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FUTURE OF PACKAGING

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REGULATION

Plastic pollution: is it time for sticks, not carrots?

As plastic waste continues to grow, there are doubts over the effectiveness of voluntary initiatives. Are mandatory measures now the only answer?

Jim McClelland

Despite years of appeals and encouragement, plastic pollution is only getting worse. Is it time to drop the carrot and pick up the stick?

The carrots have been positive and plentiful. There are international public-private projects, such as the Afri-Plastics Challenge, backed by the Canadian government, which is tackling the alarming rise in plastic waste across Africa. There are other efforts in domestic markets, like the UK Plastics Pact from the Waste Resource Action Programme (WRAP).

Industry-led initiatives abound, too. Last June, for example, five of the UK's biggest names in branded fast-moving consumer goods — Mars UK, Mondelez International, Nestlé, PepsiCo and Unilever — formed a £1m Flexible Plastic Fund to make recycling more economically viable for operators and easier for consumers. Individual retailers like Boots also have their own programmes.

For all this wave of activity, the scale of the plastic problem appears to dwarf the efforts of business and industry. The reality is that the world produces twice as much plastic waste as it did two decades ago, with the bulk of it ending up in landfill, incinerated or leaking into the environment. Just 9% of plastic waste is successfully recycled, according to the OECD.

In response, the UK government will be wielding a brand new stick, as of April 2022, in the form of the Plastic Packaging Tax (PPT). Under the PPT, a £200 per tonne tax will apply to plastic packaging containing less than 30% recycled content. It is estimated that the measure could affect up to 20,000 packaging producers and importers.

So, could sticks be the answer? Paula Chin is senior policy adviser on consumption at the World Wildlife Fund (WWF). There is no simple answer, she explains. Addressing the manifold complexities of production and consumption needed to stem the flow of plastics into nature is ultimately a transboundary issue.

"We've already seen a combination of levers adopted by governments across the world to address the plastic pollution crisis, including bans, taxes, charges, regulations and legislation. But as yet these actions have not been enough to tackle the issue." A narrow focus on specific legislation can have unintended consequences, Chin notes.



"Where sticks have been used, they've addressed low-hanging fruit, for example bans on plastic straws, charges on single-use carrier bags. But these measures have led to material-switching by producers, which merely shifts environmental and social burdens to different supply chains, all of which have their own impacts."

The main challenge to date has been a lack of global coordination, which is needed to ensure the measures taken by individual nations scale up to deliver real benefit. That's why the news from the UN Assembly in Nairobi earlier this month was met with such applause, when representatives of 175 nations signed a breakthrough global resolution to end plastic pollution.

This landmark leap towards an international legally binding instrument raises questions for the packaging industry. It may be entering a new era of headline, mandatory policy and regulatory drivers, which will supersede softer-touch voluntary schemes.

When it comes to policy implementation, delays in delivery don't help.

The launch of the UK's first Deposit Return Scheme (DRS) in Scotland, for instance, has been pushed back twice already to 2023. The Extended Producer Responsibility (EPR) reforms are in danger of faring even worse; they're no longer due next year, with no new timetable officially in place.

This is a revamp of 1997 legislation, so it's seriously overdue. The new EPR would see producers effectively made liable for the full cost of managing the packaging that's put on the market. The government estimates the impact could total about £2.7bn in the first full year of operation.

The fact that it languishes in post-consultation limbo is a source of significant frustration, given its potential to effect change, says Louise Nicholls, Chair of the Institute of Environmental Management and Assessment (IEMA), a professional body for environment and sustainability practitioners.



"The key to transformation is EPR" Nicholls believes. "A mix of taxation to encourage sustainable packaging; transparent reporting of quantified targets; strong focus on citizen behaviour change; and support for local authorities and waste collectors to develop and maintain infrastructure."

Numerous Extended Producer Responsibility mechanisms already exist in other countries, including Canada, South Korea and Japan, along with several European nations. However, Britain's stated hopes of achieving an overall recycling rate for EPR packaging of 73% by 2030 seem to be fading.

Unplugged gaps in the regulatory framework are another significant bugbear, says Nicholls.

"Plastic shrink wrap on multibuy cans, such as beer, fizzy drinks and beans, has definitely been poorly regulated, with home recycling not consistently available," she explains. "Alternatives exist, for example card, but there's little incentive or pressure for manufacturers to change."

A perceived long-term lack of resources and investment in enforcement bodies also raises concerns that any policing of new rules and regulations will lack the necessary teeth.

"With a problem of this magnitude, voluntary measures can only get us so far," admits Jeff Kirschner, founder and CEO of Litterati, a North American data-science company that aims to empower people to 'crowdsource clean' the planet.

With more than a quarter of a million members in 185 countries worldwide, Litterati has so far recorded and mapped an overall litter pickup of over 15 million pieces of rubbish.

Witnessing the packaging waste problem first-hand on a daily basis, however, Kirschner is convinced that while regulation and various corrective measures may play a role in reducing plastic waste, there are other practical solutions. "Whether it's the shift from single use to reuse, where innovative businesses are providing refillable options, or a push for nationwide DRS, all options should be on the table."

In the end, however, sustainable change calls for both prizes and penalties, believes Litterati's Kirschner. "Ultimately, we may find that reward-based incentives coupled with punitive actions create the one-two punch needed to solve plastic waste." ●



DESIGN

Brands get creative to ditch secondary packaging

Consumers are tired of excess packaging. Brands are seeking to meet environmental demands without selling their products short

Sophie Benson

Boxes, sleeves, lids, tubes: the trappings of secondary packaging add up. Companies are cutting back on these added layers, but it's not as easy as it sounds. Reducing such waste makes business sense, with today's customers put off by all that packaging. In fact, 68% of UK consumers say the environmental impact of a product's packaging affects their purchasing choice, rising to 77% in Germany and 81% in Spain.

