in a steel spray can. Now, I get both in plastic. We used to get our milk exclusively in glass and our motor oil in a steel-and-paperboard

canister. Now, we get milk in plastic or plastic-coated paperboard and motor oil in plastic bottles. With this plastic and other materials, we get waste. Some of it we recycle and most of it we don't, or can't. Regardless of the waste we create we could all do a better job of recycling. But with all the new plastic we use, are we creating more waste?

If you are like most people, you missed the publication in the journal *Waste Management* of a peer-reviewed article titled [“Role of plastics in decoupling municipal solid waste and economic growth in the U.S.”](#) This article, by



## **It turns out that as plastic consumption grew, the percentage of waste that is paper, metals and glass and glass is reduced.**

researchers from City College of New York's Chemical Engineering Department, explored the historic drivers of municipal solid waste (MSW) and the links to the materials that make up the waste.

Typically, we would expect that waste would track with population and economic growth. As the economy grows, people buy more goods and services which economists express as personal consumption expenditure (PCE). This takes population growth out of the picture, which seems fair. As we buy more, you would expect we would throw more away. The U.S. Environmental Protection Agency tracks MSW by material and categories and determines what we recycle, what we incinerate for energy and what we landfill.

### **Weight watchers**

It turns out that as plastic consumption grew, the percentage of waste that is

paper, metals and glass and glass is reduced. As many of these other materials are recycled at a higher current rate than plastics, you might think this is bad. In fact, the researchers determined there would be 30 percent more waste if we didn't have plastic. They write: "The correlation with PCE demonstrates that since the late 1990s there has been a decoupling of MSW generation rates with PCE or economic growth. Plastics play a role in the decoupling due to materials substitution that reduce the overall weight of MSW and down-gauging that reduces the amount of material needed."

This may seem sort of boring, but it is also important. As we consider banning plastic materials, we need to think about what we are replacing it with. If we replace the plastic items with heavier, more resource-inefficient materials, we will cause an increase in energy use which correlates to greenhouse gases and climate change.

The Waste Management article cites research where plastic reduced waste across six categories of products: caps and closures; beverage containers; stretch and shrink; carrier bags; other flexible; and other rigid packaging. Thus, for example, beverage containers that normally would be glass were replaced with plastic, and caps and closures that would be metal were replaced with plastic. The environmental impact in the United States, where the total material weight replaced was 109 million pounds over the six categories, resulted in an 80 percent energy reduction and a 130 percent reduced potential global

## My conclusion from the studies referenced above is that we need to think deeper before jumping to conclusions.

warming impact. This same study also notes that while replacement reduces weight and resource use, plastics continue to be source-reduced after they replace another material such as metals or glass. Between 2000 and 2014, they averaged a 3 percent per year reduction in weight.

### Back to the future?

Another way to look at this is to consider the consequences of shifting back to non-plastic materials. A [2016 Trucost study \(PDF\)](#) for the American Chemistry Council estimated that moving back to alternatives globally, away from plastics in consumer products and packaging would increase environmental costs by 3.8 times — from \$139 billion to \$533 billion.

In today's world of knee-jerk reactions, banning plastic packaging items altogether requires careful thinking, especially as it relates to climate impacts. As with most sustainability questions, the simplest answer is often incorrect, envi-

ronmentally speaking. The correct answer will depend (as it always does) on a number of factors — do we need to use the item in the first place, are there ways to use less of it, and are the alternatives really better?

My conclusion from the studies referenced above is that we need to think deeper before jumping to conclusions. Plastics have contributed to a significant reduction and decoupling of waste generation. As we look at switching back to alternatives such as glass, metals and paperboard, we all need to ask, “Will the alternative require more energy to make and process, and thus contribute more to global warming than the plastic item it is replacing?”

We also need to insist that the waste we do create is managed properly, which means we need to recycle, compost, recover the energy or landfill everything. Nothing should end up being littered or in our oceans.

Sitting here in hot and burning California right now, I vote to reduce global warming and manage all my waste properly.

*Tony Kingsbury leads a consulting practice focused assisting companies and organization to improve the supply chain sustainability of their packaging, plastics and chemicals, and was formerly Global Plastics Sustainability Leader at Dow Chemical.*



# 3 models of collaboration for sustainable packaging innovation



*These experiments are challenging the status quo around certain recycling processes.*

BY MEG WILCOX


Public awareness of the [perils of plastic waste](#) never has been higher, thanks to National Geographic's [June magazine](#) dedicated to the problem. Company recycling commitments and governmental bans are on the rise, even as China's ban on U.S. recycled materials continues to reverberate across the industry.

This pivotal moment of crisis and opportunity is a chance to reimagine and rebuild the U.S. recycling industry. As Nina Goodrich, director of the Sustainable Packaging Coalition, said in her keynote address at the recent [SPC Advance](#) conference: "We need to take the opportunity of the wakeup call from China to build the infrastructure that's going to manage the materials of the future and not get caught flat-footed by looking to the past."

