5° Internal Workshop on «Bio-plastic Innovations»

Marco Scatto

(MIXCYCLING srl)

Co-funded by the European Union

This project has received funding from the European Union's Horizon Europe, grant number 101057765. This includes funds from the UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee, grant number 10038028.

UK Research and Innovation

Innovative Bio-Plastic Formulations

Today, there is a bioplastic alternative for almost every conventional plastic material and corresponding application. Bioplastics are plastics that are biobased, biodegradable, or both have the same properties as conventional plastics and, in many cases, even offer additional advantages. This includes a reduced carbon footprint or additional waste management options, such as composting. Bioplastics are an essential part of the bioeconomy and a fast-growing, innovative industry that has the potential to decouple economic growth from resource depletion and environmental impact. Bioplastics are a diverse family of materials with differing properties. There are three main groups:

- Biobased or partially biobased non-biodegradable plastics, such as biobased PE, PP, or PET (so-called drop-ins) and biobased technical performance polymers, such as PTT;

- Plastics that are both biobased and biodegradable, such as PLA and PHA or PBS;

- Plastics that are based on fossil resources and are biodegradable, such as PBAT, PCL.

Co-funded by the European Union

UK Research and Innovation

Fossil based polymer are polymers entirely based in fossil sources, **NOT renawable**

Bio-based materials is focused on non food and feed renewable resources and waste resources such as ligno-cellulosic resources, agricultural waste, food waste, etc.

From European Bioplastics Association:
Biodegradable polymer certified for industrial compostability following EN 13432, can be from renewable resource or from fossil resource.

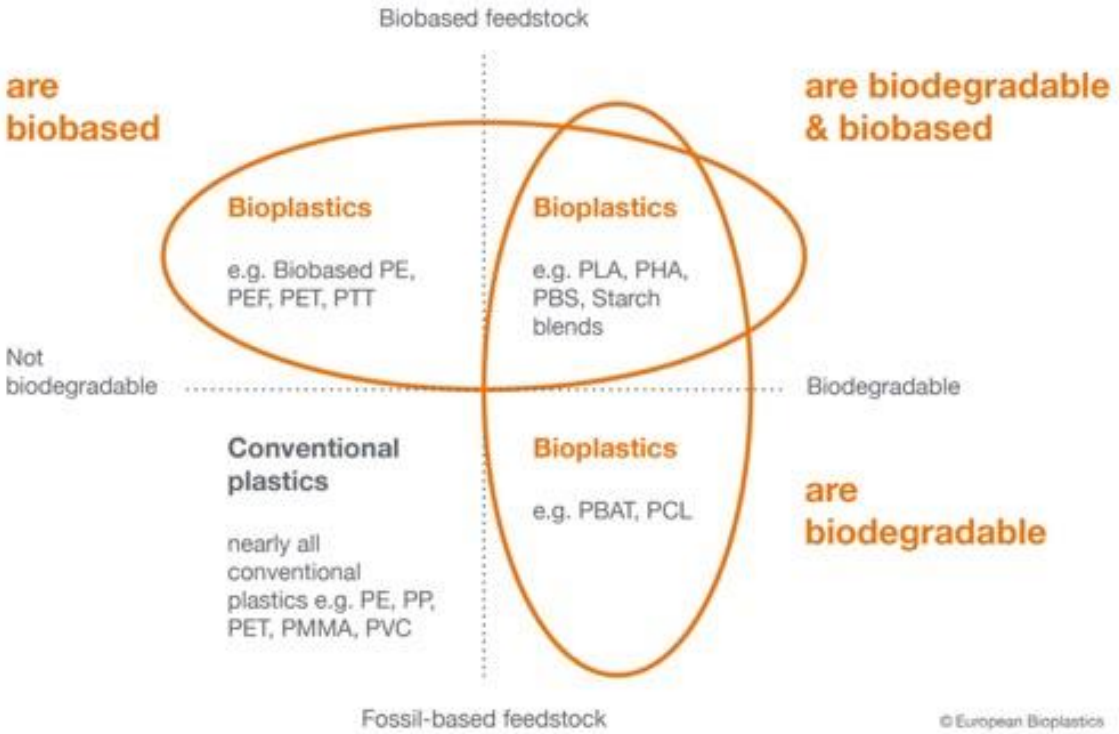
Biobased polymer from renewable resource can be biodegradable or not biodegradable

Co-funded by the European Union

UK Research and Innovation

Material coordinate system for bioplastics

Bioplastics are biobased, biodegradable, or both.



