East & North FINLAND

VANGUARD INITIATIVE
New growth through smart specialisation

Bioeconomy Pilot

9:45 – 10:45

Bio-economy pilot: State of play and bio-aromatics demo-case focus

Interregional Conference of the Vanguard Initiative Network
The Next Steps of Interregional Collaboration in Bio-economy
25-26 September 2024
Kajaani, Finland

Ilaria Re, COO at Consorzio Italbiotec, Lombardy Green Chemistry Association, Co-lead of the Bio-economy pilot
Ludo Diels, Portfolio Manager at Processes4Planet and Senior Advisor Sustainable Chemistry - VITO, Bioaromatics demo case leader of the Vanguard Initiative Bio-economy pilot

Contents

Vanguard Initiative

Supported by Policy, driven by Industry

BIO-ECONOMY
VANGUARD INITIATIVE

01

REGIONAL COOPERATION

driven by a political commitment of 40 EU regions

02

S3 SMART SPECIALIZATION

S3 to boost new growth through bottom-up entrepreneurial innovation

03

INDUSTRIAL INNOVATION

multi-level governance for encouraging emerging industries (beyond TRL 5) to reach the market

04

INTERREGIONAL INNOVATION INVESTMENTS

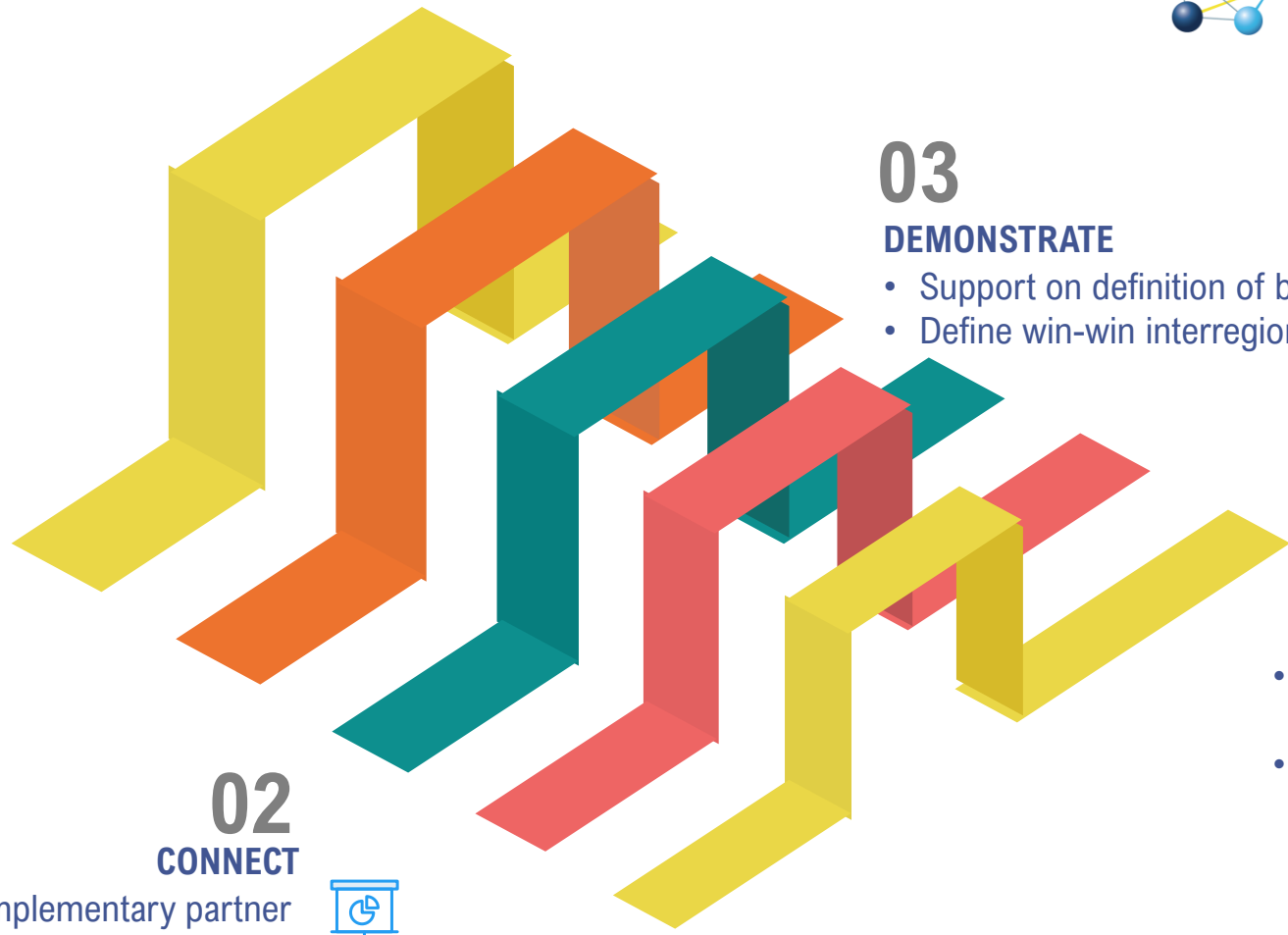
Deliver investments on S3 related priorities and reinforce globally competitive EU value chains

S3 SMART SPECIALISATION STRATEGY

The Vanguard Initiative's methodology

Learn, connect, demonstrate, commercialise

BIO-ECONOMY
VANGUARD INITIATIVE



INDUSTRY INSPIRED

01
LEARN

- Mapping promising business models, facilities, projects
- Identify lead regions and actors

02
CONNECT

- Matching events for complementary partner
- Identity funding instruments
- Stimulate interregional dialogues

INDUSTRY DRIVEN

03
DEMONSTRATE

- Support on definition of business plans
- Define win-win interregional business opportunities

04
COMMERCIALISE

- Launch of new ventures, partnerships, start-up
- Create new interregional value chains

INDUSTRY OWNED

The Bioeconomy Pilot mission

Key objectives

BIO-ECONOMY
VANGUARD INITIATIVE

Support the creation of **new integrated bio-based value chains** between chemistry, agrifood, bioenergy, and biofuels sectors

Promote new **business opportunities** through interregional cooperation and ideas exchange

Encourage projects at the **demonstration stage to upgrade** and **exploit business** (beyond TRL 5).

S3 SMART SPECIALISATION STRATEGY

Support investment pipelines based on **industry-driven business cases coherent with the S3** of the participating regions

Promote **political engagement** to position the Smart specialisation agenda at the centre of the EU's drive for a sustainable economy

The Pilot's strategy

Key activities

BIO-ECONOMY
VANGUARD INITIATIVE

1 / Build an **interregional bioeconomy alliance** by promoting stakeholder engagement in the Pilot

- Organising **B2B matchmaking events**
- Building **alliances** with funded projects
- Designing **decision-making tools for SMEs** using Big Data and AI

2 / Demonstrate the bioproducts' **large-scale feasibility production** by raising public and private funds

- Boosting **industrial scale validation** of pilot plants in lignin and lignocellulosic sectors
- Demonstrating industrial-scale production of **sustainable bio-based advanced chemicals**
- Encouraging the industrial validation of plants, services and products

3 / Increase **bio-based products market uptake** by accelerating interregional demonstration projects

- Providing business development support, business intelligence and business plan desing
- Identifying promising **industrial models** in the VI regions
- Activating **interregional cooperation** and attracting EU **funding sources** towards demos' validations

The Regional commitment

Participating regions

18 Regions participating from 10 countries

Austria
- Lower Austria

Belgium
- Flanders

Finland
- East and North Finland

Germany
- Lower Saxony
- North Rhine-Westphalia
- Saxony-Anhalt

Italy
- Autonomous Province of Bolzano/Bozen – South Tyrol
- Emilia-Romagna
- Lombardy
- Piedmont

Slovenia
- Slovenia

Spain
- Navarra

Sweden
- Värmland

The Netherlands
- South Netherlands
- Randstad/Zuid Holland

UK
- Scotland
- Wales

The Pilot's demo-cases

Interregional cooperation on innovative use of non-food biomass

BIO-ECONOMY
VANGUARD INITIATIVE

Bioaromatics demo-case	Lignocellulosic biorefinery demo-case	Liquified Bio-methane demo-case	Biopolymers demo-case
			
Creating interregional value chains to produce lignin-based aromatic molecules and innovative sustainable materials	Set-up of European value chains from lignocellulose biomass to intermediate and end-products of bulk and fine chemicals.	Enhance wide diffusion of bio liquified natural gas for sustainable transport across Europe, by advancing the state of the art of biogas upgrading	Creating interregional value chains by matching polymer market applications and new biobased technologies

The Pilot's key achievements

1 / Building an interregional bioeconomy alliance

1.	Increase Vanguard Initiative regions participation in demo case activities	• **17 participating regions from 10 countries** • **10 annual events** organised on average with over **500 bio-based experts involved** • **10 project proposals** supported by new partnerships linked to the Pilot mission
2.	Bring together a community of bio-based experts	• 1 **Memorandum of Understanding** signed with the **Bio-based Industry Consortium's** (BIC) • Cooperation for the creation of the **BIC Regional funding platform** • Over **30 EU projects mobilised in synergic actions** of multi-learning and cooperation, communication and policy influencing
3.	Develop a platform based on big data and AI for creating circular value chains	• **12 new Vanguard regions involved**, **70% of biomass**, and **100 technologies** mapped • **Digital platform** for modelling cross-regional value chains supported **(VCG.AI)**

BIO-ECONOMY
VANGUARD INITIATIVE

Bio-based Industries Consortium

https://biconsortium.eu/regional-funding-platform

vcg.ai
VALUE CHAIN GENERATOR

https://vcg.ai/

The Pilot's key achievements

2 / Demonstrating the bioproducts' large-scale feasibility

BIO-ECONOMY
VANGUARD INITIATIVE

1.	Bioaromatic applications towards their industrialisation through the **Biorizon program**	• Several TRL 4/5 **pilot units to demonstrate** the individual steps of the end-to-end process from biomass to aromatics • Testing and launch of the **LIGNOVALUE plant** (Mol, Belgium) to produce lignin oil (after depolymerization) and its fractions. The **startup Relement**, founded at the end of 2020, is currently commercialising its first product, MPA.
2.	Strengthen biorefining technologies to convert various lignocellulosic fractions into intermediates and building blocks that can be used to produce biofuels and chemicals	• Development of a 100% fossil-free asphalt thanks to the replacement of bitumen with a bio-base binder (**CIRCUROAD Program**) • Design of a **business plan** for the production of Bio-LNG for road transport in Lombardy and a **replicability plan** in Slovenia • Design of a **business plan** for the production of biopolymers from agricultural biomass

https://youtu.be/NTSRazQB9kk

CIRCU ROAD

https://circularbiobaseddelta.nl/focus-themas/projecten/chaplin/

The Pilot's key achievements

3/ Boosting bio-based products commercialisation

1.	Identify promising industrial business models in Vanguard regions to produce value-added products	• **10 new mature business models (above TRL 5) assessed** as new inter-regional demonstration cases • **Decision-making index** for resilient and market-ready inter-regional value chains to be incorporated into VCG.AI designed and validated (**Sustainability Assessment Tool** by InnobioVC project and **Business model design tool** by SYMBIO project))
2.	Activate inter-regional cooperation and attract EU funding sources	• **5 projects/year in EU programmes** to support the most promising demonstration projects towards industrial and market exploitation • Promote the **I3 biopolymers partnership** by attracting stakeholders from Vanguard regions • **Innovation Express Call 2024** (IEC2024) via S3 synchronisation designed and launched • Develop an IEC2024 expansion and incorporation plan with **Vinnovate.**

