

Time to get PP into the circularity loop

Polypropylene (PP) is what I call the 'do everything' plastic. Its high rigidity-to-weight ratio, strength, transparency and toughness means it is used across multiple industries, from packaging to textiles and cars. Even the surgical masks the world is now wearing are made from PP.

This highly versatile polymer makes up 20% of global plastics production, a figure that is growing at 6% a year. In 2018, 56 million tonnes were produced valued at \$97bn (£77.6bn) and it has been estimated that, by 2025, we will be producing 83 million tonnes worth \$147bn.

In the UK about 300,000 tonnes a year of PP is used in packaging, of which about 70% is food-grade material. Yet PP is hardly recycled, even in developed countries. Worse still, to date, there is no food-grade recycled PP available for reuse into new packaging. So Nextloopp's mission is to create circular food-grade PP from post-consumer packaging.

Given PP's versatility, it may seem strange that it has so far evaded the recycling streams, but it is this very versatility that has caused the material to be left out. Recycling really took off with bottles, starting with glass and continuing with plastic, as collection and recycling systems grew over the years.

Nextloopp is a project focused on making a reality of food-grade recycled polypropylene. **PROFESSOR EDWARD KOSIOR** explains why it is time to close the loop on this type of plastic

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But the fact that PP is used in many applications such as pots, tubs and trays (PTT) and not predominantly in bottles like PET and HDPE meant it was left out of the collection scope. This has changed over time, and now PP has reached a critical percentage of the packaging stream it can be readily recycled once collected.

As a specialist in plastics recycling, it is little wonder that one of the most pressing enquiries I receive regularly from retailers and brand owners relates to unlocking the value in PP and turning it into high quality food-grade rPP. This has been the key driver behind the Nextloopp project, launched by consultancy Nextek.

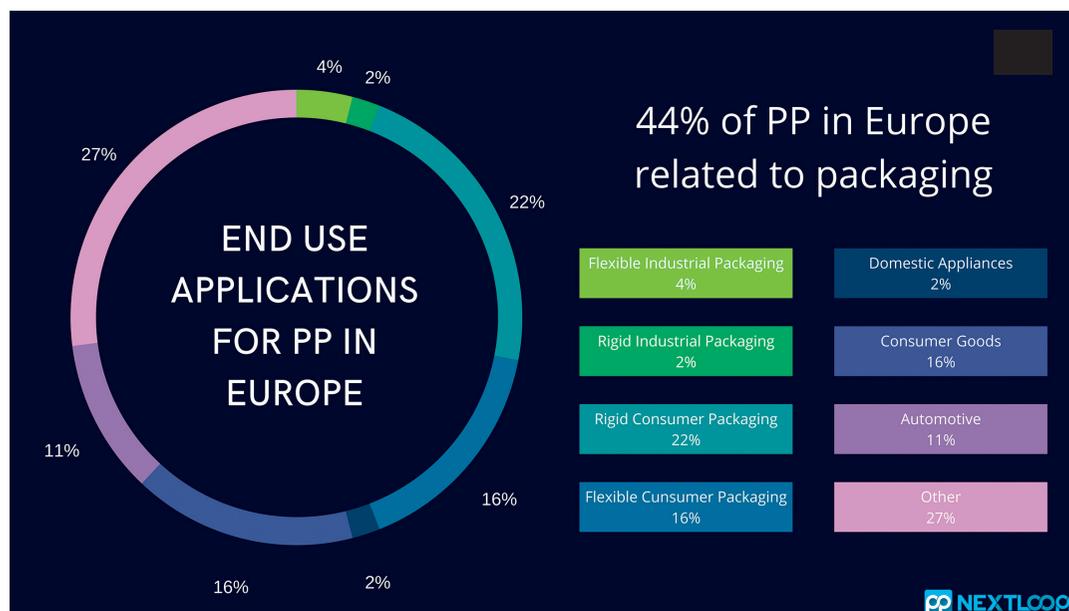
The UK plastics tax that applies to packaging

with less than 30% recycled content, coming into force in April 2022, has certainly been a major incentive. However, there is also a real appetite to face the plastics waste issue head-on and find sustainable, long-term solutions to this crisis.

We only have to check the pledges from global brands to see the commercial world is finally taking plastic waste seriously. From the likes of Unilever, McDonald's and Coca-Cola, which are pledging to make all their plastic packaging reusable, recyclable or compostable, most are heading for 25% recycled content by 2025. The stakes are high but, in truth, there is no other solution. All eyes are on plastic.

PP is a fantastic polymer resource that is currently going to landfill or being reused where other lesser polymers would suffice. It is a waste of precious energy to produce virgin PP when we have the ability to efficiently identify, sort, decontaminate and recycle the current PTT that is being produced.

The burning question is why continue to inundate our environment with more plastic when we have the fundamental technologies to finally close the loop on PP? We simply cannot afford to ignore the imperatives of tackling waste today.



FEATURES

Nextloopp's goal is to establish a supply chain model for the collection, sorting and reprocessing of food-grade PP packaging. From there we aim to manufacture high-quality and food-grade rPP efficiently. During the next 24 months, we will shift from pilot to large-scale operations to eventually create rPP that can be used across a wide range of applications and products that meet recycled packaging targets.

Nextek already has the cutting-edge technologies required to decontaminate and sort. These are plug-and-play ready and can be easily implemented in most recycling plants. The sorting technology alone is poised to transform the way recycling is managed because it has the potential to identify and sort all waste rapidly, efficiently and at very high purity.

The next key steps towards producing food-grade rPP for consumer products require establishing European Food Safety Authority and US Food and Drug Administration certification for the manufacturing processes. The Nextloopp multi-client project aims to develop new food-grade recycling guidelines for brand owners, retailers and converters. There will be no middle measures so that the loop for PP gets better with future cycles.

There is an opportunity to enhance the cur-



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rent recycling and decontamination processes to boost economic efficiency and reduce costs, and mechanical recycling makes perfect sense to achieve this.

Certainly there have been a few raised eyebrows when it comes to opting for this rather than chemical recycling. But I believe there is little point in spending millions of pounds on chemical recycling plants that use significant amounts of energy only to turn plastic back into its original hydrocarbon building blocks, convert this to the monomer, which is not so easy, then purify to very high levels and repolymerise back to the polymer.

We still want to use plastic because it is an excellent product, but we need to manage it

better and mechanical recycling is the perfect low-cost, highly efficient solution for PP packaging.

Following on from Nextloopp's recent virtual launch, we have seen a surge of interest from retailers and global brands, to converters, recyclers and resin manufacturers. We are currently having in-depth discussions with interested parties to be part of this exciting project. At this early stage we have also received many expressions of interest from numerous businesses and a number of leading universities from around the world, which will definitely be taking part.

Interest in the project has come from a number of sectors, including the cosmetics industry and fast-moving consumer goods, which will be able to apply for innovation funding as well as supporting the Nextloopp multi-client project.

Creating and then closing the loop on food-grade PP has taken eight years of intense research and commercial trials. Now we are poised to finally close the loop in the circularity of PP and we are very much looking forward to this next stage. ♻️

● Professor Edward Kosior is managing director of Nextek

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