By removing elements like shrink wrap on multi-packs and secondary lids on yoghurts and creams, UK supermarket Tesco managed to remove 1 billion pieces of plastic. Portuguese retailer Sonae MC, meanwhile, eliminated 725,000 cardboard boxes a year by removing secondary boxes from its own-brand toothpaste and substituting a display tray.

"The ultimate goal around sustainability for packaging is zero waste, so any innovations that remove layers is a step in the right direction," says Jennifer Creevey, head of food and drink at WGSN, a trend forecasting specialist.

Simply removing a layer without bringing something new to the table mightn't be enough. In many cases, secondary packaging is part of the customer experience. It facilitates unboxing, communicates quality, denotes hygiene, and provides precious real estate for marketing and branding.

But with the right approach, removing secondary packaging can be an opportunity for innovation, providing new avenues for consumer engagement.

In September 2020, evian launched a label-free bottle in its bid to become fully circular by 2025. Available in hotels initially, the minimalist, etched design set it apart from its label-clad competitors, while a new pink lid was introduced as a distinctive marker for the new design. According to Reuters, 481.6 billion plastic bottles were sold in 2018, so the impact of removing the associated labels would be significant.

The move also opens new approaches to design. The possibilities were evidenced in the C2 Drinking Water project, an honouree in

the 2021 Core77 Design Awards. Expressive embossed illustrations turned each bottle into a collectable work of art.

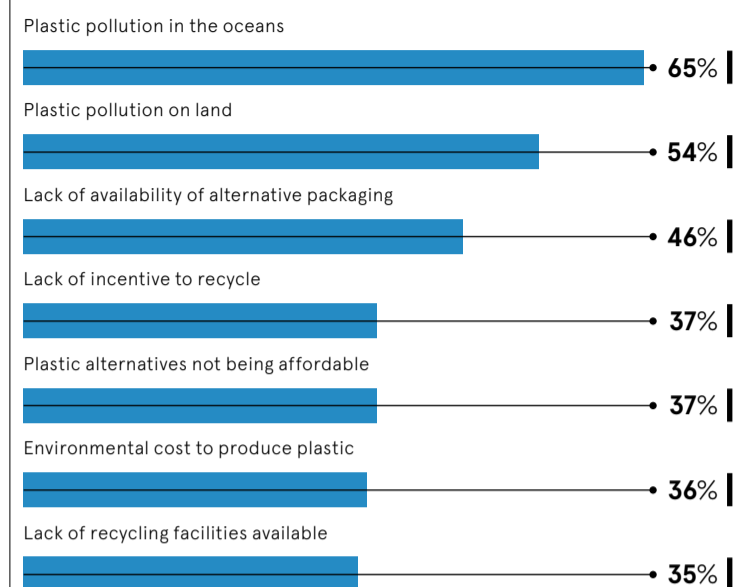
Beauty brand e.l.f. took on secondary packaging with its Project Unicorn initiative, stripping down secondary cartons and boxes. Its new, patented design replaces hang tab boxes with a simple adhesive loop, removing secondary packaging can be an opportunity for innovation, providing new avenues for consumer engagement.

"Because packaging is so close to the consumer, it's often viewed as one of the most tangible impacts,

“**Reducing packaging benefits consumer brand perception, making it a key point of differentiation**”

HOW UK SHOPPERS FEEL ABOUT PLASTIC

Percentage of British consumers who feel the following are the biggest issues surrounding plastic packaging



The Grocer, 2021

regardless of the share of a company's environmental footprint it represents," says Laura Peano, global plastics lead at Quantis, a sustainability consultancy. "Reducing it benefits consumer brand perception, making it a key point of differentiation."

By stripping back packaging, brands can connect with consumers who view environmental impact as a driver behind their purchases. "Brands can also make a story of their journey...which helps drive positive brand awareness," notes Creevey.

However, other consumer priorities like quality, engagement and experience must be kept in mind. Around 90,000 people type 'unboxing' into YouTube each month and the 'unboxing' hashtag has 30.5 billion views on TikTok. In that context, providing engaging, shareable experiences remains a key strategy.

In seeking to elevate customer experience, wine brand 19 Crimes didn't turn to boxes, bottle sleeves, or display cases, as many beverage brands do. Instead, it introduced 'Living Labels'. By downloading the dedicated app, consumers could watch the stories of the characters on their bottles' labels in real time.

While most of the characters are fictional, the Cali Red wine features brand partner Snoop Dogg delivering a new line each time the phone is pointed at the label.

MIT-based project Illusory Material created a very different but equally shareable and interactive primary packaging experience with nseen. The group created a mechanism for branding that only reveals itself when someone interacts with the product. Front-on, the packaging appears transparent, but when handled and viewed from different angles, the once-hidden branding appears.

With Kai's paper razor, launched in 2021, the packaging actually becomes the product. Users pop the flat razor out of the cardboard sleeve using the pre-cut edges and fold it in an origami-inspired fashion according to the instructions, which are also part of the packaging. Then they secure it with tape that initially comes as a protective covering for the blade.

Interactivity is ideal for social sharing, but it can also provide a route for product storytelling. The Lush Lens, available on the Lush Labs app, erases the need for leaflets or information cards. Users point their camera at a product to reveal information such as product descriptions, price points, ingredients, and immersive usage demonstration videos. Such technology could be expanded to communicate ingredient provenance or manufacturing techniques.

