

Circular Economy, Bioeconomy

Biorefining - the UK offer



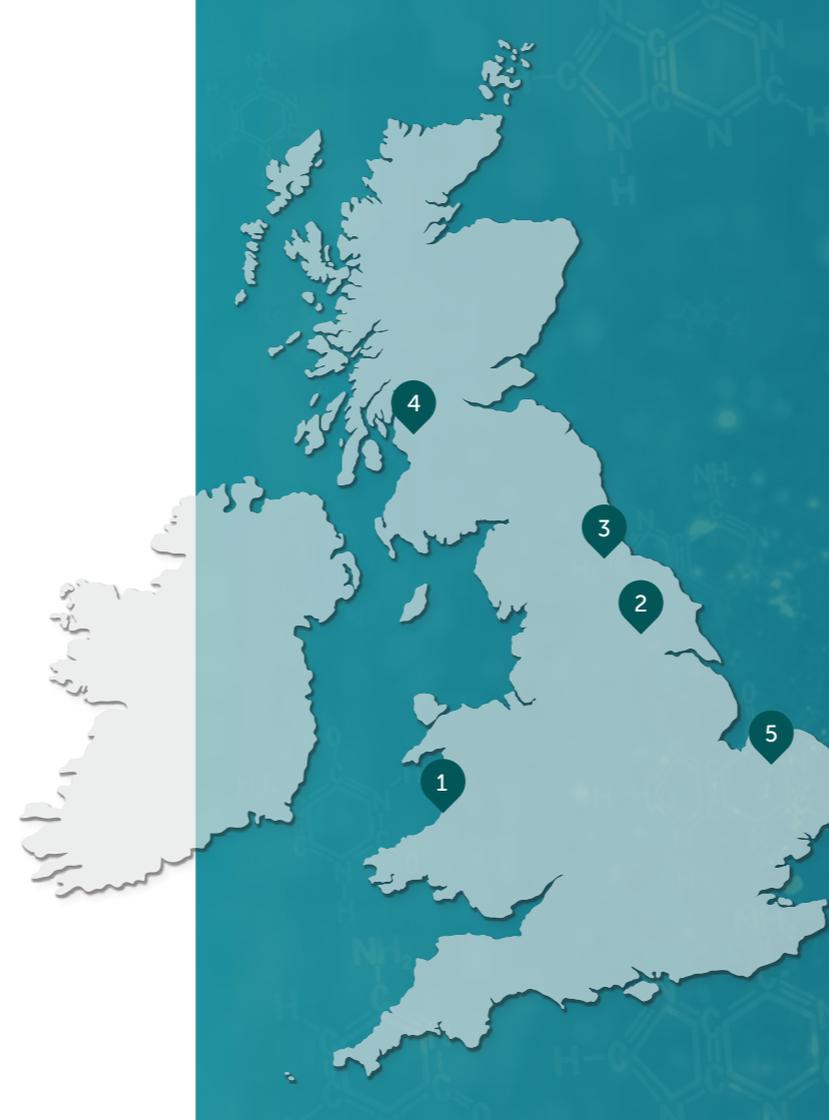
BioPilotsUK

The Alliance of Open Access
Biorefining Centres

Biorefining R&D in the UK

In our modern world there is a seemingly limitless requirement for chemicals, materials and energy. In direct contrast, the earth's resources are finite, ultimately leading to higher costs of raw materials that are used to make everyday products. Biorefining provides a profitable and renewable way to meet the demand for new products without costing the earth.

BioPilotsUK is a collaboration created by five established biorefining open-access centres who recognise the importance of partnerships to develop UK bio-based value chains. Together, we de-risk the commercialisation of bio-based products and processes by trialling new technologies to ensure our partners are investing in the right technologies for their business.



Our Vision

The UK as a global leader in biorefining technology development and bio-based product manufacture within a sustainable high-value bioeconomy.

Our Mission

...To provide a stable, integrated, cost-effective pilot and process development service linked to the higher education (HE) sector for the benefit of bio-based industries and the bioeconomy.

...To work collectively and internationally to increase knowledge and capabilities in biorefining and industrial biotechnology (IB).

...To nurture the development of SMEs and larger companies to support the growth of bio-based value chains.

Developing Biorefineries and Bio-Based Products

Major technical developments over the last decade have helped develop a rich and diverse technology offer for organisations working in the bioeconomy. Our open-access scale-up centres de-risk the commercialisation of bio-based products and processes by trialling new technologies to ensure our partners are investing in the right technologies for their business.

BioPilots UK combines the nation's leading expertise and facilities to help businesses develop and scale-up new sustainable processes to commercialise products from biomass, including: plants, algae, by-products and wastes. Due to the varied nature of the raw materials, or feedstocks, there is no one size fits all approach, rather a series of technologies that must be trialled and combined to maximise the opportunity.

