

HemiCoat – Conversion of Hemicellulose to Coatings

A CORNET Project: COLlective Research NETworking

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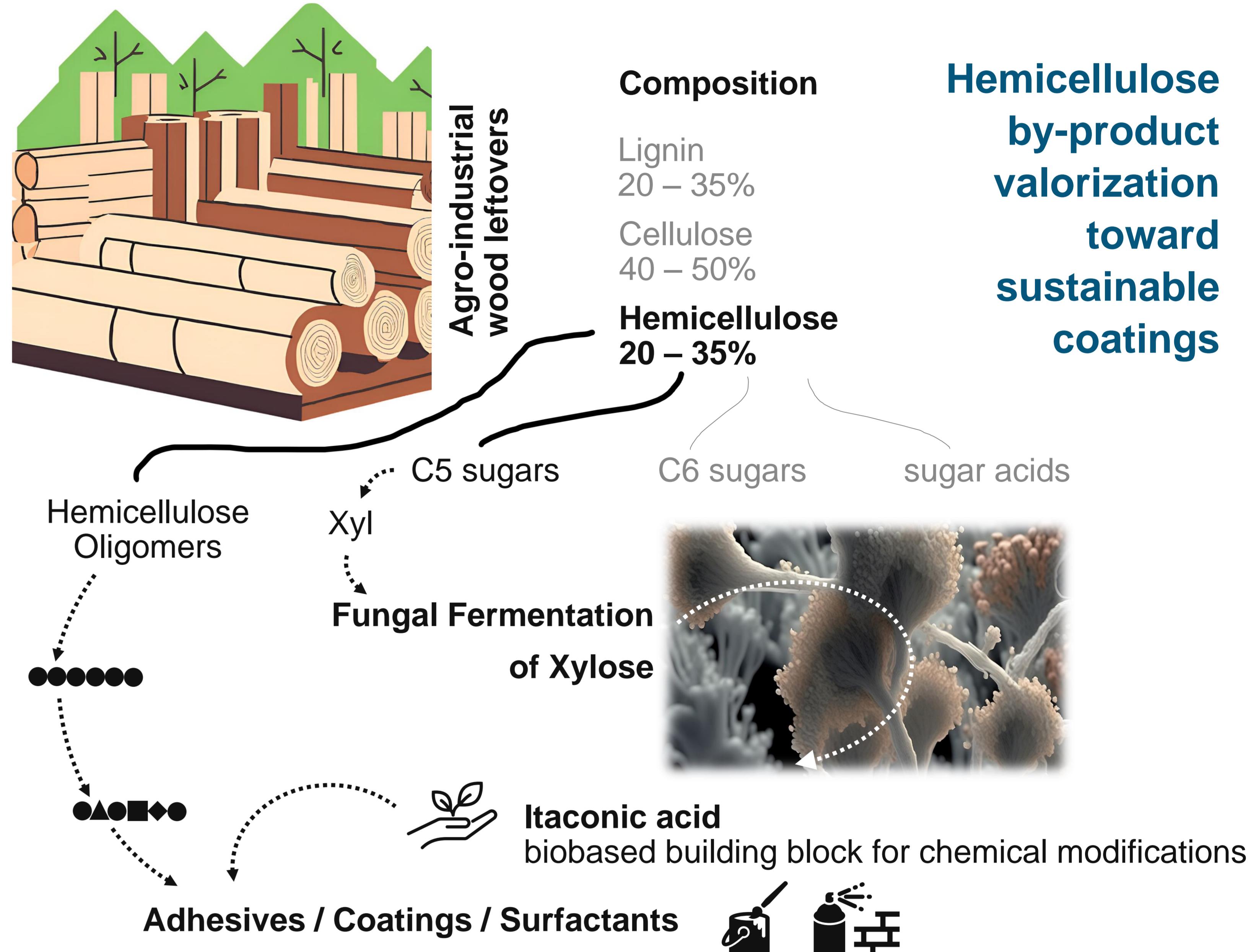
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HemiCoat in a nutshell

The main focus of this project is the valorization of hemicellulose by-products from wood to obtain high-value-added chemicals for sustainable coatings, adhesives, and functionalized additives. Through economic and sustainability analysis, we design innovative approaches for a top 10 biobased building block and its further use for novel coating technologies starting from leftover fractions of pulp manufacturing or agricultural lignocellulosic biomass.