"All sectors are placing more focus on packaging eco-design," says Peano. However, "for the food and cosmetics industries it's particularly central because they tend to be more packaging-heavy."

Cognac brand Rémy Martin began removing secondary packaging from its VSOP line in 2020, with plans to extend the project to all markets by 2024. Multi-brand retailer Beautycounter says it's saved half a million cartons annually by removing secondary packaging from numerous product lines.

Grocery retailer ICA Gruppen sought to invent new technology, being one of the first grocery retailers to pilot laser marking on fruit and vegetables as an alternative to stickers and plastic wrapping. The laser has no impact on the product itself, only altering the pigment of the skin. EcoMark, which offers 'natural branding' as a service, says the shelf life of products is 100% guaranteed when using this method.

While she believes secondary packaging should be removed "when it serves solely a marketing purpose", Peano says care must be taken not to remove packaging where it contributes to preservation. Apeel, an edible, plant-based protective layer which keeps produce fresh for twice as long, may help answer such conundrums.

There is ample innovation to enable the removal of secondary packaging. The key to making it work is targeting the right products and understanding the gaps which need to be filled to deliver on both environment and experience. ●

The rise of environmentally sustainable packaging

The packaging industry is often derided for its environmental impact but there are companies making real leaps forward for sustainability, although there is still more to do

All too often, the talk in packaging circles is about the distance still to run in the race to reach our sustainability goals. It is easy to forget, though, how far we have already come.

Things are simply not the same for packaging in 2022 as they were 10, or even five, years ago. Growing consumer demand for environmentally sustainable solutions is driving green markets. In addition, legislation is ramping up at both national and international levels.

The UK Plastic Packaging Tax comes into force this April. On the world stage, 175 nations endorsed a historic resolution to end plastic pollution, at the UN in early March.

Consumers will pay to go green

In the Trivium 2021 Buying Green report, an annual global survey of 15,000 consumers, more than two in three respondents (67%) described themselves as environmentally conscious. The commitment to the green cause was even stronger among the younger generation, with almost nine in 10 (83%) willing to pay more for sustainable packaging.

Looking ahead to the 2022 results, demand for packaging that helps protect the planet is only increasing, says Trivium Packaging chief sustainability officer, Jenny Wassenaar.

"Sustainability matters, the imperative is already here. However, the stakes are raised for brands, retailers and manufacturers alike, as consumer awareness grows and demand for fact-based information rises. The next-level debate is now about true recyclability of materials," she says.

According to the latest figures from the European Union, recycling rates for both paper (82%) and metal (78%) are roughly double those for plastics (41%). Furthermore, metals such as steel and aluminium are infinitely recyclable, delivering huge circularity benefits.

To best evaluate sustainability in the round, Trivium adopts a practice of holistic packaging sustainability assessment that accounts fully for circularity, while also factoring in the impact of packaging materials on the waste stream and improving shelf life.

Food waste for thought

When it comes to food, shelf life matters. The most recent (pre-Covid) figures from the UN Food and Agriculture Organisation revealed around 931 million tonnes of food waste was generated in 2019, with the majority from households (61%).

Of the remainder, losses in food service (26%) and retail (13%) can be attributed to issues such as inadequate storage and transportation. These impacts are often exacerbated by shelf-life limitations affecting stock purchasing, sales and management.

To make matters worse, all this waste leaves a carbon footprint. The Intergovernmental Panel on Climate Change estimates food waste alone is responsible for between 8% and 10% of global greenhouse gas emissions - more than double the contribution from aviation.

In response, not only does metal packaging help protect and preserve food contents for longer (in some cases for up to five years) but canning also supports enhanced levels of nutrient content per calorie consumed.

Award-winning, by design

Happily for brands, this drive to go green calls for no compromise on design aesthetics. Options with cans include direct full-body printing, which provides a label-free 360° canvas on which to display attention-grabbing graphics, as well as key product and user information.

