

The LIFE CIRCforBIO Project – A circular economy system for multi-source biomass conversion to added value products.

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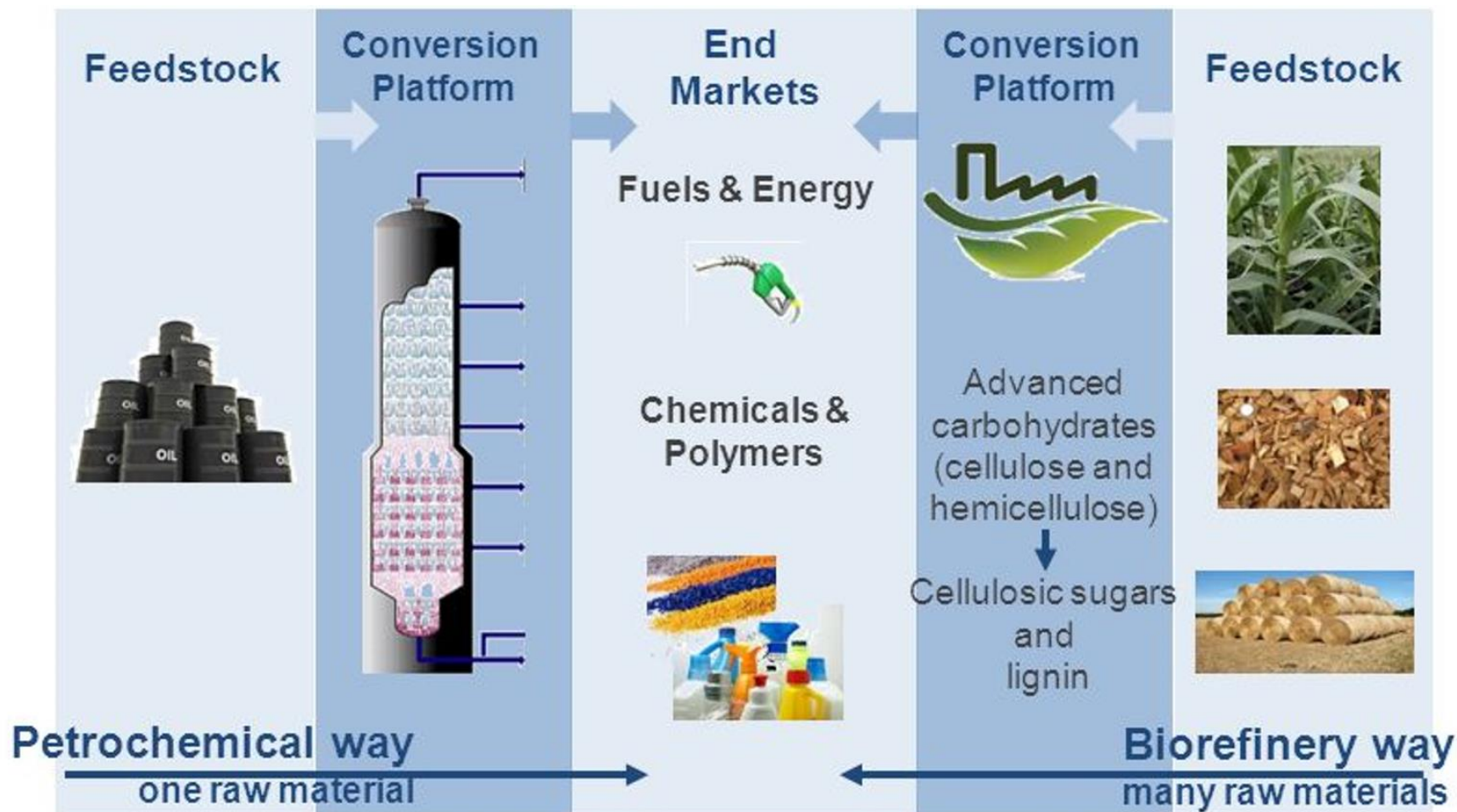
CHANIA 2023

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Biorefinery to valorize waste biomass

the alternative concept to petroleum-based processes and products



A circular economy system for multi-source biomass conversion to added value products