One of the biggest challenges is creating market demand for new post-consumer materials. "If everything is recyclable, but nobody wants it, is it recyclable?" Goodrich exhorted the crowd.

Companies can help solve this conundrum by working with both their supply chains to design materials that are more recyclable, and with the recycling industry to ensure that materials recovery is economically viable.

"Brands need to think about the entire system and engage the value chain, taking a leadership role on the design and innovation side but also playing a significant role in reimagining how this stuff gets through the system," said Bridget Croke, vice president of external affairs, Closed Loop Partners.



## Great things can happen when partnerships are formed that don't typically work together.

Which companies are offering models — or at least experiments — that are worth emulation? During the conference, I came across three examples of cutting-edge collaborations, where companies are driving innovation and working to modernize the U.S. recycling infrastructure. Although the efforts are still small-scale, they're poised for growth. And worth keeping an eye on.

### 1. Starbucks pilots cup-to-cup closed loop recycling

For decades, the coffee giant has led efforts to solve the stubborn problem of single-use cups, but this year it got a lot closer to cracking that nut.

The problem? Some 60 billion paper cups are landfilled annually in the United States because of inconsistent recycling infrastructure. Historically, one of the biggest challenges has been the removal and recovery of the inner plastic linings that are added to cups to prevent leakage.

By collaborating with its business and supply chain partners, including two paper mills and a cup manufacturer, Starbucks successfully has demonstrated that not

## **Polypropylene, for example, is one of the most widely used plastics, but its recycling rate is abysmal — less than 1 percent.**

only could multilayered cup liners be cost-effectively removed, but that a closed loop, zero-waste solution was possible.

Speaking at SPC Advance, Rebecca Zimmer, global director of environment for Starbucks, said that the closed loop initiative shows how “great things can happen when partnerships are formed that don’t typically work together, and you’re innovative about your working relationships.”

When Zimmer discovered last year that the company had 18 truckloads — or 25 million cups — of excessive inventory destined for landfills, she used that revelation to introduce a closed loop cup recovery system, partnering with a paper mill known for its ability to process poly-coated paper into food grade product, [Sustana](#). Other partners included a second paper mill, [Westrock](#), and a cup manufacturer, Seda.

The initiative “debunked the myth around the difficulty of extracting the liner that’s in the cup,” Zimmer said. “For me, the takeaway was that this is techni-

cally possible. It’s viable, and that got me excited that eventually we’ll get to the point where we’ll see this process being replicated more broadly.”

Debunking that myth is key to broader replication. Perception remains that cups can’t be recycled, even as individual mills in the United States and Europe evolve paper pulping and cleaning systems to handle the material. Westrock in fact just [announced](#) that it would begin accepting paper-based foodservice packing, including cups, for recovery at eight U.S. mills.

“As more paper mills realize that other mills are successful at processing it, maybe they’ll take a look, and they may find that they’re very successful at it,” said Jay Hunsberger, vice president of sales for North America at Sustana.

Ultimately, Starbucks wants to develop a cup that is both recyclable and compostable because many countries have zero recycling infrastructure and composting is a better option, Zimmer said. But working with U.S. partners to build its recycling capacity remains a priority.

“Our cups are not going to be recyclable until all cups, hot and cold, can be recycled and put into the system. We can’t do this alone,” she said.

### **2. A new recycling process for flexible plastic packaging**

Flexible plastic packaging (FPP) is the fastest growing type of packaging in the United States, and no wonder. The stand-up pouches, flexible bags and



wraps that crowd supermarket shelves are lightweight, malleable and durable. They extend the shelf life of food products, consumers like them and they're less wasteful to produce.

But here's the rub: until recently, it wasn't possible to recycle the material in the U.S. recycling system. The recovery infrastructure wasn't designed to handle it, and that means that some 12 billion pounds of FPP was destined for landfill yearly, according to industry data.

A collaborative initiative, led by companies ranging from global plastics producers to consumer goods companies, wants to change that.

In 2019, FPP will be recycled in a pilot at a materials recovery facility (MRF) in Pennsylvania. [TotalRecycle](#) will pick up the waste through its curbside recycling program, separate out the material and process it into bales that can be sold to end markets, such as durable goods and building materials.

To recycle the FPP, the MRF installed optical sorters, which were funded by a collaborative, [Materials Recovery for the Future \(MRFF\)](#), a project of the American Chemistry Council. MRFF has conducted [research and development \(PDF\)](#) for years to determine how best to recycle the emergent waste stream, which can gum up existing recycling infrastructure or intermingle with and lessen the value of paper bales.

MRFF's 10 corporate and five trade association members are also providing



“thought leadership and sweat equity,” said Emily Tipaldo, American Chemistry Council, in an email.

