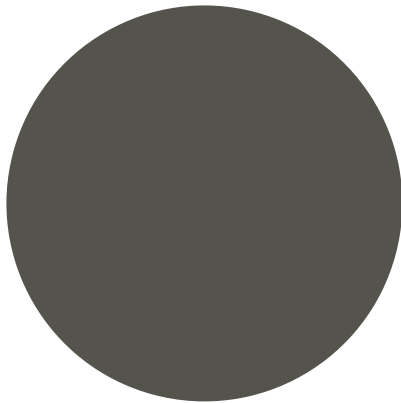
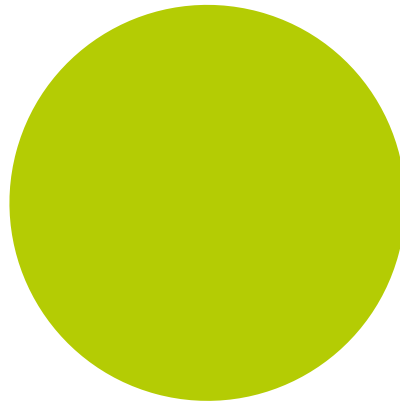
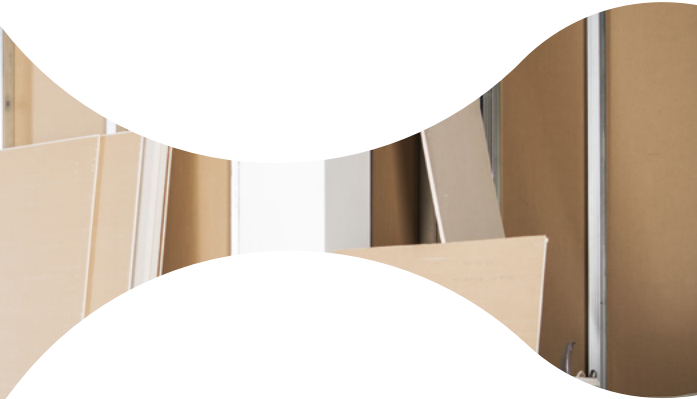




Suchy
next
CIRCULAR
BIO-BASED
COMPOSITES



JEC WORLD
2026 EDITION



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SHAPING THE FUTURE OF BIO-BASED COMPOSITES



Context

In recent years, due to increasing environmental concerns, there has been a growing renewal of interest in fibres and building blocks derived from lignocellulosic feedstock. Plant fibres exhibit numerous advantages in the fields of ecology (renewable resource usage, recyclability, biodegradability), of economy and social aspects (wide availability, low production cost, preservation and development of agricultural jobs in the fibre-producing countries) and from a technical point of view (high specific mechanical properties, damping properties). In addition to their historical and traditional applications, mainly in the textile, pulp and paper industries, new opportunities have emerged for plant fibre.

Thanks to outstanding research efforts, this resource has become an attractive material for engineering applications. Hemp natural fibre is among the natural fibre that can be valorised in many potential applications.

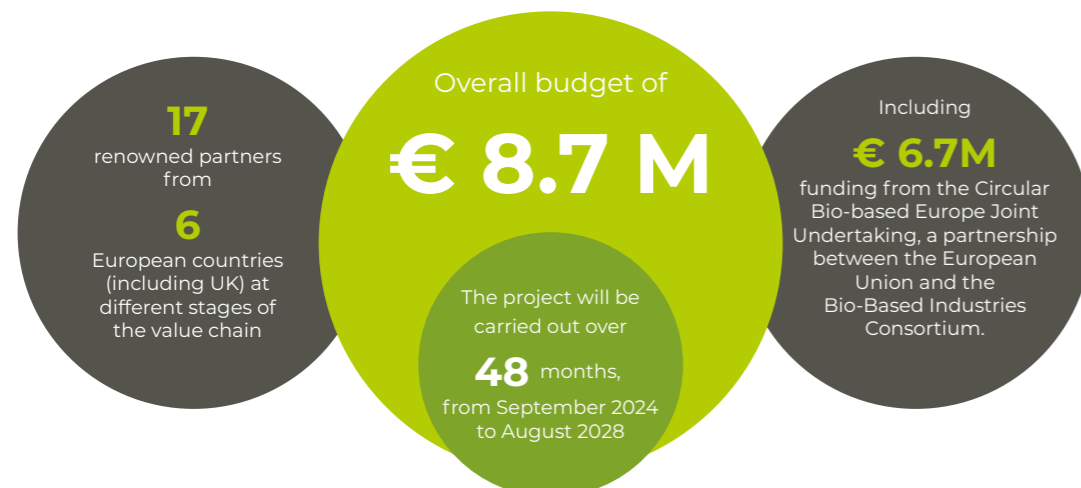
Value chain

Feedstock sourcing and initial processing (Hemp fibre)	
Initial processing (Bio-based resins)	
Integration in applications and prototypes developments	
Materials developments, recycling, LCA	
Stakeholders' engagement and market uptakes	

Approach

SSUCHY-Next seeks to elevate various aspects of the hemp fibre supply chain to TRL 7, a significant step towards industrial viability. This includes scaling up the production of hemp fibre products, from field extraction to composite materials.

