

BBI SYNERGY LABEL PILOT



PROPOSALS 2019



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SUPROV

Industrial valorization of Lignocellulose sugars from spent sulphite liquor & tissue paper.

SUPROV will exploit the lignocellulosic sugars from the spent sulphite liquor industry and tissue paper by-products as feedstock to obtain different high marketable chemical products by synergistic combination of microbiological and chemo-catalytic routes. For this, various intermediate chemicals, i.e. dicarboxylic acids, oligosaccharides and functionalized biosurfactants will be developed to be used in several industrial sectors such as home appliances, personal care and hygienic products, animal feed, cosmetics, (bio) pesticides, mining, emulsions, etc.

Specialist partners will combine the latest technologies in separation and purification in order to obtain high-purity sugars and intermediates to produce the high-quality targeted products. In parallel, SUPROV aims to develop a new technology to tailor made concentration of the sugars with very low energy consumption to reduce contaminations or premature fermentation. New business models to sale concentrate sugars among biorefineries are proposed to reduce storage cost, maximize the sugar value and enlarge the biorefinery portfolio with the development of new products.

As the SUPROV process allows to work with sugar quality comparable to 1G sugars and, therefore, with similar yield, final cost of proposed chemicals is expected to be competitive in comparison with current bio-based ones. Moreover, LCA and consumers' acceptance will be assessed as a key prerequisite to ensure marketability of the select products.

SUPROV consortium has a well-balanced composition and geographic distribution (partners from 10 different EU countries). This consortium brings together a wealth of expertise and resources to maximize the valorisation of lignocellulosic sugars. Each partner has a clearly defined role within the project and will contribute specific expertise that will enable the project success. Three RTD Partners (AIMPLAS, NIC & UNITELMA), three SME partners (BIOTREND, BGENE and BIO-MI), two non-profit consultancy companies (NNFCC & AXELERA) and six IND partners (MEGARA, HAYAT, NOVASEP, 3VTECH, BIOPOLIS and ARCELIK) will provide the fundamental knowledge, technologies and expertise to achieve the project objectives, as their activities within the project are fully in line with their own core business and research strategies.

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NUTRIBANK

Unlocking microbial biodiversity as a toolbox for the production of feedstock-specific high-performance ingredients from alternative primary and secondary biomass sources.

The NutriBank project focussed on the production of high value functional ingredients from agri food residues and alternative primary biomass. The project draws on enzymes, bacteria and fungi available from MBio's Biobank. The first application was the release of high-performance ingredients from mushroom residues to create innovative functional foods, and beverages, cosmetics, healthcare and animal nutrition products. The projects capability was complemented by DDNA's enzyme expression expertise, Bio Base Europe's scale up facilities and market facing consortium partners including Evonik, Biozoon, Nutrition Sciences, MAVI and Cencira. Nutribank explored parallel application to brewery residue streams and insect protein production. The project was further supported by expert input from BioDetection Systems, University of Extramadura, Food Safety Consult, PNO, Fundacion Tecnalia, and IDENER.

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BIOBESTicide

BIO-Based pesticides production for sustainable agriculture management plan.

The BIOBESTicide project will validate and demonstrate the production of an effective and cost-efficient biopesticide. The demonstration will be based on an innovative bio-based value chain starting from the valorisation of sustainable biomasses, i.e. beet pulp and sugar molasses and will exploit the properties of the oomycete *Pythium oligandrum* strain I-5180 to increase natural plant defenses, to produce an highly effective and eco-friendly biopesticide solution for vine plants protection.

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ALINA

Development and implementation of completely new value chain to produce sustainable functional ingredients from unconventional sources.

The overall objective of ALINA is to validate that, different sources such as agrowastes, microalgae and insects biomasses can be combined in an efficient way to extract high value ingredients such as PUFAs, carotenoids, phytohormones and chitin. The ALINA project will demonstrate its industrial viability by building a new business model that will use innovative and cost-effective extraction technologies (PEFs, US, sc-H₂O and sc-CO₂) and the obtained ingredients will be formulated and incorporated into at least eight new final products for three different sectors: Cosmeceuticals, nutraceuticals and agro food. A business strategy has been envisaged, leading to safe, sustainable, economically viable & attractive products acceptable by the end users. The ALINA consortium involves 12 partners (5 RTDs, 1 large industry and 6 SMEs). ALINA project has a duration of 48 months and a total estimated budget of € 7,266,414.