The two main objectives of the project are (i) to recover most of the hemicellulose from lignocellulose biomass processing and (ii) to use its building blocks in a fermentative conversion to produce itaconic acid as a precursor for the chemical synthesis of surfactants. Additionally, other compounds from the woody hemicellulose will be tested in the manufacture of biobased adhesives.

Our results directly will help small and medium enterprises (SMEs) that work with Itaconic acid-based products by diversifying sources of supply, increasing quality, or decreasing cost. Moreover, we see the possibility of technological breakthroughs for SMEs to replace their commonly used fossil-based reagents and materials with bio-based alternatives from itaconic acid, and extend the field of application towards anhydrides, coatings, plastics, or functionalized additives. We are convinced that the project will likewise impact SMEs interested in the valorization of their lignocellulosic and hemicellulosic agro-industrial wastes, and therefore open the perspective for new and sustainable business ideas.



A German – Walloonian Collaboration

Expertise



Deutsches Biomasseforschungszentrum – DBFZ (DE)

Purification of wood hydrolysates
Design of biorefinery concepts
Mapping & Assessment of bio-based resources



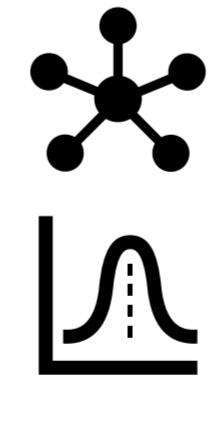
CELABOR (BE)

Valorization of sustainable vegetal resources
Extraction of natural compounds
Fermentation for applications in diverse sectors



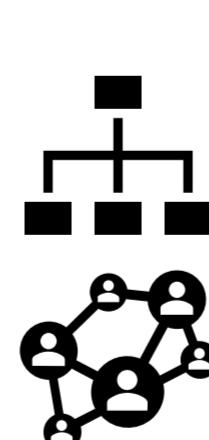
Materia Nova (BE)

Development of biobased polymers
Multidisciplinary research axes
Analytical & Characterization platform



DECHEMA (DE)

Project coordination & Dissemination
Networking
Market analysis & Life Cycle Assessment



Responsibilities in HemiCoat

DBFZ **celabor** **MATERIA NOVA** **DECHEMA**

Hemicellulose **Xylose** **Itaconic acid** **Coatings**

- estimation + up-scaling of woody biomass & wood hydrolysates from industry
- separation & purification of hemicellulose fermentable monomers
- investigations on the suitability of oligomers as adhesives (shared task with DBFZ)
- valorization of liquid effluent rich in monosaccharides and residual oligomers in fungal fermentation to produce itaconic acid
- functionalization of itaconic acid & development of functionalized oligomers and polymers
- evaluation of itaconic acid as a bio-based alternative for petrochemical building blocks
- market analysis, exploitation strategy & Life Cycle Assessment
- project coordination, meetings & documentation

CORNET – Focus on small & medium-sized companies

“CORNET is a network of ministries and funding agencies that combine their existing funding schemes to increase the competitiveness of small and medium-sized enterprises (SMEs). CORNET is designed to provide low barriers and unbureaucratic procedures [...] to perform an international Collective Research project to solve SME problems.”

