

### THE FUTURE OF FOOD PACKAGING

There are 8.3 billion tons of plastics in the world -6.3 billion tons are trash. Plastic represents 44% of the global packaging consumption. Its production started in the 50s and has been exponentially growing for the past seven decades, under the moto "Plastic is Fantastic". Yet, in 2020, there was a sudden change. The plastic production started to go down. The decrease was mostly coming from the European market.

**INDUSTRY** 

We became aware that the use of plastic is hurtful to our planet. As the value proposition of plastic cannot be easily replicated, we are looking for alternatives to improve its circularity and replacing part of it with easier to recycle materials such as glass, aluminum and paper. New bioplastics are also seeing the light of day.

What will be the future of packaging? How will we achieve shifting to more ecological solution? Which solutions are the most credible ones?

## TOWARDS PLASTIC CIRCULARITY

As plastic has become a central material for packaging and as it is hard to replace, the most straightforward option would be to improve its circularity. By redesigning and rethinking packages in the first place, they could be easier to collect and recycle.

In 2020, 10.2Mt of plastic were sent to recycling facilities globally. Yet, 93% of the global polymer demand is virgin plastic. The rest are mostly plastics recycled mechanically. The process of mechanical recycling itself does not suffice a total shift into circularity, as it is more expensive than virgin plastic while having fewer applications.

To compensate for this lack of efficiency, the industry has been investing in molecular recycling, also known as advanced recycling. This method is commonly breaking down and purifying plastic waste to make it odorless, colorless and deprived of contaminants. In other words, advanced recycling is looking for a solution to make a virgin-like resin. The process is achieved by using chemicals, pyrolysis or other nonchemical substitutes. The use of advanced recycling is expected to grow to become up to 10% of the annual plastic use by 2040. Yet, one question mark remains. Is advanced recycling really sustainable? This process can be very consuming in terms of energy or very polluting in terms of chemicals used in the process. In the following years, the sector will require a considerable investment and its sustainability would have to be evaluated.

### SUBSTITUTES TO PLASTIC: THE OUTSIDERS

While the plastic industry struggles to close its circularity loop, three other sustainable options are available in the packaging industry: glass, aluminum and paper.

Unlike plastic which is a pretty young invention in the history of humankind, glass has been found centuries ago. The first hollow glass container has been created by the Egyptians in 1500 B.C. Its use was highly democratized during the Roman Empire, with the invention of the blowpipe. It was the beginning of glass as we know it today. Glass is a simple material, yet it has many great properties. It is infinitely recyclable without loss of material, it is odorless and thus infinitely reusable. Its circularity loop has been closed long ago. In the end of the 19th century, the first milk glass bottle was patented and along with it emerged milkmen.

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They would come to one's door, bring fresh milk in the morning and take empty bottles to reuse. It was a simple circular economy. We actually stopped using this closed loop with the apparition of refrigerators in the 30s. It is only now that we are getting back to its simplicity with the apparition of bulk stores. Glass still has a significant share in the packaging industry with a market size of over USD 50bn.

While glass is often seen as a viable sustainable option, its recycling is more expensive and less ecological than the one of aluminum. Due to the weight of glass, emissions of transporting and cooling cans are 35% to 49% lower than the one of glass bottles. For this reason, since the 80s, the secondary market of recycled aluminum has been growing. As a result, almost 75% of aluminum ever produced globally is still in use today. Aluminum cans on the market today contain 73% of recycled content, which is 12 times more than PET and 3 times more than glass.

The market of aluminum has a value over USD 50bn. With growth at a CAGR of 4.4%, aluminum is a sustainable option which is getting more and more adopted by final consumers.

Paper is also a good sustainable option. It can be recycled 5 to 7 times. In the US, the recycling rate is 68%. Yet, unlike aluminum, paper is not infinitely reusable; we will always need more raw material to provide resources. The Pulp and Paper industry is also known to have a high water consumption. To produce one sheet of A4 paper, the industry requires 20 liters of water. The overall paper market is expected to grow at a low to mid-single digit CAGR. Still, paper appears as a more sustainable option than plastic. Its market share in the packaging sector is increasing, as we see more and more brands switching from plastic to paper bags and wrapping paper. Danone Waters targets to eliminate the use of virgin plastic from its packaging. To do so, they introduced Combismile, a paper bottle of Swiss leader SIG Combibloc.



Source: SIG Combibloc & Danone

# BIO-PLASTIC, THE NEW COMER

On the other side of classic materials, new comers re-invented plastic in a more sustainable way, to create bio-plastic. There are two main attributes to bio-polymers making them greener than their conventional alternative: bio-sourcing and bio-degradability. The total capacity of the market to this date is 2.42Mt and almost half of it is in Asia. 1/3 of the bio-polymers are bio-sourced, but not bio-degradable, and 2/3 are biodegradable.

Bio-sourced polymer manufacturing requires any type of carbon source. Nowadays, the first sources are crops and oils, which makes it attached to a commodity-type cost variation. While some bio-polymers source from food supplies, others can be produced using industrial waste or crop scraps, avoiding the issue of using food that is suitable for humans or animals. The next generation, which is until now a bit of a science-fiction, will be directly made from carbon molecules.





Today, the most commonly produced biopolymers are PLA and PBAT. Their production cost is competitive, but their price is kept higher than the one of traditional polymers. PBAT is a fossil-sourced bio-degradable soft plastic. PLA is a rigid plastic resembling PET.

The market of PLA is capital intensive; therefore, it is mainly composed of big players, who nowadays have no interest in growing outside of the food segment, in order to secure a high price. Bio-degradable plastics should be used only where they make sense and where they add value. Still, for the final consumers, a confusion remains. What does bio-degradable mean? Some polymers, such as PLA, require industrial composting. They need high temperature to degrade, while others, like PBAT, can biocompost. They can be left in soil and degrade in less than a year.

The downside of bio-polymers is that when they are mixed with other recyclable polymers, they make the recycling process more complicated. Throughout the following years, countries will have to legislate highly on which polymer has to be used for which product and educate the population to recycle their plastics properly to make a difference.

In the end, maybe the future of packaging will be no packaging at all. As the growing production of plastic is not sustainable anymore, the trend is to going back to fundamentals, and to simpler circular routes. And who knows, maybe someday milkman will knock at our doors again.



Source: Just Water



Source: Ball Corp



#### Investment team

Two portfolio managers with extensive investment experience in equities specialized in the food sector.



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