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D-rAinBOW

An integrated Biorefinery process using Agro-Industrial water, Eco-friendly Harvesting and Stepwise Extraction of Functional Compounds: Cosmetics, Feeds, Nutraceuticals, Pharmaceuticals & Foodstuffs.

D-rAinBOW consortium aims to create a whole sustainable bioproduct value chain based on microalgae cultivation in agroindustrial process water, providing water biotreatment while producing biomass and high-value compounds and materials. D-rAinBOW proposes the construction of a modular pilot plant for the cultivation and down-processing of microalgal biomass grown in agroindustrial process waters, containing a full processing line for industrial applications relative to five markets. With this approach, all the microalgae biomass and biocompounds produced in the process will be fully used in different industrial sectors. D-rAinBOW strategy will allow to obtain several high-value bioproducts derived from microalgae with novel applications in Nutraceuticals, Cosmetics, Cosmetics at slow release of functional compounds, Pharma Formulations, New Super Food, Feed for aquaculture for Food and Ornamental Fishes.

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HEALTHnALGAE

Functional macro algae feed ingredients for health and climate protection.

The Health'n'Algae project will develop and demonstrate sustainable and cost-efficient functional feed supplements for the livestock feed industry based on red, green and brown macro-algae, thus contributing to global health and climate protection. The project will cover the whole value chain starting from cultivation, via pretreatment and biorefining, to in vitro and in vivo animal tests of the final formulated feed products. Focus will be on 3 innovative bioactive products demonstrating: 1) at least 30% methane reduction from dairy cows upon demonstration tests in Denmark and Belgium, 2) at least 50 % reduction of pathogens i.e. campylobacter in chicken demonstrated in Denmark and Poland, and 3) at least 90% reduction of coccidiosis in chicken demonstrated in Poland. Furthermore, aspects related to sustainability, certification, logistics, exploitation and various other related issues will be part of the challenging work program. The project consortium is strongly industry driven with 1 large enterprise, 8 SME's and 5 RTD's/UNI's from 7 EU countries.

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NUt-WAVE

Hazelnut waste products additional value exploitation.

The Nut-WAVE project demonstrates cost-effective and sustainable exploitation of the hazelnut biomass through a circular economy approach that allows to increase the value of the biomass through the extraction from waste streams and valorisation of bio-active ingredients to be used in consumer products for dietary supplements, food, animal feeding, cosmetics and packaging.

NUt-WAVE undertakes an holistic and circular approach of hazelnut value chain, from “farm-to-farm” including crop production, hazelnut processing, extraction of bio-active compounds (polyphenols and fibre); valorisation pathways for the bio-active compounds (cosmetics, animal feeding, functional food, packaging, dietary supplement) and closing the loop with farm sector use through biochar application as fertilizer. The ambition of the project is to bring together stakeholders of different sectors to demonstrate, assess and optimize the sustainability performance of compounds from processing of hazelnut. The NUt-WAVE project generates multiple cross-sector new interconnections through the participation of partners which are not traditionally directly involved. The NUt-WAVE project develops and demonstrates the operation of 6 distinct value chains and a range of products using the bio-active compounds. Compounds and products will be evaluated and documented to meet all regulatory requirements and to correspond to market standards: Dietary supplements; Fibre enriched food products; Animal feed or additive with bioactive properties (antioxidant, antimicrobial...) improving animal health and performances; Pet food rich in polyphenols; Skin care cosmetic products with polyphenols and Make-up cosmetic products with fibre and Biochar for industrial and agricultural uses.

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BIO-Proseed

Large-scale production of bio-based proteins for food and feed applications from rapeseed.

The aim of BIO-PROSEED is to build an integrated bio-refinery to demonstrate technical and economic large-scale production and valorization of a first-of-its-kind, sustainable high value plant protein isolated from an inedible agricultural byproduct of non-GMO rapeseed oil extraction. The resulting protein is a unique plant protein combining a high nutritional value with strong functionalities and a good taste-profile, as a result of which it can be used in a wide range of food applications.

