

# BIOnTop

Novel packaging films and textiles with tailored end of life and performance based on bio-based copolymers and coatings

## Summary

A significant proportion of used plastics – in some countries more than two-thirds – is either incinerated or sent to landfill; with only a small proportion recycled. If the EU is to realise its ambitions of delivering a genuinely circular economy, this needs to change.

BIOnTop will develop a range of complementary bio-plastics and coatings, where possible derived from readily-available agro-food by-products, with improved biodegradability properties. It will validate these bioplastics, coatings and biocomposites for use in food and personal care packaging and determine their potential environmental impact and economic feasibility compared with existing products.

In addition, it will recommend relevant applications for these new bio-based products taking into account the growing consumer and end user demand for more sustainable packaging. It will approach this by reaching out to, consulting with and encouraging an exchange of knowledge with, stakeholders throughout the bio-based value chain.

### Type of Action:

Research & Innovation Action

**Value Chain:** VC4 – organic waste

**Start date:** 01 June 2019

**End date:** 31 May 2023

**BBI JU contribution:** € 4,219,696.74

## Objectives

With only around 30 percent of plastics currently being recycled, it is clear, if the EU wants to meet its circular economy ambitions, that this level need to increase significantly. The BIOnTOP project seeks to improve this by helping deliver novel bio-based biodegradable packaging that continues to protect products while using more than 85 percent renewable resources, thus conserving natural resources.

Specifically, BIOnTop aims to:

- Develop ‘recyclable-by-design’ cost-competitive packaging that can be mechanically recycled or industrially/domestically composted, reducing levels of waste plastics.
- Source the raw materials for its bio-based plastics locally, renewably and sustainably.
- Provide improved ‘End of Life’ options, such as materials and organic recycling, home and industrial composting and biogas production, reducing the levels of waste

## Expected impacts

BIOnTop aims to deliver the following impacts. It will:

- Establish a new bio-cluster connection and intensify a further four connections, in the bioplastics, packaging, agri-food, personal care and textile sectors.
- Create three new stable and effective value chains by both creating new interconnections upstream of the current value chain and by remodelling existing value chains to substitute fossil-derived manufacturing with bio-plastics.
- Develop two biopolymer-based innovations that will be used to create a number of consumer-oriented products such as packaging and wrapping.
- Develop and validate two novel approaches; one to obtain copolymerisation, focusing on developing novel, lower-cost bio-copolymers; the other will focus on fatty acid grafting that will coat bio-based films to improve their water-

incinerated or sent to landfill.

- Develop a specific monitoring device that will ensure materials are correctly sorted for either organic or mechanical recycling.
- Evaluate and model the planned biodegradation in different environments and demonstrate the environmental and economic sustainability of the compounds and products being developed.

- resistance and ease of emptying.
- Minimise the environmental footprint of the packaging materials by developing 'sustainable-by-design' approaches that better suit biodegradability and recycling demands.
- Reduce the overall cost of the end-of-life burden of the packaging products by making materials suited to waste and mechanical recyclability, industrial compostability or biogasification.



## Project coordination

- Aimplas - Asociación de Investigación de Materiales Plásticos y Conexas (Spain)
- Consorzio Interuniversitario Nazionale per la Scienza e Tecnologia Dei Materiali (Italy)
- Centre Scientifique & Technique de l'Industrie Textile Belge (Belgium)
- Fachhochschule Albstadt-Sigmaringen (Germany)
- European Bioplastics EV (Germany)
- Total Corbion Pla BV (Netherlands)
- Planet Bioplastics SRL (Italy)
- Bio-Mi Društvo S Ogranicenom Odgovornoscu Za Proizvodnju, Istrazivanje i Razvoj (Croatia)
- Emsur MacDonell SA (Spain)
- Cristóbal Meseguer SA (Spain)
- Silon SRO (Czech Republic)
- Sioen Industries NV (Belgium)
- Wearebio OU (Estonia)
- Queserías Entrepinares SA (Spain)
- Ubesol SL (Spain)
- Organic Waste Systems NV (Belgium)
- Romei SRL (Italy)
- Iris Technology Solutions, Sociedad Limitada (Spain)
- Aboratori Archa SRL (Italy)
- Enco SRL (Italy)
- Movimento Consumatori (Italy)

**Organisation name:** Aimplas - Asociación de Investigación de Materiales Plásticos y Conexas (Spain)