FMCG flexible packaging:

accelerating the move from plastic to paper

A new report from Aquapak Polymers Ltd

May 2024


almost
70%
of the
UK's plastic waste
is plastic packaging

Foreword

According to UK Government figures, the FMCG sector is worth over £134 billion annually, making it a significant contributor to the economy, a major manufacturer and an employer of over 400,000 individuals employed by circa 7,000 companies.

However, it is also one of the biggest creators of plastic waste, particularly in packaging. Plastic packaging has long played an important role in protecting goods as they move through the supply chain to the end consumer, extending shelf-life and reducing food waste.

According to WRAP, plastic packaging on the market in the UK totals 2.3 Mt, with plastic packaging now accounting for nearly 70% of the UK's plastic waste. A situation that is unsustainable and doing untold damage to the environment.

We know that the FMCG sector has embraced some sustainable packaging, and global brands have committed to pledges on targets to reduce conventional packaging and introduce more sustainable materials which combine functional requirements with meaningful end of life options. However, many have yet to do so at scale and make the wholesale shift from conventional plastic to more sustainable packaging. Our study explores the future of flexible packaging in the sector, the materials likely to prevail, the timeframes for doing so and the perceived barriers which must be overcome.

The study is based on research with 100 UK packaging experts responsible for packaging R&D, technology, design and sustainability for FMCG brands, which produce products ranging from food and snacks such as crisps and nuts, to home and personal care, and medical items. The research was carried out by international market research firm Pureprofile in March 2024.

Dr John Williams
CTO, Aquapak Polymers Ltd

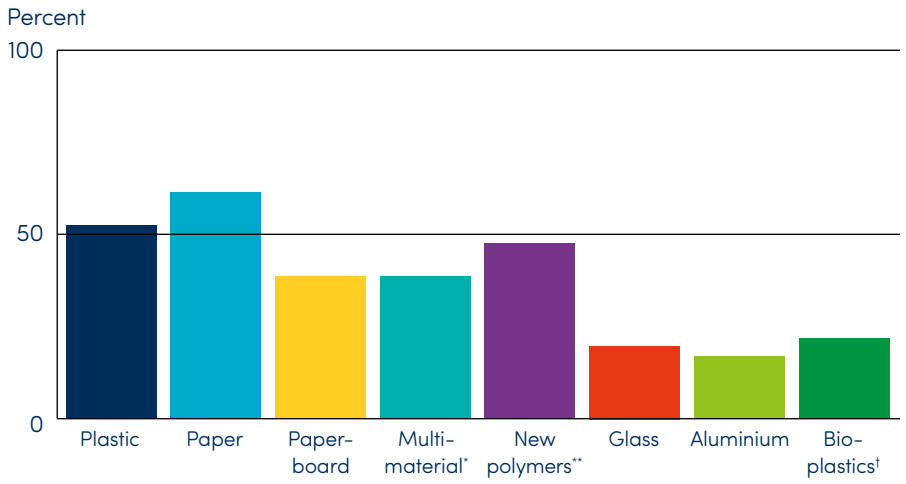
hydropol™
an aquapak product

The future of packaging

When it comes to packaging materials, almost two thirds (62%) of UK packaging experts said they currently use paper for their consumer packaging, 53% use plastic, and 48% use new polymers – new materials with the same properties as plastic, but without harming the environment. Paperboard and multi-material – combinations such as paper and plastic – are used by 39% respectively.

Encouragingly, the majority (92%) of respondents said that their business plans to stop using plastic in their consumer packaging altogether. Thanks to consumer demand, packaging suppliers are also moving to more sustainable packaging to create a competitive advantage.

Chart 1: the type of packaging materials respondents' businesses currently use for end-user/consumer packaging



* Combinations of materials such as paper and plastic

** New materials with the same properties as plastic, without harming the environment

† Plastic materials produced from renewable biomass sources, such as vegetable fats and oils, corn starch, straw, woodchips, sawdust, recycled food waste, etc.