BIO-ECONOMY
VANGUARD INITIATIVE

Interreg Co-funded by the European Union
Alpine Space

INNOBIOVC
https://www.alpine-space.eu/project/innobiovc/

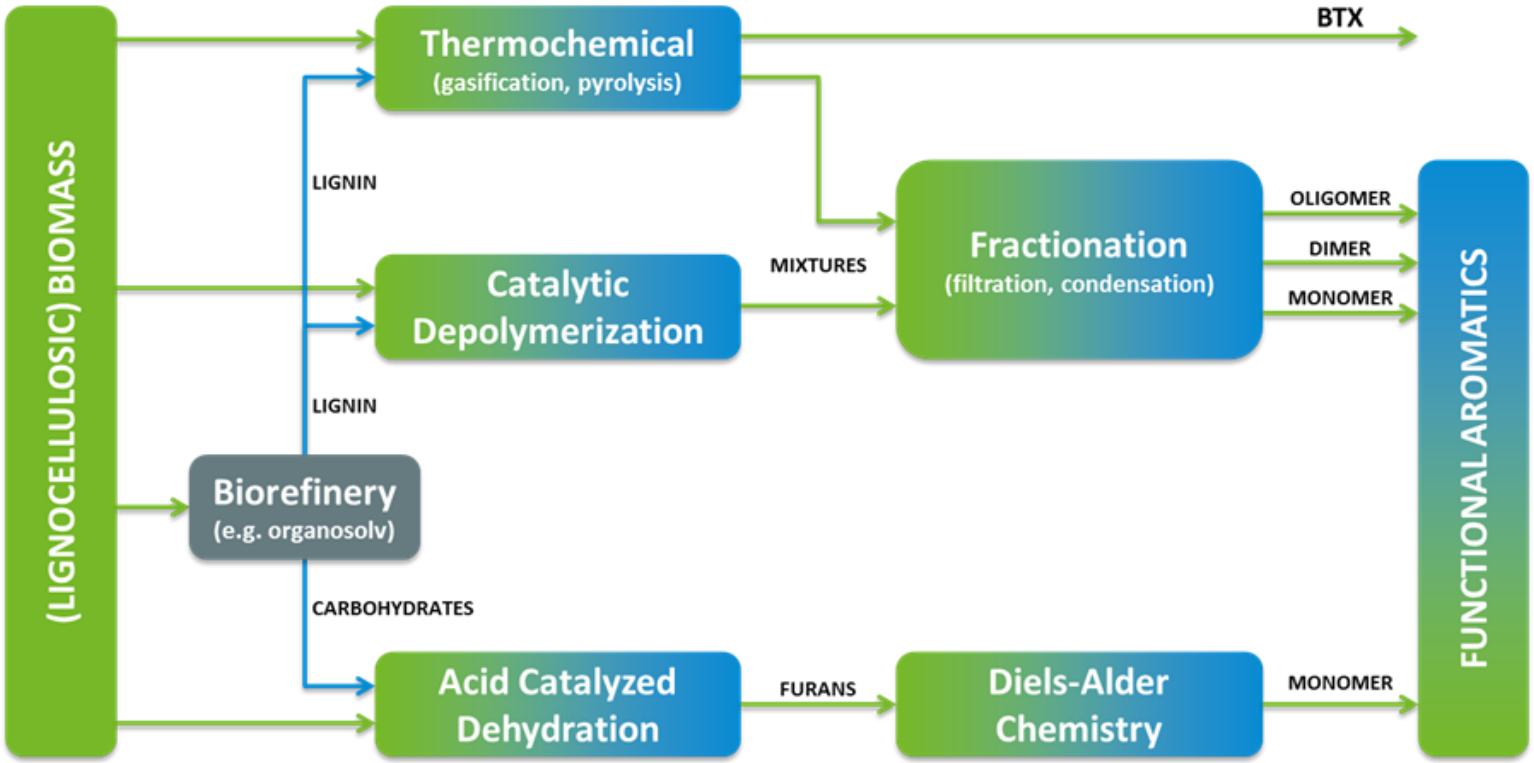
SYMBIO
MEET YOUR SUSTAINABILITY TARGET
https://www.symbioproject.eu/index.html

https://www.s3vanguardinitiative.eu/multipurpose-page/call-2024

I3 Interregional Innovation Investments Instrument
https://eismea.ec.europa.eu/programmes/interregional-innovation-investments-i3-instrument_en

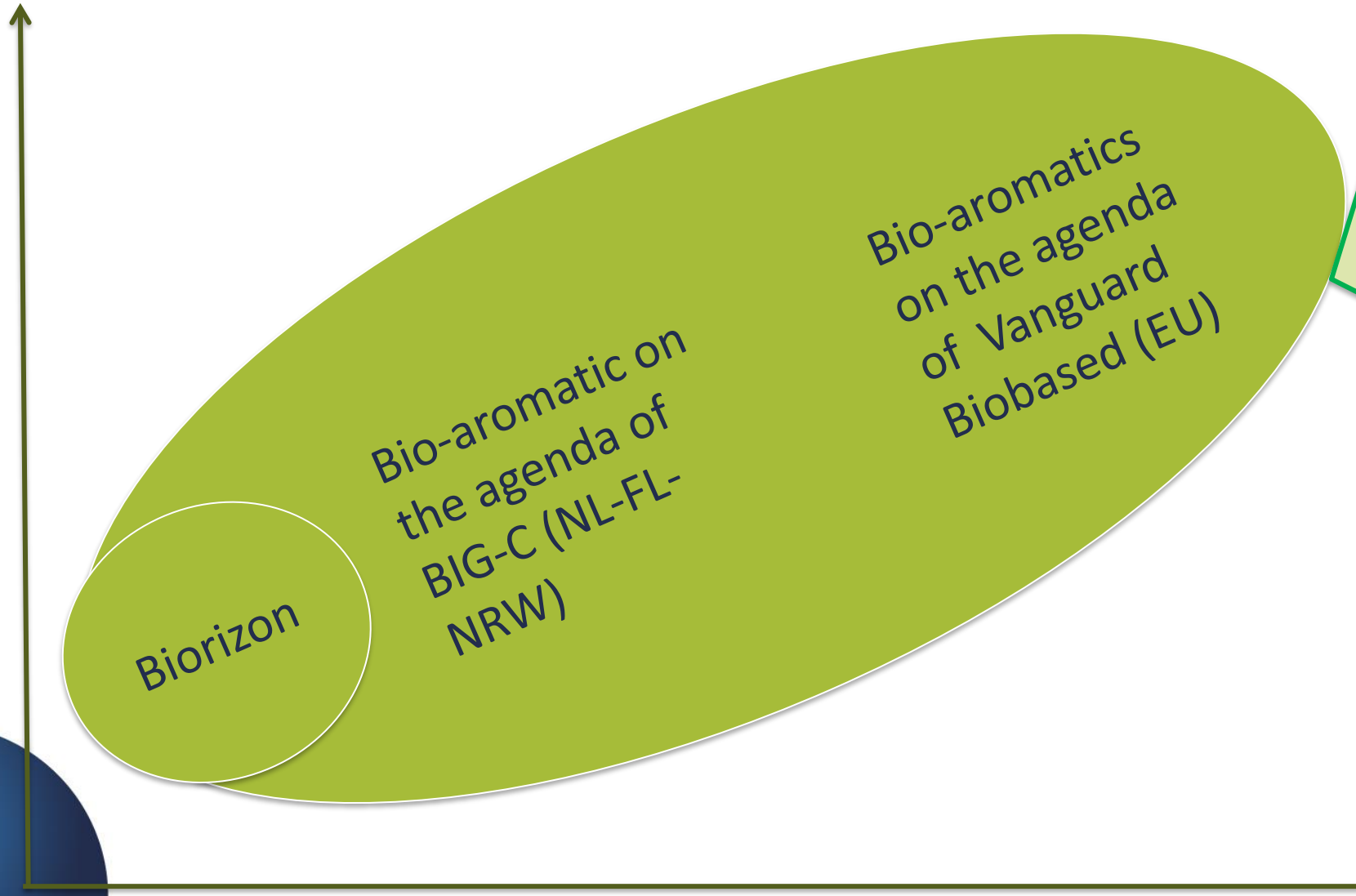
VANGUARD INITIATIVE

Bioaromatics via the lignocellulose Biorefinery



Byproducts:
- Energy
- Plastic recycling

VANGUARD INITIATIVE
New growth through smart specialisation



Thanks to Triple Helix bio-aromatics is nog very well on the regional, but also international agenda. It starts from the strong chemical region Antwerp-Amsterdam-Rhein-ruhr Region
Ideal starting point

VANGUARD INITIATIVE
New growth through smart specialisation

Biorizon Development

LignoValue Pilot

PYRENA-PYPO Pilot

Commercial production of bio-aromatics

Demonstration phase

Pilot phase

Research & Development

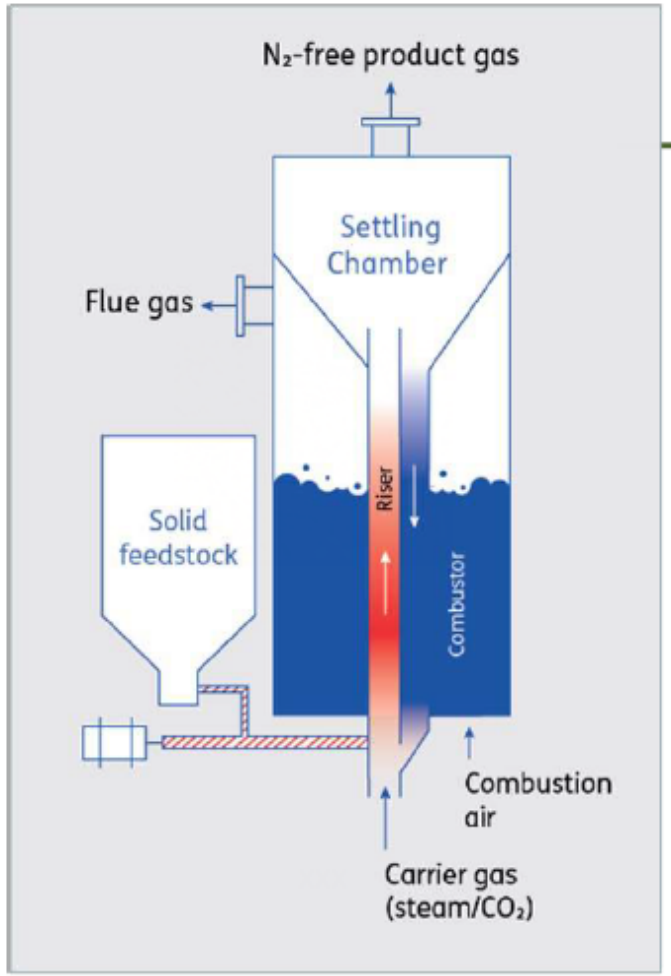
Continuous Diels Alder skid

RELEMENT

Spin-off launched

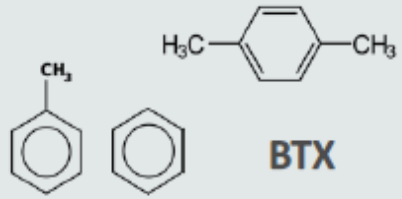
2013 2015 2020 2025

Gasification: Milena and Olga Technology



Milena gasification → Olga gas cleaning

Biorizon



BTX

Green gas (SNG)

- ✓ Benzene, toluene and xylene are by-products of gasification and typical drop-in chemicals
- ✓ Increases the value of gasification products
- ✓ TNO is exploring the production, recovery and purification of Benzene and Toluene to industrial grade quality

Valorisation via Thermochemical Depolymerisation

Pyrolysis and staged condensation


Mattresses


Windmill blades


Plastics


Laminated wood

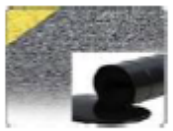
Increased market interest in recycling of waste streams


Lignin


Biomass

Fast Pyrolysis → Pyrolysis vapour upgrading

- ✓ Interest from industry in pyrolysis for the production of bioaromatics from lower value waste streams
- ✓ Rapidly growing interest from industry in pyrolysis for recycling of plastics, laminated wood etc.
- ✓ Increased focus on higher-added-value application of the pyrolysis vapour (chemicals / materials instead of fuel)


