

Project facts

The IMPRESS consortium consists of 10 leading European companies as well as research, development and educational organisations.

Project name:

IMPRESS - Integration of efficient downstream PROcessEs for Sugars and Sugar alcohols

Project duration:

1/9/2019 – 31/8/2023

Overall budget:

€ 17 867 930

Project Coordinator:

Avantium (the Netherlands)



The Future of Biorefining

Towards a fossil-free future



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 **IMPRESS**



Avantium is a fore-runner in renewable chemistry and will accelerate its Dawn and Ray Technologies in addition to utilising its expertise in catalysis.



KNAUER uses its expertise to contribute in continuous separation technologies, such as Simulated Moving Bed (SMB) chromatography.



Lenntech will dehydrate the sugar streams in IMPRESS. Through a series of laboratory tests, we will choose the most suitable technology and develop an on-site pilot.



PDC leads the conceptual process design, technology integration and techno-economic assessment, using structured methods and expert systems (PROSYN®).



Aalto aims to develop separation processes for sugar alcohols and sugars by means of crystallisation, and conversion processes for woody biomass.



Sulzer is a global leader in fluid engineering. Our innovative solutions create customer value. Whatever your industry, our services support you.



CNRS develops new nanoporous materials such as hydrophobe zeolites and Metal-Organic Frameworks (MOFs) for the challenging separation of short polyols.



Vogelbusch will adapt and scale up two dedicated processes for the production of fodder yeast and the production of xylitol from hemicellulose hydrolysates by fermentation.



Sphera is a global leader in sustainability and LCA software and consulting, delivering relevant insights on environmental performance within IMPRESS.



Xamk is responsible for the development and implementation of educational modules and the leader of communication and dissemination activities.

IMPRESS explained

IMPRESS is here to impress! We are heading towards a fossil-free future with the European know-how. IMPRESS will integrate selected key technologies to refine plant-based material into multiple sustainable chemicals and materials that can replace fossil-based products. Related technologies will be substantially improved in order to provide a better future for both us today and the generations to come.



Technologies

IMPRESS is a novel concept that aims to assess multiple purification and separation technologies that are used to develop plant-based products with an improved carbon footprint.

The concept will be thoroughly evaluated from a techno-economic and environmental perspective. This is carried out by means of executing a life cycle assessment and the completion of conceptual process designs in order to demonstrate the positive impact on circular economy. The generated know-how will also be distributed to future experts and employees through a lifelong learning e-platform.

The biorefinery concept is based on the efficient integration of proven purification and separation technologies, such as crystallisation, membrane filtration, SMB and adsorption to optimise the quality of all product streams. The key conversion processes included in the concept are the Dawn Technology™, Ray Technology™ and xylitol fermentation technology. The Dawn Technology™ allows forestry and agricultural residues to be converted into industrial sugars and lignin. The industrial sugars can be used by the Ray Technology™ for the production of plant-based MEG (key component for the production of plastics) and plant-based MPG. The industrial sugars can also be used for the production of xylitol and fodder yeast.