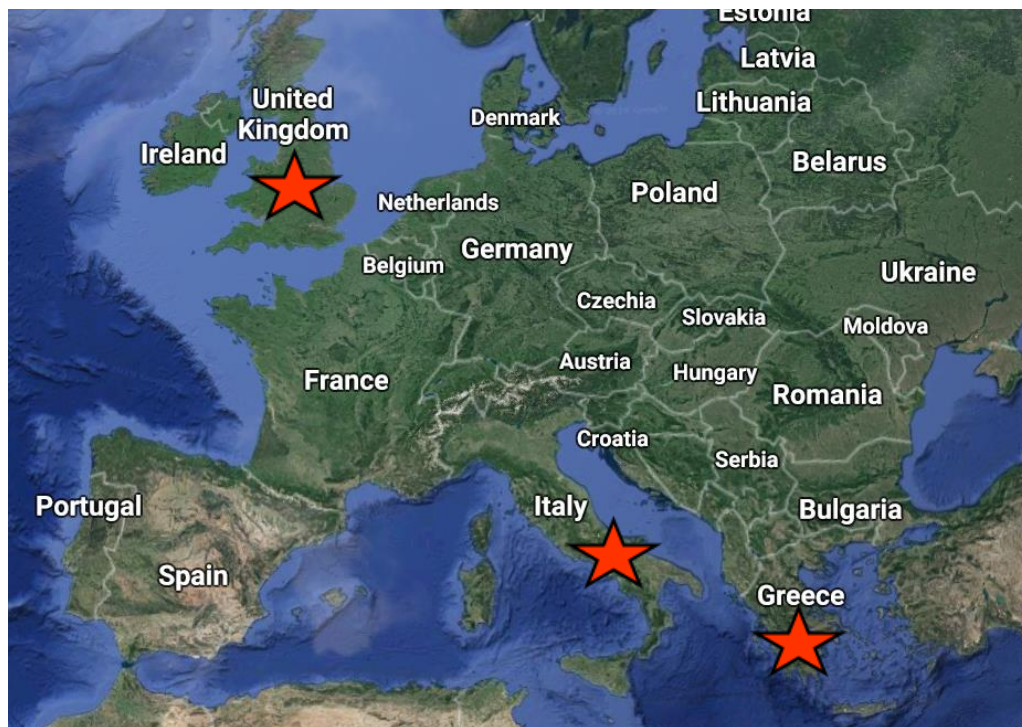
LIFE18 CCM/GR/001180

With the contribution
of the LIFE Programme
of the European Union

Project Duration: 01/10/2019 – 31/05/2023

Total project budget: 2,636,693 €

EU financial contribution (55%): 1,450,181 €



Coordinating Beneficiary:



NATIONAL
TECHNICAL
UNIVERSITY OF
ATHENS (NTUA)

Beneficiaries:



MUNICIPALITY
OF LAVREOTIKI



FEDERATION
OF HELLENIC
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The project is co-funded by the EU through LIFE programme for the Environment and climate action



Background information on LIFE CIRCforBIO

Aim of LIFE CIRCforBIO project

The overall aim of the CIRCforBIO project proposal is to:

- achieve **high GHG emission savings** from the substitution of fossil fuels with advanced biofuels
- promote the realization of the **circular economy concept for biomass**.

This will be achieved through:

- the implementation and **demonstration of an innovative biorefinery** concept for the production of **bioethanol**, **used oil** (raw material for biodiesel) and **other bioproducts** using municipal and industrial biomass
- the **creation of an interactive platform** for facilitating the realisation of the circular economy concept for waste biomass in Greece.

Biorefinery Feedstock

The biomass streams to be collected and their respective suppliers are:

- Municipal biomass (Lavreotiki municipality)
 - food waste (households and restaurants)
 - spent coffee grounds (cafeterias)
 - bread waste (bakeries)
 - green waste
- Industrial biomass (Association of Greek Food Industries - ΣΕΒΤ)
 - potato peel waste (potato chips industry) - TSAKIRIS AVEE
 - brewer's spent grains (breweries) - Hellenic Brewery Atalantis (EZA) SA
 - orange peels and apple pomace (juice industry) - ASPIS SA



Treatment scheme

Thermal pretreatment unit - Dryer

Installation of organic waste dryer using biomass as fuel that serve for stabilizing the feedstock inhibiting biodegradation and enabling storage. Also, it helps opening up biomass fibers and making them more accessible for subsequent processes.



