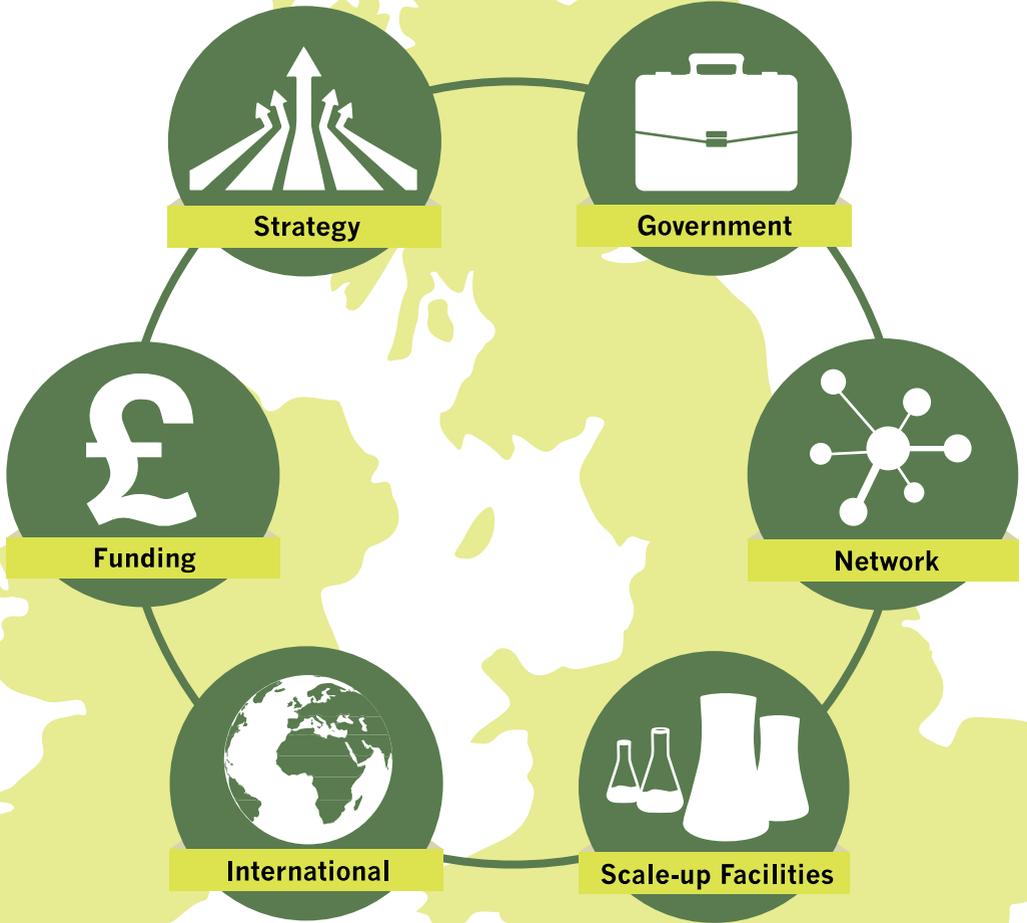
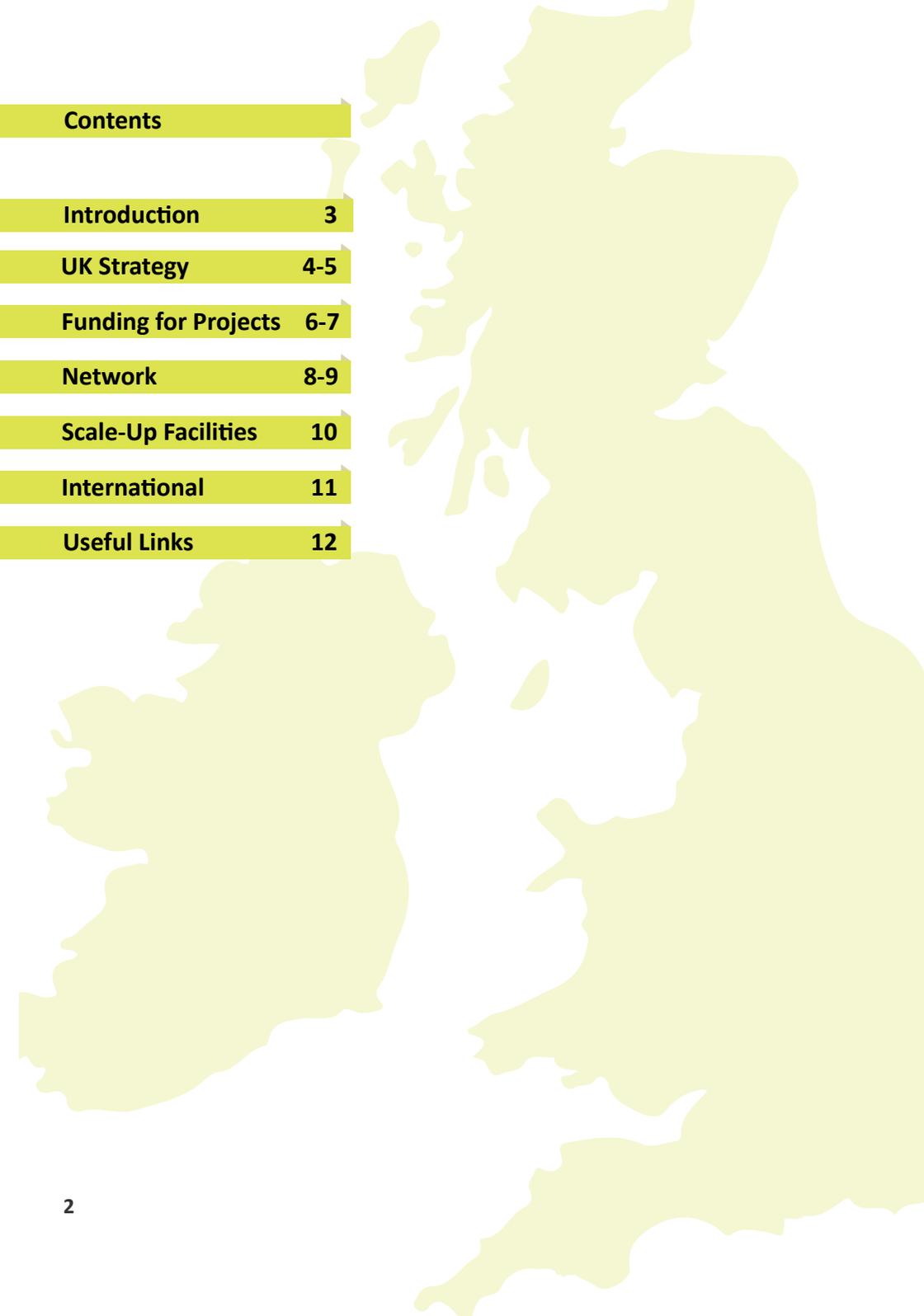