Source: Institute for Bioplastics and Biocomposites (IfBB) and European Bioplastics (EUBP)

Co-funded by the European Union

UK Research and Innovation

- 1 star: 20 – 40 % BCC
- 2 star: 40 – 60 % BCC
- 3 star: 60 – 80 % BCC
- 4 star: > 80 % BCC

OK biobased

TÜV AUSTRIA

Co-funded by the European Union

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or HADEA.
Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

Sustainability and Circularity in Bio-Plastic Manufacturing

Biodegradable polymer jar

Biobased polymer jar

Biobased polymer closure

Biobased – Biodegradable compostable polymer jar

Biobased PET jar

Biobased cosmetic make up packaging

Co-funded by the European Union

UK Research and Innovation

Use of vegetable wastes micronized as filler in biobased polymer

Application in rigid packaging: jar and cap where biopolymer is mixed with waste from cork processing or rice husk

MIXCYCLING APPROACH

MIXCYCLING ORGANIC MATERIAL BLENDS

Co-funded by the European Union

UK Research and Innovation

Sustainability and Circularity in Bio-Plastic Manufacturing

SCRAPS FROM CORK PROCESSING

Cork scraps have various applications, mainly as an insulator or as biomass.
At Mixcycling, these scraps are **recovered and sterilised, processed into microgranules and sanitised** in order to make SUGHERA.
Thanks to the sanitation and activation process, the fibre is free from heavy metals and bacteria, 100% suitable for food contact.

WHERE?

HOW?

Cork is obtained from the bark of a specific type of evergreen oak without killing the tree in the process.

It is considered a fully recyclable fibre because it can be recovered while maintaining intact its mechanical properties.

Opportunely milled and processed, the fibre is recovered to enter new and different production cycles.

SCRAPS FROM RICE PROCESSING

Rice husk has various applications, mainly as litter or as mulch.
At Mixcycling, these scraps are **recovered and sterilised, processed into microgranules and sanitised** in order to make LOLLA.
Thanks to the sanitation and activation process, the fibre is free from heavy metals and bacteria.

WHERE?

HOW?

Rice husk is obtained from local rice production processes, which makes it a km0 resource.

Over 280.000 tons of rice husk are produced in Italy every year: this means that rice husk is an abundant resource the recovery of which contributes to waste reduction.

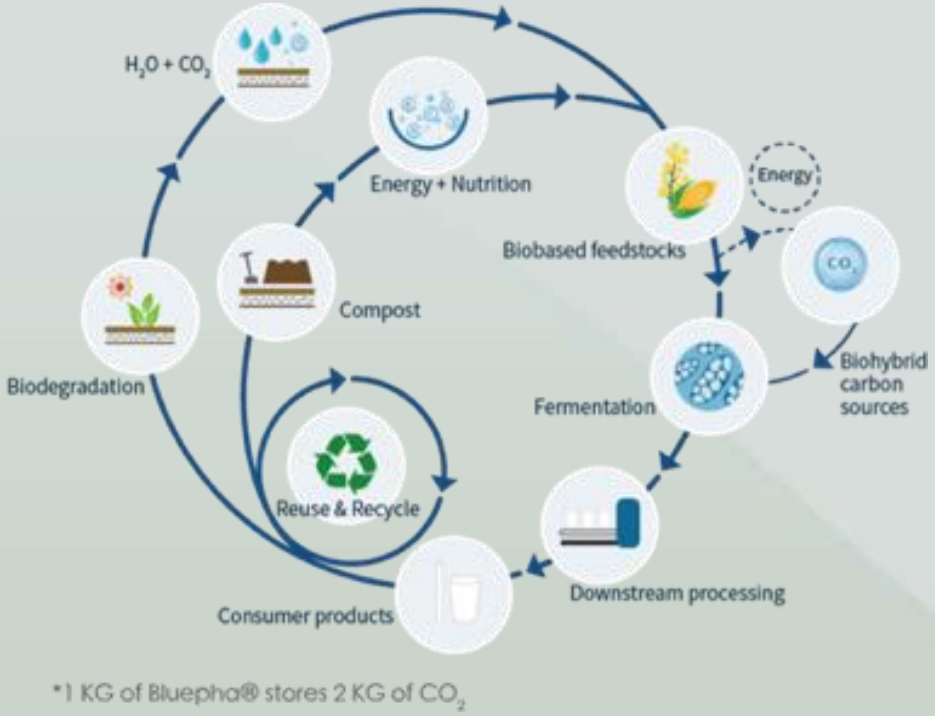
Opportunely milled and processed, the fibre is recovered to enter new and different production cycles.