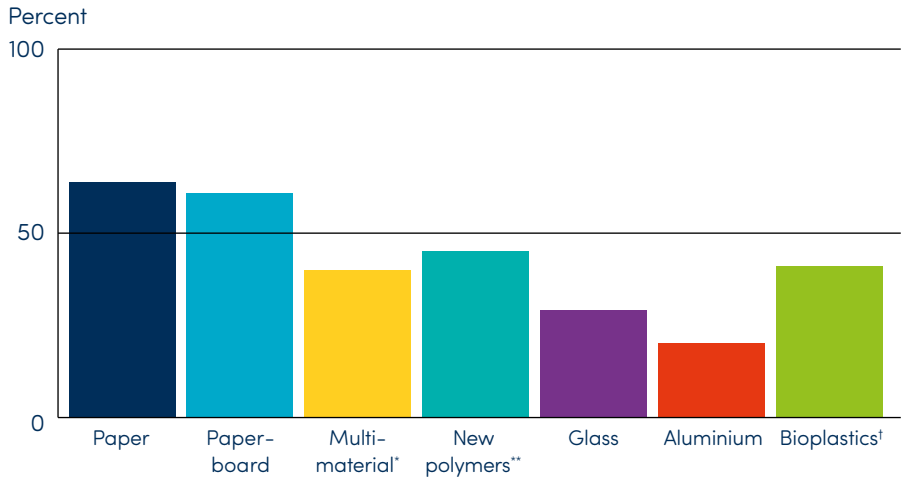
Chart 2: Key drivers of the move away from plastic

Item	Overall	Rank Score	No. of Rankings
Consumer demand for more sustainable packaging	1	501	100
Packaging suppliers moving to more sustainable packaging	2	463	100
Competitive advantage	3	442	100
Pressure from NGOs/media to adopt more sustainable materials	4	388	100
Regulatory pressures	5	361	100
Packing machine suppliers moving to more sustainable packaging materials	6	332	100
Recyclability as a key to meeting sustainability targets	7	313	100

Paper prevails

Paper and paperboard are the replacement materials of choice, followed by new polymers, bioplastics, and multi-materials. This is mirrored by the materials that consumers prefer, with paper topping the bill.

Chart 3: Materials businesses plan to use instead of plastic in end-user/consumer packaging



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According to the packaging experts questioned, paper is the most sustainable in terms of the resources used and their recyclability. Although cost and strength are the two most important attributes of the packaging material they use, high recycling rates of material thanks to kerbside collection, marine safety and use of renewable resources also rank highly as favourable features. Other important aspects include the end-of-life options for packaging materials, with biodegradation in soil and water the most important, ahead of recyclability of material and avoiding landfill.

However, it is important to note that paper material combined with the wrong plastic i.e. conventional polymers, won't provide the answer the industry needs as it doesn't solve the end-of-life problems or improve recyclability of packaging. The answer to this challenge lies in innovative new solutions.

4,375 Mt Hydropol addressable market (1 g Hydropol/pack) with

5% market penetration saving

8,313 Mt of conventional polymer

Chart 4: most sustainable materials in terms of the resources used and their recyclability

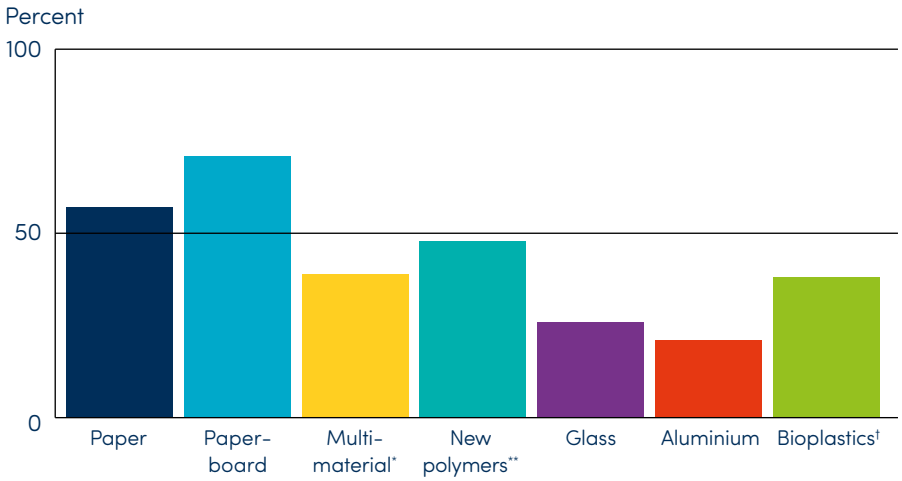

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Chart 5: most important attributes of the packaging material