Bitumen

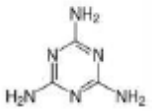

Fuels

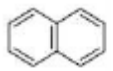

Tyres


Foams


Paint


Resins





New aromatics from recycling

Projects

Successfully concluded: BIORECEPY (bio-oil application in resins, tyres and biofuels)
Ongoing: PRIMA-2 (aromatics recovery from laminated wood via pyrolysis)
New !: Better Biobased Building Blocks, SLICE and BIO-CAPPP

The Fabiola Process

Agricultural residues
Forestry residues
Food processing residues
Energy crops
Short rotation coppice
Organic waste

Pre-extraction

Fertiliser / Fine chemicals

Distillation

Acetone | Liquor

Fractionation

140 °C, 60-90 min, 50% acetone, pH 1.8

Lignin (fractions)

Hemicellulose hydrolysate

Cellulose pulp

Partial depolymerisation

Conversion

Concentration/purification

Enzymatic hydrolysis

High / low molar mass lignin fractions

Lignin oligomers

Furanics

Hemicellulose sugars

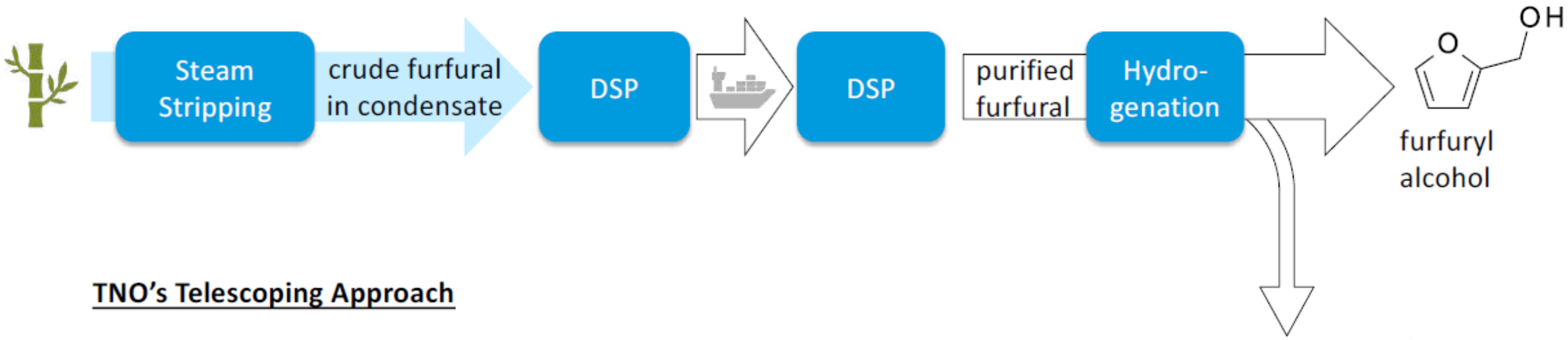
Cellulose sugars

Material applications

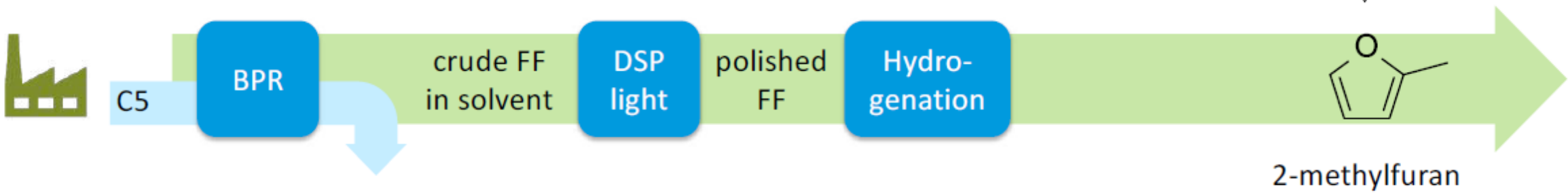
Enhancing Access to Sugar-Derived Platform Molecules

React-EU – Bright Coatings

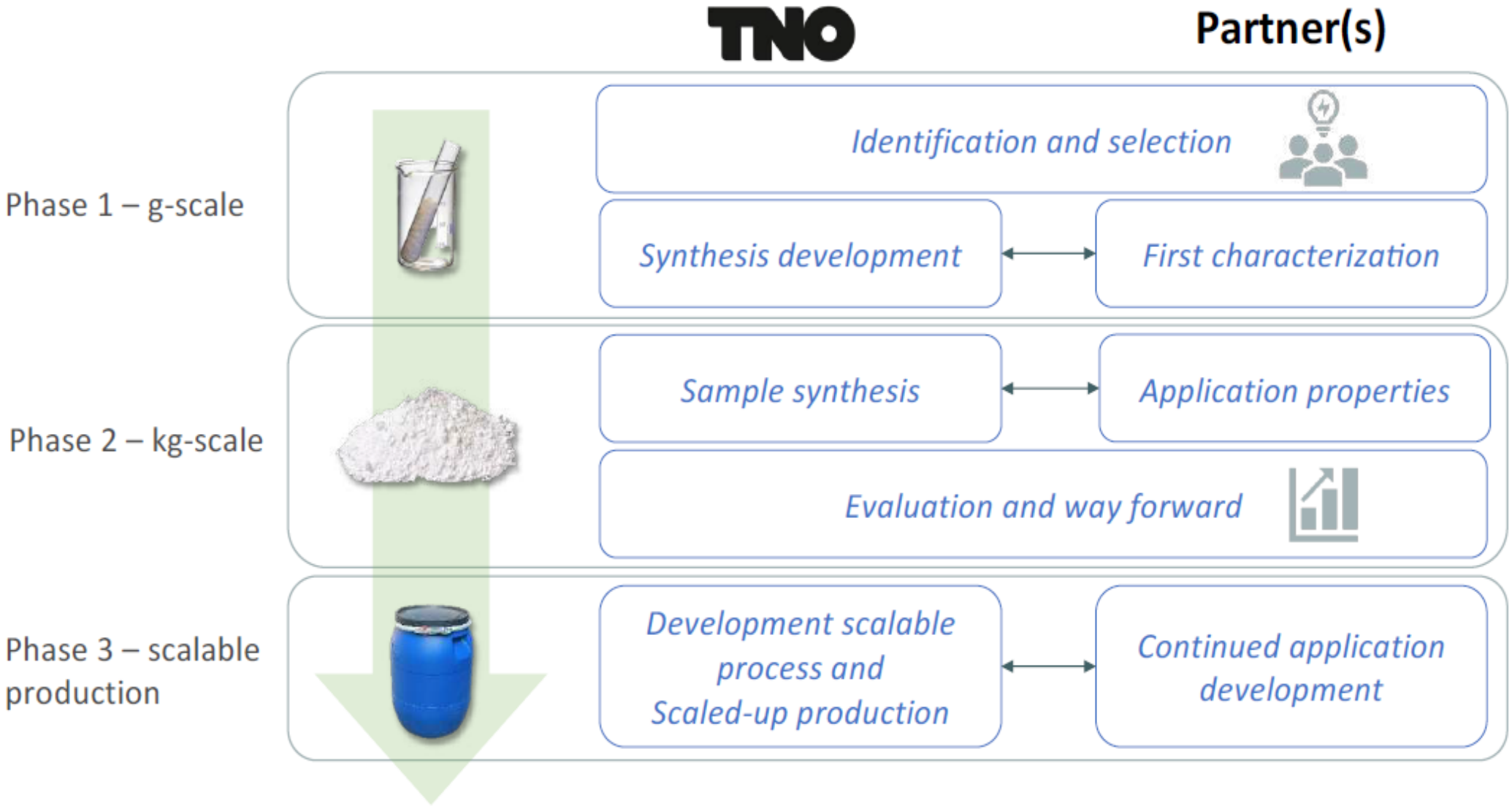
Industrial Standard



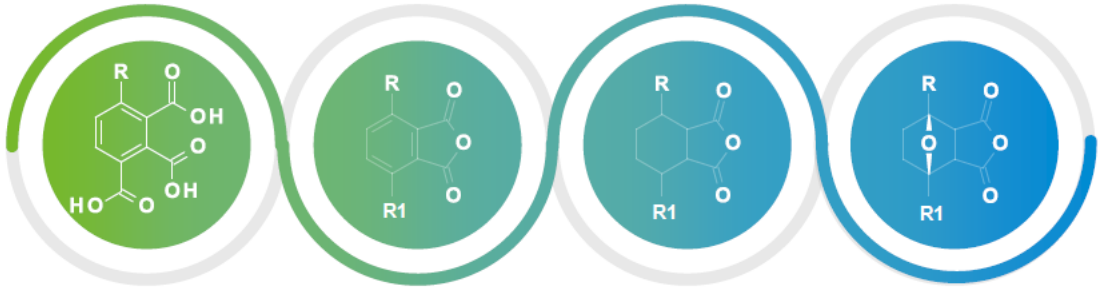
TNO's Telescoping Approach



Developing Novel Biobased Building Blocks – *Together*



Ability to offer a bioaromatics platform
Spin off: Relement

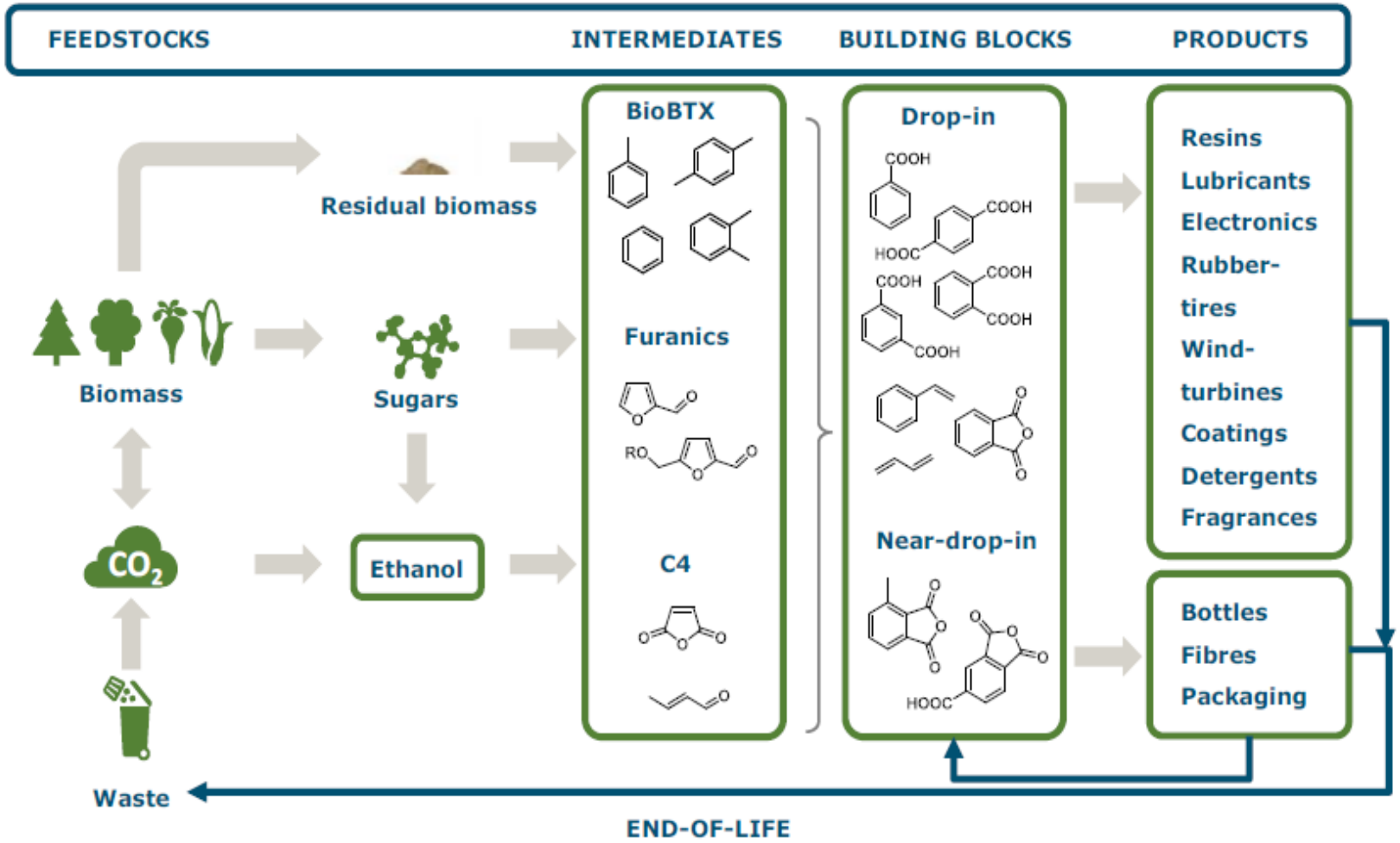


	Hemimellitic Acid	Phthalic Anhydrides	Hexahydro Phthalic Anhydrides	Epoxy-Hexahydro Phthalic Anhydrides
Targeted Markets	Polyurethanes Specialty lubricants Plasticizers	UV resistant coatings Monomer	UV resistant coatings Plasticizers Epoxy Curing agent	Novel coatings Other innovative applications
Volume Possible	10's of kgs	10's of kgs	10's of kgs	10's of kgs
Performance	Dimensional stability High Temperature Stability	Higher UV resistance	Super UV resistance Electrical insulator	To be explored
Derivatives Available	1	2	3	3