Co-funded by the European Union

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or HADEA.
Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

Sustainability and Circularity in Bio-Plastic Manufacturing



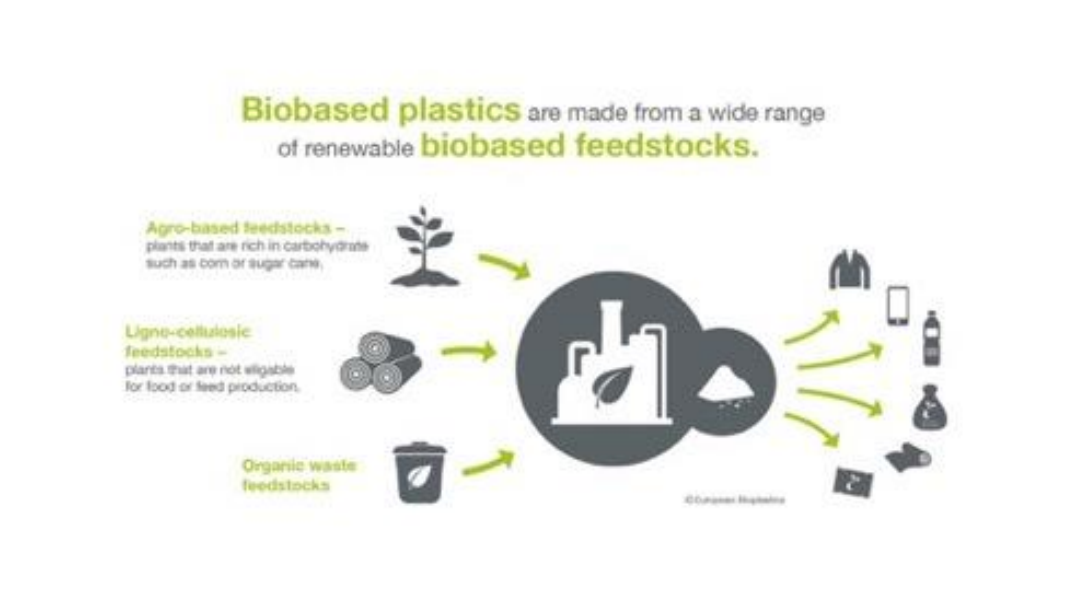
*1 KG of Bluepha® stores 2 KG of CO_2

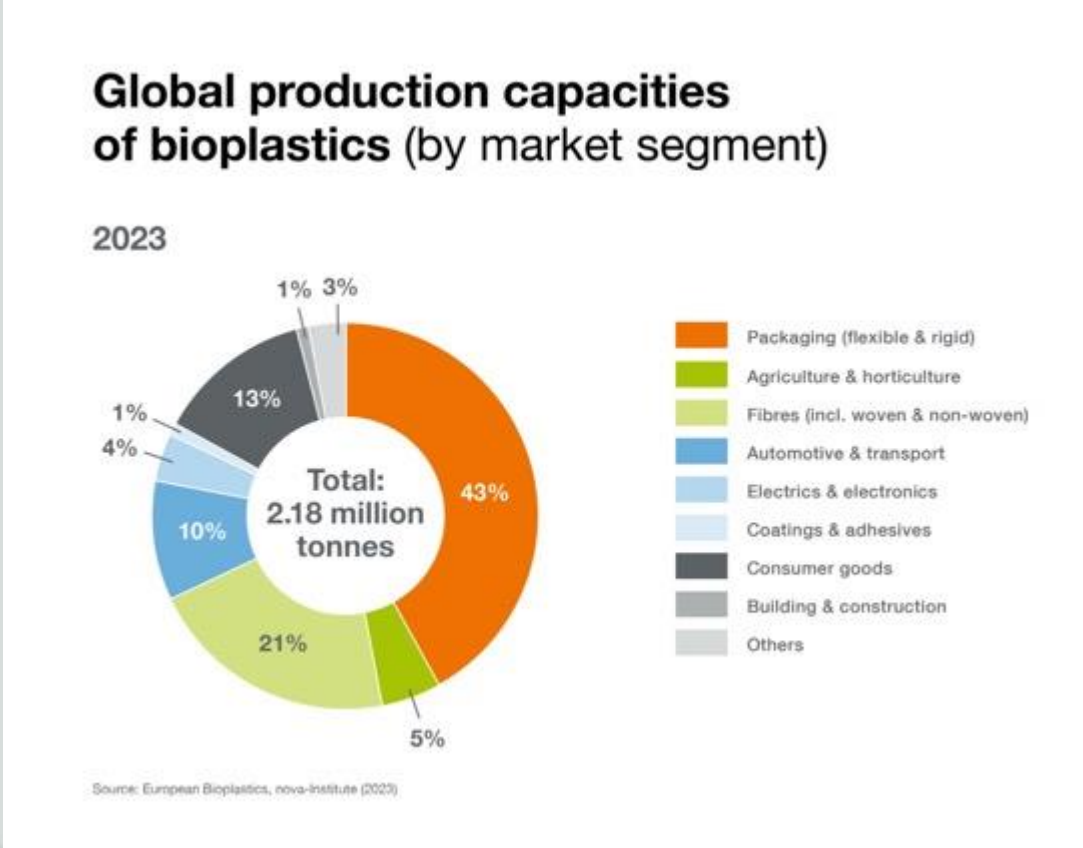
Co-funded by the European Union

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or HADEA.
Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