Item	Overall	Rank Score	No. of Rankings
Cost	1	1,081	100
Strength	2	1,000	100
High recycling rates of material thanks to kerbside collection of material	3	953	100
Marine safe	4	884	100
Material comes from a renewable resource	5	782	100
Production uses relatively little water	6	735	100
Material is technically easy to recycle, promoting high recycling rates	7	728	100
Production mainly uses renewable energy	8	725	100
Extending the shelf life of food and drink	9	711	100
Promotes the circular economy	10	701	100
High functionality - ease of use for endconsumer	11	640	100
Barrier protection – keeping products in prime condition	12	624	100
Lower carbon footprint across its lifecycle	13	621	100
Other	14	315	100

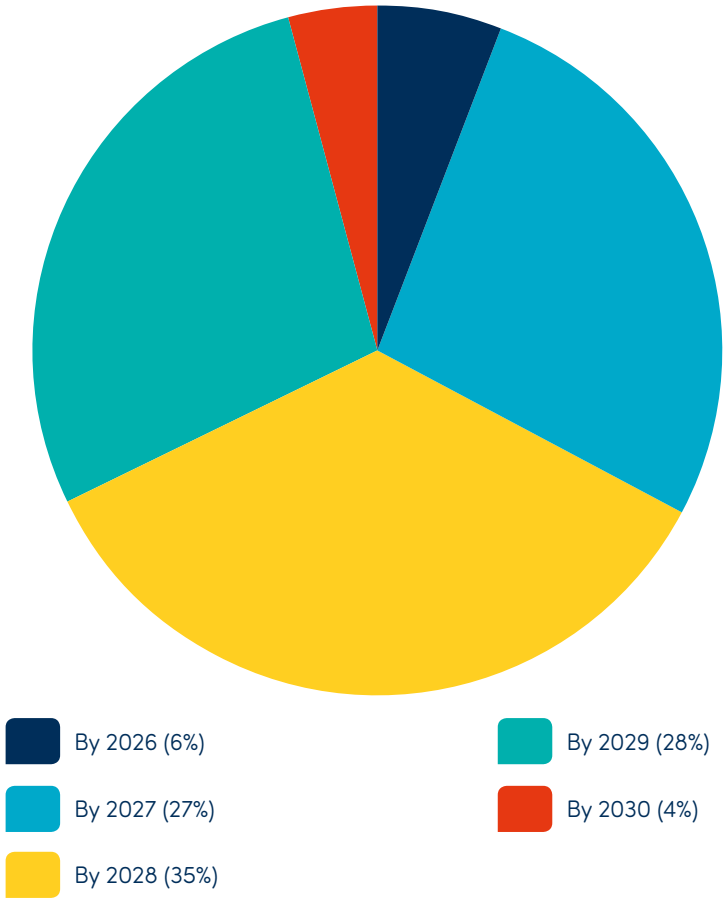
Transition to alternative materials is slow

However, although there's almost universal commitment among respondents to move away from plastic, the timeframe for transition to alternative materials is still considerable, with 27% of packaging experts expecting this to happen by 2027, 35% by 2028 and 28% by 2029.

Just under one third (30%) describe the move to new packaging materials in their business as too slow, 58% describe it as 'moderate pace' and only 11% say it is fast. Crucially, the majority (87%) want the switch to alternative materials to replace plastics to take place more quickly.

This is despite alternative solutions being readily available and scalable now, making the ability to take millions of tonnes of conventional plastic out of the market a reality.