VANGUARD INITIATIVE
New growth through smart specialisation

Process Development to Expand the Renewable Carbon Horizon

MOOI - AROMATICS



avantium · BioBTX · RELEMENT · iff · TEIJIN · AkzoNobel · TNO · WAGENINGEN UNIVERSITY & RESEARCH · Unilever · Utrecht University · allnex · Symeres · TransitionHERO

Metsä Group and ANDRITZ plan a lignin product demonstration plant at Äänekoski

Metsä Group Press release 29 May 2023

Metsä Fibre, part of Metsä Group, is planning to build a demonstration plant for a modified lignin product in cooperation with ANDRITZ. The aim is to develop the process to separate lignin from black liquor in pulp production and to further process it for new end-uses.

The demonstration plant would have a capacity of about two tonnes per day and would be located within Metsä Group's Äänekoski bioproduct mill. An investment decision on the plant is expected to be made during the course of this year.

In pulp production, lignin that acts as a binder for wood fibres, is removed from fibres. It has traditionally been used for bioenergy production, but it also has a number of other potential uses. The technical assessment and development of the product for end-use applications is being driven by leading material science company, Dow. The high-performance bio-dispersant products produced in the demonstration plant could be used, for example, as bio-based concrete and gypsum water reducer used in construction markets.

Subscribe to our releases

OPEN THE FORM

Latest news

Metsä Group and Quant Finland agree on a common goal to reduce fossil CO2 ...

Biorizon partner VITO opens LignoValue pilot plant in Flanders

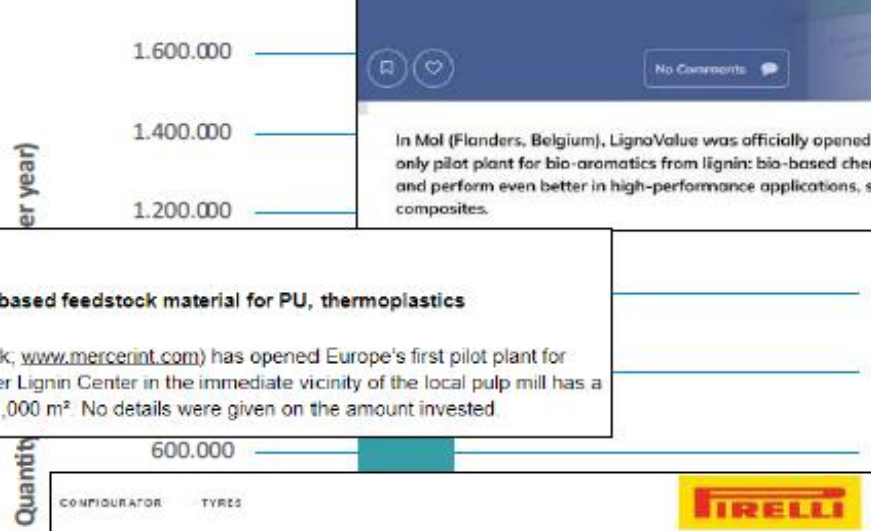
Bio-aromatics from lignin

In Mol (Flanders, Belgium), LignoValue was officially opened on 6 October. It is the first and only pilot plant for bio-aromatics from lignin: bio-based chemicals that replace fossil products and perform even better in high-performance applications, such as paints, coatings and composites.

MERCER

Lignin pilot plant opens in Germany / Bio-based feedstock material for PU, thermoplastics

US timber group **Mercer** (New York, New York; www.mercerint.com) has opened Europe's first pilot plant for lignin in Rosenthal, Germany. The new Mercer Lignin Center in the immediate vicinity of the local pulp mill has a production capacity of 300 t/y on an area of 1,000 m². No details were given on the amount invested.



Stora Enso and Valmet collaborate to develop next-generation lignin

Feb 16, 2023

Stora Enso and Valmet have started collaborating on next-generation lignin product and process development to drive Stora Enso's lignin-based businesses and further improve the performance of the Valmet LignoBoost technology. The objective of the partnership is to further develop the quality and customer value of lignin, increase the supply by optimized process machinery and asset design, and to accelerate the speed of meeting the growing lignin demand of the future.

CONFIGURATOR TYRES

PIRELLI

HOME = TECHNOLOGIES = SMARTGRIP+

SmartGRIP+ Compound

The SmartGRIP+ Compound is a special chemical formulation specifically designed for e-bike use, it features the characteristics of the Lignin - a natural chemical element derived from the production of paper. The Lignin is an additive with low environmental impact that enhances the mechanical strenght of the rubber, laboratory tests certified a 10% improvement in tear resistance which is a crucial feature for modern e-bike use
The enhancement of the tear resistance comes without compromising on the main features of the original SmartGRIP Compound, including chemical grip and durability. The SmartGRIP+ features a superior grip on every terrain and a predictable behavior in every weather condition along the whole lifespan of the tyre

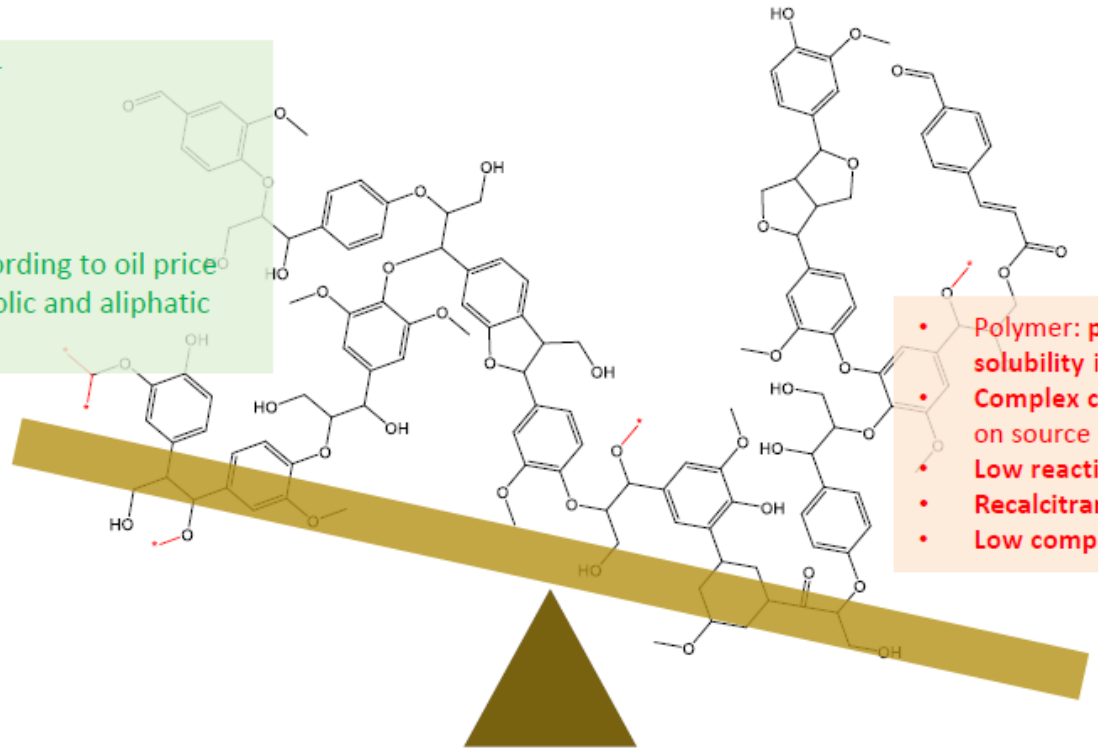
— 60 kton k

Biorizon
The way to aromatics

TNO & VITO

Lignin as resource for bioaromatics

- Phenolic natural polymer
- High availability
- Sustainable
- Non-toxic
- Low cost
- Price not fluctuating according to oil price
- Functional groups (phenolic and aliphatic OH)

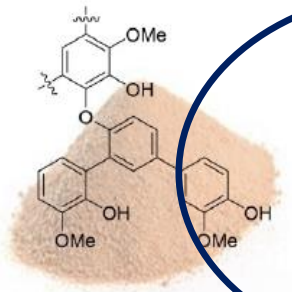


- Polymer: **polydisperse, heterogeneous, solubility** issues
- **Complex chemical structure**, also depending on source
- **Low reactivity**
- **Recalcitrant**
- **Low compatibility** with conventional polymers

JARD INITIATIVE
through smart specialisation

Analytics & polymer design

- Need to map complex mixtures and functionality

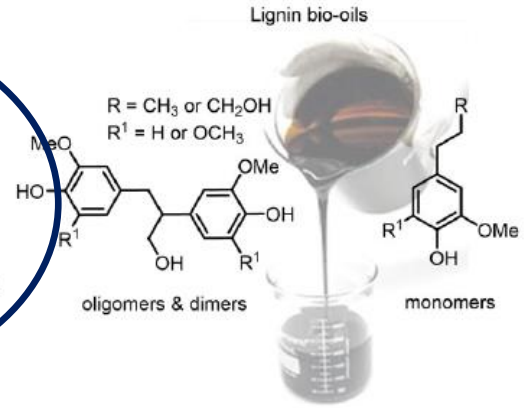


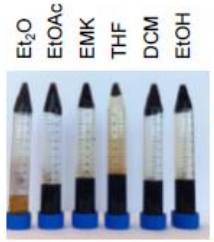
Technical (Kraft) lignin

Lignin bio-oils are more
- reactive
- homogeneous
- soluble

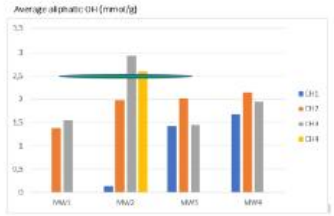
than technical lignins and therefore more suitable for polymer development.

