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## Welcome to the first CAFIPLA newsletter!

Dear Reader,

We would like to welcome you to the first CAFIPLA newsletter.

In a few words, we will introduce you to our BBI funded project that will unlock the potential of currently un(der)used biogenic waste streams as feedstock for the bio-economy by implementing an innovative and pragmatic approach to biomass pre-treatment.

You are curious how the CAFIPLA concept will be realized?

Enjoy reading our first newsletter and **subscribe** to stay tuned with CAFIPLA news!

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CAFIPLA consortium

This newsletter contains

1. Objectives
2. The CAFIPLA concept
3. Methodology
4. Join our network!
5. Consortium

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## 1. Objectives

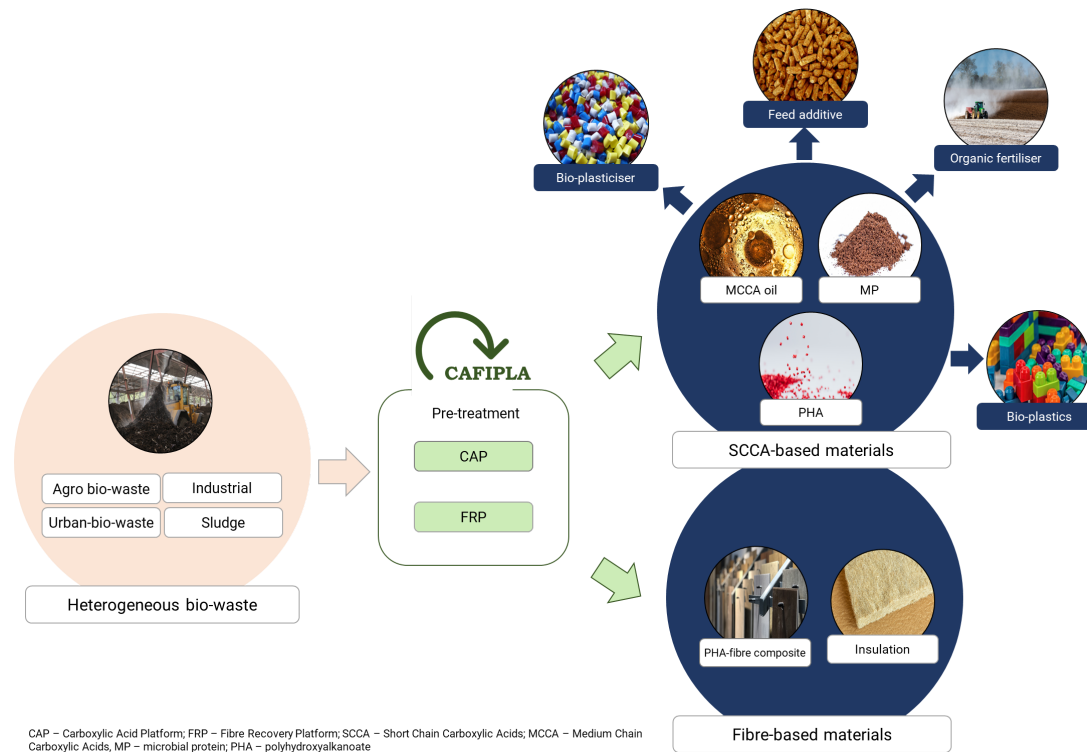
The general objective of CAFIPLA is to develop an **integrated pre-treatment process to convert heterogeneous organic materials to building blocks for the bio-based economy**. This will be achieved by linking a **Carboxylic Acid Platform (CAP)** with a **Fibre Recovery Platform (FRP)**.

The CAP will be optimized to

- steer the hydrolysis process to create a specific carboxylic acid spectrum depending on the target application in the bio-based economy (application flexibility) and/or
- obtaining a constant output quality/spectrum from fluctuating input (input flexibility).

The research in the FRP focuses on

- the implementation of an environmentally friendly process for insoluble fibre extraction using deep eutectic solvents (DES) and
- the provision of fibres for different applications considering differences in feedstock / biomass supply.



## 2. The CAFIPLA concept

The overall concept is to optimize, integrate and demonstrate **two platform pre-treatment technologies (CAP and FRP) in a TRL 5 demonstration** unit using a mixture of regionally available, mixed organic waste streams.

