Lactic and succinic acid production from lignocellulosic biomass

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Contents

Introduction

What are bio-chemicals and why they are important?

Bioconversion pilot line

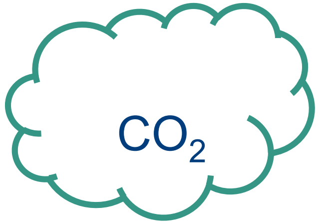
Lactic acid (LA) and Succinic acid (SA) production

Summary BIOMAC Project – structure and goals

Outlook

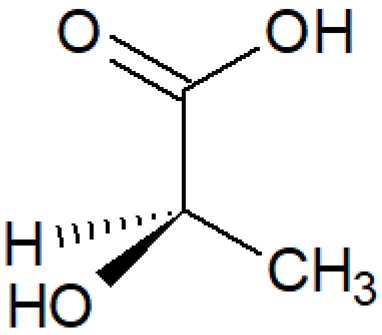
Why bio-chemicals are so important?

- Geopolitical situation
- Replacing fossil-raw materials
- Climate neutral feedstock
- Sustainable forestry
- Improved CO_2 footprint
- Microbiological production

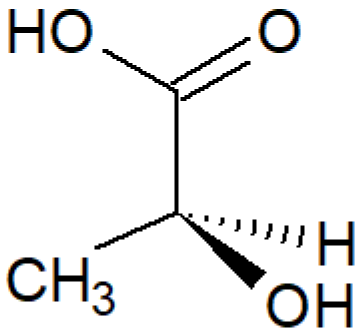


Two monomers: Lactic and succinic acid

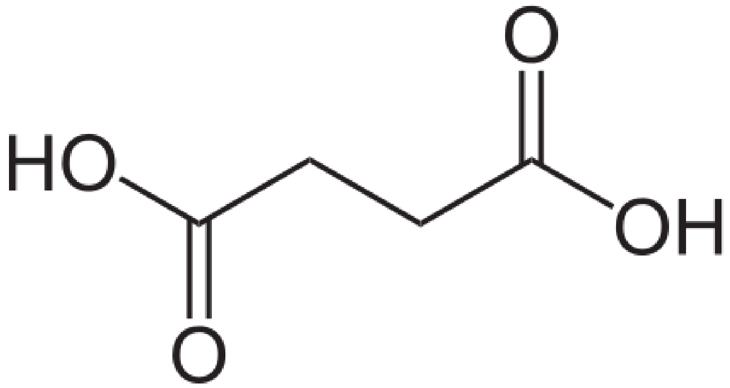
IS THE SUSTAINABLE ROUTE BECOMING ECONOMICALLY VIABLE?