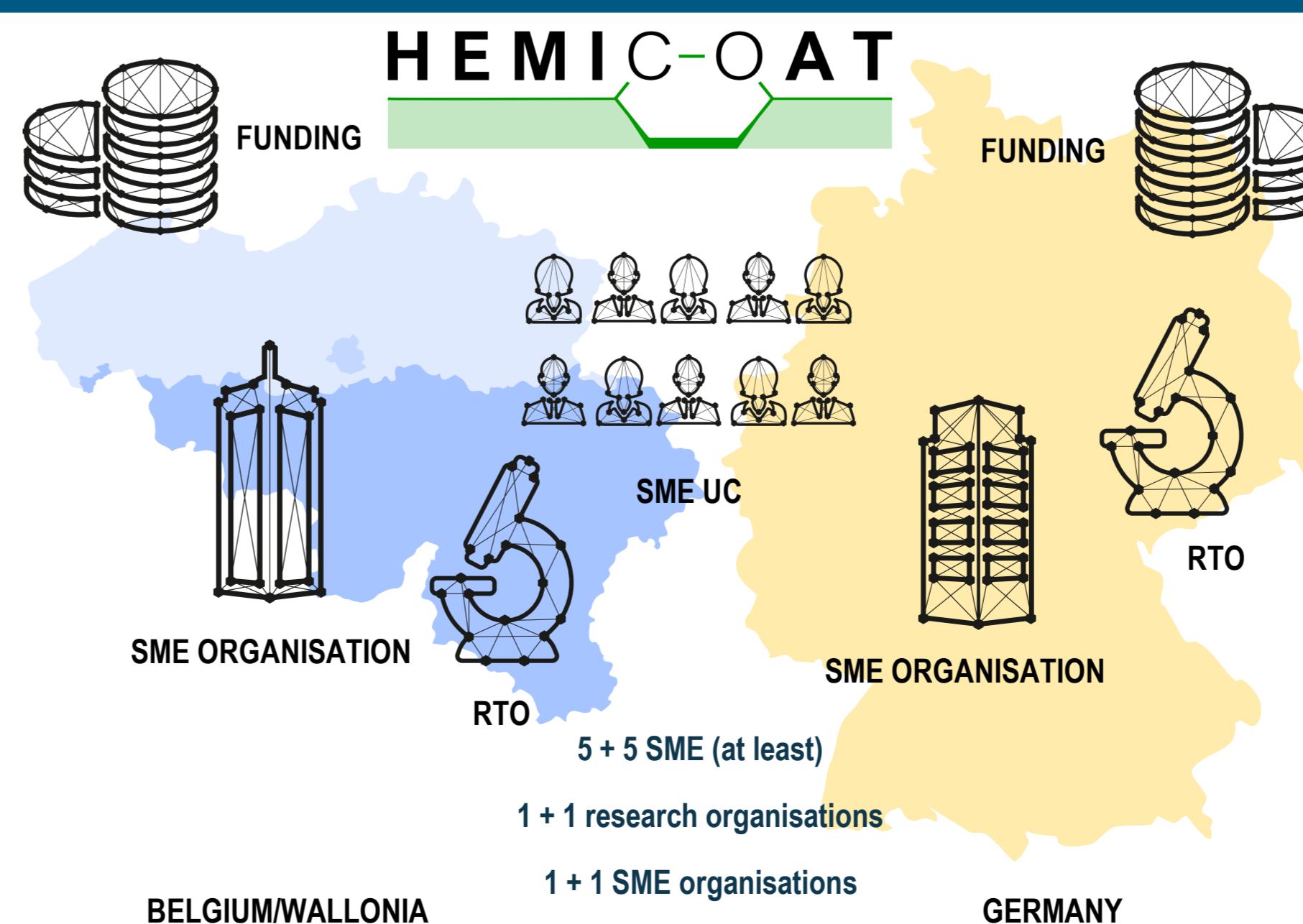
Beneficiaries in CORNET

SMEs... represent User Group (Committee)

SME organizations... represent needs of SMEs in the relevant sector

Research and Technology Organization (RTO)... conduct R&D

(<https://cornet.online>)



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2 years
Sep 2024 – Aug 2026

budget: ~ € 1 Mio
equal national fundings