Navigating the IB landscape in the UK



**An Introductory Guide to Networking
in Industrial Biotechnology**



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Introduction

Industrial Biotechnology (IB) is a powerful technology platform that has applications in a number of market sectors. It also encompasses many scientific and technical disciplines and is core to renewable and sustainable, as well as green, technologies. The scope of IB in this work includes the use of renewable and bio-based feedstocks in the production of chemicals, materials and enzymes.

The breadth of applications for IB and the number and variety of stakeholders inevitably leads to a wide range of initiatives and incentives to ensure that IB is properly supported – but often with different aims and focus.

There could have been potential for confusion, mismatch of strategies and emergence of unintended consequences but the UK has addressed this with the creation of the industry-led Industrial Biotechnology Leadership Forum.

This influential forum develops and delivers against the strategy that emerged from a review of IB in the UK undertaken in 2009 and ensures that the UK is on target to maximise the potential of IB.

We summarise here some of the opportunities for engagement in IB and how the various bodies interact.





Ian Shott, Chairman

The **Industrial Biotechnology Leadership Forum (IBLF)** is chaired by Ian Shott, a senior industrialist with extensive experience in the commercial deployment of IB. The Forum receives Government support from the Minister of State for Business and Enterprise.

Senior industrialists form the IBLF membership with input from organisations engaged in various aspects of IB. This ensures that commercial focus is connected with research and development initiatives.

Stringent targets are set for areas such as company engagement, development of skills, public perception of IB and provision of access to scale-up facilities for IB processes.

The IBLF is the vehicle to make policy makers aware of this significant opportunity and the challenges faced.

List of organisations represented on the IBLF

- AB Sugar
- AkzoNobel
- AstraZeneca
- BBSRC
- Biosciences KTN
- BIS
- British Association for Chemical Specialities
- Calysta Energy
- Chemical Industries Association
- Chemical Sciences Scotland
- Chemistry Innovation
- Cogent
- CPI
- Croda
- EPSRC
- Forum for the Future
- Fujifilm Diosynth Biotechnologies
- Green Biologics
- Ineos Group
- Ingenza
- Institution of Chemical Engineers
- Romec
- Roquette
- Seventure
- Shell
- ShottTrinova
- Syngenta
- Technology Strategy Board
- Unilever
- World Economic Forum



Government

A number of **Government** Departments are involved with progressing Industrial Biotechnology.

