

nenu²PHAr

A European project

TO REDUCE THE ENVIRONMENTAL IMPACT OF PLASTIC

Over the last 20 years, the global consumption of plastic has continued to increase, while these materials are difficult to recycle, generate microplastics when they are released in the environment and thus constitute a real danger for biodiversity.

In order to fight against their impact on the environment, single-use plastic products are gradually banned by 2040, particularly since the adoption of the European Directive on Single-Use Plastics. Adopted in 2019, this directive is implemented in France through the AGEC law (Anti-Waste for a Circular Economy) which will prohibit the production of single-use plastic packaging by 2040.

To achieve this, reduction, reuse and recycling targets are set by decree and research initiatives have emerged to develop new plastics.

* A biobased product is made from material derived from living organisms (source: Ademe).

6,4 M €
Total cost

42
MONTHS
September 2020
February 2024

17
EUROPEAN
companies

In this context, the Nenu²PHAr research project is born and consists in developing a new competitive and sustainable value chain of biobased plastic* based on PHAs.

What is PHA?

PHAs are a range of polymers produced by bacteria which accumulate them as reserve molecules.

PHAs are obtained from substrates such as sugars or oils, and thus capture CO₂ via photosynthesis linked to the growth of the biosources from which the substrates are derived.

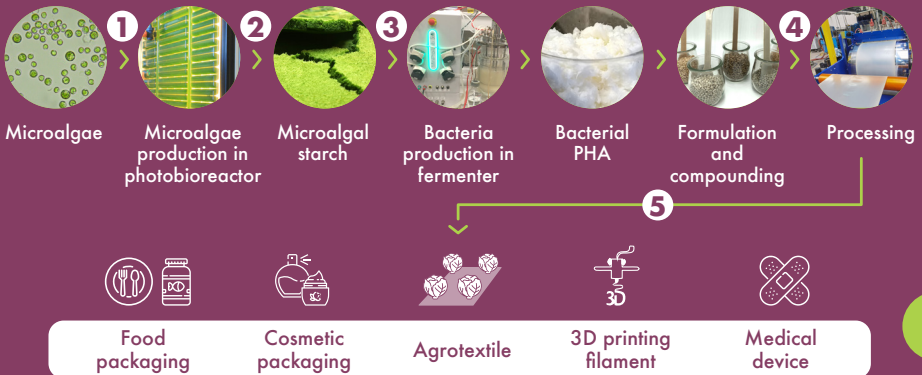
These groups of polymers are biodegradable (depending on the degradation conditions), represent a renewable resource and alternative to petrobased plastics and have a lower impact on the environment.

Project's objectives

Thanks to the support of the European Union and for 4 years, 17 European companies and research organizations are working together to:

- Reduce the cost of production of PHA in order to competitively meet the needs of plastic product manufacturers in Europe.
- Improve the sustainability of PHA materials through improved efficiency of the production process.
- Develop a range of eco-designed products for single-use applications (food and cosmetics packaging) or applications that are hard to recycle due to their multi-layer composition or their collection (3D printing filament, textiles for agriculture and medicine).
- Raise awareness among stakeholders and consumers about bio-based plastics, in order to accelerate social acceptance.

How does it work?



- 1** Microalgae are first extracted from the marine environment as the main material.
- 2** They are cultivated with sunlight and CO₂ to obtain starch, necessary for the production of PHA.
- 3** This starch is then transformed into PHA by bacteria in fermenters.
- 4** This biodegradable polyester is formulated to be transformed into granules of plastic material.
- 5** Finally, this synthetic plastic is processed into new everyday items such as packaging for cosmetics or food, 3D printing filament or textiles for medicine or agriculture. Their end of life is studied according to different scenarios (industrial or domestic compostability, biodegradability in sea water, mechanical or chemical recycling).

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