

Combining carboxylic acid production and fibre recovery as an innovative, cost effective and sustainable pre-treatment for heterogeneous bio-waste



Project Overview

Visit us on: www.cafipla.eu

This project has received funding from the Bio Based Industries Joint Undertaking (JU) under the European Union's Horizon 2020 research and innovation programme under grant agreement No 887115. The JU receives support from the European Union's Horizon 2020 research and innovation programme







CAFIPLA





Nationales Stakeholder Vernetzungstreffen IEA Task 42 - Tulln, Austria

ABOUT CAFIPLA



ABOUT CAFIPLA

5

Biorefinery concepts are demonstrated

• **CAFIPLA** 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.

1 Demonstration plant at TRL 5

Public non-profit waste treatment facility CAFIPLA will 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).





Nationales Stakeholder Vernetzungstreffen IEA Task 42 - Tulln, Austria

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 and/or
- 2. obtaining a constant output quality / spectrum from fluctuating input.



THE FRP RESEARCH FOCUSSES ON

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



CAFIPLA SPECIFIC OBJECTIVES



Convert 80% of the easily degradable organic matter in selected bio-waste to short chain carboxylic acids (SCCA) at TRL 3.



Manipulate the SCCA fermentation process from heterogeneous bio-waste in order to produce minimum 3 different SCCA product spectra with a fixed composition at TRL 3-4 (max 10% deviation).



Recover 65% of the insoluble fibre content in the selected bio-waste mixes, of which minimum 30% for high quality applications at TRL 3-4.





Nationales Stakeholder Vernetzungstreffen IEA Task 42 - Tulln, Austria

13 October, 2022

4

Integrate the CAP and FRP in an optimized cascade process considering biomass supply chains and demonstrate the feasibility in a TRL 5 pilot plant at the IDE test site treating 10 t/y mixed bio-waste.

5

Demonstrate the application potential of the produced intermediates in 5 bio-refinery concepts.

6

Demonstrate the sustainability and safety of the pre-treatment processes.







PROCESS SCHEME

CAFIPLA





CAFIPLA METHODOLOGY

- CAFIPLA combines physical, chemical, enzymatic and bacterial processes, all at soft operating conditions, to efficiently obtain carboxylic acids and fibres.
- These pre-treatment activities are directly linked to the subsequent conversion steps that result in the production of biomaterials, biochemicals and feed additive.
- CAFIPLA process development phase will result in demonstration activities at TRL 5.
- 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.



- CAFIPLA aims at developing novel process technologies in which control strategies are immediately implemented.
- Supply-chain aspects as a key to the successful implementation of a novel biorefinery scheme are integrated.
- Integration of the CAFIPLA cascade with existing technologies such as composting or AD
- CAFIPLA will include the development of a post-project implementation
- Dissemination of non-confidential results, interaction with stakeholders, development of business models to demonstrate the economic opportunities upon implementation of the CAFIPLA pre-treatment strategy.







Pilot plant: "The Loop" – arrived at IDELUX!

The pilot facility is currently installed and operation will start within the next weeks













Markus Neureiter

Universität für Bodenkultur Wien Dept. IFA-Tulln, Institut für Umweltbiotechnologie

3430 Tulln, Konrad-Lorenz-Str. 20



Bioraffinerie Netzwerktreffen IEA Bioenergy Task 42 Bioraffinerien in der Bioökonomie der Zukunft TullIn, 13.10.2022

Thank you for your attention

Visit us on: www.cafipla.eu





This project has received funding from the Bio Based Industries Joint Undertaking (JU) under the European Union's Horizon 2020 research and innovation programme under grant agreement No 887115. The JU receives support from the European Union's Horizon 2020 research and innovation programme



and the Bio Based Industries Consortium.