Chart 6: Expected timeframe for transition to other materials

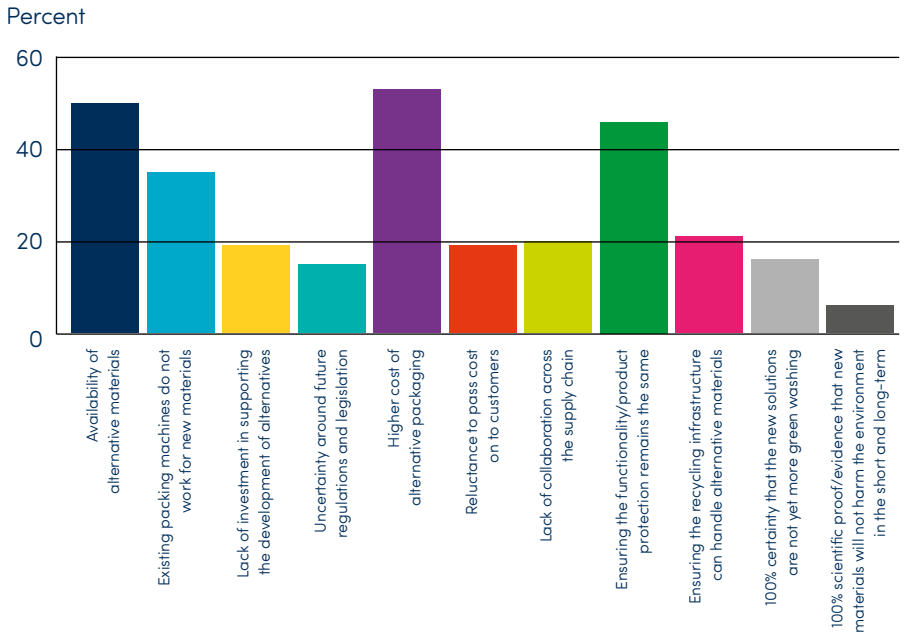


166,250 Mt
of conventional polymer (1.9 g/packet) potential to be replaced by recyclable paper

Speeding up the implementation of more environmentally friendly materials

Currently, the main barriers to using more environmentally friendly options are the higher cost of alternative packaging material which was cited by 53% of respondents, the availability of alternative materials (50%) and ensuring the functionality and product protection remain the same (46%).

Chart 7: The main barriers to moving away from plastic packaging to more environmentally friendly options

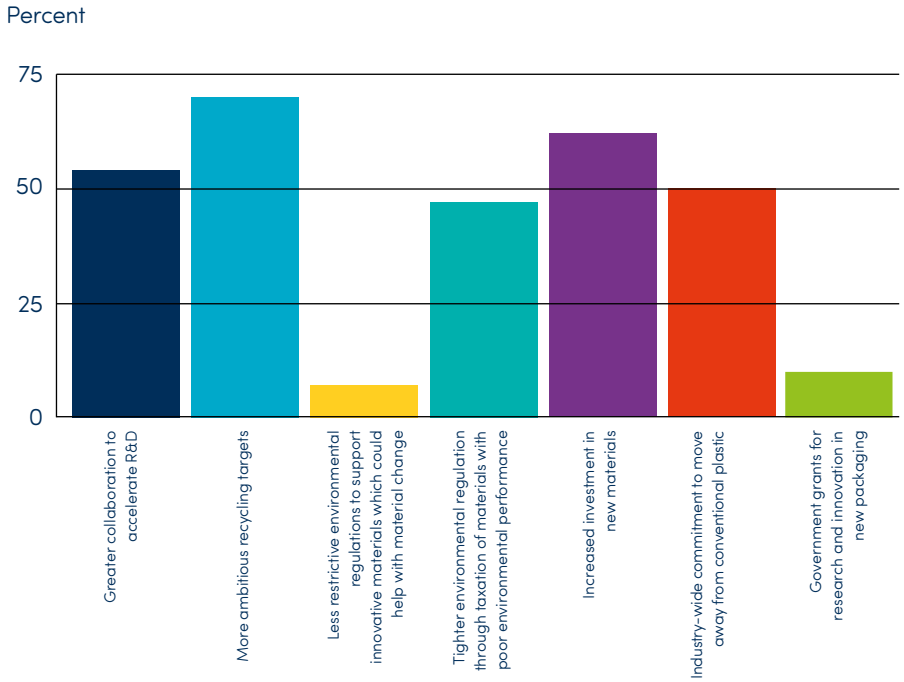


When asked about the key drivers that would help the FMCG sector speed up new material development and implementation, the research showed that 70% of respondents believe that more ambitious recycling targets are key, 62% want to see increased investment in new materials, and 54% say greater collaboration to accelerate R&D is needed. Half say that an industry-wide commitment to move away from conventional plastic is necessary, whilst a further 47% cite tighter environmental regulation through taxation of materials with poor environmental performance as being important.

£2.7bn

Total flexible packaging sales globally for confectionary including chocolate.

Chart 8: Measures which could help the industry speed up new material innovation and implementation



What is Hydropol?

Hydropol is a unique highly functional speciality polymer resin based on PVOH (Polyvinyl Alcohol). It has been developed, manufactured and patent protected by Aquapak Polymers Ltd. It provides thermo-processability and tailored solubility at scale unlocking the full chemical potential of PVOH. This solubility enables diverse functionality which makes it suitable for applications that would otherwise be environmentally damaging.