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ProtiFinery

Integrated Biorefinery Concept for the Large-Scale Production of Plant-Based Food Protein and High Quality Feed.

ProtiFinery will meet the growing global protein demand by using an alternative and sustainable protein source. The overarching objective of ProtiFinery is to develop a complete flagship value chain at TRL 8 for the extraction of protein from stillage, a low value residue stream, by using a biorefinery approach. Upon completion of the ProtiFinery project, the value chain will facilitate the production of two kinds of high added value protein products that are new at the European market: a protein concentrate for use as high protein feed that can substitute soybean meal and a protein isolate for use as plant-based food protein ingredient. These new protein products have major benefits versus current protein products, such as good nutritional properties, low land utilization and high availability at a low price level and non-GMO. Furthermore, the protein products have significant lower carbon footprints compared to the marked dominating but imported soy protein.

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BIO-BEETCHEM

Bio refining beet sugar production side streams into valuable chemical building blocks through anaerobic fermentation.

The Bio Beetchem flagship is based on a proprietary technology that converts non-food biomass into biobased chemical compounds for food, feed, pharma, and cosmetic applications, as well as bio-based fertilizers. The technology has been developed through a non GMO process and is propelled by a circular economy concept.

The consortium counts on several European companies, all leaders in their respective markets. The ambition is to build a first of its kind facility in the North East of France that produces bio-based acids, not only to replace their omnipresent petrol based peers that dominate the global market today, but also to reduce by 3 the CO2 emissions by such companies, all within a zero waste process.

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TAN-UP

Scale-up of nano-filtered chestnut tannin production for valorisation into high added value markets.

How to respond to the ever-increasing demand for products from chemical industry? How to fight against global warming? One of the key answers deals with the use of novel and sustainable bio-based building blocks, outperforming fossil-based materials in terms of functionalities and performances.

However, these existing innovative products have still a much higher production costs that affects the price of downstream products, thus slowing down market uptake for sustainable products.

Thanks to the expertise of 11 EU partners, TAN'UP will deliver a first-of-a-kind bio refinery demonstrating the technical and economic viability of large-scale production of nano filtered Chestnut tannin (6 000 tons). It is used as high-value building block in 8 new bio based value chains for a wide range of mass markets, from resins to composites and bio-foams, with hundred billion euros potential.

Beyond substituting fossil raw material with bio-based ones, the TAN'UP building block brings outstanding properties to the end-products that include among others: fireproofing effects to the automotive and building applications, anti-allergenic, low VOC in products such as mattresses applications, fully natural products to coat seeds or fertilizers for agriculture applications.

The socio-economic potential is substantial considering the available chestnut biomass in Europe, bringing to poor economic regions the possibility to open new facilities that create wealth and employment. TAN'UP, keeping notably the whole value chains in Europe, will finally help to reach the environmental objectives decreasing global warming potential, CO2 emissions and fossil resources consumption. It will contribute to develop with a long term and sustainable perspective the bio-based economy.

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STARSHIP

Sustainable Transformation of macroalgae and carob biomass into high value Products.

To respond to the rising demand for high functional ingredients, STARSHIP focuses on demonstrating feasible solutions towards the Sustainable Transformation of Algae and caRob biomass into High value Products. This sustainable transformation is achieved by revalorizing biomass processing side streams for the extraction of high-value compounds (bioactive polysaccharides and polyphenols) for applications in food, beverages, nutraceuticals, feed and cosmetics. Two different sources (marine and terrestrial biomasses) will be demonstrated in four pilots to show the replicability of the approach across biomass sources. The bioactive compounds and benefits of brown macro-algae and carob fruits are well described in the scientific literature, however, their presence as bioactive ingredients is still underdeveloped in the industry, focusing on utilizing them as stabilizers, thickeners or sweeteners. The project will run for four years and involves 13 partners covering two value chains starting with biomass producers and suppliers, involving key players in the bio refinery process and targeting ingredient manufacturers and end users with market access in Europe. The partnership is strongly industry-driven with the participation of large companies, SMEs, an association, experts from technological centers and academia.

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