The project addresses the challenge of the limited availability of bio-based polymer matrices, crucial for sustainable composite production, by focusing on three bio-based polymer systems and aiming for high bio-content and recyclability: bio-based acrylic polymer Elium® with very high bio-content, fully bio-based benzoxazine, and fully bio-based BG-epoxy, building upon the system developed in the first SSUCHY project.



Concept

SSUCHY-Next will use hemp fibre as basis and develop 3 bio-based resins for high-performance bio-based composites. The project will lead to the extension of the range of applications to sectors such as: wind energy and building applications. Some demonstrators will be developed (wind turbine blades and construction materials, such as façade cladding panels) and integrate these composites.

Objectives

- **Developing the hemp fibre supply chain** to produce fibre across regions with diverse climates.
- **Advancing the development** of 3 bio-based and circular matrices
- **Evaluating and improving the newly developed hemp fibre preforms and bio-resins** at the composites level. Improve fibre-matrix compatibility, moisture durability coupled with mechanical ageing.
- **Optimising** structural damping, **understanding** non-linear material behaviour, and **enhancing** the fire, smoke and toxicity performance of bio-composites for various applications.
- **Producing 95% bio-based composite materials** and aiming for at least 90% bio-based resin.
- **Developing wood-based composites** to replace glass-based materials and metal in the construction sector.
- **Demonstrating large-scale building and construction applications** of circular bio-based composites, optimising manufacturing processes and reducing the environmental footprint.
- **Proving improved life cycle assessment** (LCA) and circularity of the bio-based composites.

Application fields



WIND ENERGY



CONSTRUCTION

A multi stakeholder project

16 partners from 6 European countries

5 ACADEMIC PARTNERS:

KU Leuven (Belgium), TU Delft (Netherlands), UMLP – Université Marie et Louis Pasteur (UMLP includes, among others, the ENSMM and hosts the FEMTO-ST Institute) (France), Danmarks Tekniske Universitet DTU (Denmark), Université de Technologie Tarbes Occitanie Pyrénées (UTTPO) (France).

2 RESEARCH CENTERS:

CETIM (France), Materia Nova (Belgium).

6 SMES:

Eco-Technilin (France), Woodoo (France), NPSP (Netherlands), Olsen Wings (Denmark), Bitrez (United Kingdom), Terre de Lin (France).

2 LARGE COMPANIES:

Arkema (France), Linificio (Italy).

1 CLUSTER:

Bioeconomy For Change (France).

📍 BELGIUM

KU Leuven has about 40 years of background in the research on composite materials and currently employs about 60 researchers in this field, of which about 10 focus on bio-composite materials under supervision of the project coordinator (Prof. Aart van Vuure). KU Leuven has also been involved in many European project consortia, in the same expertise field. Important focal points of its research are on bio-composite (moisture) durability and fibre-matrix interfaces, which is also its contribution to SSUCHY-Next. The research group Sustainability Assessment of Materials and Circular Economy has long-standing expertise in the field of Life Cycle Analysis and participated in various projects concerning bio-composites. The synergistic combination of the expertise and experiences gained from the first SSUCHY project along with the new advancements in the LCA methodologies over the recent years, allow the Sustainability Assessment of Materials and Circular Economy team to significantly contribute to the sustainability of the SSUCHY-NEXT project, while simultaneously leading and propelling the advancements in the life cycle management methodologies beyond the current state-of-the-art. The project management is supported by the knowledge transfer unit of KU Leuven – KU Leuven R&D, who have managed over the years multiple European projects and overseen the creation of more than 140 spin-off companies.

Main task(s) in SSUCHY-Next

KU Leuven is coordinating the project, works on improving the moisture durability and fibre-matrix compatibility for the new bio-composites and works on the Life Cycle Analysis that is made to assess the performance of the bio-based products developed in the framework of SSUCHY-Next.

Expertise – Material development, durability & advanced characterisation (WP3)

Within SSUCHY-Next, KU Leuven leads the work on material development for enhanced performance and durability of bio-based composites. This expertise focuses on evaluating and optimising hemp fibre preforms and bio-resin systems at composite level, with particular attention to fibre-matrix compatibility and moisture durability. KU Leuven applies a combined physical, chemical and micromechanical approach to improve interfacial adhesion, supported by extensive mechanical, hygrothermal, fatigue and creep testing. The university also contributes to a better understanding of non-linear material behaviour and structural damping, ensuring that the developed bio-composites meet the demanding requirements of load-bearing applications such as wind turbine blades. Results are continuously fed into demonstrator manufacturing to ensure industrial relevance.



