



BREXIT

and the bioeconomy

Operating in the bioeconomy, consultants NNFCC and Sustainability Consult discuss the potential impact of Brexit on Europe's bioeconomy and how it will continue to succeed afterwards.

IT MAY BE fashionable for some politicians to dismiss the work of experts, but technology companies rely on the expertise of their staff and collaborators and recognise the value they add. NNFCC and Sustainability Consult, experts in bioeconomy development and communications, have built companies by embracing the ideals of European collaboration with staff recruited from across the EU. They have participated in many successful collaborative European projects, including flagship project BIOSKOH, which is transforming a brownfield industrial site into a 55,000 kiloton cellulosic ethanol production facility. Here they consider the implications of Brexit on bioeconomy development.

Bioeconomy

The European bioeconomy uses renewable biological resources such as crops, forests, fish, animals and micro-organisms to produce food, materials and energy. It is worth €2.2 trillion and accounts for 9% of the EU's workforce. While currently dominated by agri-food and traditional forestry, with the food and drink industry representing the largest manufacturing sector in the EU, the economic potential of the bioeconomy lies in new emerging areas, such as biobased chemicals, biobased, biodegradable

and compostable plastics and other biobased materials.

An innovative bioeconomy is a key industrial strategy pillar in both the UK and EU. Regarded as an important source of new jobs, the bioeconomy is an opportunity to develop a more resilient energy system and address climate change. The production of biobased chemicals, plastics and transport fuel, coupled with the generation of power and heat using bioenergy, can play a significant role in the move towards a circular and low-carbon economy. As Brexit draws nearer, what are the implications for the UK's and the EU's bioeconomy?

Innovation

Bioeconomy growth relies on bringing disruptive innovation to the market. Unfortunately, innovation is too often viewed through the prism of invention and technology development. A vibrant innovation landscape requires a healthy ecosystem with many components. Innovation requires knowledge development: the learning activities that drive technological development as well as the understanding of markets, social dynamics and sustainability considerations. Furthermore, this knowledge needs to be exchanged and diffused among stakeholders to ensure uptake.

The generation of knowledge requires resources: materials, infrastructure, expertise and finance, and these resources need to be available and accessible. Beyond knowledge, if markets aren't in place they need to be formed: this means making the case for legitimate development – consider the challenges facing biofuels – and countering the inevitable resistance to change. Critically, entrepreneurial activity is required to turn inventions, concepts and processes into commercial products.

In an emerging market, resources can be thinly spread and considerable effort is required to bring together expert teams capable of creating and distributing new knowledge and to access the infrastructure in which technology can be developed.

Most biobased chemicals and plastics remain at an early stage of market development. The resources required for development are distributed across Europe and therefore effective mechanisms for collaboration and joint working are required. How might Brexit impact on UK research and development?

Collaboration

Developing new biobased products is challenging. The use of renewable resources is an area unfamiliar to most chemical

companies; new business relationships must be forged and value chains created. Areas such as raw materials supply, refining, chemical processing and product formulation require collaboration across several countries, stretching the ability of small- and medium-sized enterprises (SMEs) to network, communicate and work across national borders.

Difficulties encountered by SMEs in forming cross-border value chains and accessing professional business support outside of their immediate business sphere is being addressed through the Horizon 2020 SuperBIO project. In this project, European funding allows SMEs to access biobased expertise in Belgium, France, Germany and the UK. In the same manner, the BIOSKOH project draws together the experience of bioeconomy research and science, industry, business development and communications experts across the EU, notably Belgium, Denmark, France, Italy, Slovakia, Sweden and the UK.

For many companies, collaboration starts with research programmes and projects funded through Europe's cooperation in Research and Innovation Framework Programmes (FP). UK science receives EU research funding and the importance of retaining access to current Horizon 2020 funding and the future FP9 programme has been widely articulated.

The UK is recognised as having a world-leading research base: strong in industrial biotechnology and excelling in synthetic biology. However, collaboration is still necessary and adds value – leading UK companies such as Scottish industrial biotechnology company Ingenza and plastics producer Biome Bioplastics grow their capabilities through European-funded projects EmPowerPutida and ZELCOR, respectively.

In a positive move, UK and EU negotiators have been able to agree – in principle – that the UK entities' right to participate in EU programmes will be unaffected by the UK's withdrawal from the EU.

The desire to participate in future programmes has been made clear and hopefully represents an important goal for UK negotiators. Continued UK participation in European science programmes should be considered a win-win situation for both the UK and EU. How will Brexit impact on the ability to access critical resources?

Recruitment

Like all innovation-driven organisations, the ability of biobased technology developers to recruit and retain talented staff is critical to business success. The pool of trained scientists in areas related to biobased chemical development such as fermentation, microbe engineering and bioinformatics is relatively small in the UK and companies routinely rely on recruiting from EU countries to fill specialised, important roles. There are widespread concerns that Brexit will make the UK a less attractive place for foreign nationals to work and make the process of recruiting staff from the EU an onerous task – an additional burden for SMEs.

Facilities and expertise

Process scale-up and accessing the necessary equipment and facilities is a key and potentially expensive step in the development of new process technology. Restricted access to scale-up resources is a recognised barrier to biobased innovation, particularly for biotechnology-based processes. Although the UK has several world-leading open-access pilot plants represented by the BioPilots UK alliance, the range of technologies and associated equipment is considerable and beyond the capacity of any single pilot plant.

The only way to ensure companies have access to the required scale-up support is to enable access to the range of facilities available across the EU. The EU's Interreg programme exists to stimulate cooperation across Europe, supporting economic and social development. One strand of the programme supports transnational co-operation: the project's investment allows regions

to tackle common issues across a range of areas including innovation and environment. In its role as a Bio Base NEW project, NNFCC used Interreg IVB investment to facilitate access of UK-based SMEs to the Bio Base Europe Pilot Plant in Gent, Belgium, with the support provided through the project acting as a catalyst to further collaboration. Going one step further, Interreg investment in the BioBase4SME project is facilitating SME access to biobased expertise in France, Belgium, the Netherlands and the UK. The project brings together the broad knowledge base required by companies to build an understanding of markets, technology and sustainability.

Looking to the future

The market for biobased products remains at an early stage of formation. While resources required for innovation are thinly spread across Europe, there is an imperative to maintain UK access to the mechanisms supporting collaboration and to keep providing access to facilities and expertise. Critically, Brexit should not become an impediment to UK companies accessing and recruiting world-class expertise and talent. The UK Government has made positive statements about cooperation and hopefully negotiations will produce a positive outcome, allowing biobased companies in the UK to benefit fully from the expertise and knowledge throughout Europe as well as letting European companies benefit from the UK's strengths. ●

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