

Excellence in Plastics



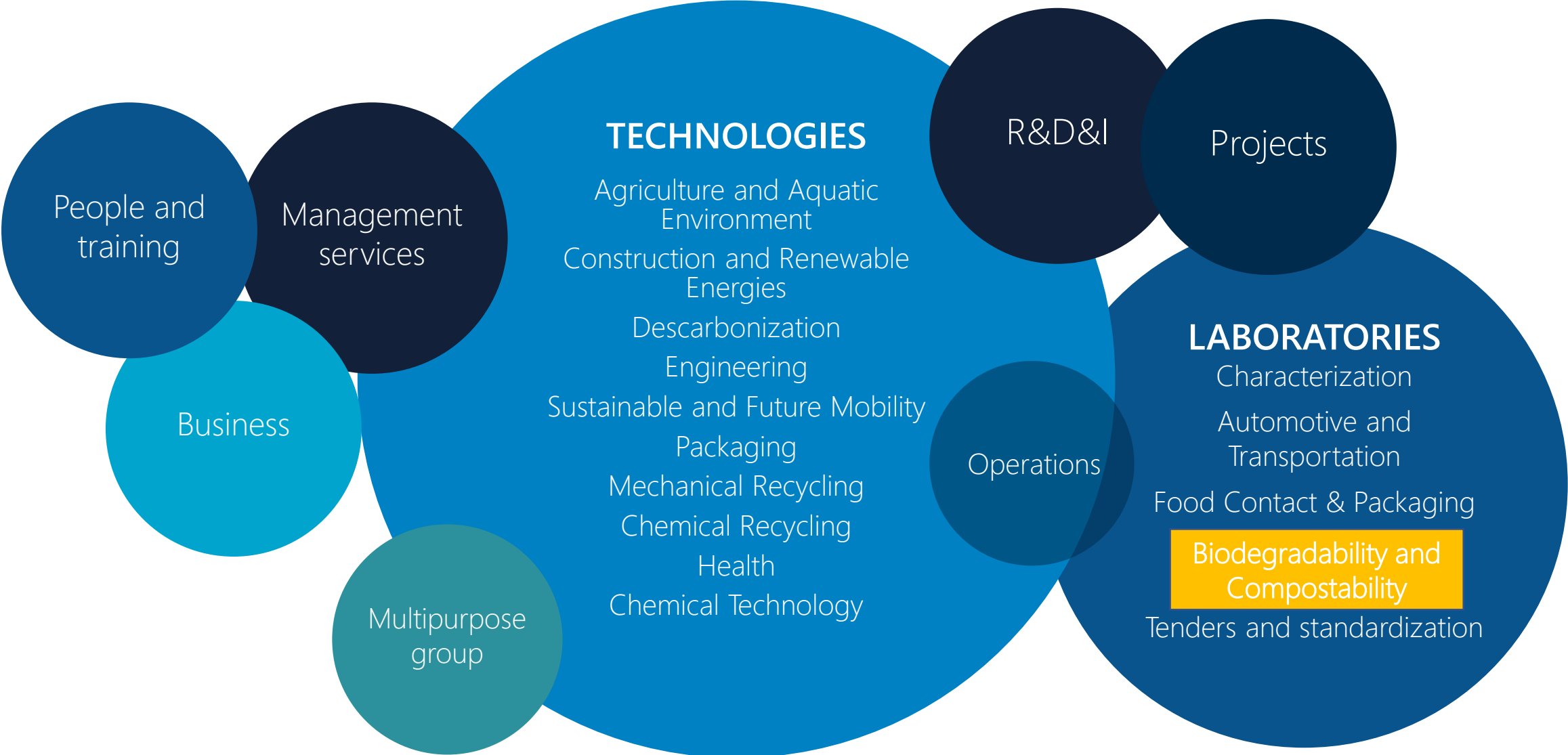
JUNE 2021



What is AIMPLAS?

A **technology centre** with more than 30 years' experience in the plastic sector.