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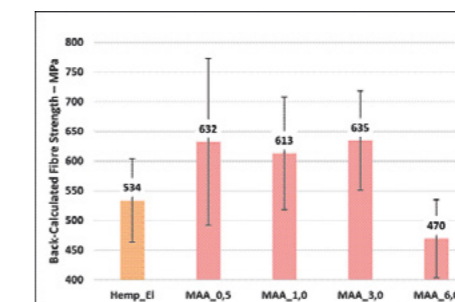
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Expertise – Life Cycle Assessment & Safe-and-Sustainable-by-Design (WP7)

KU Leuven also leads the Life Cycle Assessment (LCA) and circularity activities within SSUCHY-Next through its Sustainability Assessment of Materials and Circular Economy (SAM) research group. This work evaluates the environmental performance of bio-based resins, fibre products and final applications across the full life cycle, from raw materials and manufacturing to use and end-of-life. KU Leuven conducts iterative LCA analyses from laboratory to projected industrial scale, integrating recycling data and scenario analyses to guide material and process optimisation. By applying Safe-and-Sustainable-by-Design (SSbD) principles, KU Leuven supports informed decision-making to maximise circularity, reduce environmental impacts and contribute to emerging tools such as Digital Product Passports.

Expertise – Project coordination & scientific integration (WP9)

As project coordinator, KU Leuven ensures the overall scientific, technical and organisational coherence of SSUCHY-Next. Drawing on extensive experience in European collaborative projects, KU Leuven coordinates interactions across work packages, aligns material development with application and sustainability goals, and ensures timely delivery of milestones and results. Project management is supported by KU Leuven R&D, the university's knowledge transfer unit, which brings strong expertise in research valorisation, innovation management and industrial collaboration. This coordination role is key to bridging fundamental research, industrial scale-up and impact-driven outcomes across the entire SSUCHY-Next value chain.



Example of research result obtained by KU Leuven in the first year of SSUCHY-Next. The interface strength between hemp fibres and acrylic polymer (Elium®) could be improved by adding a few percent of methacrylic acid to the resin, which improves its polarity and capabilities to bond to hemp fibre

FRANCE

With its unique expertise in materials science, Arkema shapes materials to meet the accelerating demand for innovative, sustainable materials, driven by the challenges of new energies, new technologies, resource scarcity, mobility, and growing urbanization. Structured around three coherent and complementary segments dedicated to Specialty Materials (Adhesives, Advanced Materials and Coating Solutions), which account for 92% of its sales, and an Intermediates segment benefiting from competitive and global product lines, the Group achieves sales of €9.5 billion. Driven by the collective energy of its 21,100 employees, Arkema is present in nearly 55 countries worldwide.



Main task(s) in SSUCHY-Next

Arkema will develop a bio-based version of their well known in-situ polymerizable Elium® acrylic resin system and work to supply the necessary quantity of resin for the various applications.

Innovation – Bio-based Elium® acrylic resin

Within SSUCHY-Next, Arkema is advancing its flagship Elium® technology by developing a new generation of bio-based liquid acrylic thermoplastic resins. Elium® uniquely combines the processing advantages of thermosets (liquid form, room-temperature polymerisation and fast curing) with the recyclability of thermoplastics. In the project, Arkema works to significantly increase the bio-based content of Elium® while maintaining high mechanical performance, industrial processability and recyclability. This innovation supports the transition toward fully recyclable, high-performance bio-composites, notably for large-scale applications such as wind turbine blades and structural components.

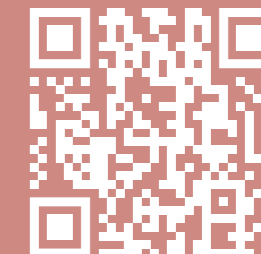
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FRANCE

Bioeconomy For Change (B4C) is a leading French Bioeconomy Cluster, recognised across Europe and internationally. It gathers over 500 members from across the entire bio-based value chain, from upstream agricultural and marine feedstocks to the marketing of end-products for several industrial sectors (food, feed, bioenergy, bio-based products). Members include agricultural cooperatives, research institutions and universities, companies of all sizes, public stakeholders, etc. Our team of 35 specialists contributes to the promotion of the bioeconomy, supports the projects of our members, and fosters networking and dynamic collaboration.



Main task(s) in SSUCHY-Next

B4C as WP8 leader, will oversee the Dissemination, Communication and Exploitation (DCE) activities.

Expertise – Dissemination, Exploitation & Market Intelligence

With its dedicated team on EU Projects management, B4C support its members to apply to EU funding with the following activities: Calls and topics analysis, Partners search thanks to our national and European network (BIC and CBE JU boards member, EuropaBio and BIP members) and support on the writing process and critical review and strategic advices. In addition, B4C is currently involved in 10+ EU projects as a partner (+20 projects since 20 years) with more than 12 years of experience and can perform several activities related to the valorisation and communication of bio-based innovation. Through dedicated stakeholders analysis and engagement actions that can mobilise its network, B4C is responsible of communication and dissemination strategies, social networks and website management, organisation and participation to international and local conferences, professional shows or workshops. In several EU-funded projects (Horizon Europe, CBE JU) on bio-based topics and different TRL (CSA, RIA, IA-demo and IA flagships). Thanks to its dedicated Business intelligence department, B4C is also able to contribute to strategic advices and market intelligence tasks.

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📍 UNITED KINGDOM

Bitrez is a resin manufacturer that offers an extensive range of highly innovative materials developed for a broad range of markets. The company works with a high standard of customer service and flexibility with controlled design, development and implementation programmes to give their customers the right solutions for their resin requirements. Since 1982, Bitrez has developed a reputation for providing quality products with exceptional service.