D-Lactic Acid

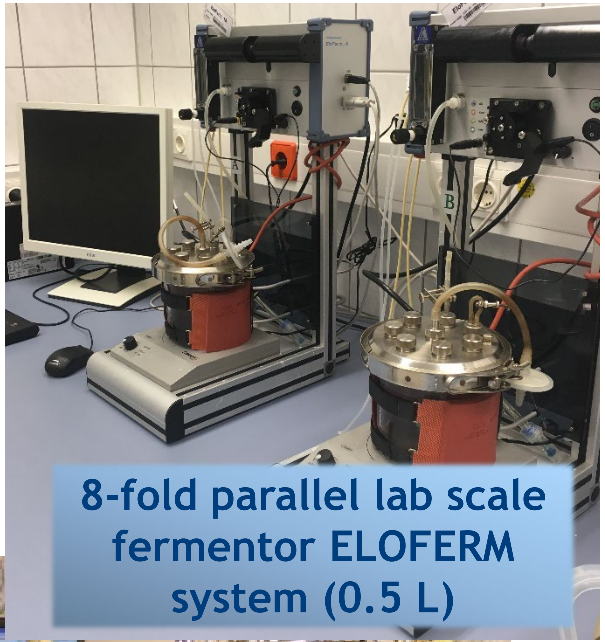


L-Lactic Acid

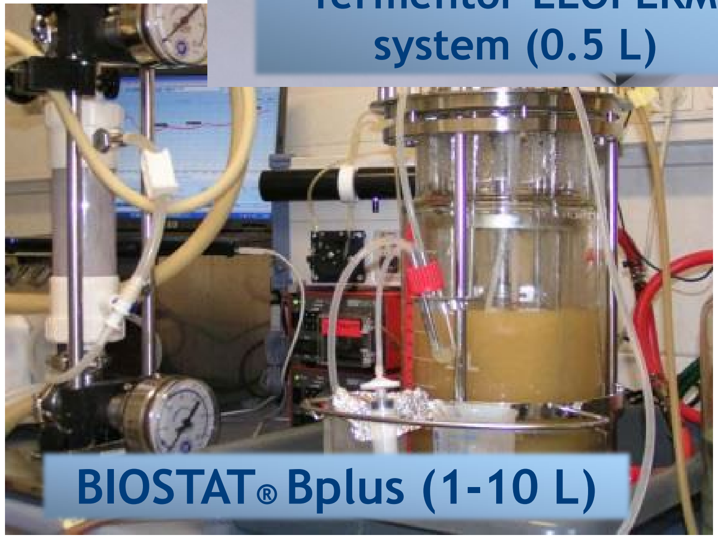


Succinic Acid

Bioconversion pilot line



8-fold parallel lab scale fermentor ELOFERM system (0.5 L)

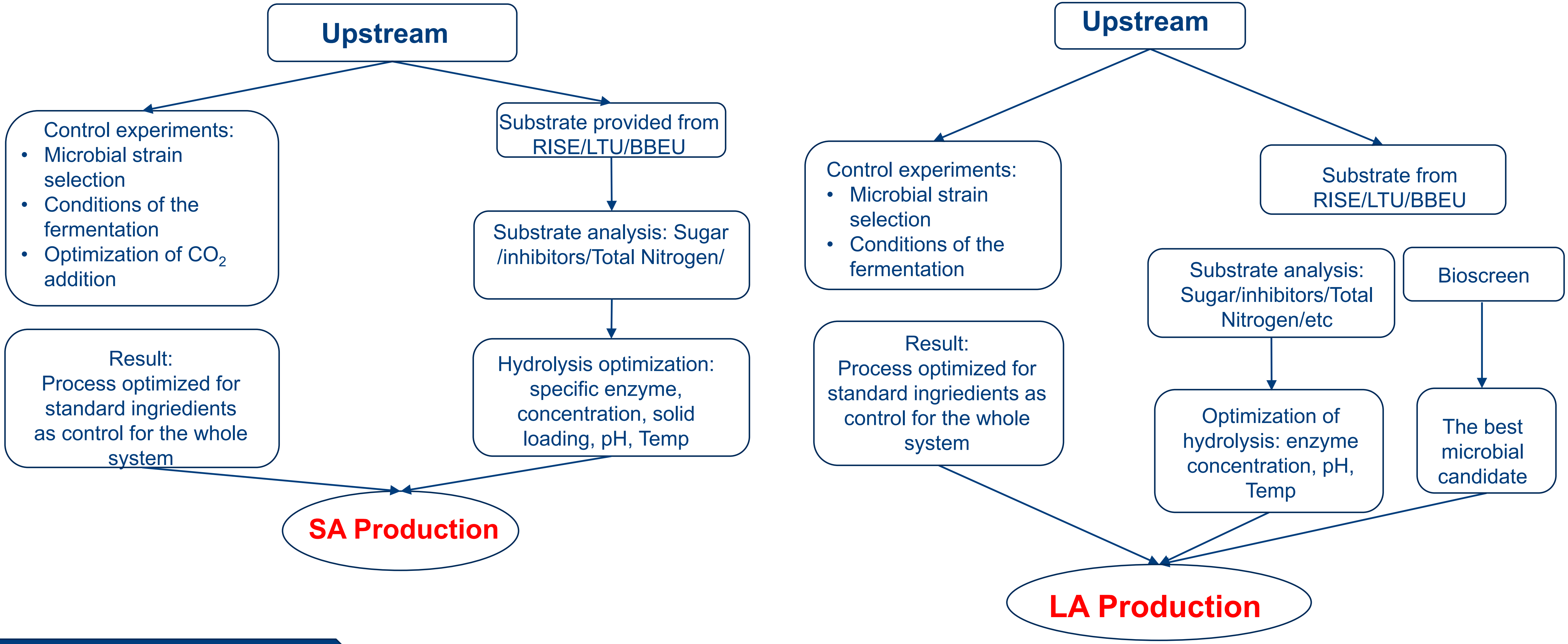


BIOSTAT® Bplus (1-10 L)