Together, the BioPilots UK centres can offer the key components required to accelerate and de-risk your bio-based projects, through access:

...to highly-qualified specialists in genetic analysis, industrial biotechnology, green chemistry and chemical engineering.

...to a broad range of discovery to demonstration scale technologies to convert biomass into useful products.

...to the accompanying analytical services and market awareness to assess viability of an idea.

We provide access to the UK's leading biorefining centres and through them, to a number of key academic institutions pioneering new bio-based ideas as well as investors and bio-based businesses all along the supply chain.

We can help you gain access to multiple approaches to feedstock optimisation, pre-treatment, processing and downstream processing technologies.

These include key areas, such as →

Our facilities are all underpinned by a range of fully serviced laboratories, analytical assessment capabilities and infrastructure to support bio based projects at every stage of development.



What we offer

BioPilotsUK offers a joined up, efficient, easy access route to business support services which complements the five centres' technical capabilities. Our services support the growth of supply chains within a high-value bioeconomy and represent a selection of services our partners can deliver.

Modelling Technologies

Two of the centres within BioPilotsUK have process modelling teams, that can apply a number of commercially available software tools to fully understand and improve your processes. Process modelling enables efficiency and the results can be used to predict hard to measure parameters, as well as cost estimation of process equipment. This knowledge complements scale-down models and identifies critical equipment design issues, saving you time, effort and money prior to scaling up your process.

Building Value Chains

The bioeconomy presents new and exciting opportunities to link up organisations with very different backgrounds who might ordinarily not meet. To speed up the process of developing new relationships, our partners can introduce organisations across bio-based value chains to help you explore new opportunities.

Scoping IP Landscape and Due Diligence

BioPilotsUK can support your commercial and investment decisions by providing technical due diligence and IP landscaping services. We can provide in-depth techno-economic assessments, enabling the implementation of suitable technology development programmes and to identify value-adding technology partnerships. Once the groundwork has been laid through the desk-based reports, we can explore the practicality and feasibility of the findings for your business in one of the five BioPilotsUK scale up facilities.



Providing Access to Funding

Investing in early-stage innovative ideas in this emerging sector can be challenging to finance. To help de-risk the commercialisation of new bio-based opportunities, we can help assess which research and innovation funding might be available to you and help you navigate the grant application process. In addition, both BDC and IBioC have secured funding that is available to Yorkshire businesses and Scottish organisations respectively.

Developing Bio-Based Skills

BioPilotsUK works at the interface between academia and industry; and supports the creation of highly skilled jobs in the bioeconomy, promoting scientific excellence throughout the UK. Our centres work in partnership with universities across the UK as well as with research councils, Innovate UK, EU, AMSCI and other collaborative projects across a wide range of disciplines and technologies to create new industrial innovation for the UK.

Testing Prototype Equipment

Securing laboratory space to set up and test new equipment can be a time-consuming and a costly activity. To help your organisation rapidly develop your technology, we can offer fully-serviced laboratory and hangar space to accommodate and evaluate developing technologies in an established test environment.

For further information about our services please get in touch at info@biopilotsuk.com.





Who we are

BioPilotsUK is made up of 5 partners who are pioneering biorefining throughout the UK with world-class expertise, knowledge and facilities.

Together, these centres contribute to the alliance to create an extensive biorefining offer including diverse capabilities at lab, demonstration and pilot scale as well as expertise in landscaping, analytical and modelling assessments.

BEACON - A Biorefining Centre of Excellence for Wales

BEACON is a partnership between Aberystwyth, Bangor and Swansea Universities, is supported by the Welsh Government through the European Regional Development Fund and is promoting development of the biobased economy.

BEACON is:

- Establishing links between the business community and academia across Wales and supporting SME development through collaborative research
- Developing new products and processes that will support economic growth
- Creating skilled jobs and supporting inward investment
- Promoting science excellence from Wales and collaborating with other UK and European partners to develop biorefining

BEACON brings together a multidisciplinary team of scientists, a range of pilot scale technologies and an extensive network of industrial partners.

www.beaconwales.org

“Organisations like the Biorenewables Development Centre and their partners are doing pioneering work. Turning waste into reusable products such as biofuels and chemicals will help make UK businesses more sustainable and more competitive.”

- Sir Mark Walport, Government Chief Scientific Advisor

Biorenewables Development Centre

The BDC works at the interface between academia and industry to develop and scale-up new biorefining technologies using biomass/biowaste as feedstocks. Since our launch in 2012, our multidisciplinary team of chemists and biologists has worked on over 350 bio-based projects with SMEs, multinationals and leading academics world-wide.

