

SWEETWOODS

Production and deploying of high purity lignin and affordable platform chemicals through wood-based sugars

Summary

The SWEETWOODS project aims to develop a first-of-a-kind biofractionation flagship plant in Estonia that uses sustainable hardwood biomass. The process combines innovative pre-treatment technology with enzymatic solutions to provide sugar recovery levels of over 90 per cent with exceptionally high-quality lignin. Sugars and lignin can be further processed and converted to high-value biomaterials capable of replacing fossil based chemicals in a wide range of products.

The project, which uses wood processing residues as a feedstock, will lead to wood-based biomaterials being produced on an industrial scale for the first time.

Objectives

The SWEETWOODS project has six core objectives. It targets to:

- Show the successful and profitable production - on an industrial scale - of high-purity lignin along with penta- and hexa-carbon carbohydrates from hardwood;
- Use all main components of the biomass feedstock while minimising any diversion of carbon content streams to low-value uses;
- Produce high-purity lignin and depolymerised lignin for a range of novel applications, namely elastomer foams for tube insulation, rigid polyurethane foam panels for insulation and polymer compounds intended for injection moulding;
- Produce high-purity sugars - glucose, fructose, xylose and glucosone - for novel end-use cases, namely producing bio-IBN, xylitol and lactic acid;
- Establish markets for lignin and novel sugar-based platform chemicals;
- Evaluate the environmental and socio-economic performance of the SWEETWOODS plant process and of the developed products through a Life Cycle Sustainability Assessment, as well as a viability analysis.

Achievements & milestones

Creating high purity lignin and affordable platform chemicals from wood-based sugars



<https://sweetwoods.eu/>

Type of Action:

Innovation Action – Flagship

Value Chain:

VC1 – lignocellulose

Start date: 01 June 2018

End date: 31 May 2022

BBI JU contribution: € 20,959,745

Expected impacts

The SWEETWOODS project expects to deliver the following main impacts.

- Establish new cross-sector interconnections in the bio-based and create new value chains between the wood-based feedstock provider to end-users downstream in the value chain;
- Establish five full new value chains based on developing under-exploited hardwood-based feedstock into value-added end-user products;
- Develop four novel bio-based materials in the areas of insulation foams, injection moulding and biofuels;
- Create a range of new bio-based consumer products including sports mats, insulation panels and replacements for plastic parts;
- Reduce waste from biorefining processes by at least 80 per cent over the current state-of-the-art.



Our SWEETWOODS project aims to develop a first-of-its-kind bio-fractionation flagship plant in Estonia to turn sustainable hardwood residues into high purity intermediate building blocks of cellulosic sugars and high-quality lignin. ‘This project really is a game changer,’ says Peep Pitk, project coordinator. [Read more](#)

Project coordination

- Graanul Biotech OÜ (Estonia)
- Metgen OY (Finland)
- Tecnaro Gesellschaft Zur Industriellen Anwendung Nachwachsender Rohstoffe MBH (Germany)
- Ultima (Deutschland) GMBH (Germany)
- Recticel N.V. (Belgium)
- Global Bioenergies (France)
- 2B Srl (Italy)
- Vertech Group (France)
- Spinverse OY (Finland)

Organisation name: Graanul Biotech OÜ
(Estonia)