



# FIBENOL: NOVEL WAY TO PRODUCE HIGH PURITY LIGNIN AND WOOD SUGARS

## AUTHORS

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## HIGHLIGHTS

- *Fibenol's innovative fractionation process that valorises over 90% of the residual wood is designed with environmental sustainability in mind, aiming to produce high-purity products.*
- *Fibenol products can be used in various fields such as food, feed, pharmaceuticals, and construction; however, entering the market with a new raw material is difficult.*
- *Companies are ready for bio-based business models; however, market and cooperation opportunities are still in the development phase to produce final products.*

## ABOUT THE CIRCULAR PRACTICE

In the middle of Estonia, the private limited company Fibenol has been developing a novel way to obtain extra added value from residual wood through wood chemistry (biorefinery). The Estonian-owned company has outgrown from Graanul Invest Group, the biggest Baltic pellet production company. Its head office is in Tallinn, the capital city, and a production site is based in Imavere, Järva county, around 100 km from Tallinn. The company was established in 2018. Since then, over 62 million euros have been invested in the construction of the Imavere pilot plant, including research and development activities.

In Fibenol, circular bioeconomy principles are integrated with the aim of ensuring the efficient use of materials. Wood biowaste is used in the material cycle, which provides additional income to the wood processing sector and creates new perspectives and symbiosis with other sectors, such as road construction, food and cosmetics industry. Sustainability and environmentally friendly production have been important pillars for the management from the start. The company is about to open the first demo plant in Estonia

## BUSINESS MODEL

Seeing the whole system is important for bio-based business models, especially when giving up or reducing the use of fossil materials in production and consumption. In such a business model, there is a relatively high investment requirement and long payback periods.

The creation of value in Fibenol's business model is related to the maximum valorisation of biomass through the use of different biotechnologies and thus obtaining a difference in end products that are competitively priced in the biomaterials market. Value capture in Fibenol is achieved through development of technologies and cooperation with research and development institutions, which allows the company to increase the market value and market access of products and thus move towards a sustainable business model.

Their innovative Sweetwater Energy Sunburst pre-treatment technology uses heat, pressure, and mechanical power to turn wood chips into a chocolate, mousse-like slurry. There are similar technologies in the market but not the same.



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## ABOUT CIRCLE

*The CIRCLE project aims to develop an interdisciplinary perspective on the circular economy in the Baltic-Nordic region by integrating insights from sociology, economics, philosophy, political science, and environmental science. The emphasis is placed on the use of by-products (bio-resources) generated as part of primary production in agriculture, forestry, and aquaculture and across the sectoral boundaries to explore the underlying models of socially- and commercially-driven collaborations, and the factors facilitating and hindering the development and wider use of circular practices and collaborative arrangements thereof.*

*More about CIRCLE:  
<https://circle-eea.eu>*

Mousse-like slurry is deconstructed into basic wood components through different fractionation processes. Fibenol's value proposition is to offer high quality natural origin raw materials: LIGNOVA™ Pure, LIGNOVA™ Crude, Lignocellulosic sugars (C5 Sugar, C6 Sugar), specialty celluloses (natural micro-crystalline cellulose (MCC), refined MCC). The key is offering sustainable solutions to clients who are searching for ways to lower their carbon footprint or environmental impacts.

## OPPORTUNITIES AND CHALLENGES

The need for companies to change their practices often originates in increasingly strict climate policies as companies need to find new climate-friendly solutions. The push towards a more circular business model in the Fibenol case comes from external political pressure, but also from the entrepreneurs' own awareness of the need to deal with developments and new innovations to increase their sustainability. The use of a modern innovative solution for the processing of wood by-products creates new social and economic opportunities. This applies to both the creation of new companies and employment. It is important for such companies to have high number of employees with higher education and to cooperate with scientific development institutions.

Developing lignin-based products can be quite challenging because of the characteristics of new material. It is important to achieve a steady flow of lignin that fits the processor's requirements and needs. Collaboration between different partners is key because there is no solution that fits all.