Applications and Market Trends for Bio-Plastics

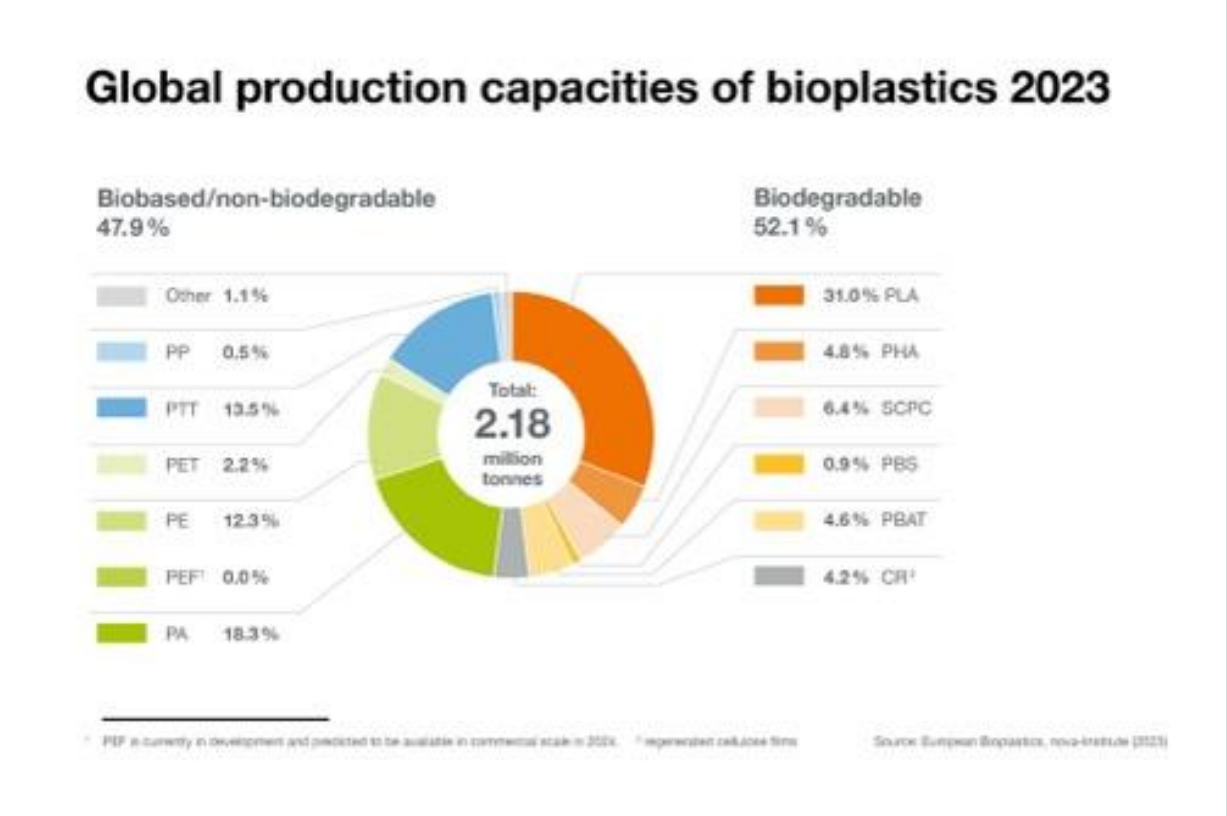




Co-funded by the European Union