E. Feghali; K. M. Torr; D. J. Van de Pas; P. Ortiz; K. Vanbroekhoven; W. Eevers; R. Vendamme
Topics in Current Chemistry **2019**, *377*, 22



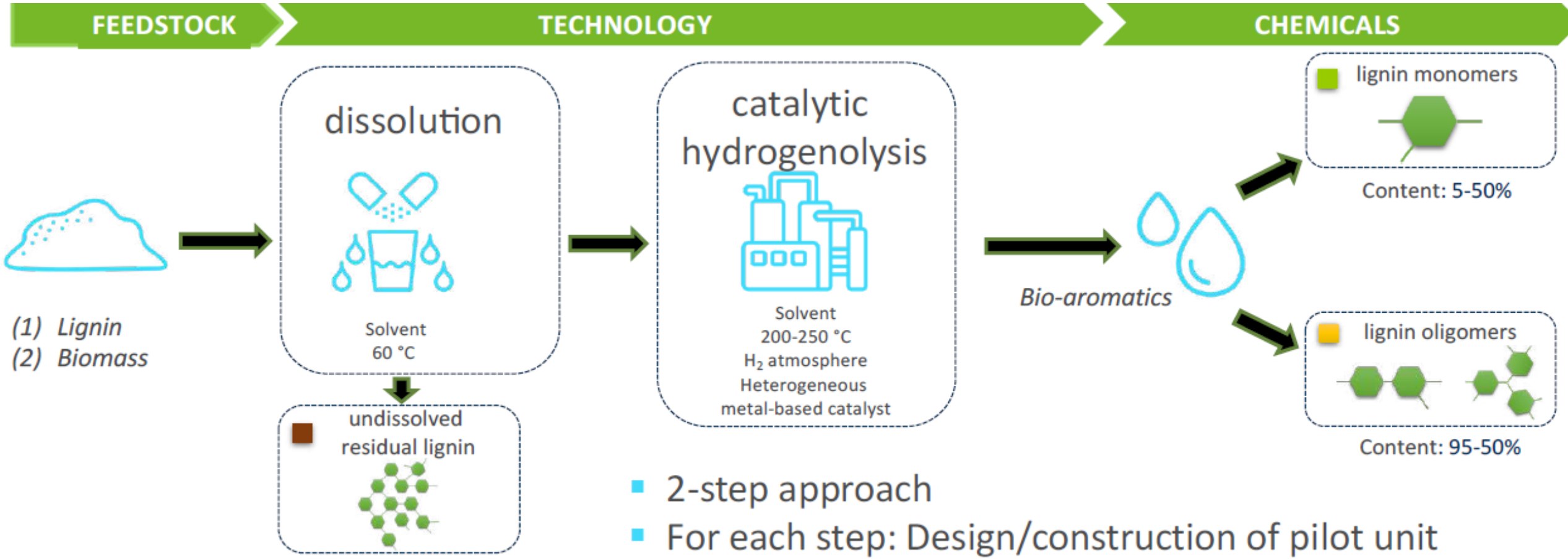


Lower MW & PDI



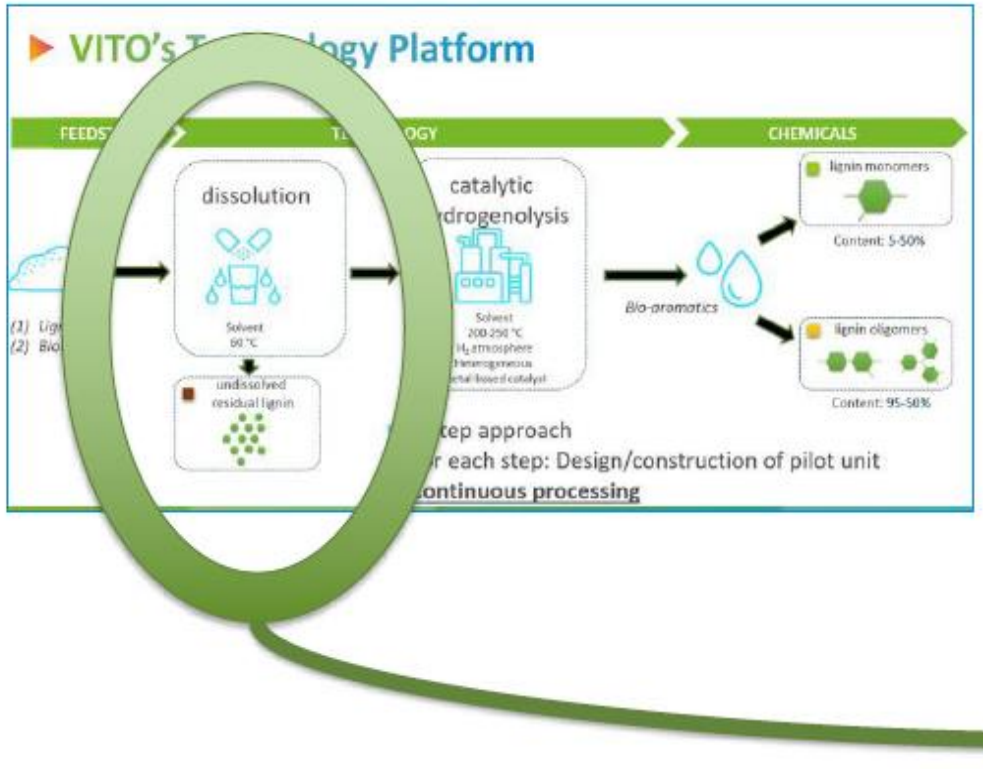
Bio-based polyol with original features for polymer development ex. PU

VITOs technology platform



- 2-step approach
- For each step: Design/construction of pilot unit
- **Continuous processing**

Pilot units



PILLAR II dissolving/extraction unit

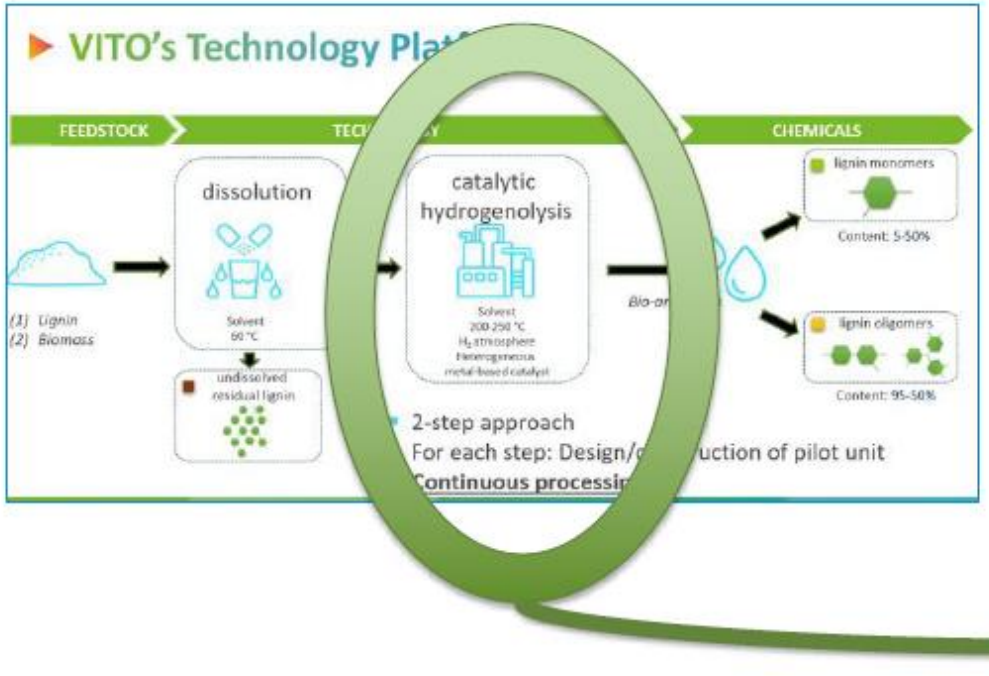
semi-continuous processing

Delivery at VITO Sustainability Park January 2024

VLAIO CATALISTI

IATIVE
specialisation

Pilot units



LignoValue Pilot catalytic reactor

Continuous processing

Already on-site at VITO Sustainability Park

New infrastructure project: LigninPLUS

Additional equipment under development

- Handling of feedstock
- Downstream processing of products

VLAIO EFRO EUROPEES FONDS VOOR REGIONALE ONTWIKKELING

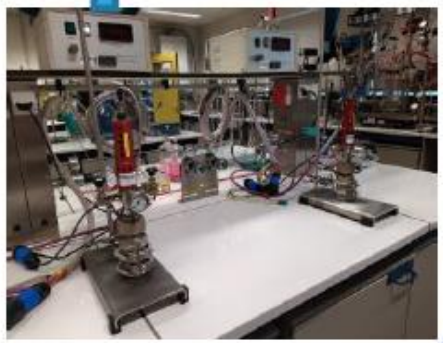
Provincie Antwerpen

ITIATIVE

rt specialisation

Lignin depolymerization
From lab scale to pilot plant

2 - 5g/day output
Timing: operational



Lab batch depolymerization system

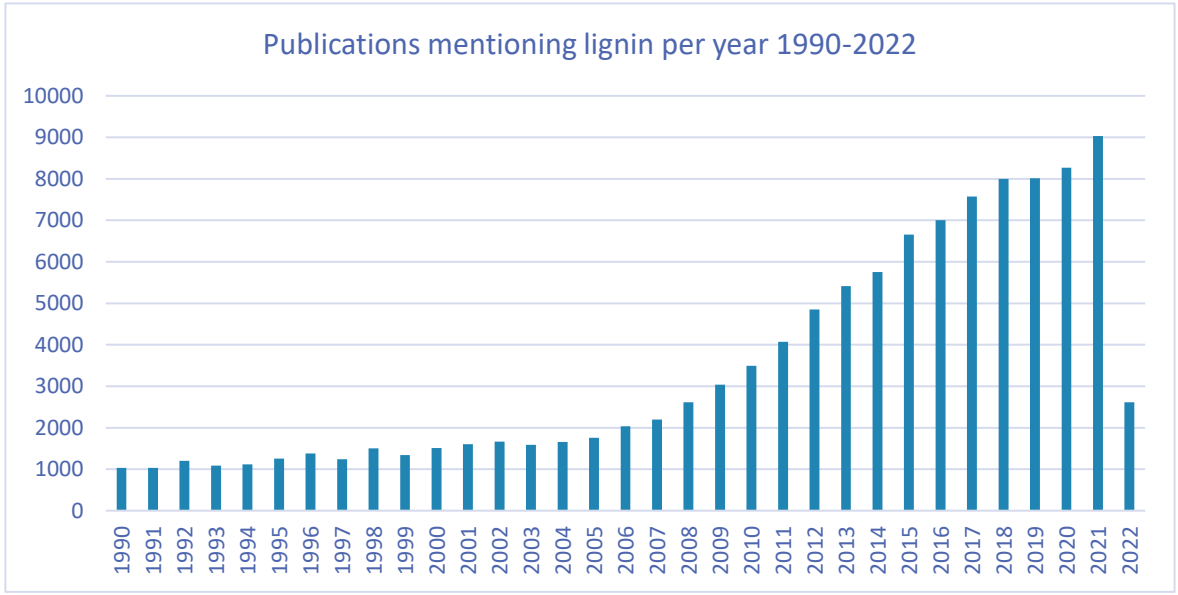
4-20 g/h output
Timing: feb 2022

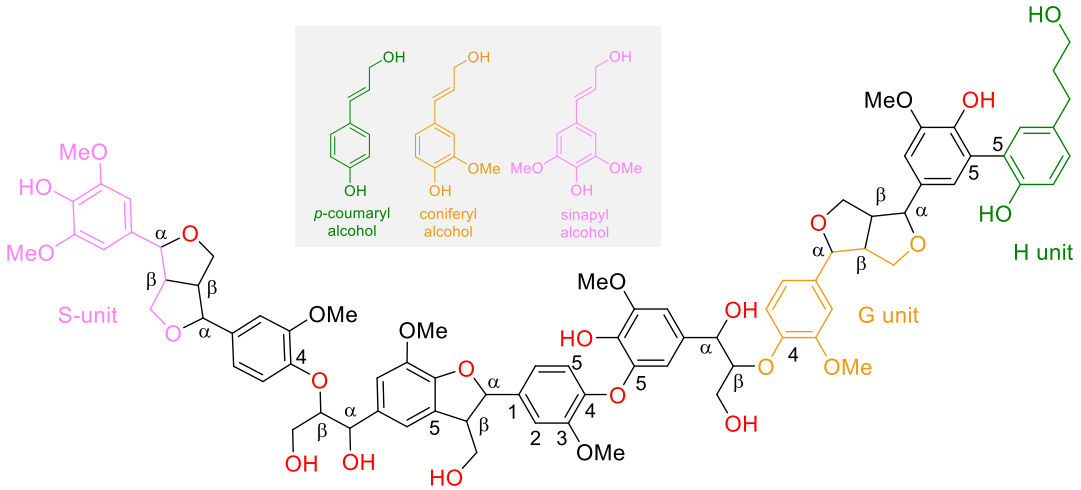
Lab continuous depolymerization system

1-4 kg/h output
Timing: Q1 2023

Pilot continuous depolymerization

LIGNIN materials, close to market?