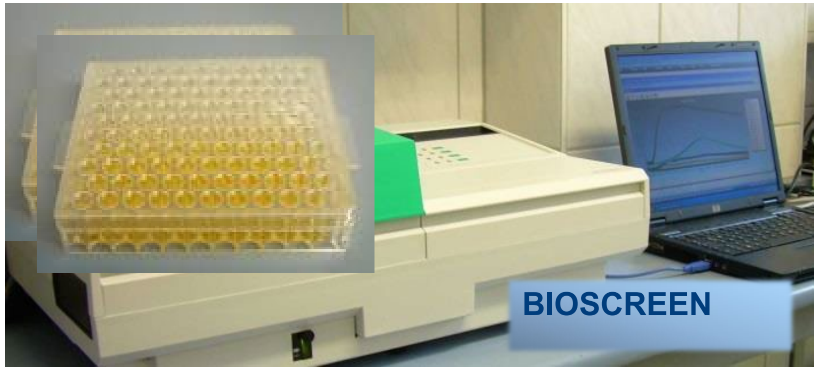
Biostat® UD (50 L)

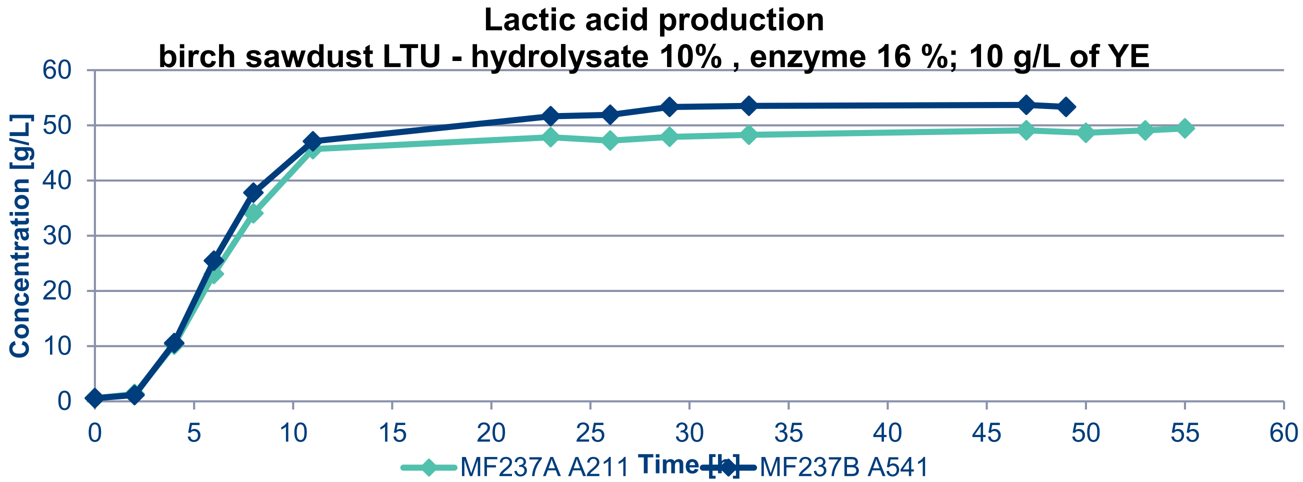
Pilot fermentor Type P, 450 L (Bioengineering AG)

How do we produce them?