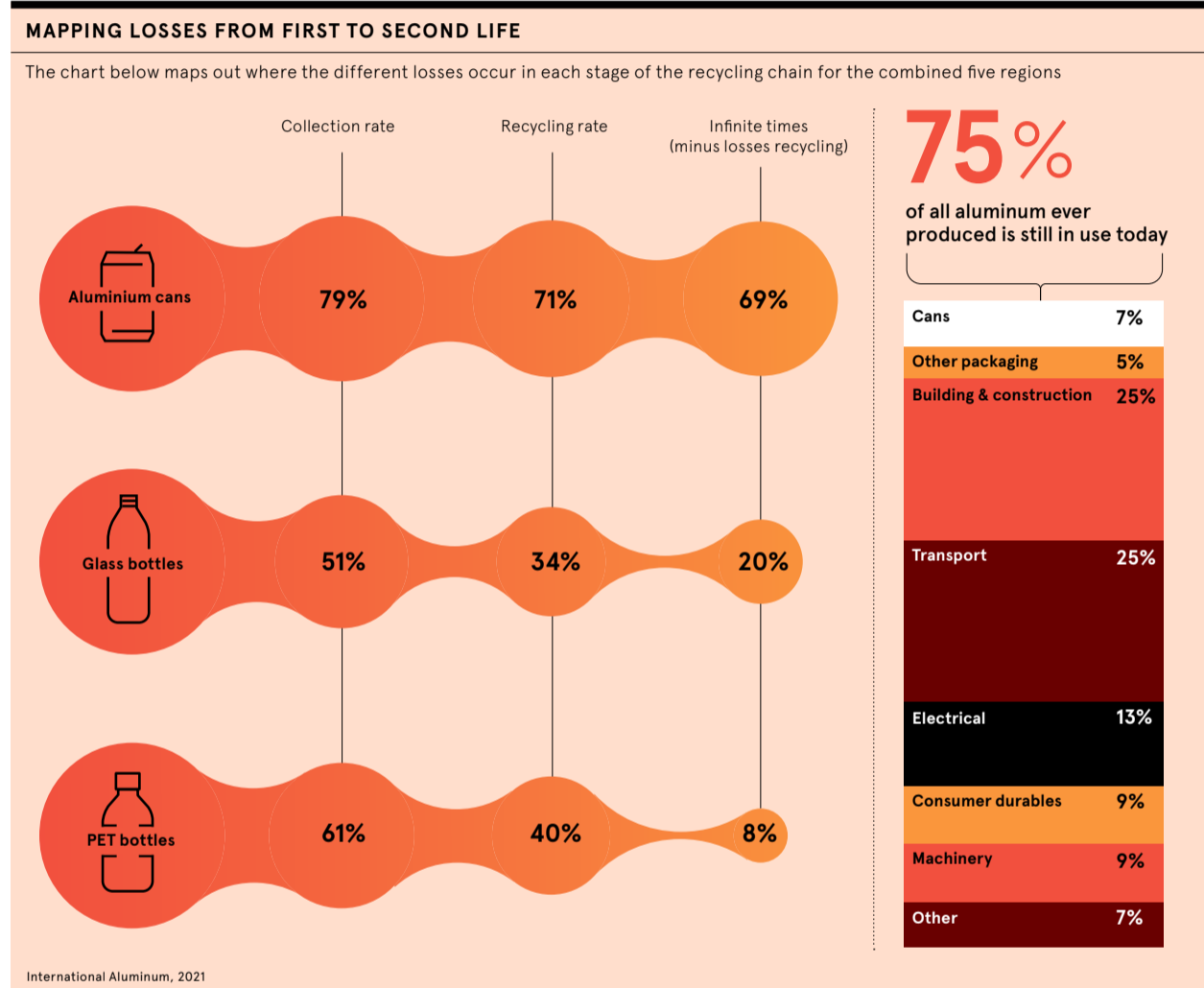
One brand pushing the envelope for innovation is Rainforest Artesian Water - a Best in Class winner with Trivium at the 2021 PAC Global Awards. The Rainforest Water 'bottle in a can' design is engineered to be spill-free and made from durable, forever-recyclable aluminium. It is also wrapped in vibrant full-colour images of wildlife, such as butterflies and parrots.

The future is refillable

In tandem with reuse, refill is another market trend clearly on the rise. One brand at the vanguard is Petal, creators of a natural zero-waste foaming hand soap system. The company's refillable pods are shipped directly to customers, then mixed with water and dispensed in a stylish, reusable and recyclable aluminium bottle.

Describing itself as a sustainability-first company with a strong focus on aesthetics, Petal was one of three winners with Trivium for Packaging Design at the 2021 iF Design Awards, along with Rainforest Artesian Water and Bubble Tree Refillable Bubble System.

The success for Bubble Tree proved particularly noteworthy, being a first-of-its kind winner in the toys category, a sector notorious for generating plastic waste. The firm's small refillable aluminium bottles feature a child-friendly ergonomic grip and colourful designs.



Commercial feature

“**To respond to the needs of more environmentally aware consumers and grasp the opportunity to make a real difference in the world, packaging companies must course-correct for a greener tomorrow**”

The luxury fragrance market is another segment not typically associated with pioneering green innovation. As a result, the recent award win for O.U.i - the first brand in Brazil to offer refillable eau de parfum - was hugely significant for the beauty and personal care industry, explains Aislan Pereira, director of commercial at Trivium Brazil.

"It was a disruptive launch that proves our new aluminium threaded bottles can be the right packaging to leverage sustainable and innovative solutions for premium markets," he says.

Sustainability is good for business

As well as aesthetics, sustainable packaging solutions can also be good for business. Purpose-driven plant-based hair-care brand Eva NYC, for instance, can point to a 100% jump in orders within two weeks of launching its new environmentally aware consumers.

Another good business story is Hand in Hand, the Philadelphia-based social enterprise specialising in what it dubs 'sustainable suds' - eco-friendly, vegan and cruelty-free personal care products such as soaps and hand wash.

Its pioneering aluminium containers for liquid hand soap and sanitiser introduced during the early months of the pandemic in March 2020 contributed substantially to the brand's 1,000% year-on-year growth and accompanying spike in charitable giving worldwide. For every product it

sells, the company makes a donation of soap and clean drinking water to children in need in disadvantaged communities, in countries such as Cambodia and Haiti.

As these trailblazing and award-winning examples show, demonstrable, real-world social and environmental responsibility go together with stand-out business success - and the packaging industry can rise to the sustainability challenge, concludes Wassenaar.

"To respond to the needs of more environmentally aware consumers and grasp the opportunity to make a real difference in the world, packaging companies must course-correct for a greener tomorrow. And they need to do so today. It is time to rethink packaging design and communication: circularity matters."

