

Zelcor

Zero Waste Ligno-Cellulosic Biorefineries by Integrated Lignin Valorisation <http://www.zelcor.eu>

Summary

Lignocellulosic feedstocks (dry matter plant biomass) are commonly used in the production of biofuels and bio-based chemicals. However, a major disadvantage of these feedstocks is the presence of substantial amounts of lignin, an aromatic polymer that is difficult to break down. This so called "recalcitrance" means lignocellulosic feedstock is often considered primarily as a waste product, utilised to produce energy through burning.

The Zelcor project intends to demonstrate the feasibility of transforming lignocellulose recalcitrant side streams (lignocellulosic residues from ethanol production, lignins dissolved during pulping and lignin-like humins formed by sugars conversion) into high added-value bio-based products, including fine chemicals. This will be achieved by combining chemical and enzymatic catalysis with insect-based bioconversion.

Demonstrating of the project's feasibility will be performed by process scaling-up, formulation of end-product prototypes and value chain sustainability and safety assessment.

Type of Action:

Research & Innovation Action

Value Chain: VC1 –

lignocellulose

Start date: 01 October 2016

End date: 30 September 2020

BBI JU contribution: € 5,256,993.00

Objectives

Zelcor aims at demonstrating the feasibility of transforming recalcitrant by-products considered as waste, namely lignin- and humins-rich streams, into high added value biobased products, including fine chemicals.

The specific driving idea is to combine chemical and enzymatic catalyses with microbial bioconversion to develop an integrated flexible biorefinery system for the conversion of these heterogeneous and variable by-products.

Expected impacts

- Optimise the economic values from agricultural residues.
- Valorise the lignin fraction of lignocellulosic biomass into valuable products, reaching at least a 3-fold value increase as compared to the current energy value.
- Achieve technological validation of at least three new bio-based products resulting from purified lignin.
- Contribute to the development of two convergent routes to produce valuable bio-based products from lignin: the microbial bioconversion exploiting termite or isolated termite microbial consortia and the catalytic depolymerisation by enzymatic cocktails.
- Improve the environmental and economic performance of different actors of the value chain, in particular of end-user sectors by diversifying the sources and types of bio-based products supply.



Zero Waste Ligno-Cellulosic Bio-Refineries

High added value bio-based products from lignocellulosic biorefinery wastes

01 June 2018

Find an article on our project Zelcor which is exploiting the potential of termites to demonstrate the feasibility of transforming by-products considered as waste into high-added value materials. [Read more](#)

- Institut National de la Recherche Agronomique - INRA (France)
- Aalto-yliopisto (Finland)
- Ardilla Technologies UK Ltd (United Kingdom)
- Arterra Bioscience Srl (Italy)
- Avantium Chemical BV (The Netherlands)
- Biome Bioplastics (United Kingdom)
- Inra Transfert (France)
- Institut National de l'Environnement Industriel et des Risques - INERIS (France)
- Nova Institut (Germany)
- Quantis SARL (Switzerland)
- Sabic (The Netherlands)
- Food and Biobased Research - FBR (The Netherlands)
- Tereos (France)
- Université Paris-Est Créteil Val de Marne (France)
- University of Warwick (United Kingdom)
- W42 Industrial Biotechnology GmbH (Germany)
- Ynsect (France)

Project coordination

Name: Stéphanie Baumberger

Organisation name: Institut National de la Recherche Agronomique - INRA (France)

Phone: +33 (0)1 30833778