Policy:

The UK Government's Department for Business, Innovation & Skills (BIS) supports the IBLF in driving IB uptake in the UK industry, whilst DECC and Defra have an interest in climate change and bio-based feedstocks respectively. The Department for Transport is concerned with renewable fuels and their supply and use.

The Scottish Government has similar interests and, through Scottish Enterprise, has an IB Development Group which dovetails with UK activities in order to maximise the impact of IB within Scotland.

The Welsh Assembly Government mirrors these interests and the BEACON project in Wales is concerned with biorefining.

Incentives:

UK Government taxation can provide significant levels of R&D tax relief for qualifying expenditure at rates from 130% to 225% depending on the company size.

Companies locating within Enterprise Zones can benefit from lower business rates and more sympathetic planning rules. The Department for Communities and Local Government (DCLG) are responsible for delivery of the Enterprise Zones programme.



Government Involvement

- Department for Business, Innovation & Skills
- DECC
- Defra
- Department of Transport
- Scottish Government
- Welsh Assembly Government



Funding

The Technology Strategy Board (TSB) is a member of the IBLF. As the UK's innovation agency, the TSB focuses on innovative technologies and their commercialisation.

Within its High Value Manufacturing Strategy 'biotech, biological and synthetic biology processing' has been identified as one of the UK's national competencies.

The TSB funds applied and commercially targeted work in IB through various competitions and initiatives and takes on board the feedback it receives from companies and organisations active in R&D.

Between 2009 and 2012 the TSB has invested over £9m in projects that are working to develop IB related technologies.

European funding, via ERA-nets, is also led by the TSB; ERA-IB & ERA-Bioenergy operate in collaboration with Research Councils.

The TSB Facilitates:

- Feasibility studies in IB through the High Value Chemical funding competitions; ideal for small and large companies working in collaboration
- Scale-up and proof of principle work through the High Value Chemical funding competitions; ideal for small and large companies working in collaboration
- Collaborative projects with Norwegian companies through the High Value Chemical funding competitions, in partnership with Innovation Norway
- Technology Inspired Innovation for small and micro companies
- SMART grants for SMEs



The UK's Research Councils (RCs) fund world class basic research in the various HEIs and research institutes around the country.

With a focus on underpinning, precompetitive research the RCs fund university research, often with an industrial collaborator, as well as research institutes with a particular focus. Research & Technology Clubs (RTCs) address particular areas of research.

The Biotechnology and Biological Sciences Research Council (BBSRC) has IB as one of the three pillars in its biosciences strategy.

The Engineering and Physical Sciences Research Council (EPSRC) supports the development of Industrial Biotechnology processes through its 'Manufacturing the Future' theme.

Economic and Social Research Council (ESRC) is interested in the socio-economic impact that IB can have whilst the Natural Environment Research Council (NERC) targets the environmental issues that can be addressed by IB.

Research Councils Facilitate:

- IB-focussed directed and responsive mode competition calls
- RTCs in areas underpinned by IB
- Coordinated academic networks
- Industrial CASE awards for HEI & company collaborations
- Participation in ERA-nets

Network



Network

The Knowledge Transfer Networks (KTNs) are funded and supported by the TSB to deliver improved business performance in a technology area through innovation by helping UK businesses access innovative technologies through partnering and networking.

The KTNs provide a coherent industry voice to Government about technology needs. Chemistry Innovation KTN, at the forefront of the chemistry-using industries, has interests in bio-based products and catalysis.

Biosciences KTN, serving the agriculture, food and IB sectors, has a membership that includes core IB companies and users of the technology.

Together, these two KTNs deliver the IBLF strategy through a Special Interest Group and engage with industry in order to provide advice, direction and insight into the possibilities presented by the application of IB.

KTNs Provide:

- Confidential visits to companies with an interest in IB to provide information and advice
- Connections to potential collaborators and partners in IB
- Information on funding opportunities and competitions
- Assistance in building and reviewing project proposals
- SPARK awards for SMEs to collaborate with academia in short, proof of principle studies; £5000 awards
- A mechanism to feed back to Government agencies the views of members



The UK has a number of initiatives, workshops and conferences that cover all aspects of IB and in particular the connecting of partners who can benefit mutually from interaction at many levels.

The IBLF, through the KTNs, delivers a number of events to provide introductions between business, academia and research institutes. Large companies, SMEs and HEIs are all involved in the network of IB users and potential users.

A quarterly newsletter provides regular updates on UK activities in IB.

Biosciences KTN runs a BioVentures group that brings together those seeking funding (at a variety of levels) and those able to invest in innovative companies. The group also provides opportunities for advice and coaching in presenting pitches.