Main task(s) in SSUCHY-Next

Bitrez will work with Materia Nova to develop circular, sustainable, 100% biobased thermoset precursor structures that can be produced on a pilot scale. The company will also supply the necessary quantity of resin for the various applications.

Expertise – Resin scale-up & industrialisation

Bitrez will work with Materia Nova to develop circular, sustainable, 100% biobased thermoset precursor structures that can be produced on a pilot scale. The company will also supply the necessary quantity of resin for the various applications.

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📍 FRANCE

Cetim is the French leading technological accelerator for industry.

Cetim brings the best of research to manufacturers and offers a global solution of consulting and engineering services. Its multidisciplinary skills and its unique R&D capacity are supported by more than 1,100 experts, doctors, engineers and technicians, who transform every day manufacturing players all over the world, for the benefit of an ever more digital, efficient, positive and sustainable industry, capable of responding to the great economic and ecological challenges of our time.

For six decades, Cetim has been linking science and industry to transform knowledge into operational solutions. Its laboratories, platforms and academic partnerships have allowed key technologies to emerge — advanced materials, intelligent manufacturing processes, hydrogen, digital twins — which contribute to the competitiveness and sovereignty of the mechanical sector.

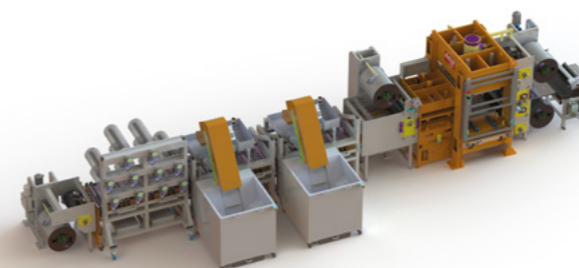


Main task(s) in SSUCHY-Next

CETIM will work to demonstrate various recycling options based on input from the wind turbine blades and Woodoo products. They will also assess the bio-based material properties and their capacity to retain attractive after several recycling loops.

Expertise – Recycling & circularity demonstration

Within SSUCHY-Next, CETIM brings its strong expertise in end-of-life strategies and industrial-scale recycling of composite materials, with a particular focus on thermoplastic bio-based composites. CETIM demonstrates the recyclability of Elium®-based composites using its patented Thermosaic® process, an innovative upcycling technology originally developed for thermoplastic composites. In the project, large composite components such as wind turbine blades are shredded and transformed into recycled sheets and panels, which can be further processed through thermo-stamping or compression moulding. CETIM optimises processing parameters to minimise material degradation and evaluates the mechanical performance of the recycled materials over several recycling loops. By combining advanced recycling trials with material characterisation and data generation for Life Cycle Assessment, CETIM plays a key role in validating high-performance, low-impact and truly circular bio-based composite solutions.



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CETIM IS EXHIBITING AT JEC 2026, BOOTH 6D107

📍 DENMARK

DTU Wind and Energy Systems at the Technical University of Denmark is a globally leading research institution with approximately 370 employees dedicated to advancing wind energy and intelligent power systems. The department is internationally recognised for cutting-edge research, innovation, and the development of sustainable and cost-effective energy solutions with real societal impact. DTU offers world-class educational programmes and operates state-of-the-art testing facilities supporting research on materials, turbine systems, and energy infrastructure.

Main task(s) in SSUCHY-Next

DTU leads Work Package 4, focusing on the development and demonstration of large-scale wind turbine blade applications using bio-based materials. In close collaboration with Olsen Wings A/S, DTU will design, manufacture, and test 12.6-metre wind turbine blades to validate the performance and industrial feasibility of these new materials.

Expertise – Large-scale wind turbine blade design & validation

Within SSUCHY-Next, the Technical University of Denmark leads the full process of designing, manufacturing, and validating large-scale wind turbine blades made from bio-based composite materials. DTU demonstrates that hemp-fibre reinforcements combined with the bio-based Elium® acrylic resin can match the structural behaviour of conventional glass-fibre/epoxy solutions.

Using its open DTU 12.6 m reference blade design, DTU adapts the structural architecture to the new material system through advanced aero-structural modelling and finite element simulations. Together with Olsen Wings, DTU develops and optimises infusion and curing strategies tailored to large composite structures, aiming to reduce manufacturing time, energy consumption, and environmental impact.

The resulting bio-based blades undergo comprehensive full-scale testing—including static, fatigue, and dynamic tests in accordance with IEC standards—and are benchmarked against conventional designs. DTU's work is central to SSUCHY-Next's ambition to demonstrate the industrial relevance and certification-readiness of bio-based composite solutions for the wind energy sector.



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📍 FRANCE

EcoTechnilin - 25 Years of Engineering in Bio-Based Composite Reinforcements

Founded in 1998 in Normandy — the global epicenter of flax production (60% of the world's non-oilseed flax) — EcoTechnilin is now the European leader in processing plant fibers (flax, hemp, kenaf) into technical reinforcements for high-performance composites.

Part of the NatUp cooperative (7,000 farmers), the company benefits from full vertical integration, from crop to finished reinforcement. This ensures complete traceability and consistent mechanical properties, meeting the requirements of automotive, aerospace and transportation OEMs.

