



EUROPEAN SSUCHY PROJECT UPDATE AFTER 4 YEARS OF WORK

SSUCHY - Sustainable structural and multifunctional biocomposites from natural fibres and biobased polymers

4 years after the project launch, the 17 European partners gathered both onsite in Leuven, Belgium and online to review the last advances and the final actions of the project before its end in February 2022.

The SSUCHY Project is developing composite constituents and materials, based on renewable resources, with notably applications in the transportation and audio sectors. It brought its 17 European partners together for 2 days of exchanges and was the opportunity to summarise the results obtained on the preforms, resins and demonstrators and to plan the last remaining actions before disseminating the project's outcomes during a dedicated final event on 9th February 2022.

New biobased polymers and reinforcements

The proof-of-concept of a fully biobased and non-toxic epoxy polymer for environmentally-friendly and renewable plant fibre composites was demonstrated. It has been designed to replace the oil-derived and reprotoxic substance (Bisphenol A) with a non-harmful epoxy monomer derived from an abundant, renewable and undervalued wood feedstock, using green chemistry. The obtained fully biobased epoxy polymer has thermomechanical properties equal and even surpassing the widespread DGEBA-based epoxy and has a very good affinity with hemp fibres. Finally, when reinforced with the woven hemp fabric also developed within the SSUCHY project, a fully biobased, environmentally friendly and non-toxic composite with mechanical performance comparable to glass fibre reinforced DGEBA-based epoxy composite is obtained. It paves the way toward a new biomass value chain for composite materials with economically viable perspectives.

A paper on the hemp shives fractionation has been jointly drafted by the partners Stockholm University, ENI Tarbes and FEMTO – UFC. Up to now, despite the prominent use of hemp fibres,

negligible attention has been given to upgrade the hemp shives. In this work, valorization of hemp shives was performed by reductive catalytic fractionation. An unexpectedly high yield of monophenolic compounds was found. It constitutes an interesting source of building blocks for bio-based polymers.

Hemp value chain

A collaborative work has been carried out by the partners UCSC, ENI Tarbes, Linificio e canapificio nazionale, ENSAIT and UFC to confirm the interest of the transformation of hemp using the flax machinery (scutching and hackling route) and improve the readiness level. The technologies related to the processing of the long-aligned hemp fibres were adapted and simplified when compared to the ones used for the classical flax textile application. They were also demonstrated in industrially relevant environment and the obtained woven fabrics were validated for use in composite applications.

Some very promising results were also obtained with medium length carded fibres for mid-range composite performance and moderate cost. The full story will be told during the project final event.

These activities and results fall within a hot topic, in complete effervescence in Europe and around the world with numerous R&D and industrial initiatives related to the production of hemp fabrics for clothing and textile applications. Long-aligned hemp fibres processing and valorisation is more an actual and major issue than ever.

Work on Sustainability, End of Life and Recyclability

Partner KU Leuven, in collaboration and with contributions from most of the partners, carried out the assessment of the environmental performance of the semi-finished products and processes through a Life Cycle Assessment approach. Even though this approach is not completely optimised for developments with low TRL as Research and Innovation Actions, the LCA is a great tool helping to address material processing bottlenecks and for decision support, in order to recommend ways to improve the performance indicators. The teams are currently finalising the assessments the environmental burden and benefits of SSUCHY's preforms, resins and demonstrators and will reveal the results by the end of the project.

3 remaining PhD defenses

After Dr. Anne-Clémence Corbin (ENSAIT), Dr. Marie Grégoire (ENI Tarbes) and Dr. Taiqu Liu (FEMTO-UFC), three other PhD students will graduate in the frame of the project soon. Benjamin Sala (FEMTO-UFC) whose work focused on "Creep and recovery behaviour of bio-based composite sandwich structures in hygrothermal environment" will defend his PhD next 26th November in Besançon. The defenses of Maria Morissa and Gilles Koolen from KU Leuven will be scheduled early next year.

Save the date: project final event will be held in Besançon (FR) on February, 9th

SSUCHY's 17 partners will invite the relevant stakeholders to attend to a final workshop for the presentation and demonstration of all the project's results. During this specific event, both academic research advances and industrial developments will be revealed and shared to the participants who will be able to join onsite in the Université de Franche-Comté FEMTO-ST premises or virtually. More information and invitations will be delivered through the project's networks in the forthcoming days.

About SSUCHY*

The SSUCHY project is positioned on the development of composite constituents, based on a renewable resource (*i.e.* bio-based polymers and plant fibre reinforcements) for the development of multifunctional recyclable and/or biodegradable bio-based composites with advanced functionalities for application in different sectors: transportation (ground transportation and aerospace) and high value market niches such as the acoustic and electronics sectors. It is dedicated to the development of specific concepts, technologies and materials to achieve a complete value chain and prove the principle at the scale of product demonstrators.

SSUCHY brings together 17 European partners. Coordinated by the Université de Franche-Comté (UFC/FEMTO Institute), the project will be carried out over 48 months, from September 2017 to August 2021, with a total budget of € 7 411 150, including € 4 457 195 of BBI JU contribution. SSUCHY has received funding from the Bio-Based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation program under grant agreement No 744349

The 17 European project partners

- 3 industries: Linificio e Canapificio Nazionale Srl (Italy), Nouryon (Netherlands) and Trèves (France)
- 3 SMEs: EADCO GmbH (Germany), NPSP BV (Netherlands) and Wilson Benesch (United Kingdom)
- 10 academic institutions: Université de Franche-Comté FEMTO-ST (France), Chimie Paris Tech – CNRS (France), Ecole Nationale d'Ingénieurs de Tarbes (France), Ecole Nationale Supérieure Arts et Industries Textiles – ENSAIT (France), Université de Bourgogne (France), Università Cattolica del Sacro Cuore (Italy), University of Bristol (United Kingdom), University of Derby (United Kingdom), Katholieke Universiteit Leuven (Belgium), Stockholms Universitet (Sweden)
- One competitive cluster: IAR, The French Bioeconomy Cluster (France)

*SSUCHY: *Sustainable Structural and Multifunctional Biocomposites from Hybrid Natural Fibres and bio-based polymers*

More information:

- SSUCHY website: www.ssuchy.eu
- European Commission website: http://cordis.europa.eu/project/rcn/210573_en.html

Contacts:

Press

Sophie MURIAS

Communications & European Projects Officer | IAR, The French Bioeconomy Cluster
+33 6 12 54 01 99 - murias@iar-pole.com

Project coordinator

Université de Franche-Comté

Vincent PLACET

+33 3 81 66 60 55 - vincent.placet@univ-fcomte.fr