The BDC specialises in scaling up bio-based technologies between the 1-100 Kg/100 L scale:

- We support the commercialisation process through helping our clients navigate the bioeconomy landscape and funding opportunities as well as through testing partner technologies in our facility
- We have built a significant network of bio-based organisations who produce feedstocks, develop technologies, use biorenewables and support bio-based innovations
- We combine technical expertise, industry insights and our extensive network to support the development of new supply chains in the bioeconomy

www.biorenewables.org

“SMEs have so many challenges - CPI has often saved us the time we would have spent finding specialists or a demonstration plant. They're a valued partner, in fact, our partner of choice for specialist chemical engineering and scale up expertise.”

- Plaxica

Centre for Process Innovation

The Centre for Process Innovation (CPI) is a UK based technology innovation centre and the process arm of the High Value Manufacturing Catapult. Established to support the UK process manufacturing industry, CPI collaborates with universities, SMEs and large corporates to help overcome innovation challenges and develop next generation products and processes.

CPI bridges the gap between early stage concept and scalable commercial process within industrial biotechnology. Utilising our state of the art facilities and technical expertise, we help our clients to de-risk process development. This is achieved through proof of concept testing to accelerate the commercialisation of new products and process technologies. Our multidisciplinary team has completed feasibility assessments, process development projects and piloting studies for UK, European and international clients.

www.uk-cpi.com

“We have had a very successful partnership with BEACON in a number of challenging projects involving the development of biological routes to chemical intermediates. A strength has been the construction of diverse consortia of academics and commercial organisations.”

- Chemoxy International Ltd



IBioIC

The Industrial Biotechnology Innovation Centre (IBioIC) was set up to bridge the gap between industry, education and government. Representing all four colours of Industrial Biotechnology (IB), our multidisciplinary team are specialists in the IB sector, with the technical expertise to help stimulate the growth of the industry through facilitating collaborations and guiding organisations from a concept or idea, through to industry adoption.

IBioIC also houses two bioprocessing centres, focusing on research and projects that are ready to scale up and need facilities to trial at commercial level before investment, allowing hundreds of UK businesses to scale-up and commercialise their concepts without outsourcing abroad.

www.ibioic.com

“We have witnessed The Biorefinery Centre’s capability to assemble teams of academic and industrial partners and work collaboratively to deliver ‘real’ projects. Their close engagement with the NCYC provides a key opportunity to exploit best yeast candidates to produce specific bio-based chemicals and to meet commercial demand.”

- Vireol Bio-Industries Plc

“The development of the RBPC and FlexBio facilities allows IBioIC to fill a critical gap in the development pathway for biological products, reducing the cost of and shortening the time for bioprocess development.”

- Heriot Watt University

The Biorefinery Centre

The Biorefinery Centre is located within the Institute of Food Research on the Norwich Research Park. The Centre has a number of key processing facilities including a Cambi™ Steam Explosion Pilot Plant and several high torque bioreactors. In conjunction with the UK National Collection of Yeast Cultures (www.ncyc.co.uk) at IFR, the Centre is involved in yeast genomics, robotic screening and propagation and undertakes R&D up to pilot scale into the production and commercialisation of biofuels, biochemical and fibrous material from food industry/processing wastes, agricultural residues, municipal solid wastes and lignocellulosic biomass.

We work with a number of different partners from SMEs and multinational companies from the agri-food and biofuel sectors to academics and research organisations across the world. The Biorefinery Centre can help you through the entire process or can aid in the optimisation of unit components within existing process schemes.

<http://biorefinerycentre.ifr.ac.uk>

Round Up

The bioeconomy offers a multi-billion pound, global business opportunity: it is worth around €2 trillion in Europe alone and is growing rapidly worldwide. Not only does it present a way of becoming less reliant on fossil resources, it also offers new sources of high-value products and innovative ways of adding value to unavoidable wastes and by-products.

In the UK, the bioeconomy is rapidly gaining traction across industry, academia and government, creating an ideal environment for growth and investment.

Both the UK and Scottish governments are developing bioeconomy and biorefining strategies respectively to make the most out of our nation's resources.

BioPilotsUK brings together the UK's leading expertise and facilities to help businesses develop and scale-up new sustainable processes to commercialise products from biomass, including: plants, algae, by-products and wastes. Due to the varied nature of the raw materials, or feedstocks, there is no one size fits all approach, rather a series

of technologies that must be trialled and combined to maximise the opportunity.

Our founding centres have been established to de-risk the innovation process through trialling and combining technologies to ensure our partners are investing in the right technology for their business.

Together, the BioPilotsUK centres can position the UK as a global leader in biorefining technology development and bio-based product manufacture within a sustainable high-value bioeconomy.

With Thanks

The BioPilotsUK partners would like to thank **David Turley** and **Adrian Higson** at the NNFCC for their insights into the UK landscape and continued support for the BioPilotsUK alliance.



NNFCC is a strategic consultancy with in-depth expertise and knowledge of the bioeconomy. Offering over a decade of experience across bioenergy, biofuels and biobased products; guiding businesses through policy, technology and international markets.

To find out more visit
www.biopilotsuk.com

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