To scale up, MRFF is exploring additional end uses for FPP bales. But more recycling facilities will need to develop the capacity. Nestle, PepsiCo and the other consumer goods companies participating in the pilot can’t label their packaging as recyclable when one small region of the country is involved. TotalRecycle plans an extensive consumer education program, but [research](#) shows that two-thirds of consumers don’t recycle material that’s not labeled as recyclable.

To spur more MRFs to join, the pilot program will continue its research. “We’re looking to document our learnings, provide data and recommendations for others interested in recycling FPP curbside,” Tipaldo said.

### **3. Procter & Gamble partners to scale polypropylene recycling**

“Chemical recycling,” or recycling processes that break down plastics into their original building blocks to make them more reusable, was a hot topic at SPC Advance. Plastics typically are recycled mechanically, which degrades their quality and limits their reuse.

Polypropylene, for example, is one of the most widely used plastics, but its recycling rate is abysmal — [less than 1 percent](#). That’s because the post-consumer product is a multicolored blend of feedstocks that can be reprocessed only into durable black plastic, according to Croke, who detailed the efforts of a new initiative to increase the plastic’s reusability.





The Closed Loop Fund is helping to finance the initiative, which is using a hybrid mechanical-chemical technology invented by Procter & Gamble. P&G open-sourced the technology, which reprocesses the recycled plastic into clear pellets and is under an agreement with an innovative investment firm, [Innventure](#), to scale up the process at a new company called [PureCycle Technologies](#).

Led by former Walgreens CEO Greg Wasson, Innventure identifies breakthrough technologies that address unmet market needs and works with large corporations to commercialize them through startups.

PureCycle is restoring polypropylene from plastic films, carpets, post-consumer material and other products. It's still finetuning the technology but expects to have its first commercial facility in Ohio producing over 105 million pounds of recycled polypropylene annually by 2020, according to Betsy Nicketakis, manager of business administration and partnerships. Longer term, PureCycle plans to build more production plants around the world, she said. Companies are signing advance contracts with PureCycle, according to Croke, who says this type of off-take agreement is a powerful tool for brands that want to invest in recycling infrastructure. "As these technologies start to come into fruition, brands need to think about contracting for the material in a longer-term way so that these solutions can get off the ground, because oftentimes there's innovation but then the price of virgin drops so low that nobody's funding it anymore," Croke said. "The investment community will come in if they know that these solutions have markets."

*Meg Wilcox is a GreenBiz contributor based in Boston covering the environment, science, food and sustainability.*



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# Purposeful packaging for the circular products revolution requires out-of-the-box thinking



*Updating international standards can take things only so far. We need a more holistic and dynamic approach to innovation.*

BY CORO STRANDBERG AND RACHEL MORIER

Step by step. Product by product. Standard by standard. Consumer by consumer. That is what it will take to re-engineer our take-make-dispose economy so it is “restorative and regenerative by design, keeping products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles,” according to the Ellen MacArthur Foundation.

Two centuries ago, the Industrial Revolution began in Britain and today, we witness — and live with — its benefits and shortcomings. What’s painfully clear is that we can’t afford to wait another 200 years to make our industrial economy

“circular.” The biodiversity and climate change impacts of not going circular are dire. Conversely, the economic advantages of the circular economy are so significant — with the potential to unlock \$4.5 trillion of economic growth — that we cannot afford a delay.

Considerable innovation is required to rethink the systems and functions in product and packaging value chains and lifecycles to enable 9 billion of us to live well on a planet by 2050.

One potential solution space is international standards. They provide specifications for products, services and systems to facilitate international trade and

## At the current rate of updates, it will take about two decades to renew all international standards with the intent to incorporate circular principles.

ensure quality, safety and efficiency. We refer here to the International Standards Organization (ISO), which has more than 20,000 international standards covering most industries. The ISO reviews standards every five years to keep them up-to-date. In 2016, ISO [published 1,381 standards](#): At this rate, it will take about two decades to renew all international standards with the intent to incorporate circular principles.

### Heavy lifting needed

We recently collaborated on the update of one such standard, the 2003 edition of ISO/IEC Guide 41: “Packaging — Recommendations for Addressing Consumer Needs,” which provides information on considerations that should be taken when determining packaging for consumer goods.

[ISO/IEC Guide 41 provides guidance](#) related to the choice of packaging to protect vulnerable goods at the point of sale. It is intended to reduce prices for

consumers by minimizing unneeded packaging and increasing the percentage of goods that reach consumers in good repair, safeguarding them from potential hazards.

We focused our input on “sustainable packaging” and “circular packaging” features within the constraints of the existing guideline. The updated standard likely will adequately address resource conservation, emissions reduction and the 3 Rs: “reduce, reuse and recycle.” There likely also will be recognition of the opportunity of using renewable and recycled content packaging materials to stimulate markets for these inputs.