Preparation

Selection and preparation of the field for the unit to be installed.



Oil extraction unit

Installation of prototype unit for extraction of oils from biowaste. A liquid extraction method will be adopted.



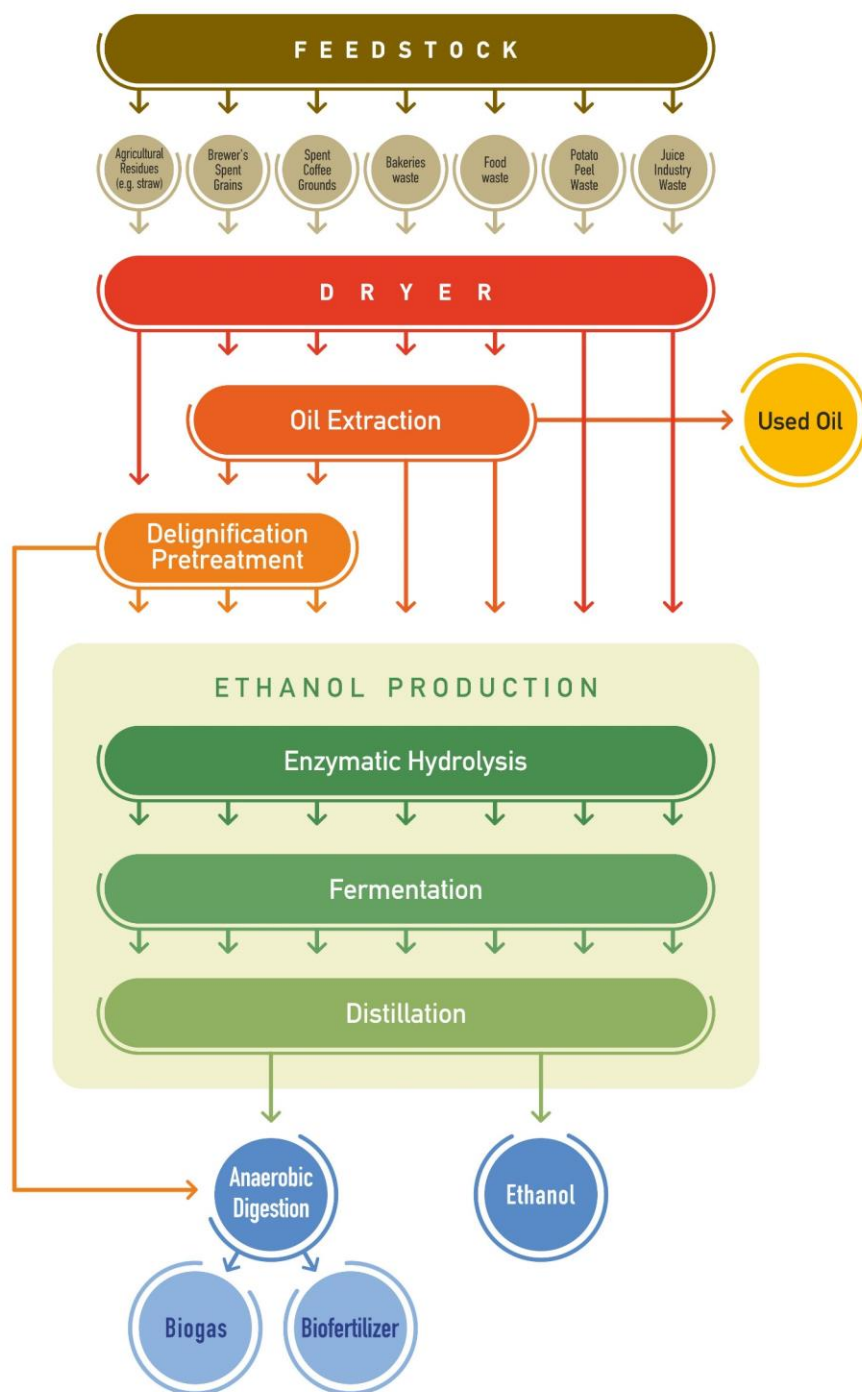
Ethanol bioconversion system

Installation of the bioreactor of the ethanol bioconversion system where bioethanol will be produced from biowaste after enzymatic hydrolysis and fermentation.



