



OPTISOCHEM:

An EU project substituting fossil-based product with biomass-based goods.

Biomass is frequently considered as an alternative feedstock to fossil oil, as this may allow to mitigate climate change and resources depletion. This biomass may be derived from agricultural residues, forest residues or agro industry residues whereas cellulose is the most abundant organic polymer on earth.



However, direct substitution is not possible and processes are needed for a preliminary conversion of biomass into intermediate products: the industrial biology sector provides such processes. As a feedstock for these processes, ligno-cellulosic sugars represent an attractive alternative to traditional sugars as they can be created from widespread resources, and do not titrate or compete with food or feed production.



This article introduces the goals and the contributors of the OPTISOCHEM project which is executed by a European Consortium project led by Global Bioenergies. It is **€16.4 million** project, Granted **€9.8 million** by BBI-JU under Horizon 2020 **with the Objective of demonstrating cosmetics and chemical applications of residual-straw**

based bio-Isobutene. It is a 4 years project and it started in June 2017. "This project has received funding from the Bio Based Industries Joint Undertaking (BBI JU) under the European Union's Horizon 2020 research and innovation program under grant agreement No 744330. This publication reflects the views only of the author, and the BBI JU cannot be held responsible for any use which may be made of the information contained therein.



CLARIANT



In the project, **CLARIANT AG** provides its Sunliquid® technology that de-construct the biomass into separate streams including i) lignin rich stream and ii) sugars rich streams called hydrolysate. The lignin rich stream is usually dedicated to applications as fuel or materials such as polymers or insulation materials. On the other hand, the sugar rich stream, or hydrolysate, is well suited to be converted, into intermediate building-block molecules, by micro-organism through a fermentation process like the one developed by Global Bioenergies.



GLOBAL BIOENERGIES

Global Bioenergies' role is i) to adapt its isobutene-producing-strain to the specific project hydrolysate so as to deliver high commercial performances and ii) to ensure quality of the final high purity grade bio-isobutene. Isobutene is an important building block currently produced and used in the petrochemical industry for lubricants, rubbers, cosmetics, plastics, solvents, and bio-based octane booster for gasoline or Sustainable Aviation Fuels. Its global market is more than 15Mt a year and is growing 2.5% a year. At the same time, customers of fossil-based-isobutene derived goods are asking for more renewables. Global Bioenergies develops a breakthrough technology which allows micro-organisms to produce bio-based isobutene via a direct fermentative route.



INEOS
THE WORD FOR CHEMICALS



OPTISOCHEM focuses on converting straw hydrolysates to end-products for cosmetics or chemicals application. **INEOS**, which sites having over fifty years of experience in the production of oligomers and polymers of isobutene, provides assessment of the quality of the bio-based isobutene and end-products which are obtained after conversion of this building block. The project addresses two different isobutene derivatives families: oligomers and polyisobutylenes. These products are currently requested by the market for a wide array of applications. Presently these needs are satisfied by commercial processes designed to be fed with fossil-based isobutene. The project will demonstrate that these needs can be satisfied by the existing processes when fed with bio-based isobutene from sustainably extracted wheat straw.



The outcome of the project will be to provide the backbone for a subsequent first of its kind 30kt per year flagship plant and a series of numerous additional plants afterwards. **TechnipFMC** together with **IPSB** are in charge of engineering activities in order to design the first of its kind plant to integrate the future value chain. Life cycle analysis and social and environmental performances are assessed by the **Energie Institute** an der Johannes Kepler Universität Linz.