Over 25 years of R&D, EcoTechnilin has developed a comprehensive portfolio covering major composite processes: Fibrimat and FibriPlast nonwovens, FlaxPly coated fabrics (UD and biaxial), FlaxTape™ unidirectional webs consolidated through a patented 100% natural process, and FlaxPreg prepregs. From lightweight automotive interiors to structural epoxy prepregs, this range makes EcoTechnilin a single partner for diverse technical specifications.

The company operates three production sites in France and Poland, supplying around fifty Tier 1 and OEM customers across 150 European manufacturing sites. It is ISO 9001 and 14001 certified and holds the EcoVadis Gold Medal.

Through its UpGreen strategy, EcoTechnilin continuously reduces the environmental footprint of its products, notably via the RECYTAL® program reintegrating 20–30% of customer production waste into new nonwovens. Within the European SSUCHY-Next project, the company is now developing HempTape, a next-generation unidirectional hemp reinforcement, extending its UD alignment expertise to new high-performance bio-based applications.

Main task(s) in SSUCHY-Next

In the project, Eco-Technilin will develop a similar product based on hemp fibre as well as produce some more traditional non-woven materials.

Expertise – Hemp-based reinforcement development & industrialisation

Within SSUCHY-Next, EcoTechnilin brings its recognised expertise in the design and industrial production of high-performance natural fibre reinforcements for composite applications. Building on its flagship FlaxTape® technology, EcoTechnilin adapts and optimises its unidirectional (UD) manufacturing process to develop a new hemp-based UD tape (HempTape) suitable for load-bearing bio-composites. Hackled hemp slivers supplied by project partners are transformed into aligned fibre reinforcements while minimising fibre breakage and maximising fibre orientation and tensile performance. In parallel, EcoTechnilin develops complementary non-woven hemp reinforcements to address a wide range of applications. A key objective of the project is to valorise medium-length fibres and tows, enabling cost-effective, scalable and industrially viable hemp reinforcements. Through this work, EcoTechnilin plays a central role in demonstrating that hemp-based UD reinforcements can reach performance levels comparable to flax, while supporting the emergence of a robust European hemp fibre value chain.



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LINIFICIO E CANAPIFICIO NAZIONALE SRL



📍 ITALY

Linificio e Canapificio Nazionale Srl SB, headquartered in Villa d'Almè - Bergamo, has been a global leader in sustainable, European production of refined linen and hemp yarns for 150 years. With 950 employees across facilities in Italy, Lithuania, and Tunisia, its production capacity is of 5,000 tons of yarn annually. Owned by the Marzotto Group, 60% of its sales are domestic. The company has participated in European projects like SSUCHY and excels in hemp and flax fiber drafting and spinning production and flax machinery technology for hackling, drafting and spinning thanks to its technical engineering department LINIMPIANTI.



Main task(s) in SSUCHY-Next

Linificio will further develop its expertise with hemp by producing woven and quasi-UD fabrics and contribute its know-how in processing Liberian fibre.

Expertise – Woven and quasi-UD fabric development for composites

Within SSUCHY-Next, Linificio e Canapificio Nazionale brings its industrial expertise in the manufacture of woven fabrics and quasi-unidirectional (quasi-UD) textile reinforcements based on hemp fibres. Scutched and hackled rovings, treated using a water-based boiling process, as well as yarns derived from long hackled fibre and carded slivers, are converted into high-quality textile preforms tailored to load-bearing bio-based composite applications. Particular attention is given to maximising fibre reinforcement potential through the use of mature fibres and by limiting structural defects such as kink bands, which negatively affect tensile performance. In parallel, Linificio conducts industrial production trials to optimise roving, weaving parameters and production rates, ensuring scalability, performance and industrial relevance of hemp-based reinforcements.



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MATERIA NOVA



📍 BELGIUM

Materia Nova is a technology accelerator for responsible innovation, ensuring technology transfer between fundamental research and industry. As innovation and research centre of the University of Mons, Materia Nova contributes actively to developing solutions to societal challenges, notably the energy transition and the deployment of the circular economy. Since 2000, Materia Nova has been adding meaning to R&D activities using three main levers: creative intelligence, contextual intelligence and collective intelligence.



Main task(s) in SSUCHY-Next

Materia Nova will contribute mainly with its expertise and know-how in the design and synthesis of new monomers derived from renewable resources commercially available, for the development of new thermosetting resins (mainly benzoxazine type) with advanced properties, their formulation and the characterization of their properties.

Innovation – Bio-based benzoxazine resins for circular composites

Within SSUCHY-Next, Materia Nova brings advanced expertise in the design and development of bio-based benzoxazine resin systems, positioning this chemistry as a key enabler for high-performance and circular bio-composites. Building on extensive experience in monomer synthesis from renewable feedstocks, Materia Nova develops 100% bio-based benzoxazine precursor structures tailored for natural fibre reinforcement, combining high thermal and mechanical performance with low shrinkage and improved durability. The work covers the full innovation chain, from molecular design and resin formulation to polymerisation and in-depth characterisation of mechanical, thermal and interfacial properties. In close collaboration with industrial partner Bitrez, Materia Nova supports the transition from laboratory proof-of-concept to pilot-scale production, ensuring that bio-based benzoxazine resins developed within SSUCHY-Next are not only innovative but also safe, scalable and ready for industrial composite applications.