Advancing circularity through a packaging standard, however, has significant limitations. The focus is on the function of the package design and doesn’t capture the concept of package design being part of a whole system where the concept of waste is entirely rethought — and designed out.

To contemplate packaging in the context of a circular economy requires a much larger scope than such a standard typically can provide. A packaging material made from a renewable source may not mean that it is recyclable or compostable at every touchpoint that the packaging is sold. Ensuring “packaging circularity” demands a more dynamic and holistic approach.

### Solutions will come from inventors and social innovators

Embracing out-of-the-box thinking can lead to new and collaborative oppor-

tunities to design waste out and incorporate the package as part of a whole system. For example, in-store packaging return programs and deposit schemes are still relevant today and can be applied in new ways. A [Vancouver Island dairy](#) offers customers the option to purchase milk on tap while selling reusable milk bottles separately.

Rethinking packaging possibilities is what led the partnership between Procter & Gamble and TerraCycle to produce the [Fairy Ocean Plastic bottle](#), made with 100 percent recycled plastic (90 percent post-consumer and 10 percent ocean plastic). Not only does this packaging help to reduce greenhouse gas emissions but it also raises consumer awareness of ocean plastic pollution.

So, how do you start to assess circular packaging if you cannot rely on standards alone? Start by taking a closer look at your entire product-package value chain and determine the inputs (energy and material resources) and outputs (emissions and waste). Ask yourself these key questions:

- What data is missing, if any?
- Where do the biggest impacts occur?
- What improvements can be made?
- What are the trade-offs?

Numerous life cycle assessment (LCA) tools and industry resources are available to assist you with your packaging sustainability strategy. Speak to your packaging industry association for further educational tips and tools.

Convenience-driven design often leads to heedless packaging — and overpackaging. You have only to look at the amount of valuable packaging materials in our landfills for evidence of this. But reimagining and reengineering our take-make-dispose economy is possible with full circle, disruptive thinking: step by step. Product by product. Standard by standard. Consumer by consumer.

*Coro Strandberg is president of Strandberg Consulting, a firm that helps companies and industry associations integrate sustainability into business models and strategy.*

*Rachel Morier is director of sustainability at PAC Packaging Consortium and leads the PAC Food initiative to investigate the causes of food waste.*



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# How Dow Chemical and Boise are taking aim at plastics



BY CASSANDRA SWEET

Dow Chemical is one of the world's biggest producers of plastics and packaging. So it may come as a surprise that the company is working with Boise, Idaho, and other cities to divert plastic waste away from municipal landfills, to factories that will reuse it as fuel or repurpose it into new products.

For Dow's Packaging and Specialty Plastics unit, that means supplying Boise with several hundred thousand bright orange Hefty bags that the city's 223,154 citizens can use to stash juice pouches, candy wrappers, plastic dinnerware and other plastic disposable items that are not recycled. The move will help the city figure out what to do with plastic waste that it can no longer ship to China.

"We know that consumers want to be able to keep plastics out of the landfill,"

said Jeff Wooster, global sustainability director at Dow Packaging and Specialty Plastics. "They don't like throwing away the packaging when they're done using it. We've created this program to facilitate the collection of these materials so they can be put to beneficial use."

Americans throw away tens of millions of tons of plastic each year, most of which ends up in municipal landfills, and some of which makes its way into the nation's waterways.

Nearly one-fifth of the 136 million tons of municipal waste that is dumped in landfills each year is plastic, according to the U.S. Environmental Protection Agency.





