

Main SUPRABIO features

The main distinguishing features of the SUPRABIO project are:

- Focusing on currently the most economic feedstocks; lignocelluloses from sustainable forestry and agricultural wastes, and organic waste streams from food industries and municipalities - being aware of the debate around the use of agricultural land for energy crops.
- Examining the production of algae, which is currently costly but for which land use is not an issue, and which has considerable potential for improvement both in terms of growth optimisation and efficiency of solar energy capture using waste nutrients, CO₂ and heat from biorefinery operation.
- Adopting a whole Biorefinery approach to maximise the value obtained from a particular type of biomass by selecting the optimum mix of products (fuels, chemical intermediates, high added value chemicals, materials, energy).
- Focusing on the intensification of critical process steps to improve the economics of building and operating equipment appropriate for smaller and intermediate scale refining and distributed production.
- Concentrating on process optimisation and sophisticated integration that considers whole Biorefinery management issues. Thus optimisation of material and waste flow within the Biorefinery, water management and process energy requirements are all considered in addition to process technologies. In this manner optimum economic benefit will be coupled to optimum usage of biocarbon and minimal greenhouse gas emission.

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SUPRABIO is supported as part of a joint call of various EC Directorates on the development of biorefineries within the Work Programme 2009. Within this call, the Commission supports three four-year research projects (SUPRABIO, BIOCORE and EUROBIROREF) and has supported the two-year coordination action project STAR-COLIBRI.



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**Sustainable products
from economic processing of biomass
in highly integrated biorefineries**

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The SUPRABIO Project

A biorefinery is a multi-disciplinary and complex concept, simultaneously addressing the production of value-added bio-products (chemical building blocks, materials), and bioenergy (biofuels, power and heat) from biomass, within a sustainability assessment carried out along the entire value chain and life cycle.

From February 2010 to January 2014, the SUPRABIO project will research, develop and demonstrate a toolkit of

- novel generic processes together with
- advanced process intensification
- heat management
- utilities management and
- integration methodologies

that can be applied to a range of biorefinery scenarios based on sustainable biomass feedstocks.

This is supported by

- an economic and lifecycle assessment of the resulting gains in energy efficiency and conversion of renewable carbon, together with
- an implementation strategy based on a product mix with optimal value.

The SUPRABIO project will contribute to the European Lead Market initiative on Bio-Based products and to the implementation of the European Energy & Climate Package. The biorefinery concept is also an important feature of the European Industrial Bioenergy Initiative (EIBI), one of the six industrial initiatives of the European Strategic Energy Technology (SET) Plan, which aims to speed up the development of clean, efficient and low-carbon technologies.



The SUPRABIO Team

SUPRABIO is a € 20 million innovative, sustainable bio-refinery research project funded by the EU and the corporate sector. The SUPRABIO consortium currently includes sixteen research partners from nine European countries: three industrial companies, seven small and medium enterprises (SMEs), three research institutes and three universities.



Brunel University London is coordinating the project



Project background

Declining petroleum resources, increased demand for petroleum by emerging economies, and political and environmental concerns about fossil fuels are driving our society to search for new sources of liquid fuels and commodity chemicals. The only current sustainable source of organic carbon is biomass.

In order that the processes for the manufacture of fuels and chemicals from biomass are competitive and sustainable, the SUPRABIO project will develop critical technologies such as efficient fractionation of lignocellulose, enhanced and selective microbial and fungal conversions, and economic distributed chemical processing using integrated, highly intensified modular reactors.

The research will focus on biomass resources such as straw, seed oil, algae and wastewater. These will be improved and converted (through microbial, fungal, enzymatic and chemical processes) to pharmaceutical intermediates, biofuels, ingredients for healthcare products and cosmetics, and nano-cellulose fibre reinforced polymer composites.

This biorefinery project will investigate and identify:

- availability and cost effectiveness of renewable raw materials
- developing technologies
- appropriate geographical locations where products can be manufactured
- size of the bio-refinery plant
- size of the market place to make each product competitive and sustainable

The project will also take into account environmental sensitivities and will not compete with agricultural land best used for food crops or compete with food products.