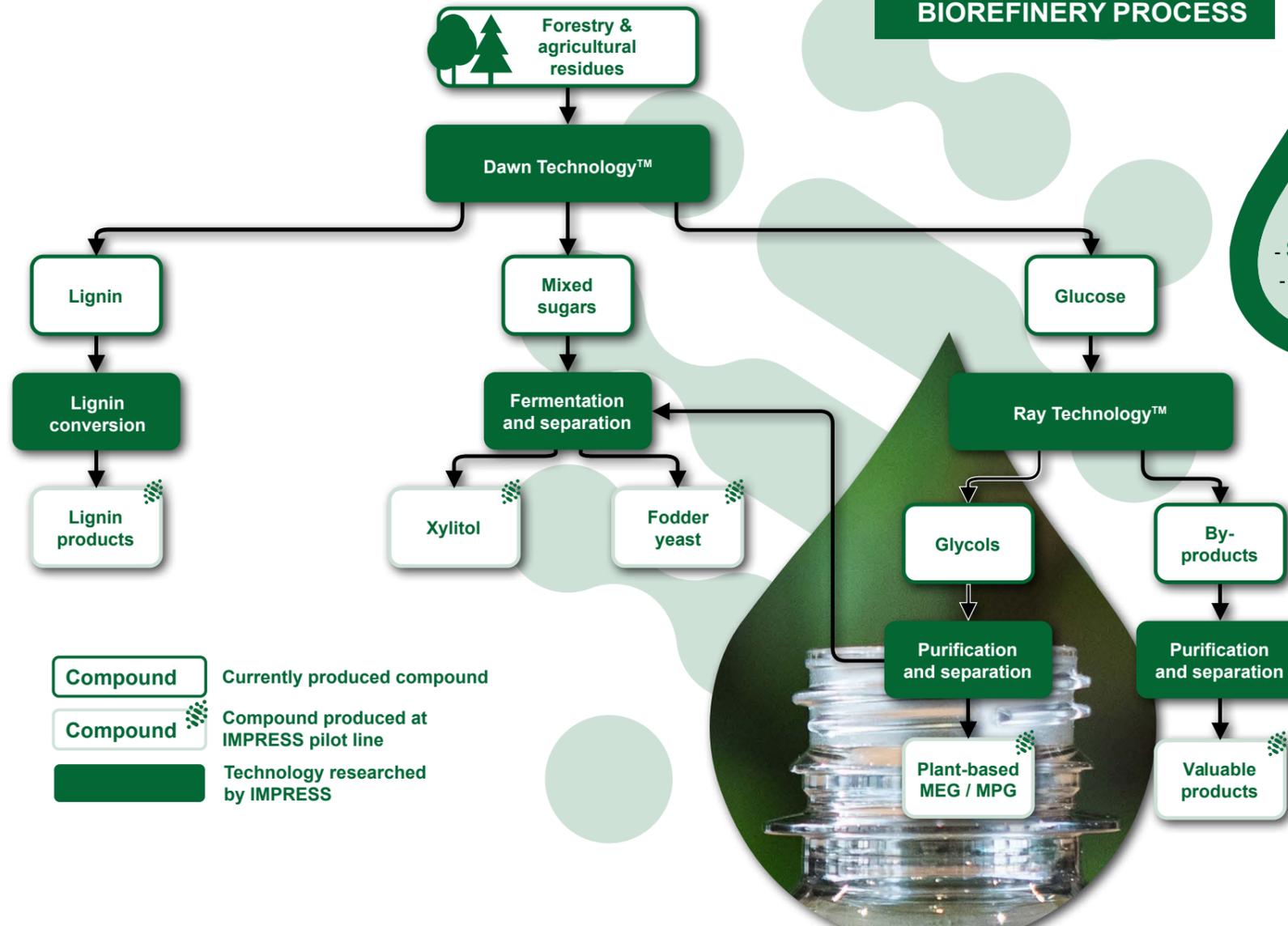


Products

Sustainable plant-based building blocks, such as:

- **bioMEG** to replace fossil resources, e.g. in the plastic industry
- **Xylitol**
- **Fodder yeast** as animal feed
- **bioMPG** e.g. for the production of functional fluids, Unsaturated Polyester Resins (UPR) and food/feed/pharmaceutical applications
- **Isosorbide** e.g. for additives
- **Sugar alcohols** from the light ends instead of burning
- **Sorbitol** to produce sweetener and vitamin C
- **Lignin nanospheres** e.g. for composites
- **Activated carbon** purification purposes

THE INTEGRATED BIOREFINERY PROCESS



LCA = Life cycle assessment
 CPD = Conceptual process design
 SMB = Simulated moving bed chromatography
 MEG = Monoethylene glycol
 MPG = Monopropylene glycol