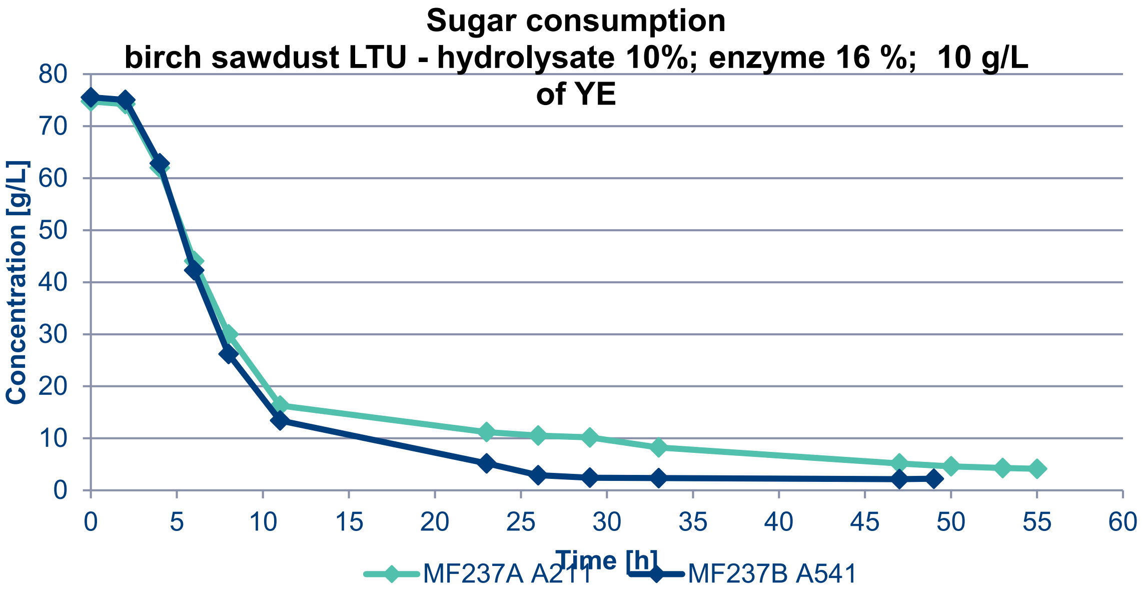
Lactic acid production from birch sawdust