For more data and insights visit trivumpackaging.com

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PACKAGING INNOVATIONS: THEN AND NOW

From barrels to bottles, cans to cardboard boxes, packaging innovations have revolutionised the way we live - from the food we can eat to the way we can brand products. And if packaging history can teach us anything, it is that even the simplest inventions can have a transformational impact

The cardboard box

Although something like paper packaging has been around since 200 BC, when the Chinese would use treated mulberry bark to transport food, the first cardboard box wouldn't be invented until 1817. And commercial use of cardboard boxes wasn't possible until Scotsman Robert Gair found a way to prefabricate them in the 1870s, completely by accident. While making paper bags for seeds, the metal ruler which was used to crease the bags slipped and cut them instead. The first brand to use this new invention was NABISCO, the National Biscuit Company, in America. Having upgraded from using barrels for their biscuits, NABISCO was also the first company to brand a cardboard box in 1896. After that, cardboard boxes became the packaging method of choice for everything from cereal to cigarettes and, with Tetra Pak's invention of the tetrahedron-shaped carton in 1951, they have revolutionised the way we store and deliver food.



Plastic

There were forms of plastic around even in the 1800s, but these were unmalleable and unsuitable for packaging. It wasn't until 1862 when Alexander Parkes unveiled his cellulose-derived plastic at the Great International Exhibition that the possibilities became clear. Parkes' man-made plastic could be moulded when heated and kept its shape when cooled, perfect for packaging. Cellophane was invented in 1908 but became more readily used after frozen food pioneer Clarence Birdseye approached chemical company DuPont, asking them to produce a waterproof version of cellophane which could keep food fresh and insulated. Plastic film was born. 1946 saw the first ever commercial plastic bottle and the advent of Tupperware and plastic has become a core staple of food, pharmaceutical and goods packaging ever since.



The tin can

During the Napoleonic wars, the emperor offered 12,000 Francs to anyone who could help improve food preservation. The prize money was eventually given to 'the father of food science', Nicolas Appert who proved food could be preserved by boiling it and then sealing it in glass, in a precursor to canning. This method was then borrowed by Englishman Peter Durand in 1810 who showed it could work in a tin can. The world's first commercial canning factory was established in London and by 1813 it was producing tin-canned goods for the Royal Navy. By 1820, tin cans were being used for everything from gunpowder and turpentine to seeds and food. The packaging method would take its first step towards fame in 1898, when Campbell's Soup launched its iconic carnelian-red and white design, memorialised in Andy Warhol's 1962 masterpiece 32 Campbell's Soup Cans.

QR codes

Originally invented in 1994, the QR (or 'quick response') code became indispensable during the pandemic, aiding track and trace and enabling restaurants to serve customers safely. But they have also become a crucial tool in smart packaging. Unlike traditional barcodes, which are two-dimensional, QR codes have three levels of security which can detect errors. Requiring nothing more than a smartphone, a QR code can help provide additional information about a package and act as a unique identifier for each item. This can help to aid loyalty programs and product traceability or simply give the consumer more information about what's inside their package. It can even help with authentication efforts, by inserting a digital watermark within the QR code.



8% of US consumers look at the QR found on food packaging for information on ingredients, after social media and friends or family



Food Insight, 2021

RFID/smart chips

Along with QR codes, radio frequency identification tags are becoming another increasingly common feature of modern packaging, mostly through the use of smart labels. They are created using printed antennas with a microscopic chip which transmits a frequency signal and can be used to track and trace packages throughout distribution. Not only that, they can prevent theft from shops, help warehouses monitor inventory and make it easier for customers and delivery drivers to keep track of their packages. They can also aid security efforts by acting as a package's digital seal - if that packaging is tampered with, the radio signal is lost, making it easier than ever to tell if an item has been opened or stolen.



Antimicrobial packaging

One of packaging's main functions is to keep the food we eat fresh and safe for consumption. Unfortunately, food packaging is increasingly reported as the root cause of bacterial spread, partly because moisture can get in, creating the perfect conditions for the growth of pathogens. Enter antimicrobial packaging. This intelligently engineered packaging film contains enzymes and antimicrobial agents which can prevent the growth of pathogenic or spoilage microorganisms. The result? Less degradation of food and a longer shelf life for our favourite items.



Bioplastics

With more than eight million tons of plastic ending up in the ocean every year, scientists and packaging experts have been working on eco-friendly alternatives. One such is bioplastics. Produced from natural materials such as vegetable fats, corn starch, sawdust, straw or even food waste, while not all bioplastics are biodegradable, many are. One recent example is a bioplastic designed by a research team at Sao Paulo State University in Brazil. The team has created a film made from bovine gelatin which is not only biodegradable, it is also anti-microbial and edible. Even big brands are getting on board, such as Coca-Cola, who launched its PlantBottle - the first ever recyclable plastic bottle made from plants - in 2015.

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PLASTICS

Has the UN put the world on track for a plastic-free future?

A global agreement on plastic waste is seen as the most important green deal since the Paris accords of 2015

Martin Barrow

A new agreement to work towards a global treaty on ending plastic pollution has been hailed as a major breakthrough by campaigners. However, there's still a long road ahead.

At a meeting in Nairobi in early March, the UN Environment Assembly adopted a resolution on plastic pollution. Delegates from 175 countries, including the UK, endorsed an agreement that addresses plastic waste and calls for two years of negotiations toward a comprehensive, international treaty on the full life cycle of plastics.

Inger Andersen, executive director of the United Nations Environment Programme (UNEP), called the agreement "the most significant environmental multilateral deal since the Paris accord" on global warming in 2015.

Over the next two years, a negotiating committee will outline the contents of a legally binding treaty that will look at how plastic is produced, designed and disposed of. The committee will consider ways to reduce plastic pollution across the planet. It will also discuss the creation of a finance facility to support the goals of

the treaty and ways to monitor progress toward achieving them, including through national action plans.

"I think some of the thornier issues will be around what kind of goals will we be setting, how will we be measuring this and what speed of implementation is it that we would wish to see," said Andersen. "But we have been here before."