Comprehensive management to provide global solutions



End-of-life for bioplastics: Global vision and key aspects

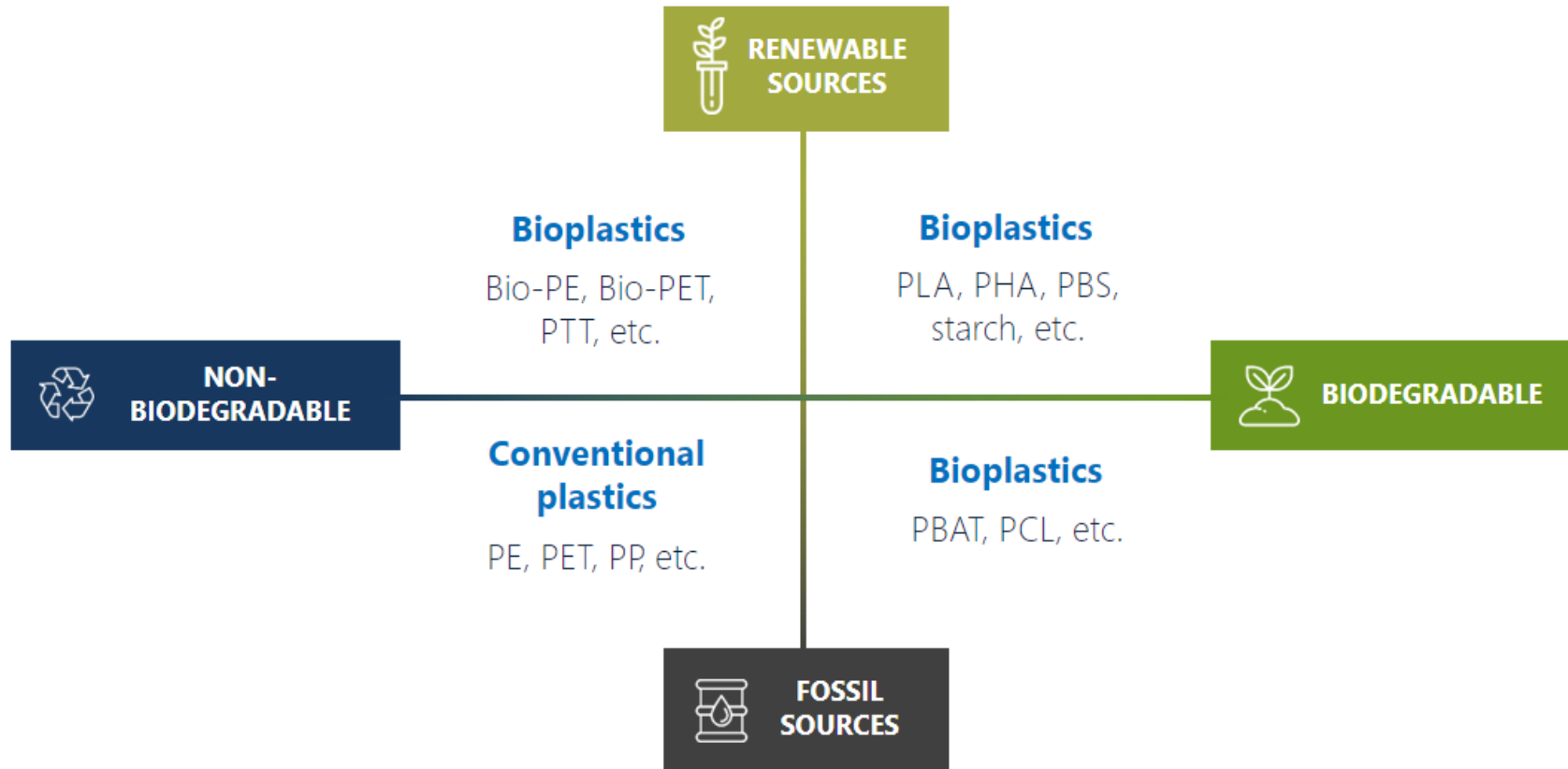
Biodegradation & Compostability Laboratory Group Leader · AIMPLAS

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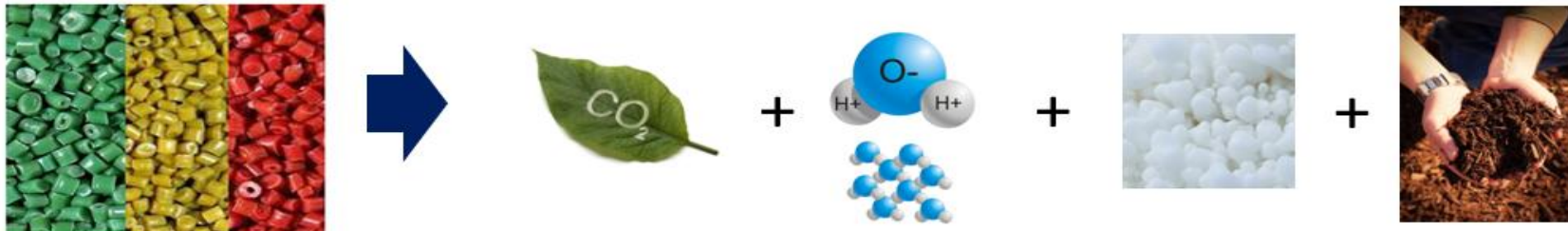
Introduction

What are bioplastics?