Avantium and Roelofs construct the world's first test road with lignin produced in the Netherlands

Bio-bitumen: Stora Enso + Poab→ Road in Sweden

Photo credit: Peab

Latvijas Finieris→ Industrial production of biobased glue in plywood

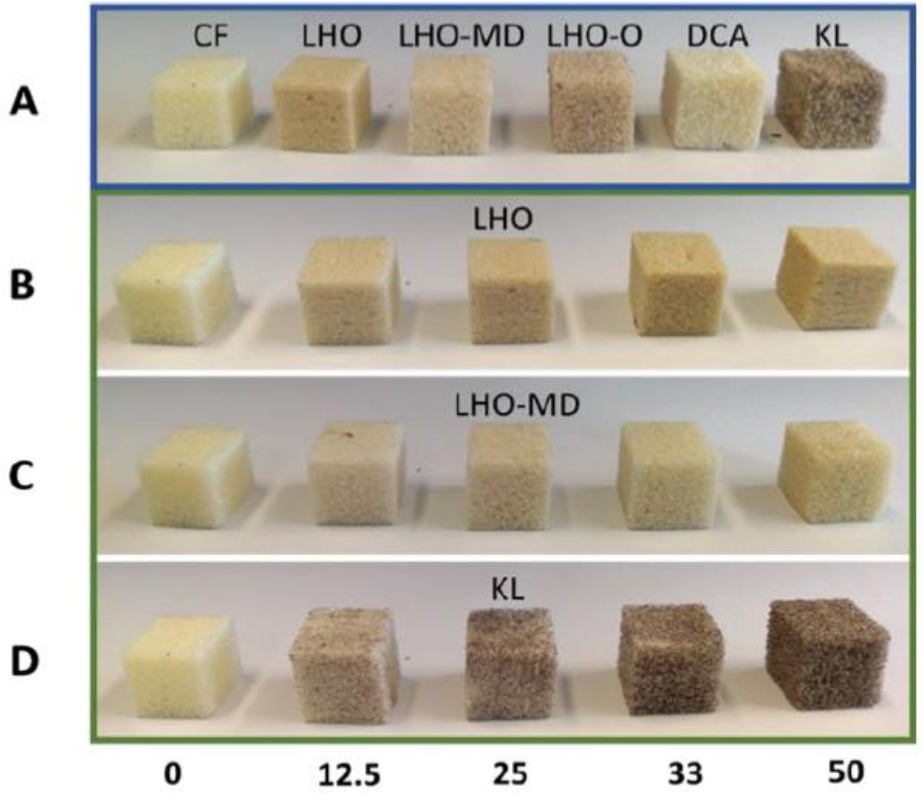
"Lignin as a coating material is **actually very promising** with its many benefits compared to the synthetic and bio-based coatings currently used. It has excellent anti-corrosion, anti-bacterial, anti-icing, and UV-shielding properties."

Lignin roles in polymer systems

- Lignin as building block for polymers
  - Polyurethanes
  - Polyacrylates
  - Epoxy resins
  - Phenolic resins
- Lignin as additive
  - Chemical modification of lignin
  - Specific function of bioaromatic additives
    - Antioxidant
    - Antimicrobial
    - UV blocking
    - Adhesion
    - Thermal resistance

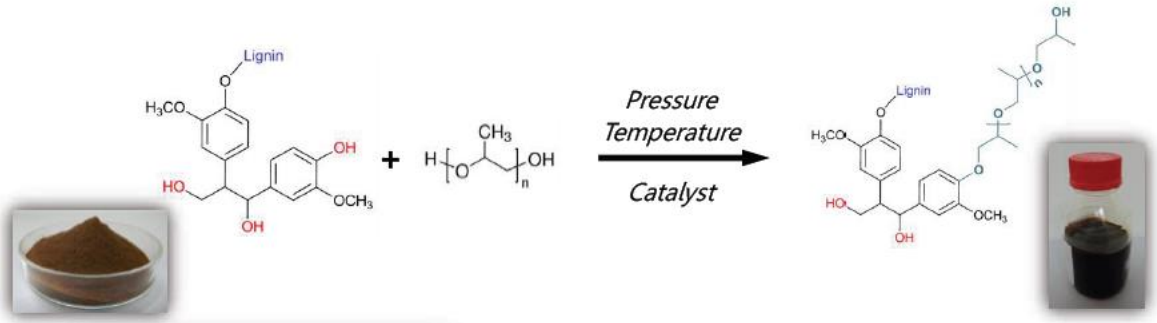
VANGUARD INITIATIVE
New growth through smart specialisation

Lignin derived polyurethanes



VANGUARD INITIATIVE
New growth through smart specialisation

Polyurethane foams with lignin as polyol



ARKEMA
INNOVATIVE CHEMISTRY

PU Panels
Industrial production

1000+ m²
Commercial product

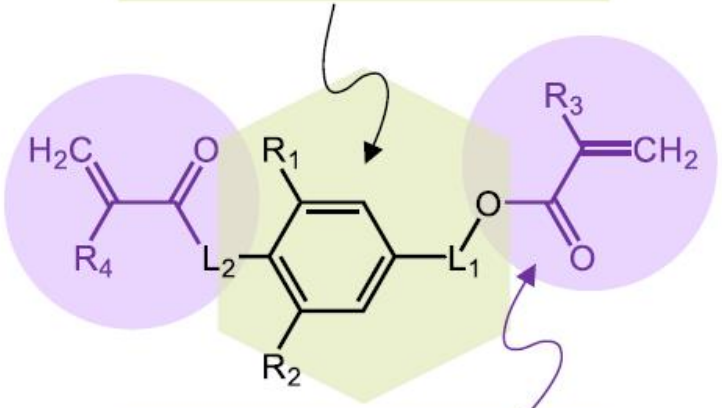
SOPREMA GROUP

VANGUARD INITIATIVE
New growth through smart specialisation

Acrylates

- **Previous work**: Integration of tailored lignin fractions in PU, PF, epoxies…
- **New development**: Demonstration of lignin-derived acrylic systems

Tailored lignin (oil) fraction



Meth(acrylic) functions

On-going research

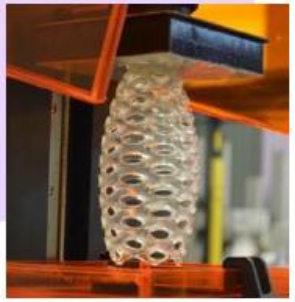
- Functionalization;
- Formulation and curing;
- Basic properties

Future opportunities

Collaborations with industry

New applications from acrylated lignin fractions:

- Coatings
- Inks;
- Adhesives
- …



VANGUARD INITIATIVE

New growth through smart specialisation

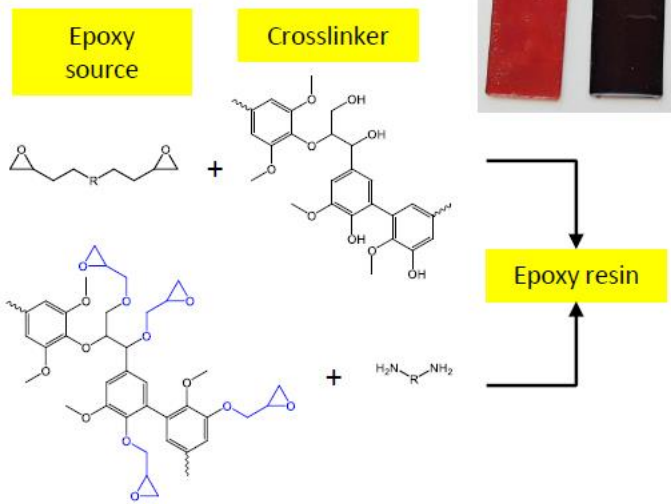
Lignin applications

Epoxy resins

Role of lignin in epoxy resins:

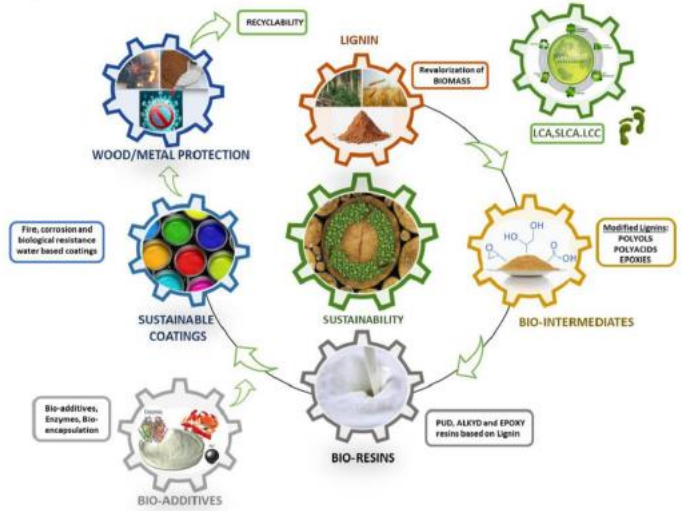
Lignin as an epoxy source (after epoxidation)

Lignin as a crosslinking agent



BBI LIGNICOAT – Epoxy resins

Bio based Industries Consortium



tecnalia · Barpimo · NORCE · vito · VTT · iris COATINGS · ARDITEC · AXIA INNOVATION · AEP polymers · universidad de león · Ecoat Eco-friendly Resins for Coating · HEXION

Horizon 2020 European Union Funding for Research & Innovation

VANGUARD INITIATIVE
New growth through smart specialisation

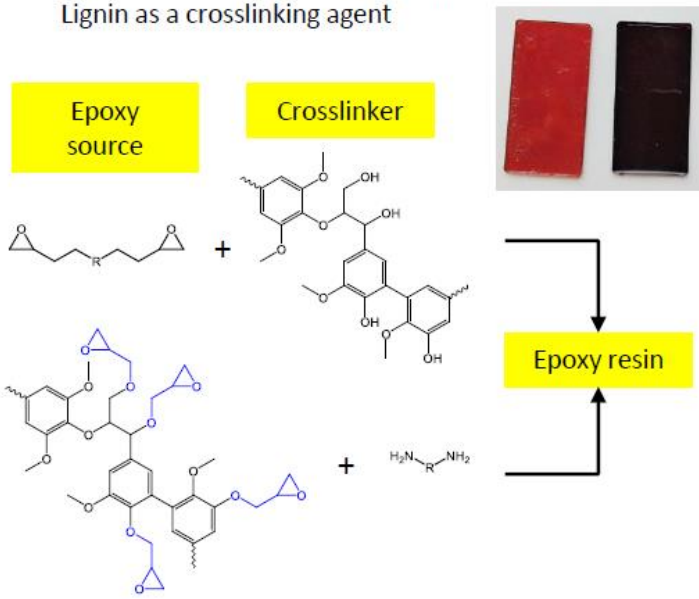
Lignin applications

Epoxy resins

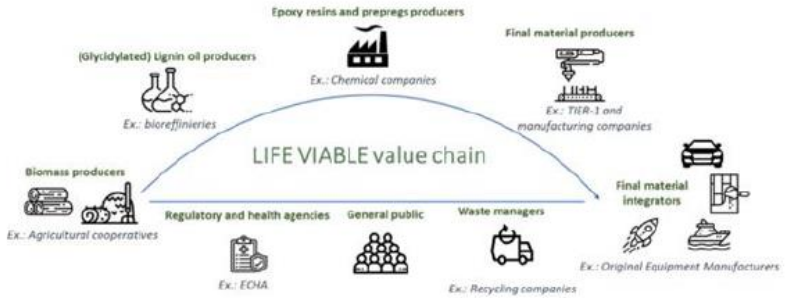
Role of lignin in epoxy resins:

