

KEY FIGURES

Duration
48 months

from April 2025 to March 2029

Funding from the European Union's Horizon Europe research and innovation program and the Circular Bio-based Europe Joint Undertaking:

€ 20 M

Total budget:

€ 40 M

12 partners
from 5 european countries

3 Academic partners

UNIVERSITE DE TECHNOLOGIE DE COMPIEGNE (France),
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (France),
ENERGIEINSTITUT AN DER JOHANNES KEPLER UNIVERSITAT LINZ VEREIN (Austria)

3 Research centres

IFEU - INSTITUT FÜR ENERGIE - UND UMWELTFORSCHUNG HEIDELBERG (Germany),
INSTITUTO TECNOLÓGICO DEL EMBALAJE TRANSPORTE Y LOGÍSTICA (Spain),
IFP ENERGIES NOUVELLES (France)

5 Large companies

MICHELIN ENGINEERED POLYMERS (France),
ADM (France),
KRATON (Netherlands),
AVANTUM RENEWABLE POLYMERS (France),
ARKEMA (France)

1 Cluster

BIOECONOMY FOR CHANGE (France)

Graphic design : www.links-web.fr



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This project has received funding from the Circular Bio-based Europe Joint Undertaking (CBE JU) under grant agreement No 101157517. The JU receives support from the European Union Horizon Europe research and innovation programme and the Bio Based Industries Consortium.

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**Produce a high-performance
bio-based intermediate
to serve the sustainable industry!**

What do we do ?

In pursuit of offering solutions that are respectful of both human health and the environment, and supporting the resilience of European economy, Michelin and its partners joined their forces to launch CERISEA, a project dedicated to the construction of a plant, to produce for the very first time in the world, 3000 tons of 5-HMF (5-Hydroxymethylfurfural) per year. The process implemented will convert fructose and advanced fructose from non-food side streams.

Nicknamed the “sleeping giant”, 5-HMF is a molecule of enormous potential and a wide range of possible applications. The “sleeping giant” is about to be awakened through this Flagship project involving 12 European pioneers. As a versatile building block, 5-HMF offers a sustainable alternative to harmful components currently used in the industry.

CERISEA will demonstrate how to overcome still existing challenges for the large-scale industrial production of 5-HMF by:

- Tackling the technical challenges of a safe and sustainable industrial and bio-based production of 5-HMF
- Building the first European value chain and the world's first factory able to produce up to 3000 tons per year
- Testing 5-HMF in its potential applications (araminolic resins, crop science, functionalized biopolymers, functionalized compounds, polyesters, polyamides, polyurethanes, plasticizers...)



Objectives

- Build, commission, start-up, ramp-up and operate the first-of-its-kind industrial scale HMF production plant.
- Secure a consistent and sustainable source of feedstock and raw material while advancing the utilisation of advanced fructose.
- Valorise and validate HMF conversion into a very wide range of applications including araminolic resins, crop science, functionalised biopolymers (modified starch), functionalised compounds, polyesters, polyamides, polyurethanes and plasticizers meeting market demand.
- Valorise the by-products of the HMF production (humins) to reduce the cost and the environmental footprint.
- Ensure safety, quality, purity, and regulatory compliance of the Process, HMF, derivatives and end-products.
- Demonstrate the techno-economic, environmental and social sustainability of the entire value chain, including the end-products through LCSA.
- Demonstrate a first-of-its-kind sustainable full value chain on HMF production at large scale, from the feedstock supply up to the consumer.
- Ensure social and public acceptance as well as market uptake of CERISEA's HMF and bio-based end-products.
- Prepare the replication of the CERISEA concept, based on the Process, by means of licensing to maximise impacts in Europe.



Expected impacts

Environmental

- Improved circularity and resource efficiency of bio-based value chains via practical application of circular bioeconomy, encompassing the resource- and energy-efficient, cascading use of sustainably sourced biomass.
- Significantly improved sustainability, strategic autonomy, resilience and competitiveness of the European chemical industry and with cascading impact in other downstream sectors.
- Reduce the fossil feedstock dependence of chemicals production and/or minimising biomass imports dependencies of the bio-based industries.
- Significant improvement of environmental and safety performance across the value chain against specified fossil and/or bio-based benchmarks.

Social

- New skilled job opportunities and investments in the bio-based sectors.
- Societal relevance and social acceptance of circular bio-based solutions and products.

A multi-stakeholders projects



Contribution to sustainable development goals

