



vito



**ligno
value**

LIGNOVALUE PILOT

A PILOT LINE FOR LIGNIN DEPOLYMERIZATION INTO INNOVATIVE, BIO-BASED AROMATICS IN FLANDERS

BRIDGING THE GAP BETWEEN DEVELOPMENT AND IMPLEMENTATION

Many studies have shown that lignocellulosic biomass (e.g. wood, straw, corn stover, switch grass, forestry residues including bark as well as waste wood) has tremendous potential for sustainable production of chemicals and fuels, and more specifically biobased aromatics. An important component of lignocellulosic biomass is lignin, which is the second most abundant renewable carbon source on Earth. Through its aromatic structure and functionalities, lignin exhibits a variety of properties by which it can serve as a renewable feedstock for the production of not only biofuels, but also materials and biobased aromatic specialty chemicals. Since the lack of reactivity is often a drawback in applying lignin as such, depolymerisation of lignin is used to create new reactive sites, hence resulting in a mixture of small molecules and oligomers. Diverse processes with varying process conditions have been developed, of which many have only been demonstrated at lab scale. The demonstration of available conversion technologies at relevant scale (TRL 5-6) is the next essential step.

LIGNOVALUE PILOT

Design and construction of a continuous pilot plant for the depolymerization of lignin into innovative biobased aromatics in Flanders.

- Partners: VITO, Jacobs België NV and Flemish Environmental Holding (VMH)
- Total budget of €4.3 million
- Cofinancing from European Regional Development Fund (ERDF), the province of Antwerp and the Flemish Department of Economy, Science and Innovation
- Actively supported by Catalisti, the Flemish spearhead cluster for chemistry and plastics
- Operational mid 2021
- Output: 250 kg/day of lignin oil (i.e. mixture of biobased aromatics)

Setting up this pilot line contributes to the ultimate goal: building and operating a demo plant in Flanders for the conversion of wood/lignin to biobased functionalized aromatics.



JACOBS



AGENTSCHAP
INNOVEREN &
ONDERNEMEN



EFRO
EUROPEES FONDS
VOOR REGIONALE
ONTWIKKELING



Provincie
Antwerpen



TECHNOLOGY SELECTION

Metal-catalyzed conversion of lignin in a **solvent** medium using a heterogeneous catalyst



Alcohols



H₂ or inert (N₂)
atmosphere



Up to 300 °C

"I'm quite convinced that this investment in the port of Antwerp, will eventually offer our companies the opportunity to develop new products, based on these new innovative molecules. Once again does Flanders reinforce its long standing partnership with the chemical sector." (Minister Philippe Muyters – Flanders' Minister of Work, Economy, Sports and Innovation)

PROVIDING COMPANIES WITH SIGNIFICANT AMOUNTS OF BIO-AROMATICS

The LignoValue Pilot plant will allow the production of larger amounts of bio-aromatic fractions, as such allowing companies to take further steps in their application development path. Often the development of applications can only be done at kg scale, if not 100 kg scale, to enable detailed properties' testing. The pilot meets the needs of various companies that have already expressed an interest in innovative molecules and a willingness to carry out application testing.

We are looking for:

- companies that have an interest in innovative molecules and a willingness to carry out application testing;
- feedstock providers that want to test their product in the pilot line;
- companies that have an interest in building together a demo plant for the production of bio-aromatics from lignin (in Flanders).



Biorizon was founded in 2013 as a shared research centre clustering the expertise of VITO, TNO and cofounder GCC. More recently, ECN part of TNO joined in 2016. Biorizon is focused on the development of value chains and technology for the production of aromatics from biomass as feedstock for the chemical and pharmaceutical industry.

Biorizon's mission is to enable commercial production of bioaromatics by 2025. Thereto, a roadmap is established, divided into 3 main tracks, called Horizons. In Horizon 1 "Thermochemical conversions" biomass is thermochemically converted into aromatics and other products. In Horizon 2 "Sugars-to-aromatics" sugars are converted into aromatics via furans. Horizon 3 "Lignin-to-aromatics", coordinated by VITO, biobased aromatics are produced by depolymerization of lignin. In extension, biorefining lignocellulosic biomass is included in the program in order to deliver the required sugar and lignin feedstock materials for Biorizon developments towards biobased aromatics.

WANT TO FIND OUT MORE?

If you want to receive more information on the LignoValue Pilot project or if you want to elaborate on the opportunities of lignin valorization for your organization, please contact

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