Designing the Next Generation Bio-Refinery: The EuroBioRef Project

The EuroBioRef project (European Multilevel Integrated Biorefinery Design for Sustainable Biomass Processing) coordinated by CNRS, France, has just been launched on the 1st of March 2010 for a 4 years duration. It is supported by a 23 M€'s funding from the EU's 7th Framework Program. EuroBioRef will deal with the entire process of transformation of biomass, from fields to final commercial products. It will involve 28 partners from 14 different countries into a highly collaborative work.

'This program is an excellent opportunity to fill the gap between agriculture and chemical industry. It integrates the whole biomass chain into a commercial viable and adaptable approach, allowing a sustainable bio-economy in Europe. Europe will be able to compete in this area with the major international actors, by proposing novel innovative technologies reinforcing its attractivity. Further, it constitutes also an occasion for creating fruitful and fair partnerships between Europe and tropical countries in this high-tech domain. The concept will promote a sustainable development of agriculture also in these countries' says the project coordinator, Prof. Franck Dumeignil, UCCS, France.

Overview

The development and implementation of bio-refinery processes is of crucial importance to build a bio-based economy. The EuroBioRef project will develop a new highly integrated and diversified concept including multiple feedstocks (non-edible), multiple processes (chemical, biochemical, thermochemical), and multiple products (aviation fuels and chemicals). The project has a specific aim to overcome the fragmentation in the biomass industry. As efficiency is the key to the bio-refinery processes, this implies to take decisive actions to facilitate better networking, coordination and cooperation among a wide variety of actors.

CERTH (Centre for Research and Technology Hellas) participates in EuroBioRef with two of its institutes, ISFTA (Institute for Solid Fuels Technology and Applications) and CPERI (Chemical Process Engineering Research Institute). The research that will be conducted in CERTH will contribute to the development of thermochemical processes for the production of valuable products from biomass.

New synergies, cost efficiencies and improved methods will be achieved by involving the stakeholders at all levels: large and small (bio)chemical industries, academics and researchers from the whole biomass value chain, as well as European organisations. Large-scale research, testing, optimisation and demonstrations of processes in the production of a range of products design adapted to large- and small-scale production units, which will be easier to install in

various European areas.

The overall efficiency of this approach will be a vast improvement of the existing situation, and will ensure the production of aviation fuels and multiple chemical products in a flexible and optimized way. It will also take advantage of the differences in biomass components and intermediates. The target is also to improve cost efficiency by as much as 30 per cent through improved reaction and separation effectiveness, reduced capital investments, improved plant and feedstock flexibility, and reduction of production time and logistics. Further, we expect to reduce by 30 per cent the energy used and produce zero waste. Raw material management will also mean that a reduction of feedstock consumption will be possible to the tune of at least 10 per cent.

The EuroBioRef concept achieves integration across the whole system from feedstock to product diversification and adapts to regional conditions, integrating into existing infrastructures, minimizing risks to investors. The flexible approach means widening bio-refinery implementation to the full geographical range of Europe, and offers opportunities to export bio-refinery technology packages to more local markets and feedstock hotspots.

The impact of the project in terms of environment, social and economic benefits is important and could give a serious advantage for European bio-industry. The techno-economic evaluation of the whole integrated biorefinery will be carried out. Moreover, the environmental life cycle assessment studies will be performed in line with the requirements of the International Reference Data System (ILCD) Handbook and the LCI data will be made available *via* the ILCD Data Network. The approach on social sustainability will be based on the recently developed UNEP guidelines for social life cycle assessment of products, allowing for the required modifications to meet the requirements of respective analysis on biorefinery chains.

The EuroBioRef project has the potential to re-energize biomass production, grow the industry, and achieve the original dream of biomass sustainability in the whole Europe.

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