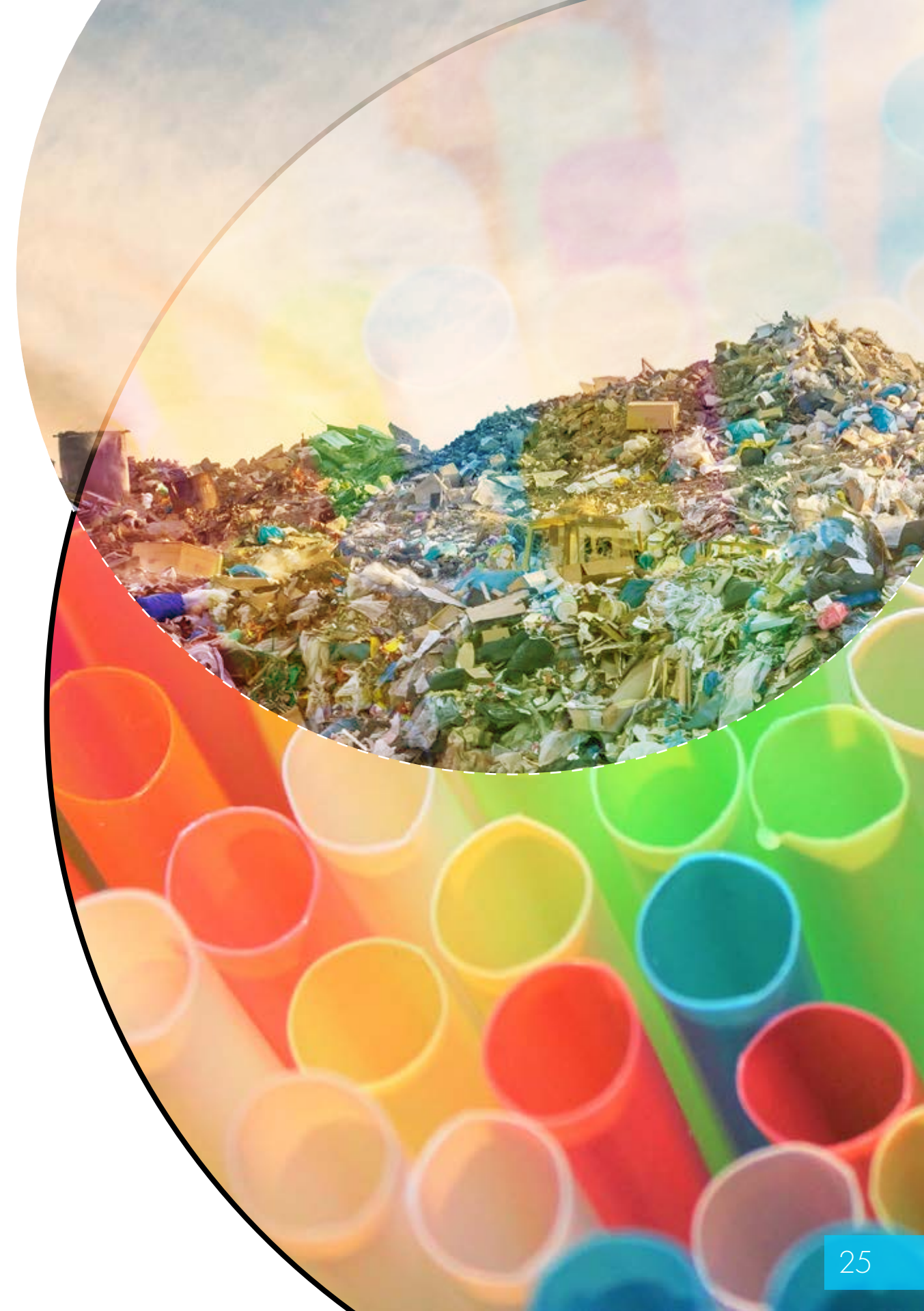
## Consumers want to be able to keep plastics out of the landfill.

The program is similar to efforts by rival chemical giants, such as Braskem, of Brazil, to address the problem of plastic waste buildup from the companies' products. Braskem supports plastic recycling efforts in Brazil and recently announced plans to produce [painting kits using recycled plastic](#).

For Boise, the goal is to distribute the orange Hefty trash bags to about 73,000 households, explain to residents how to use the bags and what to fill them with, and then ensure the bags are picked up at the curb and delivered to a plant in Utah, where the plastic will be converted into fuel. The fuel can be used to replace conventional diesel.

The program will allow Boise to continue to collect residents' waste plastic and do something positive with it, after the city's longtime recycling provider said it would no longer accept many plastic items that customers were used to putting in their blue recycling bins.

Cities and towns across the United States similarly have struggled to find a way to recycle their plastic waste, after China announced last year that it [would stop](#)



## This is an innovative solution that allows us to turn a bad situation into something quite positive.

importing 24 types of foreign waste and would tighten its standards for stray items that find their way into bales of scrap plastic and other materials. “This is an innovative solution that allows us to turn a bad situation into something quite positive,” said Boise Mayor David Bieter.

In addition to the Hefty bags, Dow Chemical is giving Boise a \$50,000 grant to help the city launch the program. Dow awarded Cobb County, Georgia with a \$50,000 grant last year to jumpstart its own plastic waste reduction program.

This year, Dow will award another round of grants totaling \$100,000 to U.S. communities that want to start their own plastic waste reduction program. The company did not say how much it would award winning cities.

The non-recyclable plastics that Boise will collect from residents will be shipped to a Salt Lake City plant run by Renewlogy, which will convert the waste plastic into diesel fuel. Renewlogy’s technology uses a depolymerization process to convert the plastics back into their basic molecular structures. The result is

low-sulfur fuel, which costs about \$30 per barrel to make, and which can be sold for about \$70 a barrel, according to Renewlogy. The fuel, when blended with other fuel components, can be used as regular diesel, for vehicles, heavy equipment and other motors, according to Renewlogy and Dow.

Diesel fuel currently retails for about \$3.10 a gallon, on average, or more than \$130 a barrel, according to the Energy Department.

Before helping Boise, Dow worked with Omaha, Nebraska, to start up a plastic waste reduction program there.