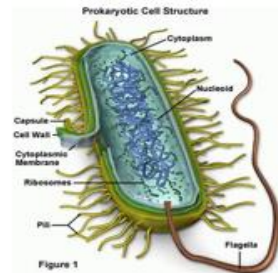


Introduction

What is meant by biodegradable plastic?



Who?



Where?



ASTM: plastic capable of being **degraded** by the action of **microorganisms** existing in the **environment naturally** such as bacteria, fungi and / or algae.

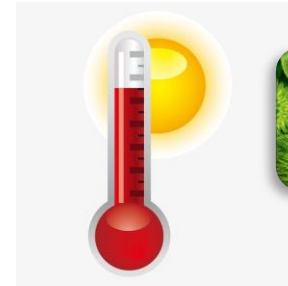
Introduction

What is meant by biodegradable plastic?



Industrial
compost

Aerobic
conditions



Home
compost



Aqueous
/Marine



Soil

Introduction

What is a compostable plastic?

ASTM & ISO: Biologically degradable plastic during the **composting process** resulting in the formation of carbon dioxide, water, inorganic compounds and biomass at a rate similar to that of other known compostable materials, and **without the generation of visually distinguishable and toxic waste**.



What is a composting process?

Process of **decomposition** of organic waste by the action of **microorganisms** in the presence of **oxygen**.



Compost is obtained, a natural fertilizer useful in agriculture, gardening, public works or restoration of natural spaces.

Regulation: Compostability study



EN 13432:2000 (UNE-EN 13432:2001). REQUIREMENTS FOR PACKAGING RECOVERABLE THROUGH COMPOSTING AND BIODEGRADATION. TEST SCHEME AND EVALUATION CRITERIA FOR THE FINAL ACCEPTANCE OF PACKAGING



EN 14995:2006 (UNE-EN ISO 14995:2007). Plastics - Evaluation of compostability - Test scheme and specifications.



ISO 17088:2012. Specifications for compostable plastics



ASTM D 6400-12. Specification for Labeling of Plastics Designed to be Aerobically Composted in Municipal or Industrial Facilities

Regulations and laboratory studies: Packaging

EN 13432:2001

REQUIREMENTS FOR PACKAGING
RECOVERABLE THROUGH
COMPOSTING AND
BIODEGRADATION. TEST SCHEME
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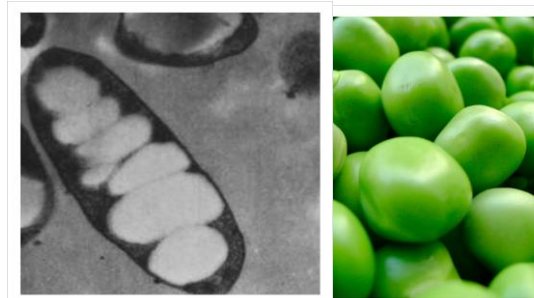
T = 58° C

Bacteria and fungi
90 %, 6 months



T = 25 °C

Fungi and bacteria
90 %, 12 months



Chemical characterization

Identification of the sample (**FTIR**)

Volatile solids **>50%**

Heavy metals and fluorine content

Biodegradability

Compost

90% biodegradation

6 months

Disintegration quantitative and/or qualitative

ISO 16929 → Pilot scale

ISO 20200 → Lab scale

**Material larger than 2 mm should be < 10%
after 3 months**

Ecotoxicity

Physical-chemical analysis of the final compost.
Study of **eco-toxicological effects in higher
plants.**

90% germination and biomass production

Regulations and laboratory studies: Mulch films

EN 17033:2018

Plastics - Biodegradable mulch films for use in agriculture and horticulture - Requirements and test methods

Chemical characterization

Volatile solids **>60%**

Heavy metals, fluorine content and other substances

Disintegration quantitative and/or qualitative

-

Biodegradation in soil

Soil

90% biodegradation

6 months → 2 years

Ecotoxicity

Physical-chemical analysis of the final compost.

Study of **eco-toxicological effects in higher plants** → **90%** germination and biomass production

Invertebrates: observed difference in mortality and biomass of adult earthworms between a soil exposed to the test material and a virgin soil must be less than 10%.

Microbial potential activity



¡Thank you!

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