



# ACATIS FAIR VALUE SPECIAL

02/2023

## CARBIOS – the revolution in plastic recycling

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Plastics have become ubiquitous. They are light, insulating, hygienic, water-tight and malleable, which means that they can be used in many different application areas. However, the biggest disadvantage from a sustainability point of view is the very slow degradation process of the materials, which leads to a lot of pollution globally. How to find the balance between demand and sustainability?

Carbios, founded in 2011 and based in Clerrmont-Ferrand (France), is a company for green chemicals, which specialises in the development of enzymatic processes designed to change or reduce the life cycle of polymers (plastics and textiles). Carbios processes are based on the use of enzymes from natural micro-organisms, which are capable of breaking down plastic. Recently, the company formed a consortium together with well-known sporting goods manufacturers, and it announced that it would develop an enzymatic process for recycling plastic textiles.

Carbios is currently building a pilot plant to demonstrate that the recycling process it has developed also works in industrial volumes. This means that Carbios is one of the world's first companies to make an important step towards a fully circular economy in the plastics segment. It is a milestone when we consider that right now, only 20% of the elaborately sorted "Yellow Bags" are actually recycled. Germany is already a "world champion" in this field. The rest is incinerated (in the best case scenario), which means that industry also loses an important and now also

expensive raw material.

In December 2022, fund management visited the company to see how this process works. Carbios uses white genetic engineering to develop its own enzymes that break down e.g. PET bottles and textile waste into their basic components (monomers), so they can be re-used for the production of 100% recycled and recyclable PET. The production buildings contain huge reactors that reach all the way to the ceiling. They are used to mix shredded and porous PET plastic with water and enzymes. After 24 hours at a temperature of only 65 degrees Celsius, the enzymes break down the long polymer chains into individual monomers. Once these are isolated from the remaining materials, they can be used directly for the production of packaging or bottles that have the same quality as the initial products at only 4% of the cost. With conventional recycling methods, the quality of the plastic deteriorates with each recycling round, to the point where it becomes unusable after approximately five rounds (after which it is incinerated). The Carbios technology can recycle any PET waste without a loss of quality, and it also does away with the incineration of PET waste, thereby significantly optimising the CO2 balance sheet. In summary, the company's products make an important contribution to SDG 12 "Sustainable consumption and production" and SDG 14 "Life below water". In the future, the technology is also supposed to be used for other plastic types and plastic textiles - a truly revolutionary solution for a more sustainable world!

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