Public disquiet and impatience over the growing mountain of plastic waste weighed heavily on delegates as they laid the groundwork for a legally binding agreement to control plastics. More than 90 CEOs signed up to a joint call for a legally binding agreement.

This included the heads of PepsiCo, Coca-Cola, Procter & Gamble and Unilever, responding to pressure from shareholders and consumers.

"We are at a critical point in time to establish an ambitious UN treaty on plastics," said Alan Jope, the CEO of Unilever, "one that cuts down virgin plastic production, fosters collaboration for systemic solutions and speeds up the transition to a circular economy globally."

US support was another significant development, in a policy shift

“We have lots of work ahead of us, but it is the beginning of the end of the scourge of plastic

from the previous administration. "This is only the end of the beginning," said Monica Medina, the US assistant secretary of state for oceans and international environmental affairs. "We have lots of work ahead of us, but it is the beginning of the end of the scourge of plastic on this planet."

Ignacio Gavilan is sustainability director at the Consumer Goods Forum, which represents more than 400 retailers and manufacturers across 70 countries.

"The plastic treaty agreement is a landmark moment in changing our relationship with plastic. Collaboration and shared commitments are essential to tackling the plastics problem. Policymakers,

businesses and consumers around the world must now capitalise on the momentum, working together to ensure no plastic ends up in nature," he says.

"There are many components needed to achieve a more positive future for plastic. We need continued research and development to find sustainable alternative raw materials to reduce our dependency on plastics. Businesses must invest in innovation to improve packaging design and eliminate the use of problematic materials and excess packaging."

Going into the summit, the main sticking points were whether any agreement would be legally binding or voluntary, and whether it would address plastic production and single-use packaging design or be confined to improving waste management and recycling.

A draft resolution, entitled End plastic pollution: Towards an internationally legally binding instrument, said the treaty should address "the full lifecycle of plastic", meaning production and design, as well as waste.

"This agreement by governments at UNEA is truly historic

Kenyan president Uhuru Kenyatta speaks at the session to commemorate the 50th anniversary of the UN Environment Programme, where members met to discuss the most pressing environmental issues, among them plastic pollution



and I'm so proud that the UK co-sponsored the proposals and helped them get over the line," said Lord Zac Goldsmith, a UK environment minister, who attended the Nairobi conference.

The UN says 400 million tons of plastic is produced every year, with that figure set to double by 2040. At present, only 9% is recycled. It is difficult to recycle, slow to decay, expensive and polluting to burn, and breaks down into tiny particles that enter the food chain and cause harm to animals.

Plastic also accounts for a significant and rising share of greenhouse

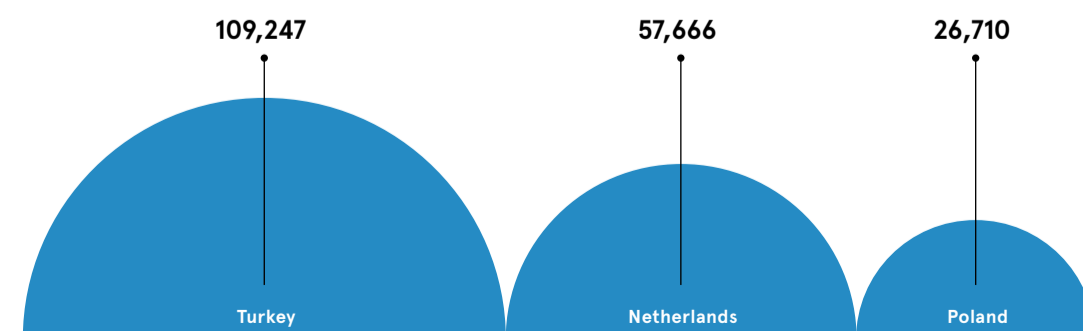
gas pollution. By 2050, plastic production, use and waste could account for 15% of emissions, according to UNEP.

Virginia Janssens is managing director of Plastics Europe, a trade body focused on reducing plastic waste. "The resolution promotes the importance of creating a supportive policy environment that is tailored to the specific needs of our industry and value chain to facilitate our transition," she said.

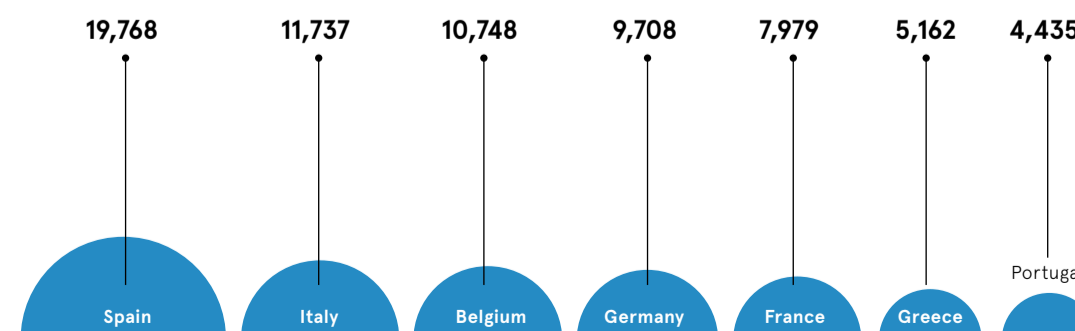
"It highlights the benefits and necessity of active collaboration and dialogue between our industry and all relevant stakeholders."

WHERE IS THE UK SENDING ITS PLASTIC?

