Renewable Materials Conference---Cologne September 2026

Peter Leonhardt

Publication Text

Cargill as a Key Enabler of Europe's Circular Bioeconomy Through Integrated Biorefineries

Version II

Integrated Biorefineries as a Cornerstone of Europe's Circular Bioeconomy

Cargill is advancing the development of a circular bioeconomy in Europe by promoting integrated biorefineries as a central industrial model. With over 160 years of experience and a global presence spanning 70 countries, the company leverages its scale, technical expertise, and innovation capabilities to connect agriculture, food production, and industrial applications into a unified and efficient system.

At the core of this approach is the concept of the agricultural biorefinery. Using renewable feedstocks such as wheat, integrated facilities convert biomass into a wide spectrum of products, including food and feed ingredients, bioethanol, and industrial materials. A defining feature of this model is the valorization of all process streams: side products, residues, and even CO_2 are utilized, resulting in near-zero waste operations and high resource efficiency.

Cargill emphasizes the importance of integration and co-location. Large-scale biorefinery hubs, such as those in the United States, demonstrate the potential of industrial ecosystems where multiple partners collaborate by sharing infrastructure, utilities, and material streams. These "over-the-fence" partnerships enable efficient resource use, reduce environmental impact, and foster innovation across sectors such as food, feed, and bio-based chemicals. In contrast, Europe's biorefinery landscape remains more fragmented and smaller in scale, limiting its overall efficiency and competitiveness.

Given current market conditions—characterized by overcapacity, economic pressures, and regulatory complexity—large-scale greenfield investments in Europe are challenging. Instead, the sector is focusing on modernization, optimization, and diversification of existing assets. To fully unlock the potential of integrated biorefineries, a coherent and enabling policy framework is essential. This includes support for

renewable energy access, incentives for capital and operational investments, and regulatory conditions that treat biorefineries as integrated systems rather than isolated industrial units.

Beyond industrial processing, the transition to a circular bioeconomy must start at the farm level. Regenerative agriculture plays a critical role by improving soil health, enhancing biodiversity, and reducing greenhouse gas emissions. Practices such as reduced tillage, crop diversification, permanent soil cover, and agroforestry not only increase farm resilience but also contribute to long-term carbon sequestration.

To accelerate adoption, Cargill has developed the RegenConnect® program, which provides financial incentives and technical support to farmers implementing regenerative practices. The program links upstream agricultural improvements with downstream market demand, enabling companies to invest in more sustainable supply chains. Farmers are compensated based on measurable environmental outcomes, such as carbon sequestration, while benefiting from agronomic expertise and long-term contracts.

In conclusion, integrated biorefineries represent a powerful mechanism to achieve circularity, sustainability, and industrial competitiveness in Europe. Their success depends on a combination of technological innovation, cross-sector collaboration, and supportive policy frameworks. By aligning agricultural practices, industrial processing, and market incentives, the bioeconomy can become a key driver of Europe’s transition toward sustainable production and consumption systems.