RENEWABLE
CARBON
INITIATIVE
INTERVIEW

Futerro

Futerro is a leading Belgian company in the lactic acid, lactide and polylactic acid (PLA) sector, a bio-based, industrially compostable and recyclable plastic capable of replacing traditional ones in our everyday life.

A pioneer in research since 1992, the company is today's second largest PLA producer with 100 ktpa capacity located in Asia. Futerro now plans to set up a new fully integrated biorefinery in France by 2029.

Interview

with **Geoffroy Delvinquier**
Public Affairs Manager
Futerro, Belgium

Geoffroy Delvinquier has worked within Futerro for 5 years and holds different positions, firstly as Licensing Engineer, Business Development and Marketing Manager and now as Public Affairs Manager. With a strong foundation in green biotechnology and entrepreneurship, Geoffroy has over eight years of experience spanning public affairs, licensing, strategic partnerships, business development and innovation policy.

He holds an International Master's degree in Green Biotechnology from Bordeaux University and a degree in Entrepreneurship from Bordeaux's IAE.

Until now, Futerro is the only company to have mastered the entire PLA life cycle from feedstock production to recycling. How could your company reach this milestone?

Futerro reached this milestone thanks to more than two decades of continuous innovation and industrial learning. Our origins lie in Galactic S.A., a global producer of lactic acid for food and feed applications. From the very beginning, our founder and current CEO had the ambition to develop PLA, but doing so required time, scale, and technological maturity.

After expanding lactic acid production across Europe, Asia and North America, Galactic launched a PLA pilot plant in Belgium in 2007, marking the official birth of Futerro. From there, we progressively invested in the full suite of PLA technologies, including both mechanical and chemical recycling. Today, our portfolio includes nearly 300 patents.

This long-term industrial strategy allowed us to construct the world's largest lactic acid facility (≈200 ktpa) and the second largest PLA plant (100 ktpa) in Asia. With our upcoming European project, we will replicate this fully integrated model, this time embedding recycling capabilities directly within the industrial platform. This complete mastery of the PLA value chain, from feedstock to end-of-life, is what makes Futerro unique.

Which (political) barriers do you see that prevent the further establishment of PLA on the market? Which steps could help boost the uptake of biological feedstock for chemicals and plastics in the European Union?

The main barrier remains in the absence of clear, long-term and binding market incentives to support bio-based materials in Europe. Over the past 30 years, the EU has announced several ambitious strategies including the Green Deal, the Clean Industrial Deal, and more recently the Bioeconomy Strategy, but these remain largely declarative. To enable real scaleup, they must be translated into concrete, enforceable regulations that create a strong Market Pull for renewable carbon and bio-based feedstocks.

Today, around half of the chemical sector's fossil inputs (which in the EU are largely imported) go to energy uses, where regulations already promote "green" alternatives. The other half is used by the chemical industry as feedstock rather than as energy, where the industry still lacks any meaningful regulatory driver to accelerate defossilisation.[1] As a result, we are only addressing half of the decarbonisation challenge.

For PLA specifically, end-of-life management is a critical bottleneck. To make PLA fully circular, policymakers need to support the development of adapted value chains and collection infrastructures, which today are almost entirely designed for conventional fossil-based plastics. Without dedicated systems, PLA's recycling and composting potential cannot be fully exploited.

It is also essential that sustainability assessments properly recognise the benefits of using biomass instead of virgin fossil resources. Current methodologies often don't recognise the benefits of biogenic carbon, creating an uneven playing field where fossil alternatives remain artificially competitive (e.g., PEF methodology).

Ultimately, finance is a decisive barrier. Scaling bio-based value chains require major capital investments: new biorefineries, recycling facilities, logistics networks, and advanced industrial infra-

[1] https://www.iea.org/energy-system/industry/chemicals

structures. Yet today, public funding frameworks and EU industrial financial instruments do not sufficiently support bioeconomy. To accelerate the transition, Europe must:

- Create de-risking mechanisms for first-of-a-kind industrial projects,
- Direct green finance toward renewable carbon solutions,
- And include bio-based materials and chemicals in strategic EU industrial funding programs.