UK Research and Innovation

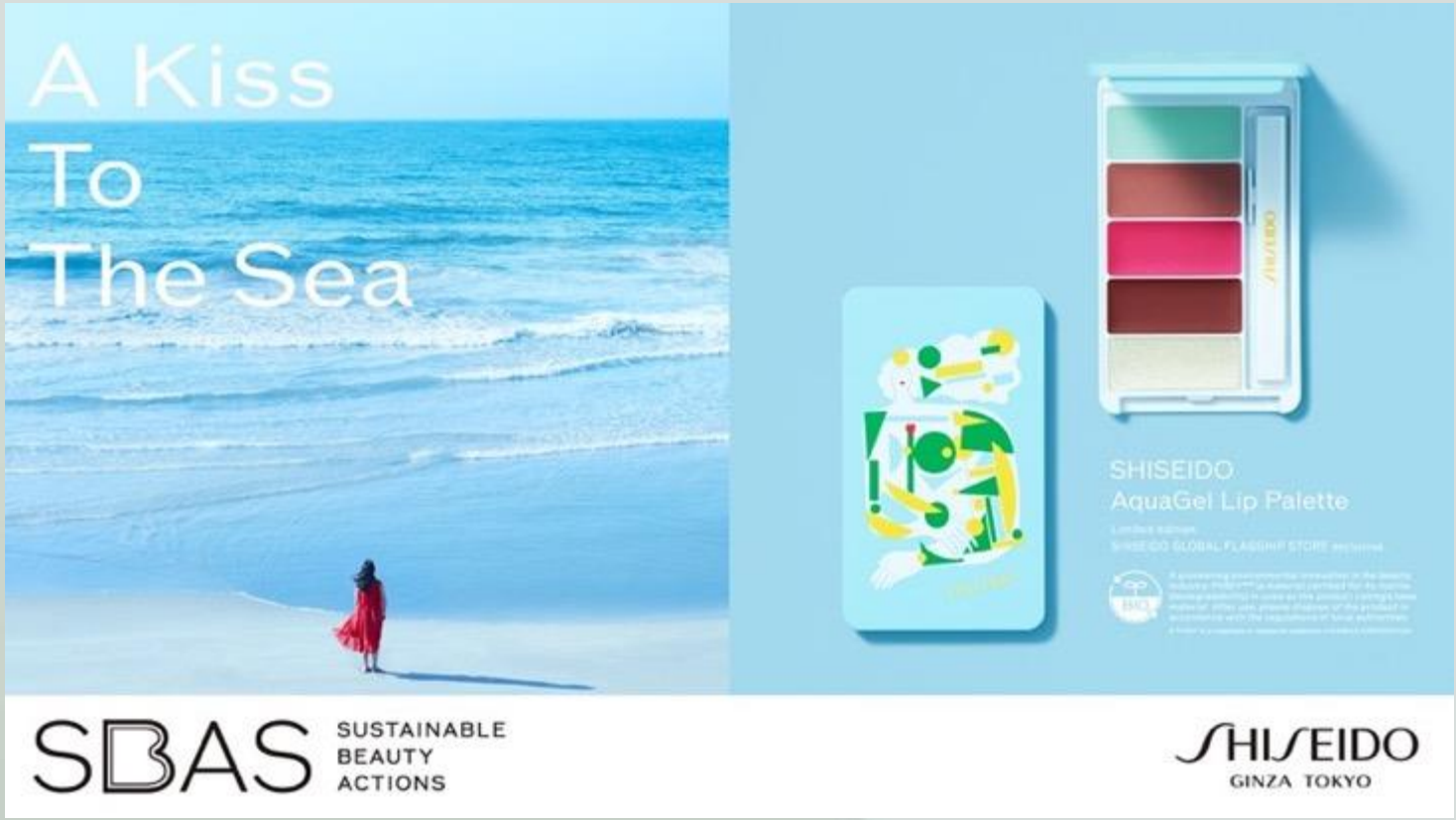
Applications and Market Trends for Bio-Plastics