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📍 NETHERLANDS

NPSP develops and manufactures innovative, environmentally friendly composite materials and products for public space, construction, design, and mobility. The company specialises in bio-based and circular composites that combine high performance with reduced environmental impact.

Using advanced production technologies, NPSP transforms natural fibre-reinforced plastics into durable, aesthetically refined solutions for everyday applications. In the previous SSUCHY project, NPSP developed a bio-based scooter demonstrator showcasing the structural potential of sustainable composites.

Main task(s) in SSUCHY-Next

In SSUCHY-Next, NPSP will work with the shorter fibre side-streams from the long fibre production and exploit them in Bulk Mould Compounds (BMC) for building products.

Expertise – Bio-based BMC/ SMC composites from fibre side-streams

NPSP contributes advanced expertise in the industrial processing of bio-based composites using Bulk and Sheet Moulding Compound (BMC/ SMC) technologies. Within SSUCHY-Next, the company focuses on the integration of short fibre side-streams from hemp long-fibre production into high-performance BMC systems.

This work addresses key research challenges, including fibre dispersion, fibre-matrix interface optimisation, rheology control, and mechanical performance consistency in compression moulded components. By combining patented processing know-how with industrial-scale production capabilities and collaboration with TU Delft, NPSP enables the translation of bio-based material research into demonstrator-ready applications.



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📍 DENMARK

Olsen Wings specializes in two products : Wind turbine blades for small wind and LEP (leading edge protection) for Mega Watt blades. The company builds on the Danish tradition and know-how within wind, and its products have been designed and developed over the years with the emphasis on quality and excellence in construction. Olsen Wings blades are innovative products, developed with help from the leading experts within wind turbine blades. Olsen Wings has a creative approach in working with blade technology and develops products that last. The company works with the most modern technology and automation processes for machining and casting wind turbine blades. Our LEP is developed together with the large wind industry and is the most resistant solution in the LEP market today. It is a Soft Shell. The properties is the best ever seen, and our Soft Shells survives more than 5 times the rough DNV-GL certified tests.

Main task(s) in SSUCHY-Next

Olsen Wings will work closely with DTU wind energy department to build hemp fibre bio-resin wind turbine blades.

Expertise – Wind turbine blade manufacturing & industrial know-how

Within SSUCHY-Next, Olsen Wings brings its core expertise in the industrial manufacturing of wind turbine blades for the small wind energy sector. As a specialised Danish SME, the company applies its long-standing know-how in blade production, moulding, infusion and quality control to support the fabrication of bio-based composite blades. Olsen Wings contributes its practical experience in manufacturing process optimisation, including resin infusion, curing cycles and defect mitigation, ensuring reliable and repeatable production of large composite structures. This expertise is essential to translating innovative bio-based materials into industrially realistic blade components, aligned with certification requirements and real-world wind turbine applications.



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📍 FRANCE

Terre de Lin is a cooperative specialising in growing and processing fibre flax, from seed to fibre. Its 800 farmer-members and 380 employees share the same passion for flax, the demand for quality and innovation. They are committed to preserving their specific know-how while developing their production practices, respect for the environment and commitment to society. TERRE DE LIN is based in Haute-Normandie, a unique region to produce high-quality fibre flax. The cooperative accounts for 15% of the world's flax production. It is a major player upstream in the fibre flax sector.



Main task(s) in SSUCHY-Next

In the project, Terre de Lin will further develop the scutching/hackling route for long hemp fibre.

Expertise – Scutching and hackling of high-quality hemp fibres

Within SSUCHY-Next, Terre de Lin brings its long-standing expertise in the scutching and hackling of bast fibres, applying and further developing these processes to hemp in order to deliver high-quality long fibres for composite applications.

We work with the hemp fibers we produce, with specific end goals, including:

- Production of hackled fibre for technical applications
- Improving our agronomic and industrial expertise through fiber production for SSUCHY
- Engaging with European partners within an emerging sector

Through this work, Terre de Lin plays a key role in securing a robust, scalable and high-quality fibre supply, essential for load-bearing bio-based composite demonstrators developed within SSUCHY-Next.



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📍 NETHERLANDS

Delft University of Technology is the oldest and largest public technical university in the Netherlands. In the 2022 QS World University Rankings, it is ranked among the world's top ten universities for engineering and technology. Founded in 1842 with the primary aim of training civil servants, the institution progressively expanded its research and education activities, becoming a polytechnic in 1864 and an institute of technology in 1905, thereby attaining full university status.

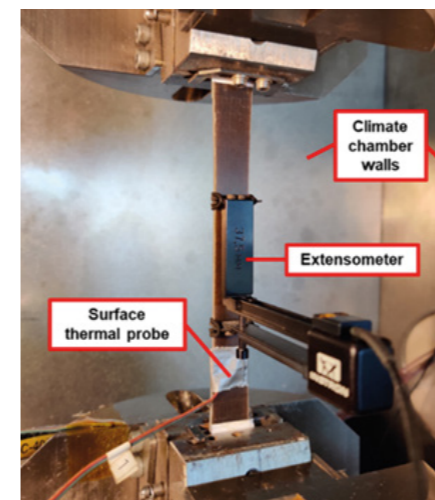


Main task(s) in SSUCHY-Next

TU Delft will contribute to tasks related to material ageing and durability, with particular emphasis on hygrothermal fatigue and creep, as well as on the interaction between creep and fatigue phenomena.

