



BRANCHES

BOOSTING RURAL BIOECONOMY NETWORKS FOLLOWING MULTI-ACTOR APPROACHES

Hemp fibres as main product for composite products (Saxony, Germany)

The concept:

FUSE is a sustainable alternative for conventional Unidirectional (UD)-Tapes as it is based on natural fibres. The idea of this innovation was born in the expert panel Sachsen-Leinen e.V. with the goal to substitute conventional fibres used in composite materials. For this FUSE developed a technique that creates fibre-tapes made out of hemp. This resource has the potential to reduce CO2-emissions and the accumulation of non-recyclable fibre waste. It maintains a regional supply chains that sources the hemp from regional farmers to shorten transportation. In this way the supply chain maintains is transparent to ensure quality and sustainability. The FUSE UD-Tape can be used for technically demanding composite products and passes the needed endurance tests for extension and flexure. The current available working width of the tape is up to 20 cm, with a future prospect of up to 50 cm. The production process also allows various natural fibres besides hemp, for example flax, sheep wool or pineapple. The product is with a TRL of about 6 still in the development phase, but the company already offers an efficient alternative for mineral based fibre and has already proved its performance as reinforcement material in ski and snowboards.

Other potential applications are in interior designs, packaging, the automobile industry and sporting equipment, as well as in wind turbines where huge amounts of fibre are needed.

Feasibility:

The concept of FUSE is a close cooperation with all participating partners. The companies cooperate with local agricultural cooperatives to ensure a high quality and regional resource while ensuring income for hemp growing farmers. Through an active development of a regional hemp acquisition structure a sustainable upscaling is possible. For subsequent production, FUSE not only offers the fibre resource, but acts as an innovation partner for customers too, in order to assist in development of applications of natural fibre composites. A cooperation with the Fraunhofer 'Pilot Plant Center for Polymer Synthesis and Processing' offers valuable scientific assistance in the technological development of composite products made from hemp fibre.

Contribution to regional bioeconomy:

One of the main activities of FUSE is the development of a regional supply chain. By cooperation with a local agricultural cooperation the participating farmers have a secure income coming from hemp cultivation. Partnering with customers and local research stimulates the development of new technologies and applications for the natural fibre. In the long run, the prospect is an upscaling with a regional supply chain ranging from crop to refinement, to support employment and the development of the bio economy.

The viability of the business model depends strongly from cooperation with research institutions as well and the fine tuning of the quality of the hemp and its fibres together with the technology to create the composite weaving with the fibres.

ABOUT BRANCHES

BRANCHES is a H2020 "Coordinaton Support Action" project, that brings together 12 partners from 5 different countries. The overall objective of BRANCHES is to foster knowledge transfer and innovation in rural areas (agriculture and forestry), enhancing the viability and competitiveness of biomass supply chains and promoting innovative technologies, rural bioeconomy solutions and sustainable agricultural and forest management.

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THE PARTNERSHIP



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Key Partnerships

- Essential suppliers are farmers or farmer cooperatives to ensure hemp supply. Farmers can benefit from a secure revenue.
- Cooperation to a technology developer such as the Fraunhofer PAZ in Schkopau enabled valuable advances in the technical development of applications for the hemp fibre.
- A network of actors focalised in the valorisation of hemp in the region (e.g. SachsenLeinen e.V.) to support initiatives and facilitate cooperations

Key Activities

- For customers FUSE acts as a provider of natural fibre, but also as partner in the innovation process of possible natural fibre applications
- Partnering with the agriculture cooperative to promote regional farming structures
- FUSE is involved in research and innovation projects for further development of their product and its applications
- Promotion of products and know-how with interested customers

Key Resources

- The hemp acquired from regional farmers. The goal is to create a local network for hemp cultivation to ensure regional feedstock supply
- Know-how about hemp, its qualities and to define the right process to produce the composite product.
- Financial instrument to support innovation activities on the hemp fields, machinery trials as technology development for the composite tape production.

Value Propositions

- With their UD-Tape made from hemp FUSE offers an alternative to synthetic fibres in composite production.
- The materials of FUSE enable other companies to create products that are made from sustainable, recyclable and regional feedstock, with similar mechanical characteristics as synthetic fibres, while being lighter than its competitors.
- FUSE UD-Tape can be used in various applications that rely on fibres for stability.
- Low cost and CO₂-efficient production increases value compared to conventional fibre composites.

Customer Relationships

- Advisory on the utilization of the composite material
- Personalization (if necessary) of characteristics of the composite product (e.g. length, width, strength, etc).

Channels

- Website
- Networking and promotion activities
- Through project development

Customer Segments

- The hemp fibre tape has very versatile applications and can be used for:
 - sporting goods,
 - industrial products,
 - car manufacturing or
 - furniture and
 - wind turbines.

Cost Structure

- The costs for the production are low and consist of sourcing and storage of the feedstock, running costs of the plant, marketing and personnel expenses.
- As production is run on a campaign basis, some costs vary depending on the production scale
- Innovation and Development cost are covered through research projects.

Revenue Streams

- B2B sales to producers of other products that require fibre reinforcement.
- Research and Development projects