Top five plastic waste exports from the UK between January and July 2021, by destination (in metric tons)



HM Revenue and Customs, 2021



INSIGHTS

'It's always impressive to see how a one-off design can create a new sense of excitement'

Josh Brooks, marketing & community director, packaging, Easyfairs on the most exciting innovations in the sector

Q In the run up to the Packaging Innovations & Empack event in May, which smart packaging innovations are you most excited about?

A One of the most interesting areas of development is the crossover between a product's packaging as a physical object and the digital experience that it can offer to consumers. The pandemic has made us all much more willing to use QR codes and brands are exploring and experimenting with their use.

There are so many more examples, but it's always impressive to see how a one-off or limited edition packaging design can create a new sense of excitement around a product.

Q How is packaging making the world a better place, beyond sustainability?

A Inclusivity is a big area of development for packaging. A lot of work is being done where packs are designed to help make the product, or information about that product, more accessible for people with disabilities.

One recent example, for blind or partially sighted people, is a smart packaging development from cereal brand Kellogg's. The company has begun adding a tag, called NaviLens, to all its cereal boxes in Europe. This tag allows a smartphone to detect a unique on-pack code and play back labelling information such as nutritional and allergen details.

Away from the grocery sector, Microsoft made headlines a couple of years ago when it created an easy-open accessible pack for its Xbox Adaptive Controller. The box was designed to allow gamers with disabilities to access the product more easily and was awarded the top prize in the Pentawards, the world's biggest packaging design competition.

All these topics - and many more - will be on the programme at our Packaging Innovations & Empack event in May. There, thousands of packaging designers and technologists will be meeting to learn about the possibilities for their brand's next packaging innovations - we can't wait to see everyone there. ●

Q What design innovations are catching your eye these days?

A I'm a big fan of limited edition packs, especially ones where artists, fashion designers or architects bring an unusual look or feel to a pack. In the spirits world, architect Daniel Libeskind created an incredibly beautiful and striking angular bottle for Hennessy that looked completely different to anything the cognac brand had done before. I love the playful limited editions that water brand Perrier currently has on sale, a collaboration with Japanese artist Takashi Murakami.



Josh Brooks Marketing & community director, packaging, Easyfairs

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INNOVATION

Packaged by nature: introducing the bio-contributors

The development of 'bio-contributing' naturally derived materials looks set to be a game-changer in packaging innovation. But there are still challenges ahead

Josh Sims

Recent years have seen the packaging industry introduce a flurry of nature-derived innovations in sustainability – prawn-shell plastic bags, the repurposing of palm leaves, cellulose moulding, wood pulp cellophane, and so on. But such notions have their limitations: both in functionality and in just how fully recyclable they actually are.

Enter the next phase: packaging that uses natural processes to not only break down entirely, but that can put something back into the soil; that is, to produce a net ecological benefit. Welcome to the era of 'bio-contributing' packaging.

"We're exploring more and more natural materials that can be used in expected ways, including packaging that's edible – that worms and bacteria will feast on, to fertilise the next cycle of life," explains Pierre Paslier, an ex-packaging engineer for L'Oréal and co-founder of packaging company Notpla. Notpla is an edible material made from brown seaweed, which grows up to a metre per day, without the need for freshwater or fertiliser, and which biodegrades completely in around a month.

So far it's been used to create sachets suitable for containing water or condiments, with the company working on applying a

layer of the material to cardboard (protective surfaces on cardboard are typically made of plastic), using the waste fibre from the seaweed to create a new form of cardboard and devising water-soluble packaging for products such as pasta. Crucially, using a natural source for the material means it's compostable at home (rather than by 'hot' industrial composting).

Indeed, Amir Afshar, co-founder and chief product officer at startup Shellworks – founded in 2019 with the creation of Vivomer, a rigid, vegan material created from marine and soil micro-organisms – suggests that this new generation of materials are the first to be properly biodegradable. The term to date has often been applied to those materials that actually require a special environment in which to break down, energy-intensive industrial processes to do so, or which only break down to micro-plastics.

"So it's another question whether at the chemical level that material is really gone or not," says Afshar, whose UK-based company is now piloting Shellmer, an antimicrobial, flexible, water-soluble and naturally fertilising biopolymer extracted from seafood waste. "Compare that to the re-purposing of a natural polymer that breaks down into the constituents from whence it came. This is contributing back to nature in the way that, say, a fallen branch breaks down to become part of the mulch. It's naturally, fully recyclable."

Retail companies have also been exploring how to produce packaging that bio-contributes as it degrades. Body-care brand Haeckels has recently introduced a bottle seal made of algae, which is kept moist until ready for use and seals as it dehydrates. The company is also experimenting with mycelium, sourced from the roots of mushrooms, which can be mixed with agricultural waste, moulded and dried to form lightweight and impact-resistant packaging.

Other examples include plantable packaging with embedded seeds, for Bloom Everlasting Chocolate; plantable wrapping paper such as Eden's Paper; and cosmetic company Lush's cork pots, the production of which sequesters 33 times their weight in carbon dioxide.

Jessica Vieira is vice-president of sustainability at US company Apeel, which in 2019 developed a plant-based, tasteless, odourless protective barrier – made from the same materials found in peels, pulp and seeds – to slow down the food spoiling process and maintain freshness for longer, reducing both food waste and packaging use. She argues that the 'naturalness' of the product is particularly reassuring to consumers.

"Looking to nature – which has already figured out how to recycle in a beautiful, efficient way – is the ultimate motivator in aiming to provide solutions [for packaging sustainability issues]," she says.

While the pace of innovation is impressive, there are challenges – not least in matters of speed and scale of production. Most of the innovations are coming not from major manufacturers but from small startups, which then have to sell the idea to a big player. "And they may be reticent to try this weird seaweed stuff," as Notpla's Paslier puts it. After all, many similar bio-materials were experimented with decades ago but failed to take hold, in part because the

sustainability problem of plastic was less well understood.

