



Novel fibre value chains and ecosystem services from sustainable feedstocks

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**Circular
Bio-based
Europe**
Joint Undertaking

 Bio-based Industries
Consortium



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the European Union



Novel fibre value chains & ecosystem services from sustainable feedstocks

CBE JU contribution: € 4.49 million

Duration: June 2023 – May 2027

Feedstock: Hemp, wood, thistle, cattail and common reed

Main products: Fiber-based products: insulation rolls and boards, composites for cars, bioconcrete and yarn

Who is FIBSUN?



[7] RTOs



Radboud Universiteit



[7] SMEs



[3] Large Companies



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What is FIBSUN?



Resilient Production Systems:

Develop scalable fibre value chains that support European industries while fostering biodiversity and ecological balance



Ecosystem Services Enhancement:

Use nature-based solutions to restore degraded soils and improve water retention, carbon sequestration and biodiversity



Five Pilot Validation Trials

Focus on non-food biomass, like hemp, cardoon and reed, in different EU regions to evaluate real-world applications

BÜHL, DE (Hemp)

- The 2,7 ha Bühl site is located in Waldhegenich, Germany;
- It is inserted in a nature and landscape conservation area. It was previously used for corn production and is now growing hemp for the third time in a row;
- The sandy soil is nutrient-poor and poses challenges to conventional farming practices due to its rapid warming and low water holding capacity;
- Resilient hemp is very tolerant of heat and drought, which makes it a suitable crop for this area;
- The hemp here is commonly used to produce hemp seed oil. Within FIBSUN we use hemp fibers for non-woven insulation material and composites for cars.



TUHKANEVA, FI (Common reed)

- 4ha site in Kauhajoki is a rewetted peatland in Finland;
- This site was used for peat mining but now the water table has raised close to the soil surface and vegetation is allowed to spread. This is expected to improve soil quality and biodiversity;
- The vegetation varies across the site but in FIBSUN we follow the spread of common reed at one part of the site;
- Reed is commonly used for example in thatching;
- Within FIBSUN reed fibers are tested as a raw material for insulation boards.



PONT-DE-CLAIX, FR (Wood)

- Land of 4 ha, formerly occupied by Becker Industrie (a manufacturer of industrial paints and varnishes);
- Has been a wasteland since the site closed in 2011. In 2019, the public landowner and the town of Pont de Claix joined forces with Envisol to set up Crisalid, a cooperative aimed at promoting the redevelopment of brownfield sites;
- The site is currently being used as a full-scale laboratory for the implementation of innovative soil decontamination techniques, with species like poplar, willow and locust establishing themselves naturally on this wasteland;
- Within FIBSUN, wood from this site will be used mixed with cement to produce bricks.





OURIQUE, PT (*Cardoon*)

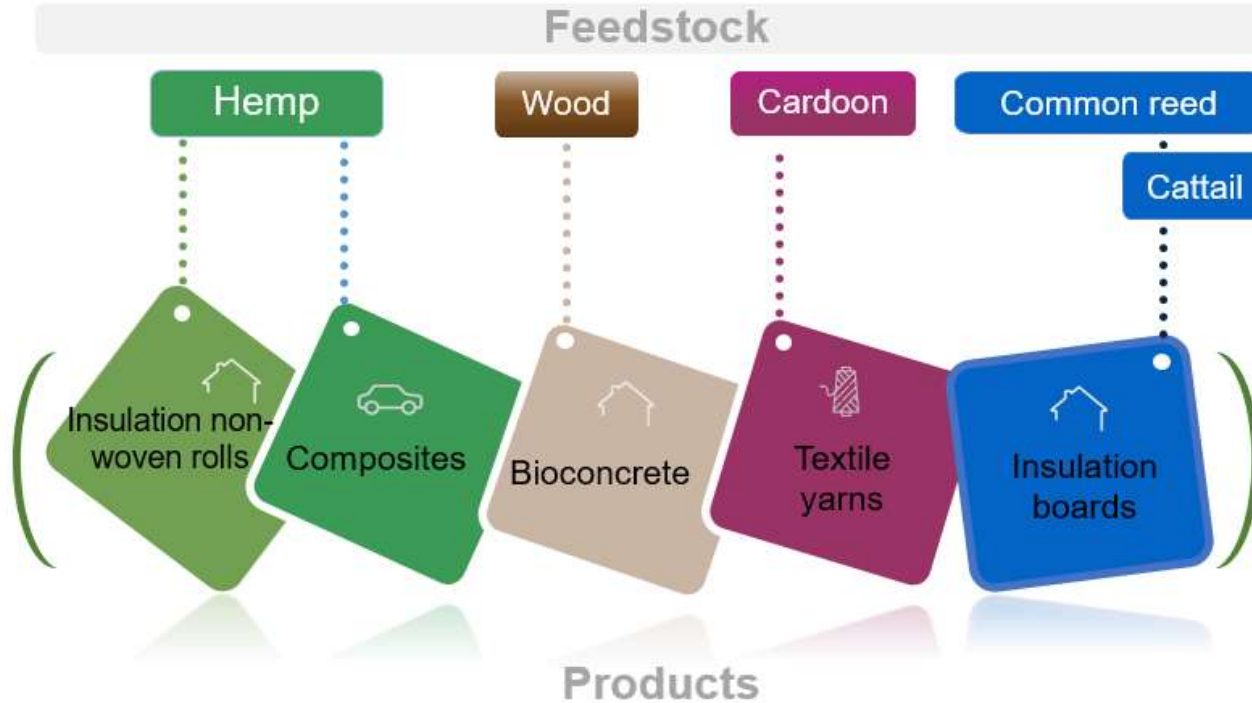
- Located in Ourique, Portugal;
- Site is characterized by vast low-relief, almost treeless plains. The land use here has always been associated with livestock and later rainfed cereal crops
- Currently the region is dominated by open and continuous fields with such agricultural matrix being occasionally interrupted by patches of shrubby or arboreous natural vegetation, including cardoon;
- Cardoon flowers and seeds are already used in the food industry;
- Within FIBSUN we use stalk and leaves as a source of fiber to produce textile yarn.

ANKEVEEN, NL (Cattail)

- Located on a rewetted peatland in The Netherlands;
- This area has been used as a low production agricultural grassland while the surrounding area is in intensive agricultural use, which is responsible for agricultural nutrient legacy in and around the site, as well as peat degradation following drainage;
- Cattail thrives in rewetted nutrient rich environments contributing to nutrient removal, while the wet conditions protect the peat from oxidation;
- Cattail can be used as building material, food or feed and as textile industry feedstock;
- FIBSUN is testing a new fibre extraction method using cattail as a raw material for insulation boards.



The FIBSUN concept





Sustainability & Innovation

Technological Innovation



- FIBSUN utilizes advanced machine learning (ML) and process optimization technologies to improve the efficiency of fibre extraction and biorefining processes

Industry Applications



- Construction;
- Textiles;
- Automotive.



Sustainability & Innovation



Environmental Benefits

- Restoring degraded soils;
- Ecosystem services;
- Sustainable land use & reduced GHG emissions.

Economic Impact



- Boosting rural economies;
- Circular economy;
- New business models.



Contribution to EU policy

- European Green Deal: Biodiversity Strategy
- Circular Economy Action Plan
- Sustainable Fibers
- Zero Pollution action plan
- Industrial strategy and Sustainable Product initiative



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