The main element of the CAFIPLA pre-treatment scheme is the initial mechanical separation of fibrous biomass and soft biomass (easily biodegradable biomass).

For each biomass type, specific value chains are put in place. The soft biomass is pre-treated in the CAP, while the fibrous biomass is further pre-treated in the FRP. This initial mechanical separation takes into account the specificities of each type of biomass, which automatically results in an adapted, more cost-effective and efficient valorisation of each fraction.



### Pre-treatment CAP

The first pre-treatment concerns the CAP, focusing on the easily degradable organics part of bio-waste. CAFIPLA will focus on the conversion process towards a specific SCCA fermentation (including lactic acid), independent of the input composition. The CAP focusses on biochemical transformations via fermentation technology, to yield carboxylic acids in solution,

which are an input to produce biochemicals, feed products or bioproducts.

#### **Pre-treatment FRP**

The second pre-treatment, the FRP, focusses on mechanical pre-treatment. The FRP valorises the fibrous residue from the CAP and will extract fibres of different quality for further applications.



#### **Application**

Any remaining organics after CAP-FRP will be converted to biogas and/or compost using a modified DRANCO process. The CAFIPLA intermediate products will be validated for five different applications: three different SCCA mixtures will be used in the production process for PHA, MP and MCCA. The fibres will be applied for fibre reinforced biopolymers (composite) as well as a fibre ingredient for thermal insulation material. This proves the broad range of potential application domains for the CAFIPLA platform. Other valorisation routes are also possible and will be further identified throughout the project and in cooperation with other.



### **3. Methodology**

The CAFIPLA project will establish a combined carboxylic acid and fibre platform as key initial steps of an integrated biorefinery.

#### **Research and development**

CAFIPLA project key activities are the development of novel process technologies and innovative approaches to radically alter the pre-treatment in biorefineries. The CAFIPLA project combines physical, chemical, enzymatic and bacterial processes, all at soft operating conditions, to efficiently obtain carboxylic acids and fibres. In its innovation strategy, the CAFIPLA projects puts the emphasis on process control, both in the case of chemical and biological processes, to obtain the desired product spectrum, product quality and product quantity for a wide variety of biomass input streams. These pre-treatment activities are directly linked to the subsequent conversion steps that result in the production of biomaterials, biochemicals and feed additive.



### Integration

CAFIPLA's strength is the integration of technical and non-technical aspects already at this low-TRL phase. CAFIPLA aims at developing novel process technologies in which control strategies that are immediately implemented. Furthermore, CAFIPLA takes into account supply-chain aspects, as this is regarded as a key to successful implementation of a novel biorefinery scheme. Furthermore, environmental and techno-economic aspects in the project execution are integrated and will detect the crucial legislative and social aspects to tackle. Integration in the context of CAFIPLA also refers to the integration of the CAFIPLA cascade with existing technologies such as composting or AD, as well as seeking connection with ongoing R&D initiatives.



### Demonstration

CAFIPLA process development phase will result in demonstration activities at TRL 5. This demonstrator case study will be implemented at the IDE site in Tenneville (Belgium). The demonstration will focus on technical performance, combined with environmental and techno-economic aspects.

### Continuous innovation

The CAFIPLA project will include the development of a post-project implementation plan to ensure the sustainable adoption of the project results. This will be realized by dissemination of non-confidential results, including interaction with stakeholders to exchange knowledge and ensure validation of the project results and development of business models to demonstrate the economic opportunities upon implementation of the CAFIPLA pre-treatment strategy



## 4. Join our network!

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## 5. Consortium



The consortium consists of 6 SMEs and 6 research institutes:

### Enterprises

- Idelux Environnement
- Biopract GmbH
- FRD - Fibres Recherche Développement
- Organic Waste Systems (OWS)
- Biotrend – Inovação e Engenharia em Biotecnologia, S.A.
- Avecom

### Research institutes

- Fundación Tecnalía Research & Innovation
- Deutsches Biomasseforschungszentrum Gemeinnützige GmbH
- Universität für Bodenkultur Wien - Dept. IFA-Tulln
- Leibniz Institute for Agricultural Engineering and Bioeconomy e.V.
- UNIVERSITEIT GENT - Center for Microbial Ecology and Technology (CMET)
- DECHEMA e.V. - Society for Chemical Engineering and Biotechnology

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