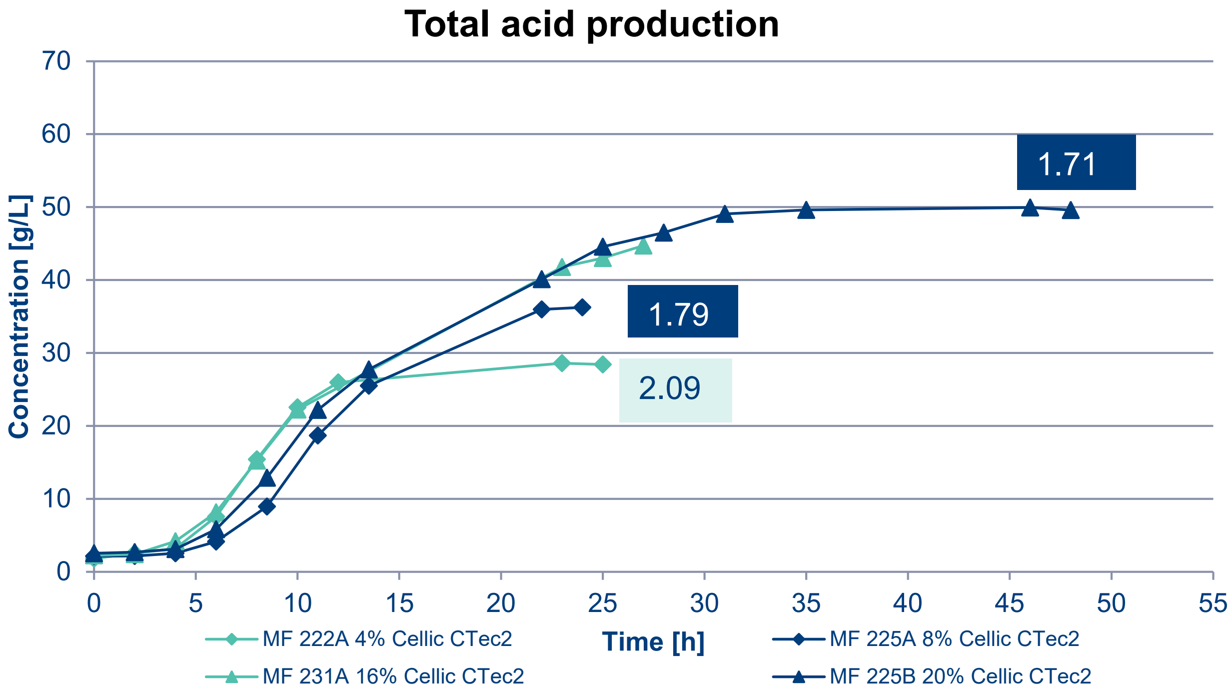
200 strains were tested

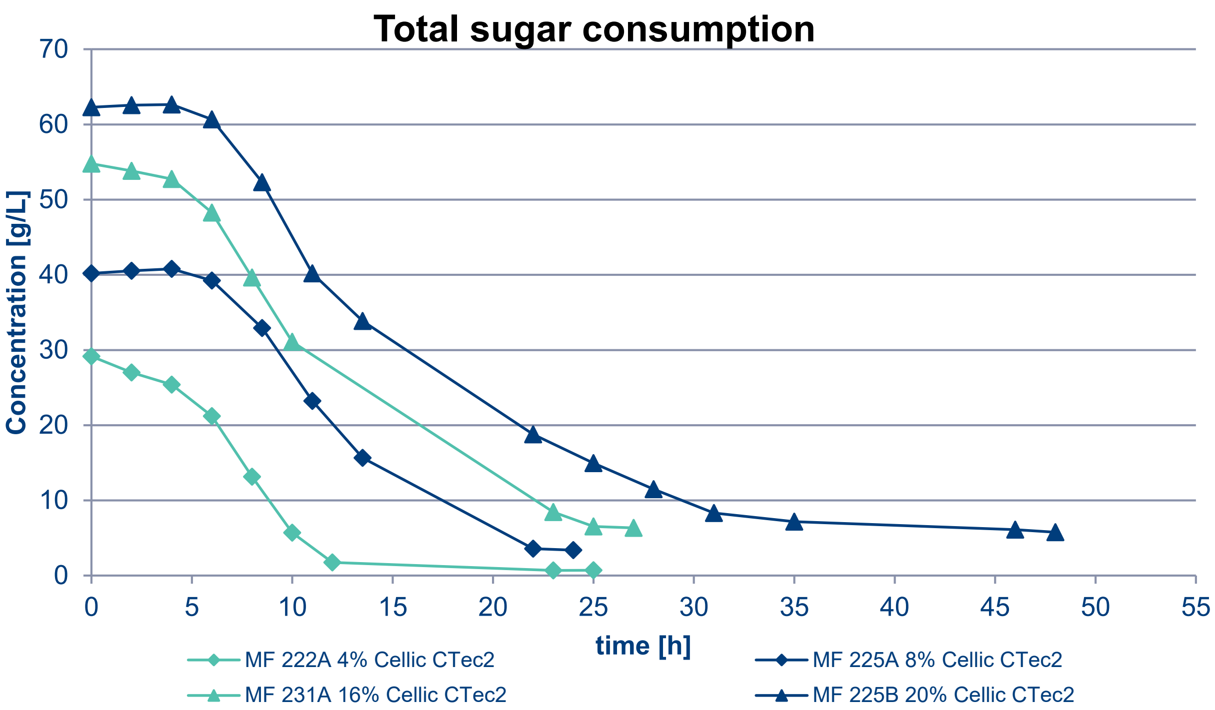
Strain	Solid loading
A541	10 %
A211	10 %



Succinic acid production from birchsawdust

Strain	Solid loading	Productivity (g/L*h)
Actinobacillus succinogenes	10 % of birch sawdust hydrolysate	In the chart