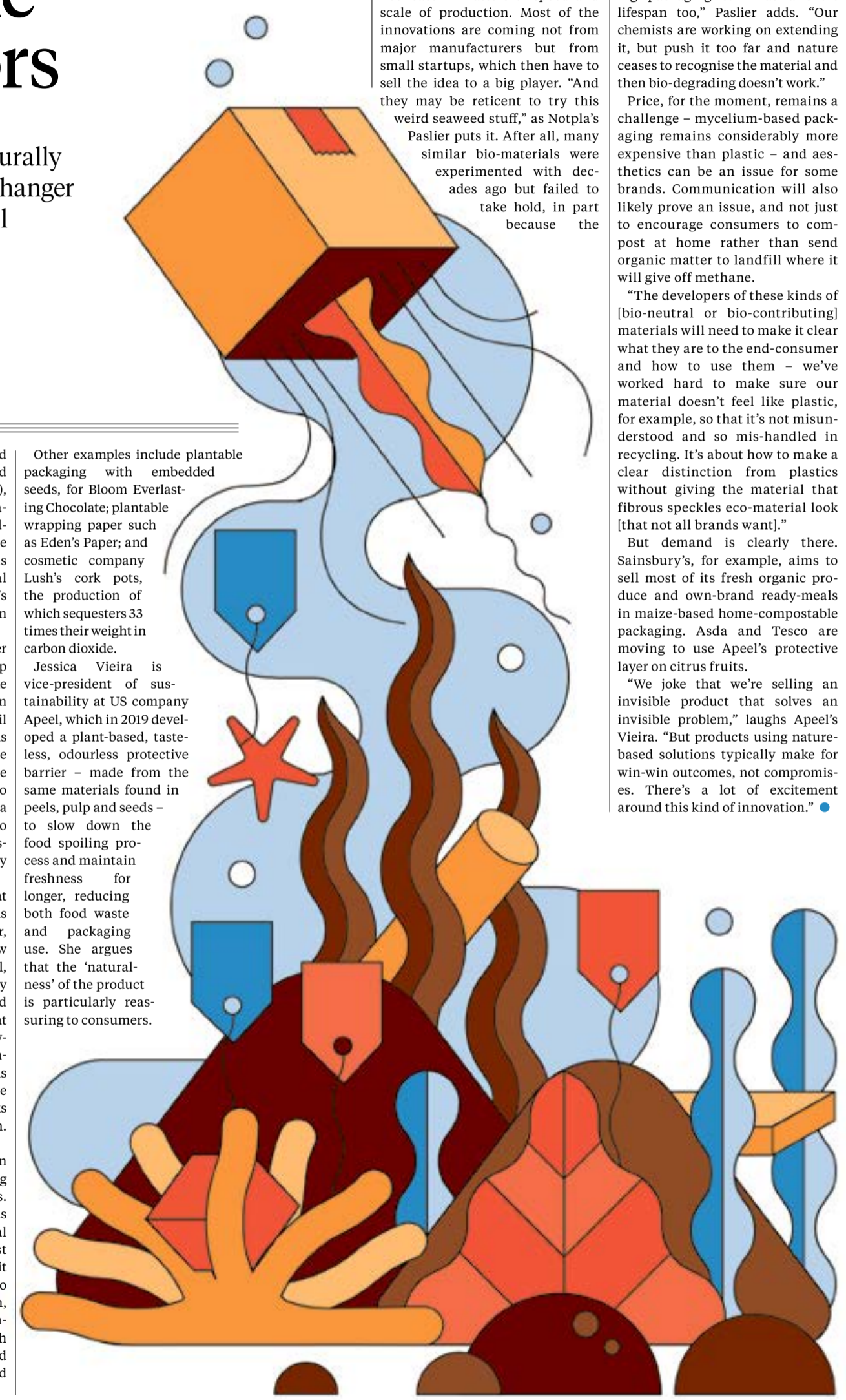
And bio-contributing packaging is not without its limitations: mycelium-based packaging, for example, sometimes hailed as the most commercially viable option, is only suitable for dry goods. "Bio-contributing packaging still has a short lifespan too," Paslier adds. "Our chemists are working on extending it, but push it too far and nature ceases to recognise the material and then bio-degrading doesn't work."

Price, for the moment, remains a challenge – mycelium-based packaging remains considerably more expensive than plastic – and aesthetics can be an issue for some brands. Communication will also likely prove an issue, and not just to encourage consumers to compost at home rather than send organic matter to landfill where it will give off methane.

"The developers of these kinds of [bio-neutral or bio-contributing] materials will need to make it clear what they are to the end-consumer and how to use them – we've worked hard to make sure our material doesn't feel like plastic, for example, so that it's not misunderstood and so mis-handled in recycling. It's about how to make a clear distinction from plastics without giving the material that fibrous speckles eco-material look [that not all brands want]."

But demand is clearly there. Sainsbury's, for example, aims to sell most of its fresh organic produce and own-brand ready-meals in maize-based home-compostable packaging. Asda and Tesco are moving to use Apeel's protective layer on citrus fruits.

"We joke that we're selling an invisible product that solves an invisible problem," laughs Apeel's Vieira. "But products using nature-based solutions typically make for win-win outcomes, not compromises. There's a lot of excitement around this kind of innovation." ●



“ This is contributing back to nature in the way that, say, a fallen branch breaks down to become part of the mulch. It's naturally, fully recyclable



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