Without accessible and targeted financing, as already done outside of the EU, even the most mature sustainable technologies will not reach industrial scale in the EU.

Why is biomass as feedstock necessary for a circular, robust, innovative, and resilient European Economy?

Biomass is essential because Europe cannot decarbonise its chemicals and materials sector without alternative carbon sources. Carbon is an unavoidable building block of almost all chemical products, and today the overwhelming majority of this carbon comes from fossil oil, gas, or coal. Biomass provides a renewable, scalable and immediately deployable source of carbon that enables a credible pathway toward climate neutrality.

Beyond climate considerations, biomass contributes directly to Europe's industrial resilience. The European chemical industry is currently facing a structural competitiveness crisis, compounded by its almost complete dependence on imported fossil resources. With rising geopolitical tensions and supply chain disruptions, this dependency has become a strategic vulnerability.

By contrast, Europe benefits from significant local and sustainably managed biomass resources. Leveraging these resources allows the continent to develop domestic value chains, strengthen its industrial autonomy, and reduce exposure to external shocks. This aligns with the broader EU objective of building a circular, sovereign and innovation driven economy under the Green Deal and the updated Bioeconomy Strategy.

What kind of biomass is PLA based on? Where does the biomass originate from and is your feedstock sustainably sourced?

PLA is produced from sustainable sugars that are derived from agricultural biomass. Several types of feedstocks can technically be used, but at industrial scale, only first generation biomass currently offers the maturity, efficiency and economic viability required for large scale fermentation processes.

For our upcoming biorefinery in France, Futerro will use dextrose produced from French wheat supplied by the agricultural cooperative, Tereos. This choice ensures both local sourcing and full traceability. Importantly, the wheat used by Tereos complies with the sustainability criteria of the EU Renewable Energy Directive (RED), meaning that it meets strict environmental and social requirements regarding land use, biodiversity protection, and agricultural practices.

Please explain why the use of biomass does not compete with food and feed production and why biorefineries should be more promoted in the EU?

It is important to clarify that the use of biomass for bioplastics does not compete with food and feed production. In Europe today, less than half of all biomasses are used for food and feed; the other half already supports energy, fuels, materials and industrial applications. Integrating bio-based chemicals and materials is therefore not a disruptive shift, but rather an extension of an existing diversified system.

Recent studies, including research by the nova-Institute, show that using a portion of agricultural crops for biobased materials does not jeopardise global food security. In fact, the debate around "food vs. materials" is often based on misconceptions and unsupported assumptions.

From a technical standpoint, fermentation processes like lactic acid and PLA production only use the starch fraction of the crop (if starting from corn or wheat). Proteins, oils, fibres and other co-products remain fully available for food and feed value chains. This means that agricultural resources continue to serve multiple purposes across sectors.

Biorefineries should be promoted in the EU because they enhance flexibility and resilience. In times of crisis, agricultural streams initially dedicated to industrial uses can be redirected back to the food market, a flexibility that is not possible with non-edible biomass. They also strengthen Europe's strategic autonomy by reducing dependency on imported fossil resources and by generating local, high-value industrial ecosystems.

In our case, the future European biorefinery will use a stream currently dedicated to bioethanol production. Redirecting part of this existing non food output toward lactic acid and PLA perfectly aligns with the cascading use principle, ensuring biomass is used where it creates the highest added value.

For which types of applications can PLA be used and what is its advantage over traditional fossil-based materials such as PS, PET, PP or PE? Does PLA maybe even show better characteristics than fossil-based materials in some applications?

PLA is a highly versatile material with applications across a wide range of sectors. It is widely used in packaging, consumer goods, fibres and nonwovens, 3D printing, and even certain automotive components. Many of these applications rely on properties where PLA performs similarly, and sometimes better than fossil-based plastics typically used today.