Key Features:

- Non-toxic
- Tailored solubility (10°C - 80°C)
- Biodegradable
- Marine-safe
- No harmful microplastics
- Compostable
- Suitable for AD plants
- Simple integration into existing manufacturing processes

Hydropol functionalises paper (the world's most recycled material) to perform like plastic. Enabling full circularity with 100% fibre recovery. The move to paper from flexible plastics creates opportunity but the paper recyclers are concerned with new materials causing problems and cost – Hydropol is proven to work. Genuine recyclability and maximum recovery of fibre without additional complexity or contamination is now a top priority. Extrusion-coated and laminated paper using Hydropol capable of being run on high-speed vertical, form, fill and seal (VFFS) opens up paper use to replace traditional multi-layer plastics. Conventional barrier systems based on emulsions and dispersions that can reduce mill efficiency are under scrutiny.

Sustainable packaging is a business priority

The research shows that increasing the volume of sustainable packaging such as paper is the number one priority for improving the environmental performance of their business according to participants, ahead of improving the energy efficiency of operations, biodiversity and reducing the carbon footprint of logistics and reducing water use and waste. Reducing or abolishing the use of plastic was seen as the least important.

Furthermore, the majority of respondents say that there is a significant threat to their business if the environmental performance of the packaging used is not improved, with two thirds describing it as high and 31% describing the risk as 'average'. Just 3% say the threat is very low.

Microplastics are a concern

All the experts who took part in the study say they are concerned about the use of plastic packaging by their business and the impact of microplastics in oceans and waterways and living organisms, including humans. Over one third (37%) say they are extremely concerned and 63% say they are quite concerned.

Furthermore, 84% say there should be much tougher regulations to help curb the introduction of microplastics into the environment, with just 6% disagreeing with this course of action, and 10% saying they didn't know.

Hydropol does not form harmful microplastics

Microplastics are tiny plastic particles up to 5mm in diameter. In the last four decades, concentrations of these particles appear to have increased significantly.

Hydropol is currently defined as a plastic and like all plastics as breakdown occurs it fragments into smaller pieces - technically defined as microplastics. However unlike most conventional plastics these small pieces are not harmful and go on to biodegrade safely thanks to the presence of chemical functional groups, common in natural materials such as starch and cellulose. These allow for continuous fragmentation without the formation of toxins, or the subsequent absorption of toxins from the environment associated with conventional plastics. There is an abundance of academic research carried out in this area.

The means Hydropol is marine-safe. Hydropol is hydrophilic (water-liking) and has no natural tendency to attract toxins or form toxic microplastics and is itself non-toxic to marine fauna. A two-year marine toxicity study on zebra fish larvae showed this to be the case.

Reputational and financial risk

The research highlighted the risks FMCG brands businesses face if they don't move away from conventional plastic to sustainable materials in their consumer packaging, ranked in order of importance:

Risk	% of respondents
Reputational risk	70
Missing ESG /sustainability targets	67
Drop in market share to competitors	60
Pressure from NGOs	37
Declining share price	33
Declining sales	33

These findings are consistent with the expectation of over two thirds of respondents (68%) that consumer pressure on businesses to adopt packaging materials will increase over the next three years.

A board-level issue

Just how seriously FMCG brands are taking the plastic packaging problems is highlighted by the report findings which showed that although 24% of respondents say that the packaging director is the ultimate decision-maker when it comes to moving to more sustainable materials in their business, 22% say it is the CEO, 17% said it is the finance director and 14% said it is the brand director, followed by the operations director (13%) and sustainability director (10%).

