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EUCALIVA: A PROJECT TO REUSE WASTE FROM PAPER INDUSTRY

The European project EUCALIVA (EUCALyptus Lignin VAlorisation for Advanced Materials and Carbon Fibres), which gathers 6 partners around Europe, has just started. It will be focused on developing and setting-up a fully-integrated, energetically-efficient, scalable, innovative and flexible processing chain based on the valorisation of Lignin for producing Carbon fibres (CF) and other carbon-based materials, mainly for functional applications.

EUCALIVA is a research project based on extracting high-purity soluble Lignin from chemical wood pulping processes (black liquors from Kraft pulping), and to transform it, through different valorisation routes, achieving a cost-efficient alternative to today's petroleum-based carbon raw materials, in fibres and other forms. New applications will be reached: multifunctional film-like conductive, piezo-resistive and piezoelectric materials (e.g., for biosensors, flexible electrodes, stretchable electronics), smart fabrics and functional fibres, as well as applications based on fibrous mats, non-woven fabrics and their carbonized derivatives (carbon-activated products).

The use of waste components from industrial activities as raw materials to obtain high value-added products is worth being investigated as a sustainable process. Lignin from pulping process is present all over Europe and represents a big source of underexploited material. There is an estimated 70 million tonnes of lignin available from pulping processes worldwide, but much of this is not isolated but burned onsite to provide steam for heat and power production. Until now only about 2% of the Lignins available in the pulp and paper industry is commercially used. EUCALIVA aims to create a valorisation chain of the lignin fraction, using *Eucalyptus globulus* waste as a source.

EUCALIVA, will be focusing on the three fundamental aspects in the preparation of high quality carbon-based materials, taking as source Kraft Lignin from black liquor (paper industries waste): (i) the optimization of Lignin separation, preparation (e.g., **blends with other polymers or by the introduction into the spinning solution of metal or other precursors**) and spinning for Lignin-based fibres manufacture; (ii) the development of efficient and faster thermostabilization routes; and/or (iii) the achievement of Carbon fibres and other carbon-based materials with new or enhanced properties.

The project's principal objectives are: to demonstrate a new bio-based, renewable and economically viable method of formulating Lignin blends as precursors suitable for Lignin-based Carbon fibres, fibrous mats and non-wovens, and stretchable films; to demonstrate the viability of the processing of Lignin into Carbon fibres and other carbon-based materials; to create new business opportunities and jobs in the pulp and paper industry; to perform Life Cycle and Cost Analyses to assess the economic, environmental and social sustainability of the developed products and the related processing routes, and to identify a strategy for market replication.

This project has received funding from the BioBased Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement N° 745789.

Expected results can be summarized as follows: reduction of industrial side-streams routed to disposal as waste, demonstrable operational and energy cost savings, introduction of ‘Lignin-to-(bio)-product’ concepts at a semi-commercial scale, delivery of one new building block based on biomass of European origin validated at demonstration scale, contribution to other BBI JU (Bio-Based Industries Joint Undertaking) key performance indicators and improving innovation capacity and the integration of new knowledge.

EUCALIVA was selected among different proposals in the EU funded H2020 BBI JTI 2016 call for projects on “Valorisation of lignin and other side-streams to increase efficiency of biorefineries and increase sustainability of the whole value chain”. This project will have a duration of 42 months and it has received funding from the Bio Based Industries Joint Undertaking under the European Union’s Horizon 2020 research and innovation programme. EUCALIVA is estimated to have a total eligible cost of 2.419.871€ and it will receive funding of about 1.795.010€.

Project partners

The consortium is composed by six partners organizations from four different countries. Among them, four partners are SMEs (Small and medium-sized enterprises): Contactica S.L. (project coordinator) (Spain), Envirohemp S.L. (Spain), Grado Zero Innovation S.r.l. (Italy), Biosensor S.r.l. (Italy); and two partners are RTD (Research and Innovation): Sächsisches Textil Forschungs Institut e.V. (Germany) and Tampere University of Technology (TUT) (Finland).

The **kick-off meeting** of this research project took place in Brussels, on September 26th.

Bio-Based Industries Joint Undertaking grant

The Bio-Based Industries Joint Undertaking is a €3.7 billion Public-Private Partnership between the [EU](#) and the [Bio-based Industries Consortium](#). Operating under Horizon 2020, it is driven by the Vision and Strategic Innovation and Research Agenda (SIRA) developed by the industry.

For more information, visit BBI website: <https://www.bbi-europe.eu/>

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