Co-funded by the European Union

UK Research and Innovation

Applications and Market Trends for Bio-Plastics



Co-funded by the European Union

UK Research and Innovation

How Plastic works to improve Sustainability

Biobased Polymer in Cosmetics

In packaging design, aspects of sustainability, such as reciclability or resource efficiency are becoming increasingly important.

A Bottle made in bioplastics consists of renewable raw materials and secondly it can be recycled using existing recycling systems. (**BioPET and Green PE**)

Co-funded by the European Union

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or HADEA.
Neither the European Union nor the granting authority can be held responsible for them.

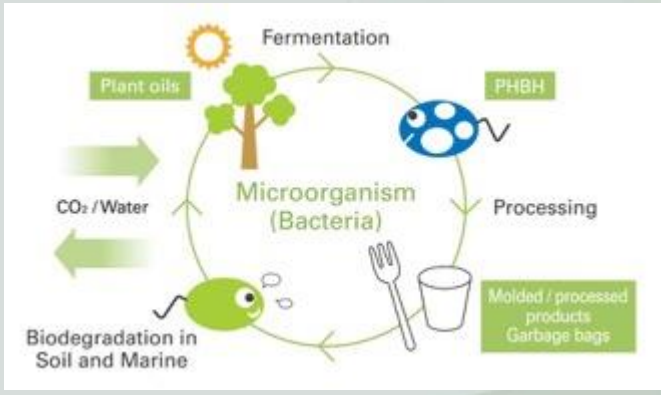
UK Research and Innovation

PHACT™ Marine Biodegradable Polymers:

CJ BIO, a division of South Korea-based CJ CheilJedang, has introduced PHACT® Marine Biodegradable Polymers based on its proprietary polyhydroxyalkanoate (PHA) technology. Being a part of the solution to change the trajectory of the plastic pollution challenge and preserving the planet is the essence of the PHACT brand. PHACT meansPHA + Act and CJ Bio is committed to impactful action delivering eco-friendly solutions with their extensive PHA technology platform. The first product of the new line – PHACT A1000P – is an amorphous PHA being produced at CJ BIO's newly commissioned Pasuruan, Indonesia facility.

Kaneka Green Planet ™ PHBH Marine Biodegradable Polymers

Green Planet™ is a brand name of PHBH(Poly(3-hydroxybutyrate-co-3-hydroxyhexanoate)) developed by Kaneka with similar properties of PP and PE. With two grades 151C (flexible) and X131A (rigid) shows gas barrier properties of PLA, PBS and PBAT.



Co-funded by the European Union

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or HADEA.
Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

THE ESSENTIAL ROLE OF BIOPLASTIC IN NEW PACKAGING AND PACKAGING WASTE REGULATION

Both, **biobased and recycled content help to reduce the environmental impact of plastics and packaging by significantly reducing GHG emissions**. Biobased plastics can feature overall significantly lower carbon footprint during their entire life cycle, and many of them **can be recycled as well, even further lowering GHG emissions**. The Commission's own Communication on 'Sustainable Carbon Cycles' sets out the aspirational objective that at least 20% of the carbon used in chemical and plastic products should be from sustainable non-fossil resources to help reaching climate neutrality.

Not all plastic products and packaging applications can be made from recycled materials, especially when **strict requirements on food safety and consumer health must be met**. Biobased materials are eligible for contact sensitive applications and must comply with all the strict regulations and tests when used as FCM and are a safe and sustainable solution when reuse or recycling are not an option.

Co-funded by the European Union

UK Research and Innovation

GREENLOOP

FOLLOW US!

https://www.linkedin.com/company/horizon-eu-green-loop

https://www.facebook.com/heu.greenloop

https://twitter.com/HEUGreenLoop

Co-funded by the European Union

This project has received funding from the European Union's Horizon Europe, grant number 101057765. This includes funds from the UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee, grant number 10038028.

UK Research and Innovation