In that initiative, Dow provides orange Hefty bags for the city to distribute to residents to stow their plastic waste and place at the curb for trash and recycling pickup. The plastic waste is sorted and then shipped to a cement factory, where it is used as fuel to generate power. The plastic is burned to generate energy for the cement factory.

The program has faced criticism from environmental groups, such as Greenpeace, the Global Alliance for Incineration Alternatives (GAIA) and the Sierra Club, which object to the practice of burning plastic to reduce waste because it can result in the production of toxic chemicals and other pollution.

*Cassandra Sweet is a San Francisco-based journalist focusing on cleantech.*

# How Amazon thinks inside (and outside) the box



| *Ready to unpack some wrap rage?*

BY LAUREN PHIPPS

Have you ever resorted to aggressively using a kitchen knife or other tools, in a state of frustration, to open a stubborn package? You're not alone. The experience of packaging-induced anger is known as “wrap rage,” a term coined by Jeff Bezos, according to Amazon’s global head of sustainability, Kara Hurst. For those of us attuned to environmental footprints and material flows, wrap rage also refers to the moral outrage spurred by the unnecessary packaging around purchases — the packaging equivalent of Russian nesting dolls, where boxes are shipped inside other boxes.

What’s the antidote to wrap rage? Amazon has been working for 10 years to figure it out. By partnering with brands and manufacturers, the retail giant

aims to both improve customer experience while cutting down on material use through a Frustration-Free Packaging program. This means packaging is easier to open (no more tools!) and made of 100 percent recyclable materials. In many cases, products are designed to ship in their original boxes, with no additional packaging.

In practice, Amazon suppliers must go through a certification process that includes a performance test simulating the journey of a parcel through its fulfillment network, complete with predictable drops, compressions and other physical stresses. But for larger brands with complex packaging and diverse product offerings, collaboration is key.



In July, for example, Amazon [highlighted a partnership](#) with Hasbro, the toy and game company of Mr. Potato Head and Play-Doh fame — and, for some, intricate packaging annoyance. Hasbro offers a “Frustration Free” option for 100 products.

To solve this design challenge, consider the purpose of packaging in its context.

For brick-and-mortar retail, the primary purpose of a box is to market, communicate and entice a customer to choose between one of many options. It all but says, “Buy me!” But when online shopping, consumers already have purchased an item once it arrives. Accordingly, its packaging serves to ship and protect, not sell.

“Fundamentally, the experience around packaging is changing,” [said Hurst](#) during a presentation at GreenBiz 17. “This drives a better customer experience, it drives cost out of the business and has massive potential for positive sustainability impacts.”

Having grown from offering 19 bestselling products from Microsoft, Fisher-Price and others to a catalog of nearly 2 million items (out of roughly 562 million sold on Amazon [as of January](#)) and more than 1,000 corporate partners, Amazon said the initiative has eliminated more than 244,000 tons of packaging materials and avoided 500 million shipping boxes to date.

**By partnering with brands and manufacturers, the retail giant aims to both improve customer experience while cutting down on material use through a Frustration-Free Packaging program.**

Despite Amazon’s packaging improvements, there’s no silver bullet for cleaning up the environmental impact of e-commerce. Online retail creates a web of sustainability challenges, from [increased urban congestion \(PDF\)](#) and emissions to “recyclable” packaging that is [never actually recycled](#).

While I typically focus on corporate and city-level decision-making, I can’t help but also notice an irony in corporate circular economy strategies that fundamentally encourage (and profit from) overconsumption. In 2017, Americans spent \$240 billion — twice as much as they spent in 2002 — on goods such as jewelry, watches, books, luggage, telephones and related communication

## Despite Amazon's packaging improvements, there's no silver bullet for cleaning up the environmental impact of e-commerce.

equipment, according to the Bureau of Economic Analysis, which adjusted the numbers for inflation. The convenience and affordability of online shopping are compounding American consumer culture, encouraging hyperconsumption and leading to more waste.

It's a problem that I doubt Amazon or most other retailers will tackle any time soon (Patagonia is the exception to the rule) and speaks to a systemic challenge of driving circularity through corporate commitments. But people will always need "stuff" and Amazon is helping us get it as efficiently, sustainably and frustration-free as possible

*Lauren Phipps leads circular economy content and coverage as the Director & Senior Analyst on Circular Economy at GreenBiz Group..*



# Loop's launch brings reusable packaging to the world's biggest brands



*How a quirky startup attracted P&G, Unilever, Coke, Pepsi, Nestle, Mars, Clorox, Danone and others to disrupt packaging.*

BY JOEL MAKOWER

A new initiative by a small company has compelled more than two dozen of the world's biggest brands to begin testing reusable packaging.

Loop, launched today at the World Economic Forum in Davos, Switzerland, has amassed a blue-chip roster of companies, all of which are piloting a new system of high-quality packaging that can be returned and refilled again and again. In essence, it changes the ownership model of packaging from consumer to producer.

The big question is, will consumers buy into it?

