BIOreact

PROBLEM

The massive use of plastic materials in recent decades has caused a serious environmental pollution problem, with few natural habitats unaffected by plastic pollution.

To alleviate and solve this problem, so-called biodegradable plastics have been developed, which are plastic materials capable of biodegrading in different media, whether in composting conditions, in soil, or in other media. PLA is one of the biodegradable plastics that has seen the greatest growth in recent years and can be found on the market in practical plastic applications such as cutlery, plates, cups, bags, films, fresh fruit and vegetable packaging or bottles.

Bioplastics account for only 1% of the more than 368 million tonnes of plastic produced annually. But their demand is increasing, and with more biopolymers, applications and products emerging, the bioplastics market is continuously growing and diversifying.

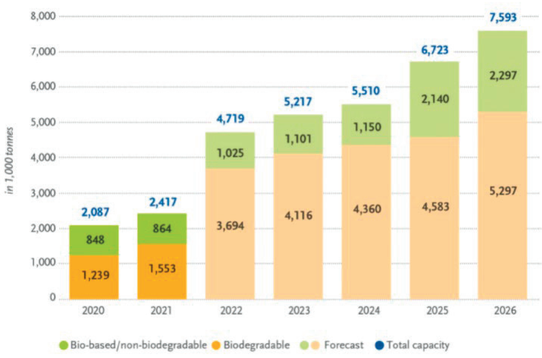

Figure 1. Current bioplastics production capacity (2020 and 2021) and growth expectations up to 2026 (European Bioplastics)

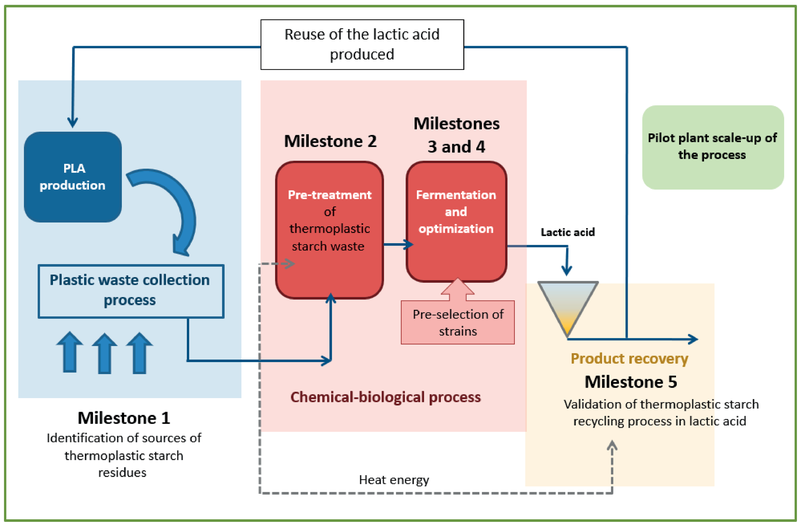

Figure 2. Flow chart of the activities to be carried out in the project

The project therefore brings a great innovation to both the state of the art and the market and opens the door to the possibility of closing the cycle by reconverting waste into value-added products that would enter again as raw materials for the production of new bioplastics.

MAIN OBJECTIVE

To boost the circular economy in the biopolymers sector, through innovation in the treatment of polymeric starch-based plastic waste in order to increase its recycling and recovery rates in a cost-effective way, obtaining recycled materials of higher quality and economic value, thus achieving a more sustainable model

Specifically, the aim is to make a material recovery of this waste by transforming it into a high added value product in great demand in the plastics sector, such as lactic acid, which is one of the possible monomers used for the production of **polylactic acid (PLA)**

In this context, the use of bioplastics is growing enormously

The growth in the production and use of these bioplastics must be accompanied by methods of recycling as well as effective recovery alternatives

PLA can largely substitute other polymers. Therefore, its demand has increased to the point where it is far higher than the available supply on the market today. The substitution of fossil-based polymers by PLA is limited by its availability and accessibility on the market.

Thanks to the development of technologies that allow the recycling of **plastic starch waste for its transformation into lactic acid**, the factors that hinder the growth of the process would be reduced, since the product obtained could be reused as **raw material** for the **production of PLA**, reducing the costs of both PLA and closing the cycle, which would contribute to the circular economy approach. Additionally, it would be a **PLA produced from waste**, which, from an environmental point of view, would further reduce its initial impact, minimizing its carbon footprint.

GENERALITAT VALENCIANA
AVI AGÈNCIA VALENCIANA DE LA INNOVACIÓ
UNIÓN EUROPEA
Fondo Europeo de Desarrollo Regional
Una manera de hacer Europa
AIMPLAS