More investment in sustainable packaging

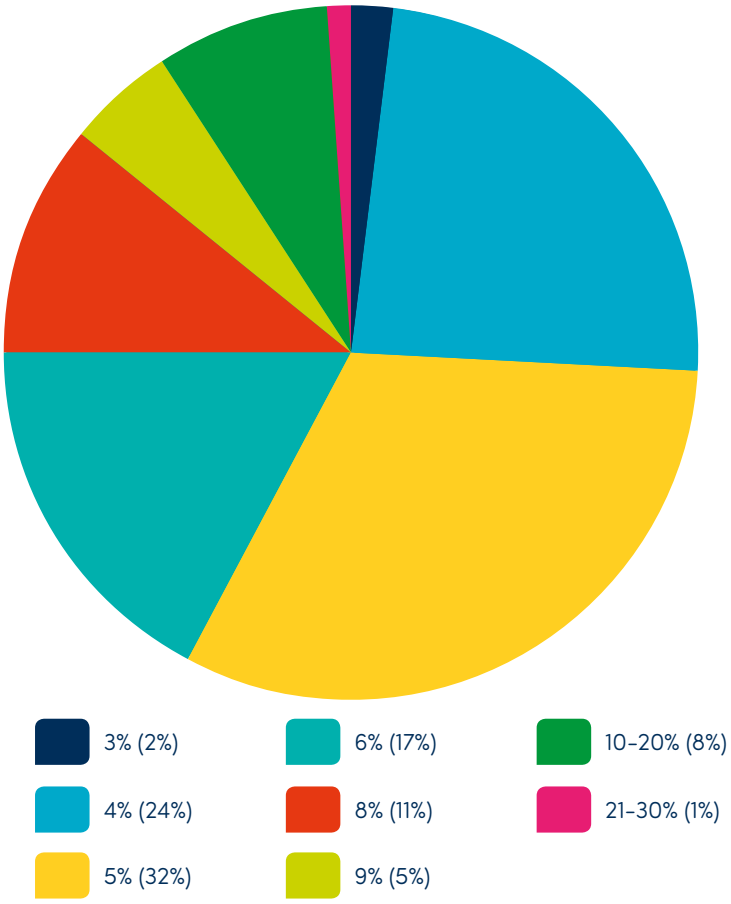
Whilst the timeframe for ridding packaging of conventional plastics, remains a longer-term ambition, 86% said that their business is prepared to pay more on packaging to improve sustainability and end-of-life outcomes which, ultimately, will reduce the risk of harmful microplastics being released into the environment.

Over a half (56%) say their business would be willing to pay 4% - 5% more for proven, environmentally friendly packaging materials, compared to existing plastics. One third say their business would pay between 6% and 9% more, and 8% say between 10% - 20% more. New materials such as Hydropol are scalable and as demand grows, costs will come down, making any uplift relatively small across the supply chain whilst providing a credible environmentally friendly solution.

6,380 Mt

Hydropol addressable market (1 g Hydropol/pack) with 10% market penetration saving 12,122 Mt of conventional polymer

Chart 9 - Businesses are willing to pay more for proven, environmentally friendly packaging materials



Taking a longer-term view, one quarter expect their business to increase its investment in packaging material with better recyclability and end-of-life outcomes dramatically over the next three years, 40% expect it to increase slightly and 35% expect it to stay the same as today.

£1.7bn

Total flexible packaging sales globally

for crisps and salty snacks

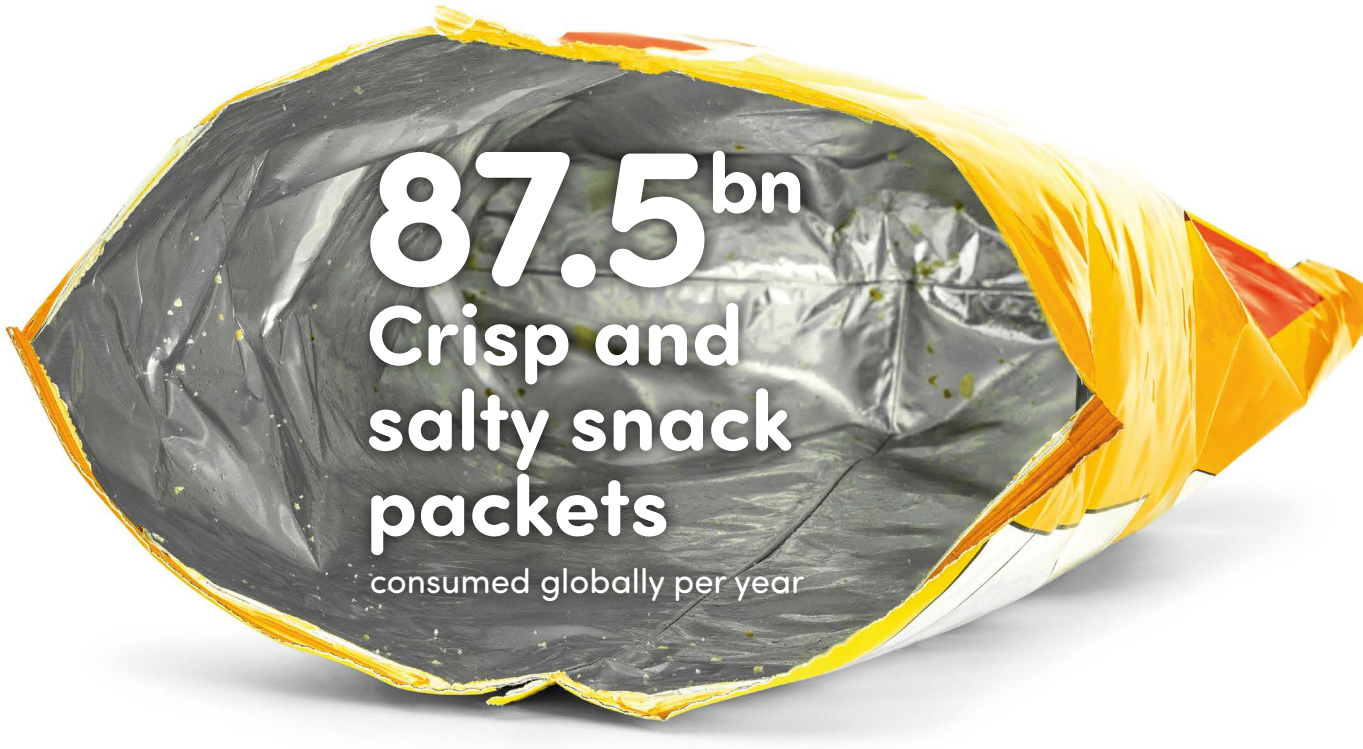
How innovative new technologies can transform conventional FMCG packaging