For more detail of how to engage and keep abreast of developments, please contact us through www.IBLF-UK.com

The Industrial Biotechnology Leadership Forum (IBLF)

- www.IBLF-UK.com website
- Leading IB events for all interested parties
- Connection with large companies, and SME providers of technology
- Connections to universities and research institutes
- Insight into existing commercial products of IB
- Quarterly newsletters
- BioVentures group meetings provide a meeting place for those seeking and offering investment

Scale-Up Facilities



Scale-up Facilities

The Centre for Process Innovation is a UK based technology and innovation centre and is the Process Industries element of the High Value Manufacturing Catapult. CPI's role is to de-risk process development, provide proof-of-concept testing up to industrial scale and to accelerate the commercialisation of bio-derived products and processes. CPI is home to the National Industrial Biotechnology Facility where companies of

any size can develop, test, trial and scale up biotech products and processes easily and cost effectively. Opened in 2007, the £24m industrial biotechnology facility includes development laboratories (including analytical suite), pilot facilities (up to 750L) and demonstrator facilities (up to 10,000L). The facility is non-cGMP and can handle flows from pre-processing of biomass through to downstream processing of fermentation broths in a flexible 'plug and play' format. For biochemical, chemical and thermal/physical process applications CPI can utilise a range of 'in-house' technologies, hire equipment on short term loan or design and build bespoke rigs for specific applications.

CPI has a team of industry based scientists, technologists, process operators and engineers who can design and test process flows from the bench to industrial scale. CPI has worked with clients to demonstrate the manufacture of cells, proteins, bio-based chemicals and biofuels and currently works with number of spin-out, SME and corporate partners in each of these areas.

CPI and the National Industrial Biotechnology Facility are an option for those wishing to develop, prove and scale up processes through a TSB collaborative R&D grant. CPI works closely with the IBLF and KTN teams to maximise the advantage for UK companies.

CPI offers:

- Product and process development
- Prototyping, demonstration & scale up
- Fabrication and pilot production
- Fuel and feedstock investigation
- Manufacturability and process assessment
- Process modelling and consultancy
- Technology Transfer Expertise
- QA/QC/Laboratory support
- ISO 9001

International



International

European Engagement:

- Bioeconomy Strategy
- FP7
- Horizon 2020
- ERA-IB
- ERA-Bioenergy
- Key Enabling Technologies
- Lead Market Initiatives:
BIOCHEM project for SMEs in IB
Star-Colibri project on biorefineries

EuropaBio:

- Trade Association
- Industrial Biotechnology Council
- Bioeconomy Working Group
- Feedstock Working Group
- Research & Innovation Working Group
- Bio-based Products Expert Group
- Water & Carbon Footprint Working Group
- EFIB

The UK operates as part of a global marketplace and as part of the European Union (EU). Initiatives arising from Europe have an impact upon activities and funding.

The EU launched its Bioeconomy Strategy in February 2012 which brings focus to the renewable and sustainable targets for Europe.

European funding through the Framework Programmes (FP) is significant and within FP7 the relevant call appears in the Food, Agriculture and Fisheries, and Biotechnology topic.

Horizon 2020 will replace FP (and many other funding mechanisms) from 2014 and will still include IB topics. It is also possible that a Public Private Partnership in the bioeconomy will operate under Horizon 2020.

The European trade association for those involved in biotechnology is EuropaBio which covers IB as well as agricultural and health technologies.

This organisation is well connected to the European Commission (EC) and is an effective lobbying body. Members are able to feed in to documents and recommendations which will be considered within the EC.

With a number of working groups on policy, access to raw materials, research and innovation and SMEs it covers much of what is happening in the UK. The Biosciences KTN sits on these groups as a member representing UK needs.

EuropaBio also runs the annual conference EFIB (European Forum on IB and the Bio-Based Economy). This is a major event for industry and Government to come together.

Useful web links

IB Leadership Forum

www.IBLF-UK.com

Technology Strategy Board

<https://connect.innovateuk.org/web/guest/home>

Department of Business, Innovation and Skills

www.BIS.gov.uk

Biosciences KTN

www.biosciencesktn.com

Chemistry Innovation KTN

www.chemistryinnovation.co.uk

Centre for Process Innovation

<http://www.uk-cpi.com/>

BBSRC - Biotechnology and Biological Sciences Research Council

www.bbsrc.ac.uk

EPSRC - Engineering and Physical Sciences Research Council

www.epsrc.ac.uk

EuropaBio's Bio-economy site

<http://www.bio-economy.net/index.html>

Report by the IB Innovation and Growth Team

<http://www.berr.gov.uk/files/file51144.pdf>