Anaerobic digestion plant

Installation of an anaerobic digestion system to treat the residues from the previous steps.



- **Biorefinery capacity:** 1tn/d feedstock-biomass
- **Production capacity:**
 - 30-60 L/d EtOH
 - & 15-20 kg/d used oil
- **Energy production:** 69,500kWh/y from biofuels and biogas
- More than **100% GHG emission savings** generated from the biorefinery
- Reduction of **raw materials consumption:** ~4,5tn mineral fertilisers substitution

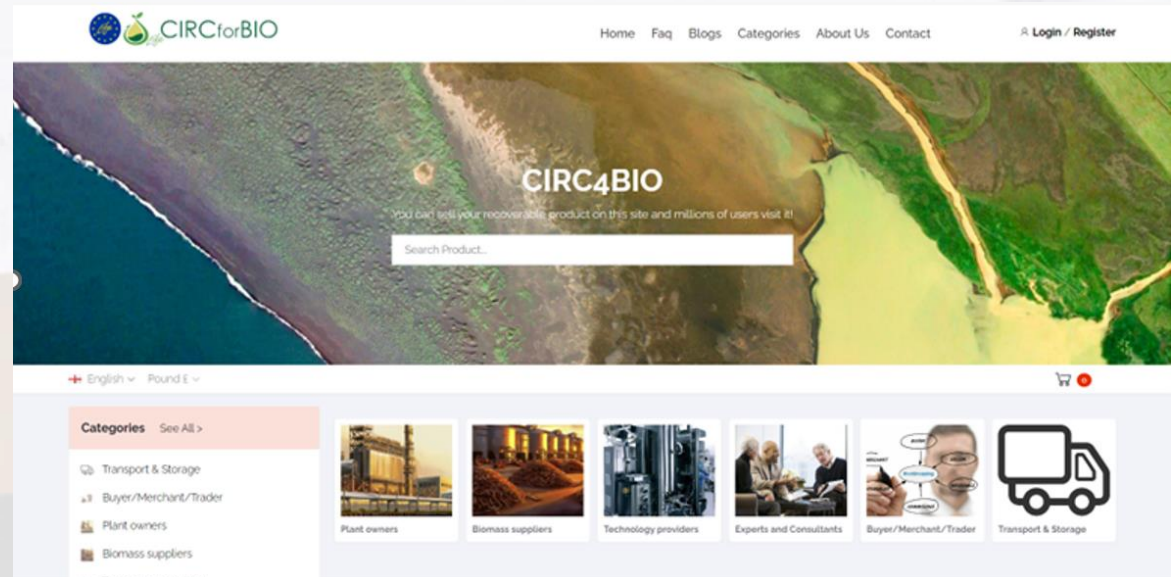
Bio circular Product Market Place: Circ4bio.com Beta

powered by:

Z-Prime
An Expert AI Platform



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A Product funded by EU Life Programme

A full E-Commerce and Value Chain Integrator covering the Full Product Life Cycle



1. Supply – Demand Management
2. Brokerage
3. Commercial Transactions
4. Trade Alignment and Facilitation
5. Integration of full Supply Chain
6. Full Product Tracking and Traceability

In the Pipeline

1. Circularity Indexing
2. Full Carbon Footprint Reporting
3. Certification and Compliance Analysis
4. AI-Driven Supply Chain Optimisation

Full Circular Bio Industry - Digitalised

- Data Acquisition Technologies
- Data Cleaning Handling and Valorisation
- Validation & Verification of Input data
- Feed into Business and Trade Architecture and Framework (Business Models - combine e-shops, e-marketplaces, e-value chain integration)
- Tracking and Traceability
- AI-driven modelling for fusion of data and performance measurement
- Reporting and Share of information

Principles of Connection and Consolidation



Suppliers



Technologists



Factories & Plants



Transport & Storage



Consumers & Goods



Consultants & Experts



Traders & Merchants

Circ4bio.com demo

<https://www.circ4bio.com/>



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for multi-source
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Register

to the project
mailing list
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