First fully recyclable paper crisp packet

Hydropol is used in the first fully recyclable paper crisp packet. Unveiled in March 2024, the new packet has been developed in partnership with The British Crisp Co. and Evopak, a manufacturer of sustainable paper-based flexible packaging.

The packet provides an environmentally friendly and scalable alternative to the eight billion packets thrown away each year in the UK, ending up in landfill or being incinerated. They have been certified as recyclable in standard paper recycling mills by OPRL, the only evidence-based on-pack recycling labelling scheme. This means they feature the green recycle logo and can be disposed of in consumer kerbside collections along with other paper material, unlike other crisp packets.

Hydropol can be recycled, re-pulped, composted and is distinctively compatible with anaerobic digestion. Furthermore, if unintentionally released into the natural environment, Hydropol – which is non-toxic and marine safe – will dissolve and subsequently biodegrade. It does not break down into harmful microplastics, so it still has a safe end-of-life even if it is not disposed of as intended.

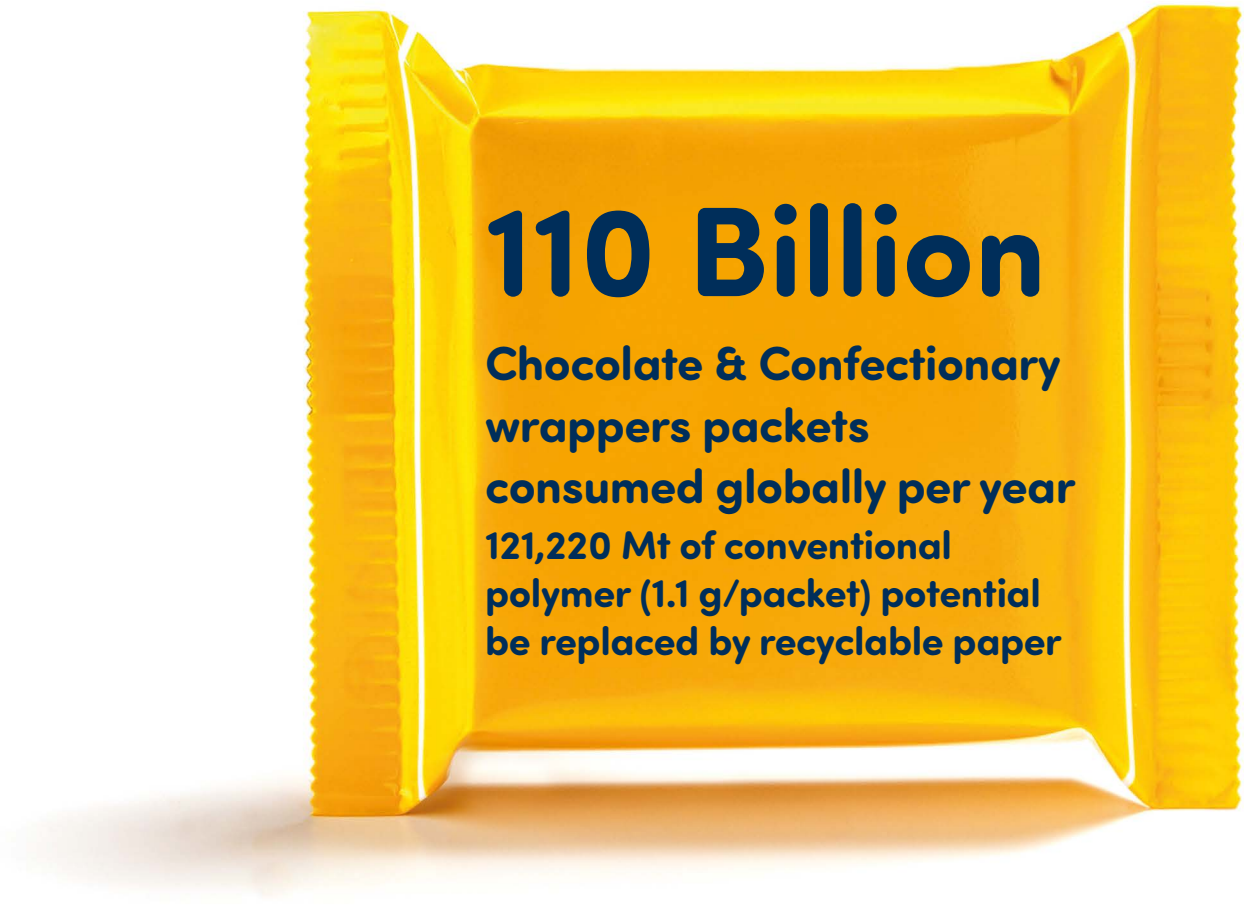


Other applications

Chocolate and confectionery

Traditional chocolate and confectionery wrappers are made of film-based structures that are difficult for consumers to recycle. Even when they are collected for recycling, recycling rates are incredibly low. Consumers love paper solutions, as do marketeers, but the challenge has been finding a coating for paper that offers the required seal, barrier and end-of-life performance. A Hydropol coating provides solutions to all three of these challenges. Including the best end-of-life credentials.

There are a wave of brands launching in paper-based solutions for chocolate, demonstrating high market demand. Chocolate is a relatively fast-to-market category compared to others. Aquapak is working with major brands assisting them with switching to paper-based solutions using Hydropol. Alongside this the organisation is working with market leaders in the paper supply chain in order to add Hydropol coated papers to their portfolio and turbo charge entry to the market.



Conclusion

