Circularity is not one single thing; for some companies it means turning brewers' spent grain and yeast into new food ingredients.

PROJECT LEAD ON THE COBIOECON PROJECT, DR JON PAUL FAULKNE EXPLAINS WHAT IRISH FARMING AND FOOD PROCESSING CAN LEARN FROM CIRCULAR PRACTICE IN GERMANY, FRANCE, AND BELGIUM

CIRCULAR BIOECONOMY: LESSONS FROM EUROPEAN AGRI-FOOD COMPANIES

The latest stage of the CoBioEcon project looks at what circular practice means in a selection of agri-food companies in Europe. Fifteen interviews were carried out with practitioners in specific regions of Germany, France, and Belgium. These regions were selected because they have dedicated regional bioeconomy strategies and share similarities with Ireland in terms of agricultural and natural capital profile.

WHAT IS CIRCULAR PRACTICE?

Circular practice means keeping resources in use for longer and reducing waste. In agri-food, this includes using by-products for food, feed, fertiliser or energy; recovering water and heat; returning nutrients to the land; redistributing surplus food; and designing supply chains so fewer materials are wasted.

One of the strongest findings is that circularity is not one single thing. For some companies, it means factory improvements, such as recovering water from crops, using residues for biogas, or turning brewers' spent grain and yeast into new food ingredients. For others, it means stronger relationships with farmers, better crop rotations, organic or regenerative sourcing, and closing nutrient loops between farms and processors. For others, it means giving food, products or materials a second life through donation, resale or upcycling. In short, circular practice is not just about waste. It is about how value moves through the food system.

FARMERS AND PROCESSORS NEED EACH OTHER

The European examples show that circular practice works best when farmers and processors have long-term relationships. If processors want lower-waste, lower-carbon or more regenerative supply chains, farmers need clear market signals, fair contracts, and practical support. Farmers cannot be expected to carry the cost of transition while others capture the value.

In the companies examined, farmer-processor relationships were often central. Some processors worked with farmers on crop rotation and soil management. Others depended on nearby farms to supply raw materials or receive organic residues, compost, or digestate. Circularity is not delivered by a single company acting alone. For Ireland, this points towards regional cooperation around slurry, grass-based residues, dairy and meat by-products, horticultural surplus, composting, anaerobic digestion and nutrient recovery. These are practical questions about who has what resource, where it is located, who can use it, and whether these economics can be profitable.

SIDE-STREAMS SHOULD BECOME FEEDSTOCKS

A major lesson from the interviews is that what is often called 'waste' can become a feedstock. Bio-innovation companies are using fermentation, fungi, biotechnology, and upcycling to turn low-value biological materials into higher-value ingredients, proteins, food products, or industrial inputs. This is relevant for Ireland because our agri-food system produces large volumes of biological material. Some of this is already well used, but more could be done to identify higher-value routes for residues and by-products before they move to lower-value uses. The basic hierarchy should be clear: prevent waste first, keep edible food in the food chain where possible, then consider feed, materials, nutrients and energy. Anaerobic digestion has a role, but it should not become the default answer to every side-stream. Some materials may have higher value uses. Others may be better suited to soil, feed or energy.

LOGISTICS MATTER

One of the less obvious findings is that logistics can make or break circular practice. Biological resources are seasonal, bulky, variable and often perishable. They may need refrigeration, drying, storage, sorting, or rapid movement. If transport costs are too high, or

if material quality declines too quickly, circular systems become unprofitable. This is why regional hubs are important. Ireland needs places where farmers, processors, co-ops, local authorities, researchers and SMEs can coordinate biomass flows, test new uses for residues, pool infrastructure and reduce duplication. These hubs may be brokerage platforms, shared storage systems, local processing sites, or practical networks linking producers with users of by-products. The key point is proximity. Circular bioeconomy projects need to be designed around real geography, not just national ambition.

POLICY AND THE GREEN OPTION

Companies repeatedly stressed that circular practice depends on incentives, rules, and markets. It is not enough to tell businesses to be circular if regulation makes reuse difficult, funding too complex, or customers unwilling to pay for better products. For Ireland, this means policy needs to align agriculture, food safety, waste, energy, enterprise, and planning. Funding must also be accessible to SMEs, co-ops and community enterprises, not only to large companies. Public procurement could help create demand for bio-based and circular products, especially where early markets are weak.

Get in touch
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The CoBioEcon project, a collaboration between University College Dublin (UCD) and the University of Galway, and funded by the Department of Agriculture, Food, and the Marine (DAFM), that is co-designing a regional strategy for the bioeconomy in Ireland.

WHAT THIS MEANS FOR IRELAND

The lesson from Germany, France, and Belgium is not that Ireland should copy their systems. The lesson is that circular practice works when it is regionally grounded, economically viable, and built around cooperation. Ireland should focus on five practical priorities: build regional circular bioeconomy hubs; support long-term farmer-processor partnerships; identify high-value uses for agri-food side-streams; remove regulatory barriers to safe reuse; and make sure farmers and rural communities capture value from the transition. The bioeconomy will only work if it is practical at farm and processor level. It must help reduce waste, build new income streams, support soil and water quality, and keep more value in rural areas. That means designing it with farmers and agri-food businesses from the start.

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