Expertise – Hygrothermal ageing and durability of bio-based composites

Within SSUCHY-Next, Delft University of Technology (Faculty of Civil Engineering & Geosciences) brings advanced expertise in the assessment of long-term durability and ageing of bio-based composite materials, with a strong focus on hygrothermal fatigue and creep behaviour. The innovation lies in the detailed investigation of how fibre–matrix interfaces, matrix chemistry, and environmental conditions (temperature and humidity) govern the time-dependent mechanical performance of bio-composites. Through dedicated experimental campaigns, TU Delft systematically evaluates damage mechanisms and performance retention under realistic service conditions, providing critical input for material optimisation. In close collaboration with industrial partner NPSP, this expertise supports the development of robust, durable, and application-ready bio-based composite products, ensuring that sustainability gains are matched by long-term structural reliability.



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FRANCE

The Université Marie et Louis Pasteur (UMLP) is a French university with the status of an experimental public institution (EPE), established on December 1, 2024. As of January 1, 2025, it succeeds the University of Franche-Comté and the University Bourgogne-Franche-Comté, consolidating their academic and research activities under a unified structure.

UMLP includes, among others:

1. SUPMICROTECH-ENSMM – École nationale supérieure de mécanique et des microtechniques (ENSMM), a public higher education and research institute that trains multidisciplinary engineers with a strong focus on mechatronics and microsystems.

Research activities are conducted within joint research laboratories. The researchers involved in SSUCHY-Next project are part of the FEMTO-ST Institute which integrates departments specializing in mechanics, materials science, mechatronics, electronics, acoustics, opto-electronics, energy, and time-frequency systems.

Main task(s) in SSUCHY-Next

In SSUCHY-Next, UMLP and SUPMICROTECH-ENSMM bring their expertise in the mechanical behaviour (static, fatigue, vibratory...) of plant fibres and their composites. UMLP also capitalises on the knowledge gained from coordinating the previous BBI-JU SSUCHY project and contributes to activities related to the wood-based composites and products developed by Woodoo.

Expertise – Structural damping and non-linear behaviour of bio-based composites

Within SSUCHY-Next, UMLP (ex-UBFC), through the FEMTO-ST laboratory and its Applied Mechanics department, brings cutting-edge expertise in the mechanical behaviour of bio-based composites under dynamic loading. The core innovation lies in the multi-scale analysis of structural damping and non-linear material behaviour of plant fibre composites, from single fibres and fibre-matrix interfaces to full composite structures.

UMLP combines advanced experimental characterisation (fatigue, cyclic loading, vibro-acoustic testing, X-ray tomography) with computational multiscale modelling, enabling accurate prediction of damping, stiffness evolution and energy dissipation mechanisms. This work provides essential input for the design of load-bearing bio-composite structures, ensuring that vibration control, durability and dynamic performance are fully integrated into SSUCHY-Next demonstrators.



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FRANCE

With about 1200 students, UTTOP is a public school that has been training general engineers in the fields of Mechanical Engineering and Industrial Engineering for 60 years. It has built its identity over the years to become a well-recognized centre in mechanical engineering and manufacturing. UTTOP has been involved in several European projects and was recently involved in the first SSUCHY project (2017-2022). The work performed at UTTOP will be coordinated by Prof Pierre Ouagne who leads the fibre, textile and (bio)composite group composed of 8 people. The group has developed a particular expertise on plant fibre at the intersection between agronomy, materials science and mechanical engineering. The group particularly deals with fibre extraction, mechanical and morphological characterisation of fibre and preparation of textile products.

Main task(s) in SSUCHY-Next

UTTOP will work on the hemp fibre supply chain with the aim to develop high-performance hemp reinforcement products for load bearing composite materials. On a scientific point of view, UTTOP will particularly nvestigate strategies to improve fibre properties using textile preparation processes. UTTOP will also work on the validation of two value chains from the field to the product with an objective of cost reduction and the use of by-products of the textile industry for lower cost mid length fibre.

Expertise & innovation – Hemp fibre mechanical performance and defect control

Within SSUCHY-Next, Université de Technologie Tarbes Occitanie Pyrénées (UTTOP) brings deep expertise in the mechanical behaviour and optimisation of hemp fibres for composite reinforcement. The core innovation lies in the identification, quantification and reduction of structural defects in plant fibres, in particular kink bands, which are known to limit tensile performance. UTTOP combines fibre extraction science, mechanical testing and microstructural analysis to establish direct links between processing conditions and fibre performance. This expertise is applied to both long and mid-length hemp fibres, enabling the development of reinforcement products that balance high mechanical efficiency, robustness and cost-effectiveness, and providing essential scientific foundations for the design of high-performance bio-based composites.



