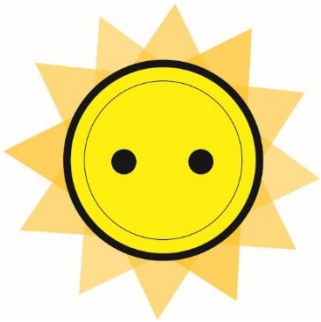

Valorization of residual biomass for advanced 3D materials - ValBio-3D

Lignocellulosic resources will play a key role in the production of novel bio-based and biodegradable materials, which have potential in replacing fossil-based products and reducing their negative environmental impact. ValBio-3D project aims at development of efficient technologies for production of sustainable and 100% bio-based materials from agro-industrial residues and their further valorization into bioenergy, biochemicals, bioplastics and biocomposites.

The project will address sustainable management and conservation of natural resources by emphasizing the appropriate utilization of agro-industrial residues available in Europe and Latin America. To achieve proper utilization of lignocellulosic biomass a suitable separation of the different components, i.e. cellulose, hemicellulose and lignin, is needed, thus requiring development of effective and self-sustainable biorefinery concepts. Novel technologies for manufacturing bio-based products from the obtained materials will also be addressed, for example 3D printing for the production of biocomposites. The environmental life-cycle impacts of the novel bio-based materials and composites will be assessed in order to ensure their positive impact.

The project is divided into 7 work packages (WPs). In WP1, the aim is to design suitable and feasible routes for fractionation of lignocellulosics and generating materials for the production of bioenergy, bioplastics and biocomposites. WP2 targets at effective utilization of the hemicellulose and lignin fractions obtained in WP1 and their conversion into biocompounds and bioenergy. In WP3, ligno-nanocelluloses will be produced from the cellulose materials obtained in WP1 and tailored for use with each specific biocomposite matrix and for different applications, such as structural and biomedical composites. WP4 studies the biopolymer synthesis starting from the materials obtained in WP1 and WP2 and targeting in their use in bioplastics and wood coatings. In WP5, 3D printing as a processing technology for structured nanocellulose-based composite products will be applied, using biopolymer-based filaments reinforced with nanocellulose as a starting material (obtained from WP1-4). The objective of WP6 is to assess the life-cycle environmental impacts of materials and products generated in WPs 1-5.

The project consortium consists of four research partners, two partners representing higher education and two industrial partners. Four of the partners come from Latin America, Argentina, Chile and Peru and four have European origins, in Finland, Norway and Germany. The research organisations and higher education partners have received funding from the respective national funding agencies.

Dr. Maria Christina Area, Instituto de Materiales de Misiones (IMAM) UNaM-CONICET (Universidad Nacional de Misiones - Consejo Nacional de Investigaciones Cientificas y Técnicas), Argentina. Coordinator and WP1 leader
Dr. Gustavo Ciudad, Universidad de La Frontera, Chile. WP2 leader

Dr. Tekla Tammelin, VTT Technical Research Centre of Finland Ltd, Finland. WP3 leader

Dr. Claudia Schirp, Fraunhofer Institute for Wood Research, WKI, Germany. WP4 leader

Dr. Gary Chinga Carrasco, Paper and Fibre Research Institute AS, Norway. WP5 leader

Isabel Quispe, Pontifical Catholic University of Peru, Peru. WP6 leader

Marcelo Miguel Melnechuk, Biorefinería Santa Ana, Argentina.

Gorm Bruland, ERIK HOEL AS, Norway.

ACADEMY OF FINLAND