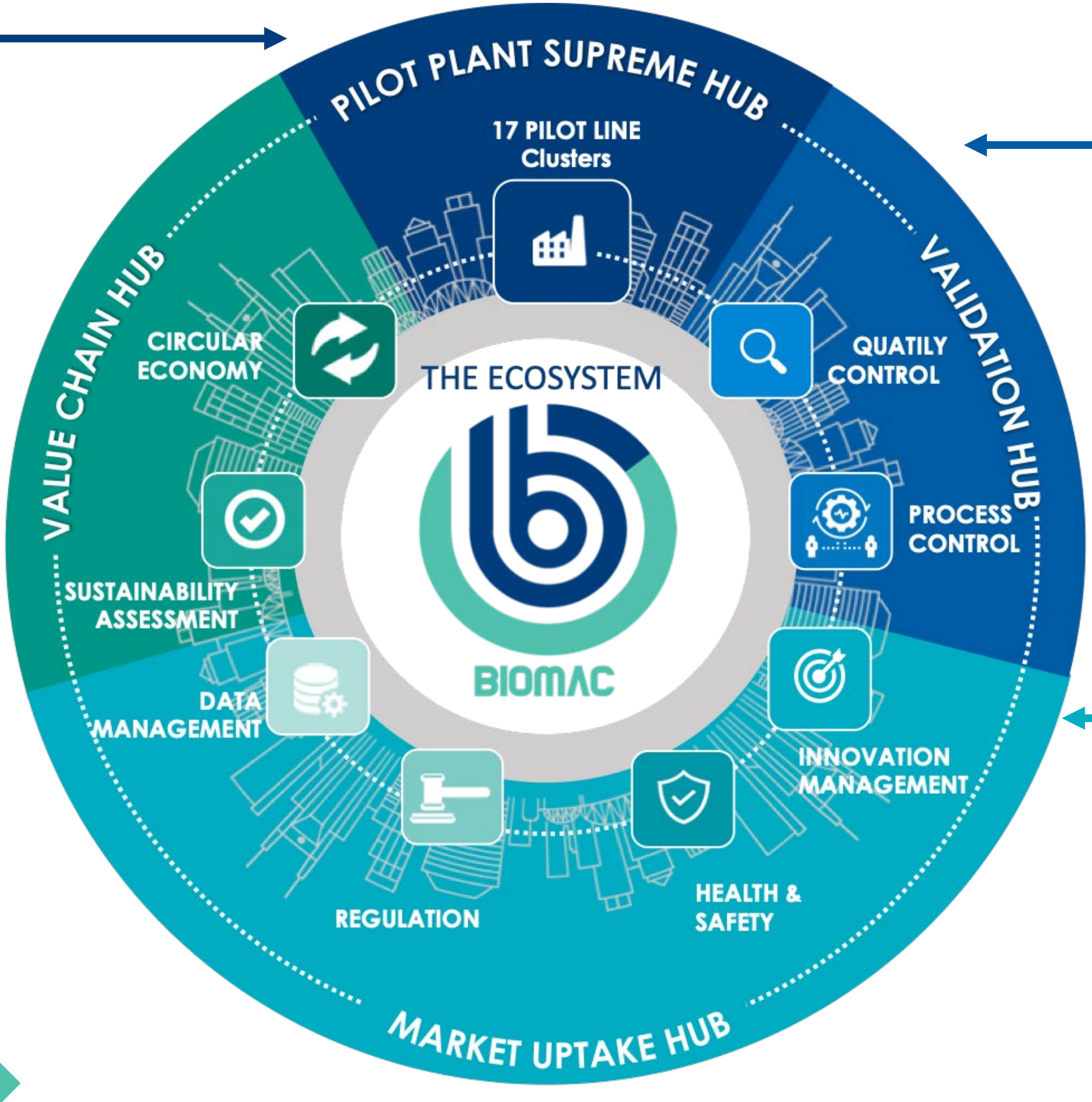


Structure of the OITB

a) Biomass Fractionation & Nanocomposite Production Cluster

b) Intermediate Materials and Nanocomposite Production Cluster

c) Final Products Production &



a) Quality Control, Characterization

b) Standardization

c) Process Validation: Modelling

a) Sustainability Assessment

b) Supply management

c) Circular economy

a) Innovation Management

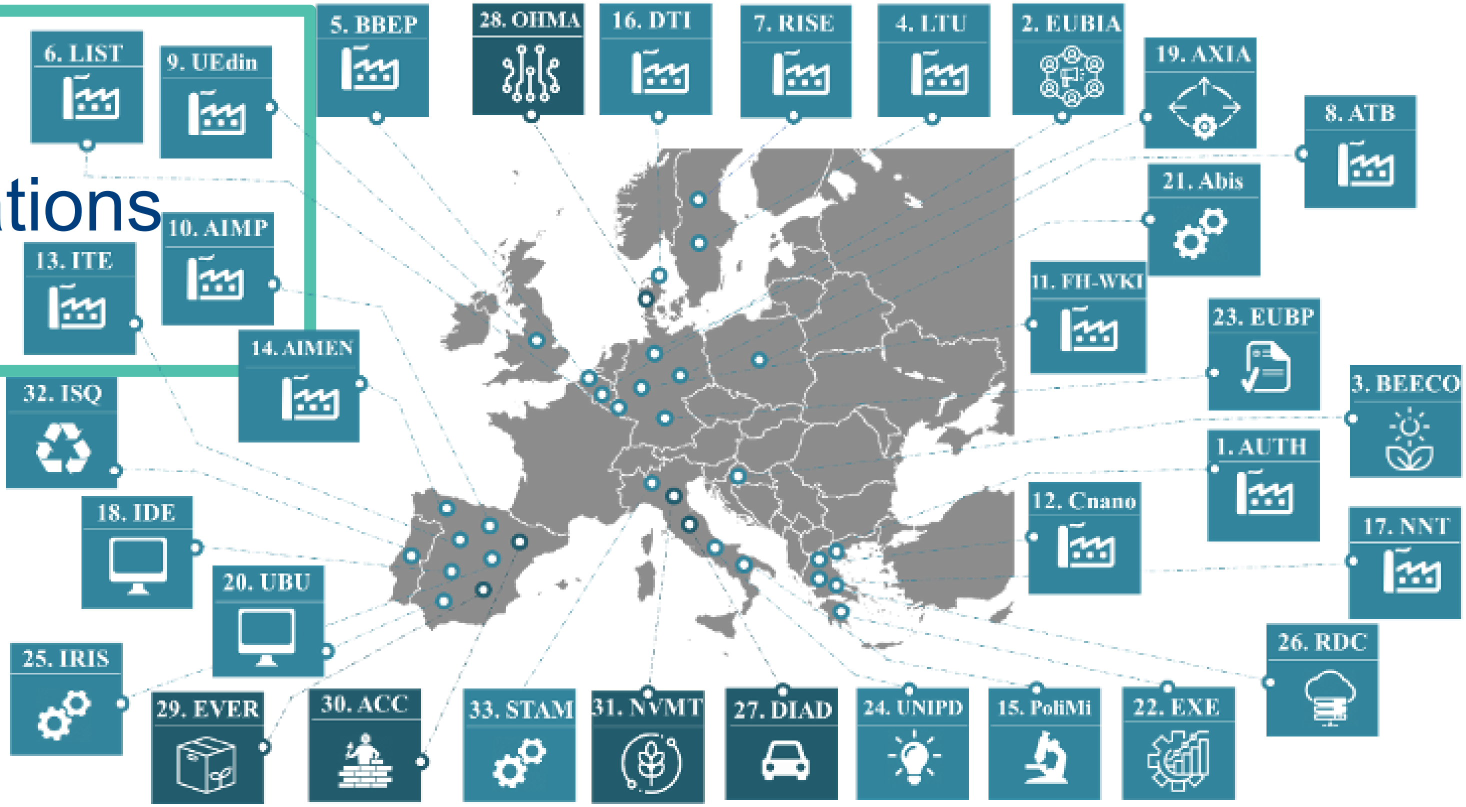
b) Health and safety

c) Regulation

d) Data Management

BIOMAC activities will enable the realization of 5 concrete Test Cases (TeCs)

- TeC1 – Automotive
- TeC2 – Agricultural applications
- TeC3 – Food packaging
- TeC4 – Construction
- TeC5 – Printed Electronics



Thank you!

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PL activities will enable the realization of 5 concrete Test Cases (TeCs)

TeC1 - Automotive: Bio-based resins reinforced with NBMs will be used in the fabrication of interior car parts and components for the automotive industry. These will be succinate-based polyesters and isocyanate-free polyurethane resins with exceptional physical properties including toughness, flexibility, and resistance to abrasion and temperature.

PL activities will enable the realization of 5 concrete Test Cases (TeCs)

TeC2 - Agricultural applications: Biomass, succinic acid will be used as a monomer of the development of biopolymers. This will be used to nano-reinforce PLA and create a material with enhanced optical properties and UV/thermal resistance to be used in agriculture. Biopolymers and nano additives will contribute to soil amendment and remediation after biodegradation of bioplastics in soil, to improve technical performances while increasing soil health and quality.

PL activities will enable the realization of 5 concrete Test Cases (TeCs)

TeC3 – Food packaging : Vacuum thermoforming will be post-utilized to produce bio compostable and biodegradable food containers, using bio-based PLA foils. These will be reinforced with polymers to enhance the mechanical and antibacterial properties of flexible packaging materials. By further improvements, the film's surface will enhance its antimicrobial and antifungal properties, leading to improved food maintenance/conservation and safety.