In many cases, PLA can directly replace materials such as PS or PET, thanks to comparable mechanical performance, transparency, stiffness and processability. For other polymers, including PP or PE, PLA substitution is also possible when the formulation is adjusted to meet processing or performance requirements.

PLA is not designed to replace technical polymers in high temperature or high chemical resistance applications. But for a majority of mass market applications, PLA offers a credible, lower carbon, circular, and high-performance alternative to conventional plastics. It is also mechanically and chemically recyclable, industrially compostable, and does not generate persistent micro- and nano-plastics giving it clear sustainability advantages over petrochemical materials.

What are PLA's unique selling points beyond replacing fossil carbon?

PLA stands out not only because it replaces fossil carbon, but because it combines strong technical performance with a superior sustainability profile.

First, PLA offers a significantly lower carbon footprint compared with traditional petrochemical plastics. As a material derived from renewable resources, it reduces dependency on fossil carbon while supporting the transition to a circular bioeconomy. It is also fully recyclable, both mechanically and chemically, and can be depolymerised back into virgin-quality lactic acid, enabling true circularity in polymer production.

Second, PLA is industrially compostable. Under the right conditions, it breaks down into simple organic molecules rather than persistent micro and nano-plastics. This is a major differentiator at a time when environmental pollution from plastic particles is a growing concern – and nanoplastics. This is a major differentiator at a time when environmental pollution from plastic particles is a growing concern.

Finally, its versatility opens the door to continuous innovation. PLA can be engineered for enhanced barrier properties or optimised for new applications. With PLA, sustainability and performance reinforce each other, forming the basis for a new class of high value, renewable and circular materials.

How would you rank bio-based materials compared to materials made from other renewable feedstocks in terms of defossilisation of the entire chemical industry in Europe?

Bio-based materials should not be seen as "better" or "worse" than other renewable carbon solutions, but as a complementary pillar within a broader transition strategy. Europe's chemical industry will not achieve full defossilisation through a single pathway. Instead, it requires a portfolio approach, combining recycled feedstocks, CO_2 based materials, and bio-based carbon, each addressing different parts of the value chain and different technological or market needs based materials, and bio-based carbon, each addressing different parts of the value chain and different technological or market needs.

In short, defossilisation is not a competition but a convergence: Europe needs all three options working together to fully replace fossil carbon in chemicals and materials. Bio-based materials are one essential piece of this puzzle, but they are most powerful when integrated into a wider renewable carbon ecosystem based materials are one essential piece of this puzzle carbon ecosystem.

Does Futerro also aim to reduce its scope 1 to 3 emissions?

Yes. Futerro has long been guided by values of innovation and environmental responsibility, and this naturally includes addressing greenhouse gas emissions across our entire value chain. While our products already offer significantly lower emissions compared with traditional fossil-based plastics, we are committed to embedding long-term sustainability into the way we operate as a company based plastics, we are committed to embedding long term sustainability into the way we operate as a company.

As a demonstration, our incoming European biorefinery will include all our recent upgrades, improving the efficiency of our processes, optimizing energy use while being based on nuclear energy and partially on biogas for heat production, and integrating as such lower-carbon utilities wherever possible. For Scope 3 emission, we take a holistic approach, assessing the impact of logistics and supply chain choices. This is one of the reasons why we choose the industrial zone of Port-Jérôme-Sur-Seine, in Normandy to build our biorefinery. The site offers multimodal connectivity, allowing us to significantly reduce transport-related emissions (Deep-sea port access, River transport via the Seine, Rail infrastructure, and Road access). This multimodal platform allows us to design logistics routes that optimise carbon intensity, cost, and reliability and to shift, whenever possible, from road to river/sea or rail.

Why did you decide to become part of the RCI and how can the RCI profit from your membership?

We joined the Renewable Carbon Initiative because the full reinvention of the chemicals and materials industry cannot be achieved by any single actor. Defossilizing such a large and complex sector requires collective intelligence, coordinated action, and a shared understanding of the challenges ahead. The RCI brings together pioneers from across the renewable carbon spectrum under one common mission.