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FRANCE

Woodoo is a company with a strong patent position on products prepared from wood-based scaffolds. The company specialises in transforming wood at the molecular scale, turning it into sustainable high-performance material alternatives to steel, aluminium and concrete for cladding and structural building applications. Their product, STACK, is crafted by transforming low-grade wood into a cutting-edge material. Woodoo's technology has already gained recognition from the most prominent customers across construction sector. They have delivered some facade projects (cladding and facade fins) as an alternative to aluminium. They have also signed a key contract with Bouygues Construction to replace concrete by STACK Augmented Wood on the structural part of datacenters.

Main task(s) in SSUCHY-Next

Woodoo will further develop and scale-up its products inside the project, employing the bio-based binder developed in the project and also hemp reinforcement.

Expertise & innovation – Polymer-modified wood composites for high-performance applications

Within SSUCHY-Next, Woodoo brings its unique expertise in the development of polymer-modified wood (PMW) composites, combining delignified wood scaffolds with advanced bio-based polymer impregnation technologies. The core innovation lies in the controlled impregnation of wood veneers with bio-based binder, using vacuum-pressure and C-RTM processes tailored to the wood's multi-scale porosity. By precisely matching resin chemistry, viscosity and refractive index to the wood microstructure, Woodoo enables the creation of materials with enhanced mechanical performance, dimensional stability, reduced moisture sensitivity and novel functionalities such as translucency, flexibility or high strength-to-weight ratio. Within the project, this expertise is applied to develop three distinct bio-based wood composites (rigid structural laminates, translucent panels and flexible leather-like materials) demonstrating how bio-based resins and natural reinforcements can transform wood into recyclable, high-value materials for construction and design applications.



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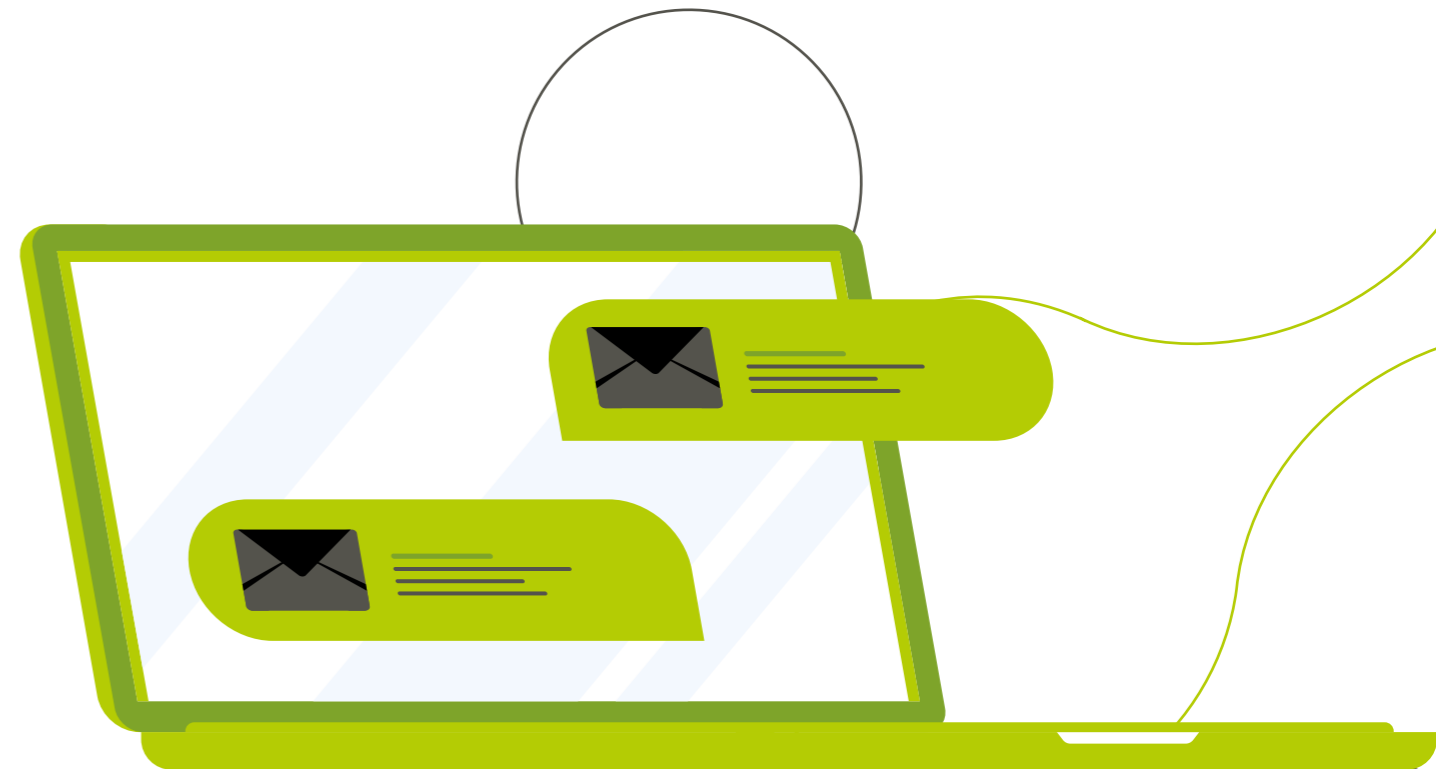
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