Lignin as an epoxy source (after epoxidation)

Lignin as a crosslinking agent



Life Viable – Epoxy resins



APESA cimv CRF Plastipolis SOLVAY

VANGUARD INITIATIVE
New growth through smart specialisation

Horizon 2020
European Union Funding
for Research & Innovation

Resins in collaboration with Westlake

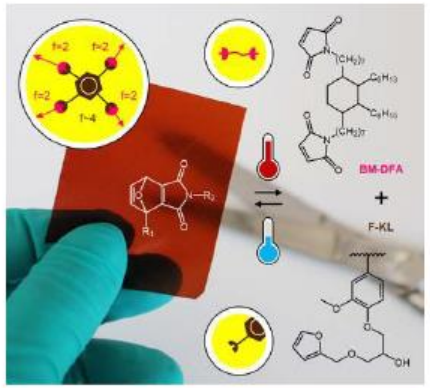
- BIORECEPY
  - Biomass after thermochemical depolymeriation and fractionation by TNO
- LIGNICOAT
  - Lignin after catalytic depolymerization by VITO + glycidation
- LIFE VIABLE
  - Eposyresins to make large composites

Westlake Epoxy

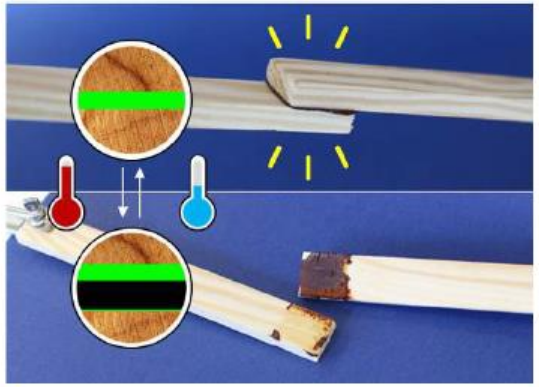
VANGUARD INITIATIVE
New growth through smart specialisation

Adhesives

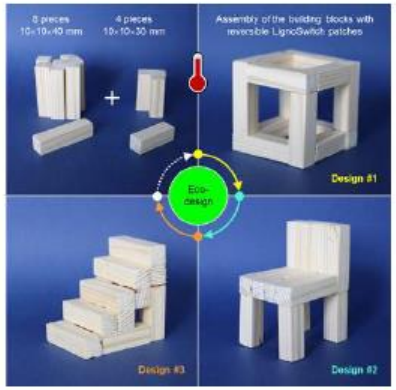
- **Previous work**: Demonstration of lignin-based adhesives using various chemistry platform (PU, epoxies…)
- **New development**: Lignin-based adhesives with additional functionalities: reversible bonding and debonding on-demand



LignoSwitch™



Reversible gluing and ungluing



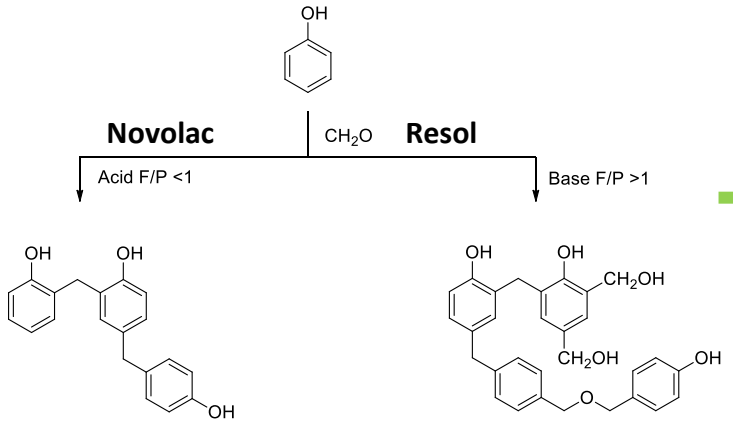
Eco-design

VANGUARD INITIATIVE
New growth through smart specialisation

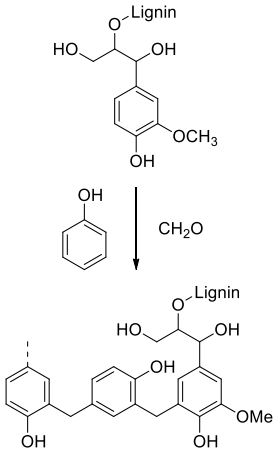
BIORESAL project

BIORESAL (BIObased RESins from Aldehydes and Lignin) Project aims to valorize technical lignins and depolymerized lignins to produce Lignin based phenolic resins for foam and molding applications→ **Replacement of phenol by lignin.**

PF resins



(L)PF resins



Chem. Modification
Tailoring lignin fractions

vito

TEA
Process design

INEOS
THE WORD FOR CHEMICALS

Chem. Modification
HCOH replacement

UNIVERSITEIT GENT

CATALISTI
WE MEAN BUSINESS

BIORESAL

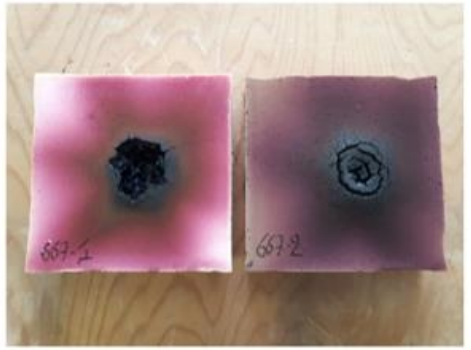
- **LPF Foam evaluation with technical, purified and modified lignins**

The thermal conductivity
Friability
The compressive strength
} on target ✓

Specifications of LPF improved after adapting the resin procedure and after formulation development of the foam at lab scale.

OK

NOK



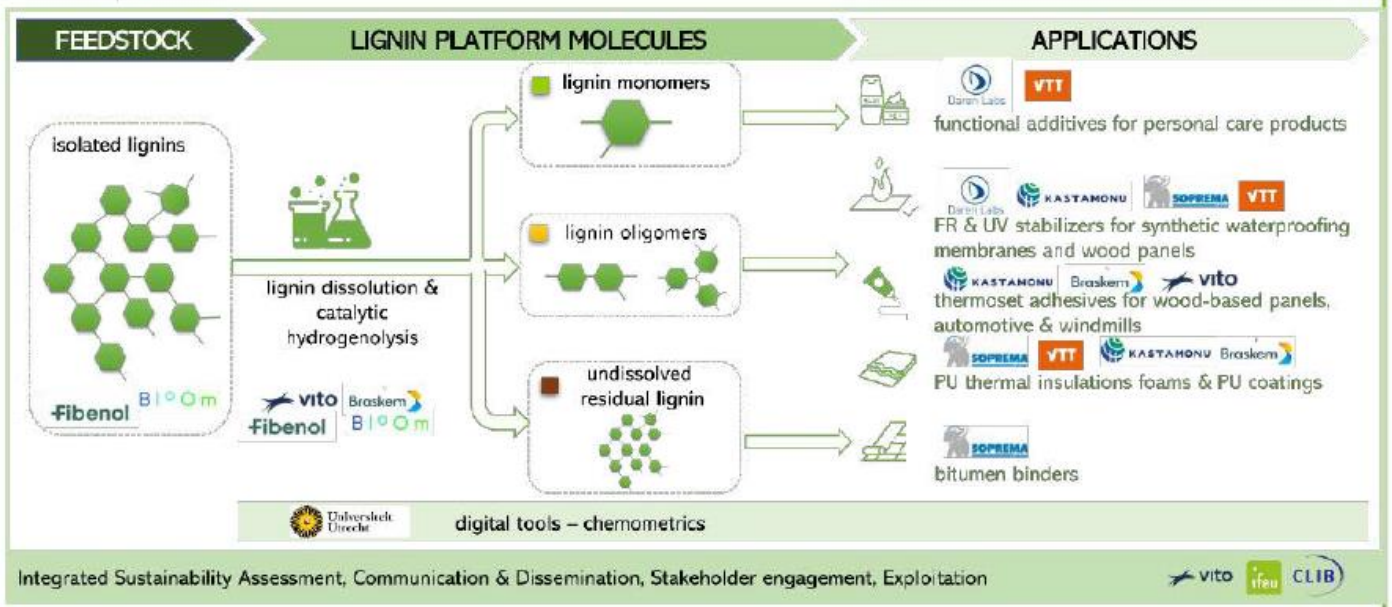
OK

ANGUARD INITIATIVE
growth through smart specialisation

COUNTLESS

Cost-Effective production of ligNin platform chemicals extending the biobased ChEmicals portfolio

HORIZON-JU-CBE-2022-IA-03



- Overall goal is to **demonstrate the cost-effective and environmentally sustainable production of novel dedicated lignin-based platform chemicals**, in an industrially relevant environment (TRL 7), via the the use of a catalytic hydrogenolysis technology to convert isolated lignin into platform chemicals for several applications in the **construction industry and cosmetics sector**.
- Duration: 4 years (2023 – 2027) – start 01/09/2023
- Total budget: € 6,9 MEUR – EC Funding: €5,4 Meur; BLOOM associated partner (€1,34 Meur)

Circular Bio-based Europe Joint Undertaking

Bio-based Industries Consortium

Co-funded by the European Union

The project is supported by the Circular Bio-based Europe Joint Undertaking and its members

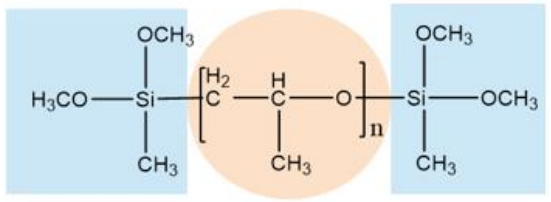
NGUARD INITIATIVE
rowth through smart specialisation

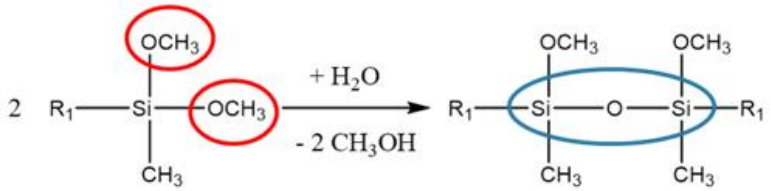
Coordinator: vito

Contact: kelly.servaes@vito.be

Cambium project

- Liquid Polymers (MS Polymer)
  - Sealants, adhesives and coatings
  - Construction, transportation and industry



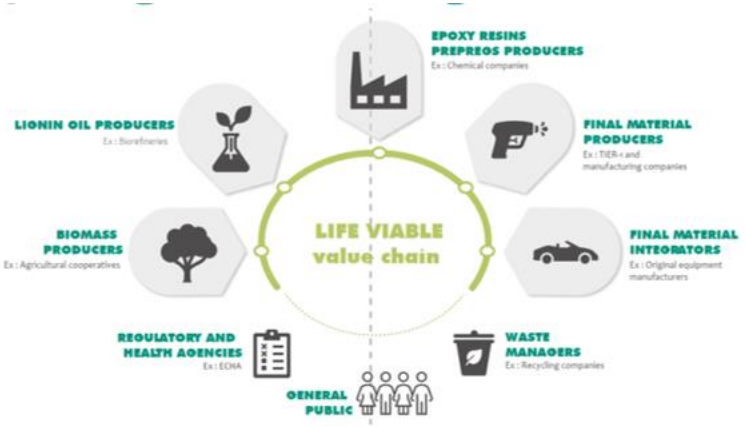


VANGUARD INITIATIVE
New growth through smart specialisation

Replacing BisphenolA by lignin derivatives

VIABLE

Valorization of lignin biomass into competitive components grAdually replacing BPA in the formuLation of Epoxy resins



CONTEXT OF THE PROJECT

BPA Bisphenol A (BPA) is a commodity chemical produced world-wide in a large volume every year. It is used in the production of epoxy resins and polycarbonates. However, its endocrine disrupting properties and its fossil-based composition raise concerns about its environmental impact and health toxicity as well as its sustainability.

