

UPM: driving the sustainability transformation of the rubber industry

UPM, who's history goes back 150-years to the origins of the Finnish forest industry with pulp and paper production, is using its vast experience of forestry and forest products to transform materials for a fossil-free future. The company is on the home straight to opening the world's first wood-based biorefinery later in 2024 that will produce biochemicals made from responsibly sourced European hardwood – with a significantly improved carbon footprint compared to fossil-based alternatives.

UPM is focused on scaling biorefineries, producing a variety of renewable fuels and chemicals made from sustainable biomass. At its biorefineries, the company is creating ingredients that will significantly reduce the footprint of materials and provide better choices to consumers.

UPM Biochemicals is providing key solutions with its two main products from the Leuna Biorefinery, BioMEG and Renewable Functional Fillers (RFF) which will be CO₂ negative from cradle-to-gate from day one - considering the biogenic carbon uptake of the sustainable feedstock and purchasing green electricity. UPM is also working on reducing the fossil-based impact from energy demand with additional reduction measures in the coming years.

UPM's Leuna biorefinery will turn wood into next generation biochemicals

Woody biomass from sustainable forest management practices and side streams and sourced from certified, regional beechwood forests will be processed at the €1,180 million biorefinery in Leuna, Germany. The biorefinery aims to produce 220,000 tonnes annually.

The wood is harvested and recovered by UPM's network of foresters and forest owners and supplied to the Leuna biorefinery for conversion into biochemicals. From the wood, cellulose is used to produce bio-glycols, lignin for renewable functional fillers and hemicellulose for industrial sugars.

When wood from central European forests is transformed into UPM Biochemicals' bio-based ingredients for consumer products, its journey from forest to biorefinery and into a product is fully traceable. The end consumer can therefore connect their product back to the carbon value of the forest.

All the wood comes exclusively from sustainably managed forests and is 100% either FSC® or PEFC certified and covered by a third-party verified chain of custody. The certification confirms that the forest is being managed in a way that preserves biological diversity and benefits the lives of local people and workers while ensuring it sustains economic viability.

Wood is selectively harvested forest, not from clear cuts, and a substantial part of the forest is always retained in harvesting. The use of individual trees means that the remaining trees accelerate their growth – increasing their value as a carbon sink – and new trees grow from the undergrowth and emerge through natural regeneration.

UPM's commitment to delivering renewable circularity

The biochemicals can replace their fossil-based counterparts. Their direct substitution is suitable for apparel, textiles, automotive and packaging and more. The BioMEG is a drop-in solution and can therefore be fully integrated into existing production and recycling processes, enabling the transformation of the entire chemicals value chain towards renewable circularity.

UPM's BioPura™, [renewable bio-monoethylene glycol \(BioMEG\)](#) will serve as a base material for various industrial products and consumer goods, such as PET bottles, packaging materials, polyester textiles and engine & battery coolants. Renewable bio-monopropylene glycol (BioMPG) will be ready to be converted into cleaning agents, deicing fluids, fragrances, and cosmetics.

UPM's BioMotion™, lignin-based [Renewable Functional Fillers \(RFF\)](#) are a completely new, sustainable product and sustainable alternative to replace carbon black and precipitated silica in various rubber end uses such as tires, hoses, rubber floorings and scores of other rubber applications.

UPM [recently announced a commercial agreement](#) for BioMotion™ RFF with Artigo Flooring. A comprehensive distribution network is ready to develop the local markets and ensure that their customers are ready to use RFF in rubber and plastics applications from the moment the UPM biorefinery in Leuna is operational.

UPM BioMotion™ RFF is also being used in the [world's first concept tire](#) to feature Renewable Functional Fillers. This collaboration between Nokian Tyres and UPM introduces a sustainable alternative to fossil carbon black. By integrating this renewable material, carbon emissions in tire production are significantly lowered when the lighter weight, 100% renewable alternative to traditional CO₂-intensive fillers is used in the tire's side walls.

Functional fillers represent approximately 30% of a tire, primarily carbon black and precipitated silica. According to an initial test series by Nokian Tyres, replacing functional fillers with UPM BioMotion™ RFF offers great potential for more sustainable tires and therefore is a highly relevant component on the path towards sustainable mobility.

Beyond Leuna, UPM is pioneering other biochemicals

UPM Biorefining combines the company's biofuels and biochemicals businesses, operating innovative biorefineries in Finland and Germany addressing renewable materials and advanced biofuels markets globally.

In Lappeenranta, Finland, UPM is operating a biorefinery to produce advanced biofuels and renewable naphtha from crude tall oil, a by-product of the pulp industry. The UPM BioVerno™ renewable naphtha is a drop-in solution that works identically to fossil-based naphtha in all chemical industry solutions.

A potential investment in a second biorefinery for the production of advanced biofuels and renewable materials, located at the Port of Rotterdam in the Netherlands, is under investigation.