Today's launch is the product of more than a year's work by TerraCycle, the

Trenton, New Jersey-based company that made a name for itself by turning hard-to-recycle waste (think juice boxes, coffee capsules, plastic gloves and cigarette filters) into new products. Along the way, the company, founded in 2001, has partnered with major consumer brands, retailers, manufacturers, municipalities and small businesses in more than 20 countries.

Loop is the natural progression of that model, as well as the corporate relationships TerraCycle developed over the years. Its Loop partners include Procter & Gamble, Nestlé, PepsiCo, Unilever, Mars, Clorox, Coca-Cola, Mondelez, Danone and a dozen or so smaller brands. European retailer Carrefour, logistics company UPS and resource management company Suez are also engaged





in the system.

The service will launch this spring in two markets: Ile-de-France, the region in north-central France surrounding Paris; and the New York region, which includes parts of Pennsylvania and New Jersey. Initially, about 300 products will be available in durable, reusable containers, many created especially for Loop.

“The key thesis statement is we can’t just recycle our way out of the garbage crisis,” Tom Szaky, TerraCycle’s CEO and co-founder, explained to me recently. “We need foundational changes. Our version of the foundational change is: How do we solve for disposability at the root cause, while matching the benefits?”

Simply put, Loop brings back the old “milkman model,” where products are delivered to customers at the same time empties are picked up, washed, refilled and restocked for delivery to another customer. The customer gets the product but the company owns the package.

The reality is somewhat more complex.

Loop initially will be an e-commerce play. Consumers can order goods from the Loop website or that of a partner and have them delivered like traditional products ordered online. But there’s a twist: Customers pay a small deposit

## **Loop brings back the old ‘milkman model,’ where products are delivered to your door at the same time empties are picked up, washed, refilled and readied for delivery to another customer.**

for a package that has been designed for 100 or more use-cycles. When the container is empty, customers place it in a specially designed tote for pickup or, in some cases, can bring it to a retailer. They can choose whether they want that product replenished; if not, their deposit is returned or credited to their account. The empties are sent to a facility where they are washed and refilled.

The entire process is handled by TerraCycle, from sale and delivery to package return and cleaning. In effect, TerraCycle is the online retailer, buying wholesale and selling retail. The package remains the property of the brand.

Eventually, Loop will expand to include brick-and-mortar retailers — Carrefour and Tesco in Europe have signed on and expect to introduce Loop products in their stores later this year; a U.S. retail partner hasn’t yet been named. In

that in-store version, consumers can bring empties back in a QR-embedded container provided by Loop.

### **Scratching a niche**

The rebirth of reuse has been long coming. Since the dawn of the recycling movement about 30 years ago, companies have tried a number of schemes to enable consumers to use packaging over and over. One plan featured small packets of concentrated liquids used to refill a bottle of household cleaner — just add water to the concentrate and, voilá, a full bottle of a brand-name product. Another approach, refill stores, emerged in cities in Europe and North America, enabling consumers to bring their own container to buy bulk goods. Refill stations also are in traditional supermarkets and in some personal care retailers.

But none of these has caught on beyond a tiny niche. Consumers, outside of a precious few hardcore greenies, don’t really want to be inconvenienced, much as they may be seeking to avoid wasteful practices.

Loop’s approach seeks to overcome those obstacles. The key, said Szaky, is trying to mimic the way consumers already buy, use and dispose of packaging.

“We realized that recycling and using recycled content is about trying to do the best you can with waste, but it’s not solving the foundational reason we have waste. We did a lot of reflection on that and realized that the foundational





Source: Loop

**We realized that recycling and using recycled content is about trying to do the best you can with waste, but it's not solving the foundational reason we have waste.**

Szaky explained that his goal with Loop was to make the system simple and familiar. “You get a box at your door with your stuff in it. Though it’s better, because your box is durable, and you don’t have to worry about recycling all that cardboard.”

Similarly on the back end. “We’re trying to emulate the way you do your recycling at home. You take your used packages and you either put them in the recycling container or into your garbage bin. And then you lug it down to the curb and your recycling company or your garbage company takes it.”

With Loop, consumers put empties in a tote or other Loop-provided receptacle, which is picked up via UPS or another carrier, or dropped off at a retail partner,” explains Szaky. “There’s no washing, no cleaning required. Just like a dispos-

able object, you throw it back into one of those durable shipping containers you would’ve received from us.” Szaky envisions a “reuse bin” eventually showing up in homes alongside garbage and recycling bins. “And when we pick up, you have the option to have it set to auto-replenish, so that you can actually make your shopping even easier, because your empties trigger your re-orders.”

### Counter-worthy

Part of the magic of Loop is reusable packaging, designed in partnership with the brand owners to be not just durable, but “counter-worthy” — attractive enough to keep in plain view, in the words of Virginie Helias, vice president and chief sustainability officer at Procter & Gamble. “You want to show it to your

## **Szaky and his corporate partners seem to have thought through many of these downfalls, but the Loop system hasn't yet been tested in real-world settings.**

friends.” But, she adds, the appeal is not just aesthetic: “It’s also the fact that it’s a better premium experience for people.”

