

CARBIOS

ENVIRONMENTAL IMPACT

Achieving PET recyclability remains a significant challenge: only 22% of PET waste is recyclable with current methods, the vast majority of these waste being beverage bottles. Therefore, many packaging widely used in food and cosmetics industries cannot be recycled or are poorly recycled.

CARBIOS' innovative technology enables the recycling of all types of PET waste, including complex waste that is currently non-recyclable or difficult to recycle (such as coloured, opaque, and multi-layered packaging). This first PET biorecycling plant will industrialize CARBIOS' innovative biotechnology, which depolymerizes PET by breaking it down into its original components using a proprietary enzyme. This process efficiently transforms waste with low or no current value into valuable resources. CARBIOS innovation goes beyond making all PET waste recyclable: it moves PET towards circularity.

Indeed, CARBIOS biorecycling technology produces monomers with virgin-like quality avoiding downcycling in PET recycling: food grade packaging (and non-food grade) can be recycled back into food-grade packaging, without the addition of virgin PET. This innovation makes it possible for plastic to be waste-based, even for high-quality applications, reducing reliance on petro-based plastic.

By incorporating PET plastic into the circular economy, this project addresses two major environmental challenges: halting the generation of further plastic pollution (353 million tons of plastic waste are generated each year) and reducing fossil fuel extraction. Over 99% of plastic is made from chemicals sourced from fossil fuels.

Fossil fuels account for over 75% of all greenhouse gas emissions, meaning fossil fuel generated plastics are directly tied to increases in greenhouse gas emissions annually.

CARBIOS conducted studies in 2023 estimating that its technology enzymatic biorecycling of PET would allow a **potential savings of 57% of CO2 emissions compared to the production of virgin PET in Europe** (Ecoinvent), considering the avoidance of a conventional end-of-life (landfill and incineration) for half of the waste entering the process.

As a result, CARBIOS' biorecycling technology significantly lowers environmental impact by promoting sustainable waste management, resource conservation and carbon emission reduction.

PROJECT OBJECTIVE

The overall objective of building CARBIOS' biorecycling plant is to revolutionize the way PET is recycled, by making it fully circular.

The plant will process 50,000 tons of prepared PET waste per year, equivalent to 2 billion bottles or 300 million T-shirts. This initiative was chosen for its strategic relevance to CARBIOS, aligning with our commitment to sustainability and innovation.

It was even more important to launch the construction of the 1st biorecycling plant for PET as EU regulations is about to increase the demand for food-grade rPET. Single-use plastic directive (SUP) makes it mandatory for beverage bottles to incorporate 25% of recycled content and 30% by 2030. Availability of complementary technology to mechanical recycling is mandatory to reach those targets.