Our study shows that the FMCG sector is highly cognisant of the need to move away from conventional plastics to more environmentally friendly materials which offer better end-of-life outcomes, be it improved recyclability or biodegradation to appease their customers and other stakeholders. The reputational and financial risk of not doing so is recognised at board-level and is a main concern for investors and insurers.

There is undoubtedly some confusion in the market by the number of "new" materials which all offer some potential, but all too often exaggerate the properties and availability of the material, causing delays in the use of genuine solutions by using valuable time in the packaging development process. It is important that there is an acceleration in the use of materials which are available at scale, offer the required functionality, run down existing conversion lines, and have a viable end-of-life solution to the consumer.

Paper and paperboard are the most favoured alternatives, but these come with their technical challenges – although none are insurmountable as our new paper crisp packet demonstrates. With a host of factors being cited as barriers to moving away from conventional plastic, it is little wonder the predicted timescales for making the switch remain stubbornly long.

Our research also suggests that the sector needs to be bolder in its commitment to new packaging materials. While 37% say they are more focused on switching to innovative, environmentally friendly materials, a quarter are developing existing materials and 38% are placing equal importance on both. Is this really embracing innovation and change or sitting on the fence until regulation forces the industry's hand? We cannot solve our problems with the same thinking we used when we created them.

New materials already exist and can facilitate the move from plastic to solutions which are functional, provide the product protection needed but do not harm the environment when they come to the end of their useful life. The hard work has been done. Packs for a whole host of FMCG products have been produced and are available for brands to use right away.

The industry can and should make the transition now.

Aquapak

Accelerating the transition to the Circular Economy

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