The VIABLE project therefore aims to improve the sustainability and the environmental impact of epoxy resins manufacture by lowering the BPA content in the formulation of epoxy resins by 20 to 50%.

vito · SOLVAY · POLYMERIS · STELLANTIS · APESA · cimv

This project has received funding from the European Union's LIFE Program under grant agreement No LIFE20-ENV-BE-000671

VANGUARD INITIATIVE
New growth through smart specialisation

Lignicoat

Sustainable COATings based on LIGNIn resins and bio-additives with improved fire, corrosion and biological resistance

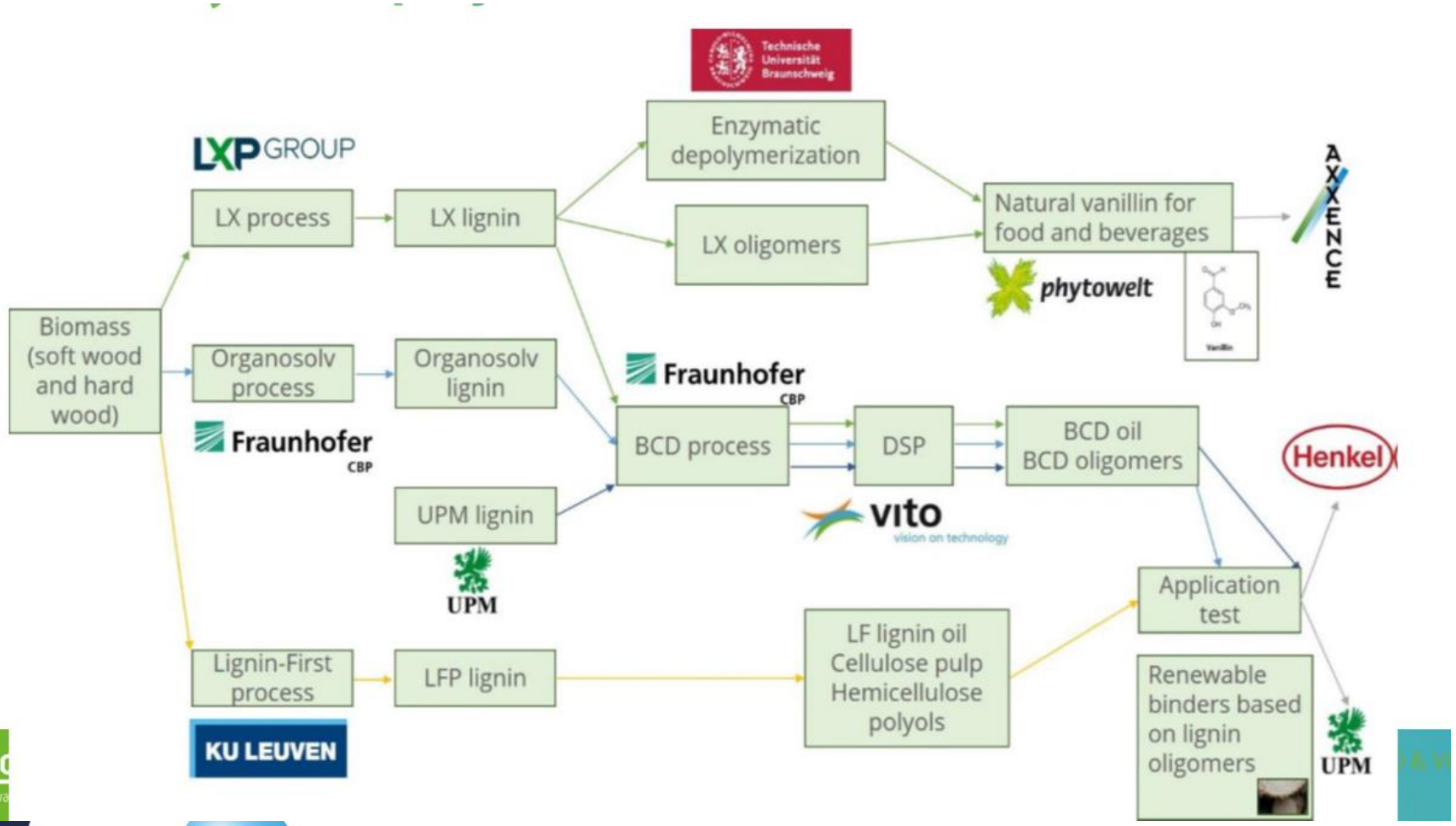
LIGNICOAT project proposes the development of eco-innovative materials from lignocellulosic biomass in order to obtain bio-based sustainable coatings considering the availability and carbon footprint of resources.
The LIGNICOAT project aims to increase the bio-based content of the coatings while ensuring performance and providing anti-corrosive, fireproof, and antimicrobial features. The ambitious goal of the project is to assist in the transition of the Paints and Coatings industry from fossil-based to bio-based products.

Project Partners

tecnalia
AEP polymers
ARDITEC
AXIA INNOVATION
Barpimo
ecoat
FORESA
HEXION
iris COATINGS
Junta de Castilla y León
NORCE
VencorеX
vito
VTT
BBI
Bio-based Industries Consortium

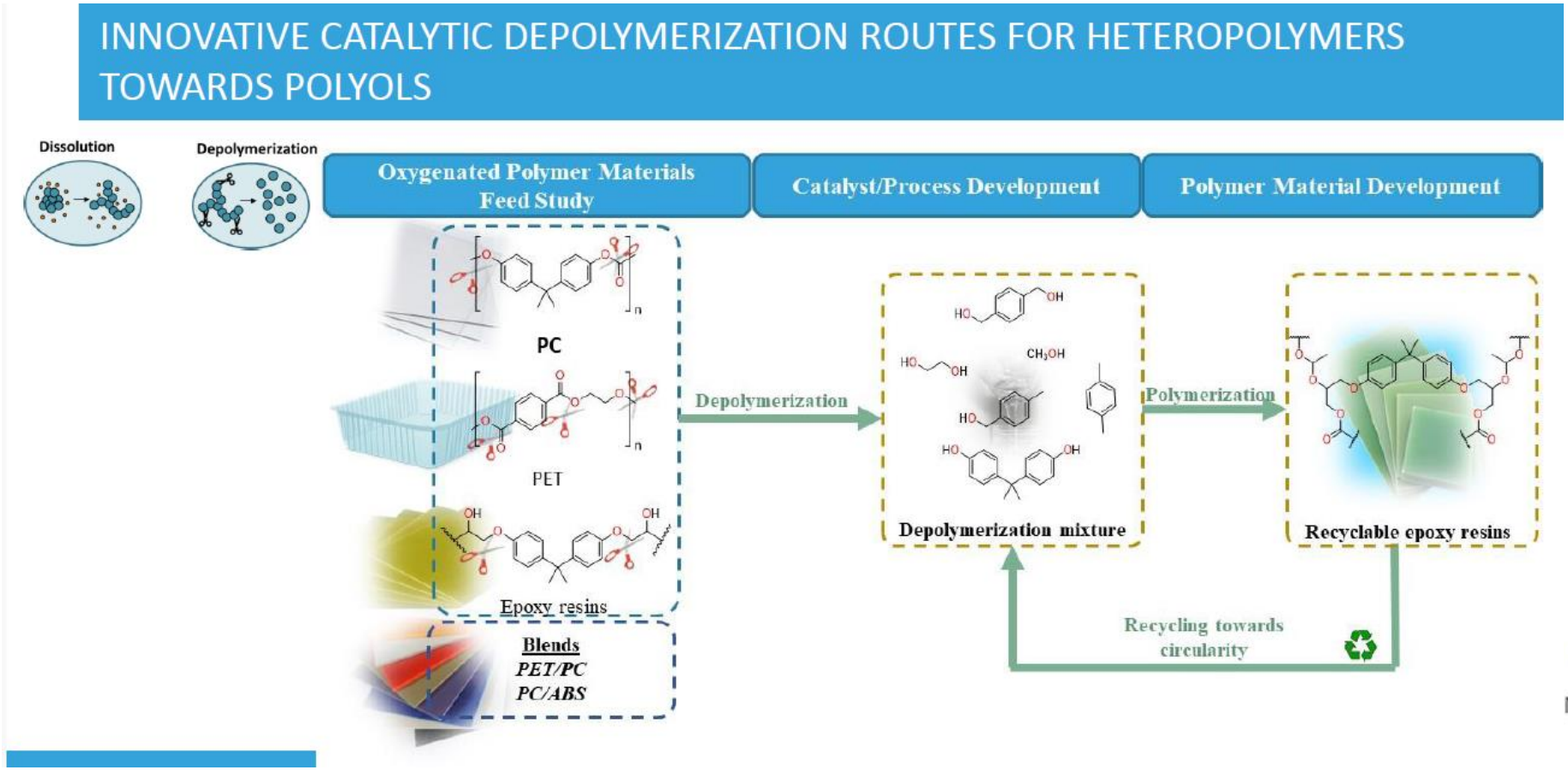
VANGUARD INITIATIVE
New growth through smart specialisation

ALIGN, BMBF project in collaboration with Flanders



VANGUARD INITIATIVE
New growth through smart specialisation

From lignin depolymerization to plastic depolymerization

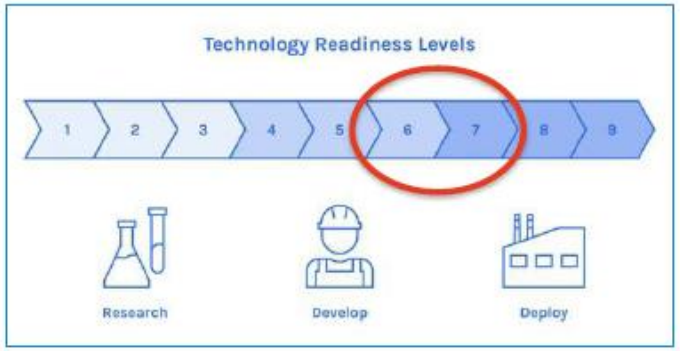


VANGUARD INITIATIVE
New growth through smart specialisation

•LIGNICOST

- Albania, Austria, Belgium, Bosnia&Herzegowina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, UK

Wrap up



ANGUARD INITIATIVE
/ growth through smart specialisation

Join our mission, join our community

27-11-2024 - 28-11-2024 /

Antwerp & Online

11th Biorizon Annual Event

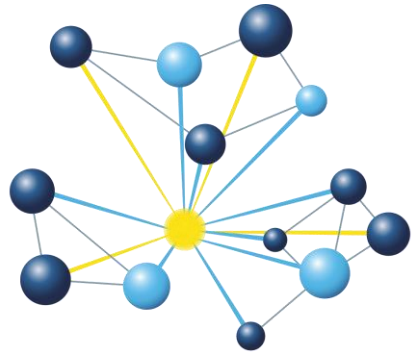
On 27 and 28 November 2024 Biorizon Shared Research Center will host its 11th Biorizon Annual Event on Bio-aromatics in Antwerp and online.

www.biorizon.eu/community/join

VANGUARD INITIATIVE

ew growth through smart specialisation

Contacts



VANGUARD INITIATIVE

New growth through smart specialisation

Ilaria Re, Lombardy Green Chemistry Association
Email: ilaria.re@italbiotec.it

Ludo Diels, Portfolio Manager at Processes4Planet and Former Advisor Sustainable Chemistry – VITO
Email: ludo.diels@vito.be