For P&G, that meant designing new packaging for the Loop platform. And, in some cases, inventing new products altogether.

For example, the company developed a toothbrush called Click, part of the company’s Oral B line. “It’s basically a new design that reduced the plastic by 60 percent because you have a durable handle which is made of composite material,” explained Helias. “And there is a mechanism which we call Click Fits, which allows you to detach the head from the handle.”

Procter & Gamble, Loop’s biggest partner, which also owns a 2 percent stake in the enterprise, has tapped into 10 of its most iconic brands as part of the Loop launch, including Ariel, Cascade, Crest, Febreze, Gillette, Pantene, Pampers

and Tide. “What was great to see was that most of our P&G categories were actually highly relevant for people in terms of having durable packaging,” said Helias.

Unilever, another Loop launch partner, is putting nine of its brands into the Loop platform, including Rexona, Dove and Axe deodorants; Signal toothpaste; and Hellmann’s mayonnaise.

With the company’s deodorant brands, “The base of the stick packaging is now made from stainless steel. As you use the product, there’s an insertable refill where you then give that back to us and then we send you a new one,” explained David Blanchard, Unilever’s chief R&D officer.

Like P&G’s Helias, Blanchard used the word “beautiful” repeatedly in our conversation to describe the company’s various reusable packaging innovations, made from glass, aluminum, durable plastics and other materials. For example, regarding the deodorants, he said, “It’s a beautifully crafted piece of packaging.”

Another Unilever innovation is Signal tooth tabs, an alternative to toothpaste. Essentially, it’s a small tablet of tooth powder you “chew, brush as usual, then rinse and smile,” Blanchard explained. “We’re creating a whole new format in a fully recyclable and refillable jar, so you get zero packaging, zero waste. It uses



less water because of the way in which you simply put the product in your mouth and then clean and rinse.”

### Will consumers buy in?

No doubt, Loop is a well-designed system with a compelling offering and a powerhouse line-up of brands. But one key question remains: Will consumers buy in to reuse?

It’s no small concern. Consumers — in Europe, North America, South America and Asia — repeatedly have foiled efforts by brands large and small to create products and delivery models that reduce waste, energy, water and other resources. In some cases, they believed that products were inferior or didn’t perform well. In others, the higher price was a barrier, and still others lacked the convenience of their conventional version. In many cases, consumers couldn’t be bothered to change their well-worn habits.

Szaky and his corporate partners believe they have thought through such pitfalls, although the Loop system hasn’t yet been tested in real-world settings.

Clearly, Loop’s big brand partners believe that their individual and combined efforts can break through. “It addresses a clearly growing expectation from people,” says P&G’s Helias. “When we ask people about what’s important

for them, packaging now becomes intrinsically important. And the frustration with other packaging is becoming very close to other factors that we are hearing about in our studies.”

Unilever’s Blanchard agrees. “We think that about 25 percent of consumers today are looking to buy brands that have a more sustainable footprint or clearly have a purpose that resonates with them from a broad, environmental sustainable purpose point of view. And then, there’s probably another 50 percent of consumers who are then increasingly looking for brands to have that point of view or that sustainable footprint.”

There’s also comfort in numbers, he says. “We’ve looked at reuse in France. We’re looking at a refill type of system in Vietnam. And we’ve not yet really cracked that business model. What Loop offered was the opportunity to be a part of a bigger consortium where consumers will get a much broader range of products. And therefore it gives them an opportunity to really do this with a bit more scale.”

Helias believes the reuse model has other benefits beyond the environmental ones. “You obviously develop a very intimate relationship with the consumer. And you build loyalty. It is all about enabling and inspiring responsible consumption, which is kind of our core agenda at P&G. And this addresses it beautifully.

This is why we have so many brands excited about the idea.”

P&G, Unilever and the other partners will be watching the forthcoming launch closely, trying to discern what works. “I think the most important metric will be the depth of repeat,” said Blanchard. “Do consumers come back to using these products time and time again? We would typically look to find at minimum a 50 percent repeat rate, so that half of those consumers over a period of time come back to use the product at least once, if not two or three times.”

And, of course, there are the environmental metrics. “It takes five Loop cycles of fill and reuse to be better from an environmental standpoint,” said Helias. “We hope can go way beyond that but that’s exactly why we are testing in market. It’s to validate that assumption.”

Tom Szaky, for his part, is already looking ahead. “The next category, when we’re ready, we want to test things like baby clothing and baby toys. We think there’s a really good opportunity for this in what we call disposable durables. That’s going to be a key question for us: How far and wide can this go?”

*Joel Makower is chairman and executive editor of GreenBiz Group.*



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