

# What we do ?

At SPLENDOR, we give lignin, a natural by-product of the pulp and paper industry, a second life. From what used to be a side stream, we now make something more valuable: bio-based aromatic chemicals that can replace fossil-based equivalents across a wide range of industries.

By using hydrothermal depolymerisation, we turn the lignin-containing side stream known as black liquor directly into bio-aromatics such as vanillin and syringol, without the need for expensive catalytic systems or complex pre-treatments. The process fits easily into existing pulp mills, helping reduce emissions and waste while improving efficiency.

In simple terms, SPLENDOR aims to prove that circular chemistry works at scale. Our pilot will deliver four real applications: fine chemicals, waterproof coatings, tire plasticizers, and renewable fuel components, paving the way for a low-carbon, circular European industry.



# Key Figures

## Duration

**36 months**

From September 2025 to August 2028

## Budget

**€ 7.3 Millions**

**A European multi-stakeholder consortium advancing sustainable innovation**



University of  
Nottingham  
UK | CHINA | MALAYSIA



Maastricht University



Circular  
Bio-based  
Europe  
Joint Undertaking



Bio-based Industries  
Consortium



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**Sustainable Production of  
Lignin-Derived End-Products  
via Depolymerisation  
Reactions**

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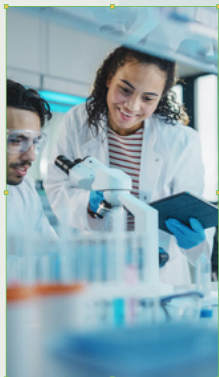
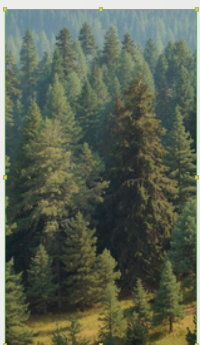


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# Objectives

**Behind this innovation lies a simple goal: unlocking the hidden potential of lignin, one of nature's most abundant yet underused resources.**

- Scale and integrate Nova's one-step process that converts lignin-rich black liquor into sustainable bio-aromatic products directly into a pulp mill, enabling a circular and resource-efficient production strategy for the bio-based industry.
- Produce and validate several industrial uses of fine chemicals, waterproof coatings, tire plasticizers, and renewable fuel components.
- Prove environmental and social sustainability through Life-Cycle Assessments (LCA), Techno-Economic Analyses (TEA), and Safe-and-Sustainable-by-Design (SSbD) evaluations.
- Contribute to the goals of Europe's Green Deal by reducing dependence on fossil resources and supporting a circular, competitive, and carbon-neutral bioeconomy.



# Expected Impact

## Environmental

Helping drive Europe's green transition by turning industrial side streams into valuable bio-based resources. Our catalyst-free process lowers emissions and maximizes efficiency, while staying aligned with Safe-and-Sustainable-by-Design principles and the EU Green Deal. Every step of the project is monitored through life cycle and techno-economic assessments to ensure that what we do is both effective and responsible.

## Societal

Believing sustainability starts with trust between science, industry, and society. SPLENDOR promotes open communication and stakeholder engagement through workshops, and social Life Cycle Assessment activities. The project also aims to create new green-job opportunities and improve the safety standards for workers and local communities.

## Economic

Embedding our technology directly into pulp mills, we create new revenue streams and strengthen Europe's industrial leadership. The process adds value to existing infrastructure, accelerates market uptake of bio-based coatings, chemicals, and fuels, and helps build a more resilient, circular economy for the future.

# Applications

## Fine Chemicals Renewable Aromatic Compounds for High-Value Markets

We focus on producing bio-aromatic molecules such as vanillin, syringol, and acetovanillone to replace traditional petrochemical fine chemicals in markets such as pharmaceuticals, cosmetics, and fragrances & flavors.

## Safer and Circular Eco-Friendly Waterproofing Coatings

Another aspect that will make our work different is our bio-based waterproofing coatings derived from lignin fractions. They are solvent-free, isocyanate-free, recyclable, and tough. They can even heal themselves, reducing waste and extending product life.

## Green Plasticizers for Tires and Rubber Products

We aim to develop renewable plasticizers from lignin-based oils to replace fossil ones in tire and rubber production. These bio-based plasticizers are intended to offer similar flexibility, tensile strength, and durability to conventional types, while cutting carbon emissions and reducing dependence on petroleum.

## Powering the Future with Renewable Lignin Fuels

We plan to turn lignin-based oils into long-lasting aromatic fuel components for aviation and transport. Lower molecular-weight oil fractions are well suited to hydrotreatment and fuel upgrading.