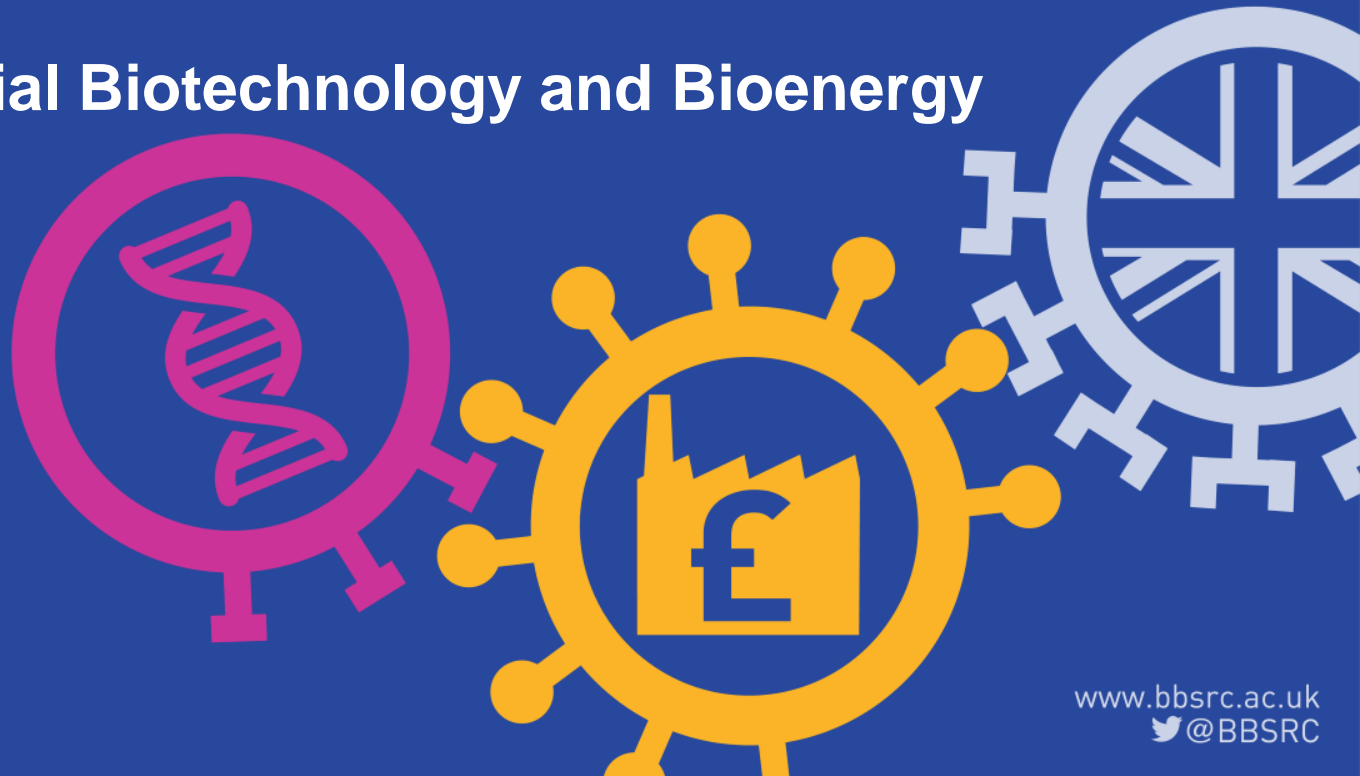


SmartPilots meeting: Indirect Support Mechanisms

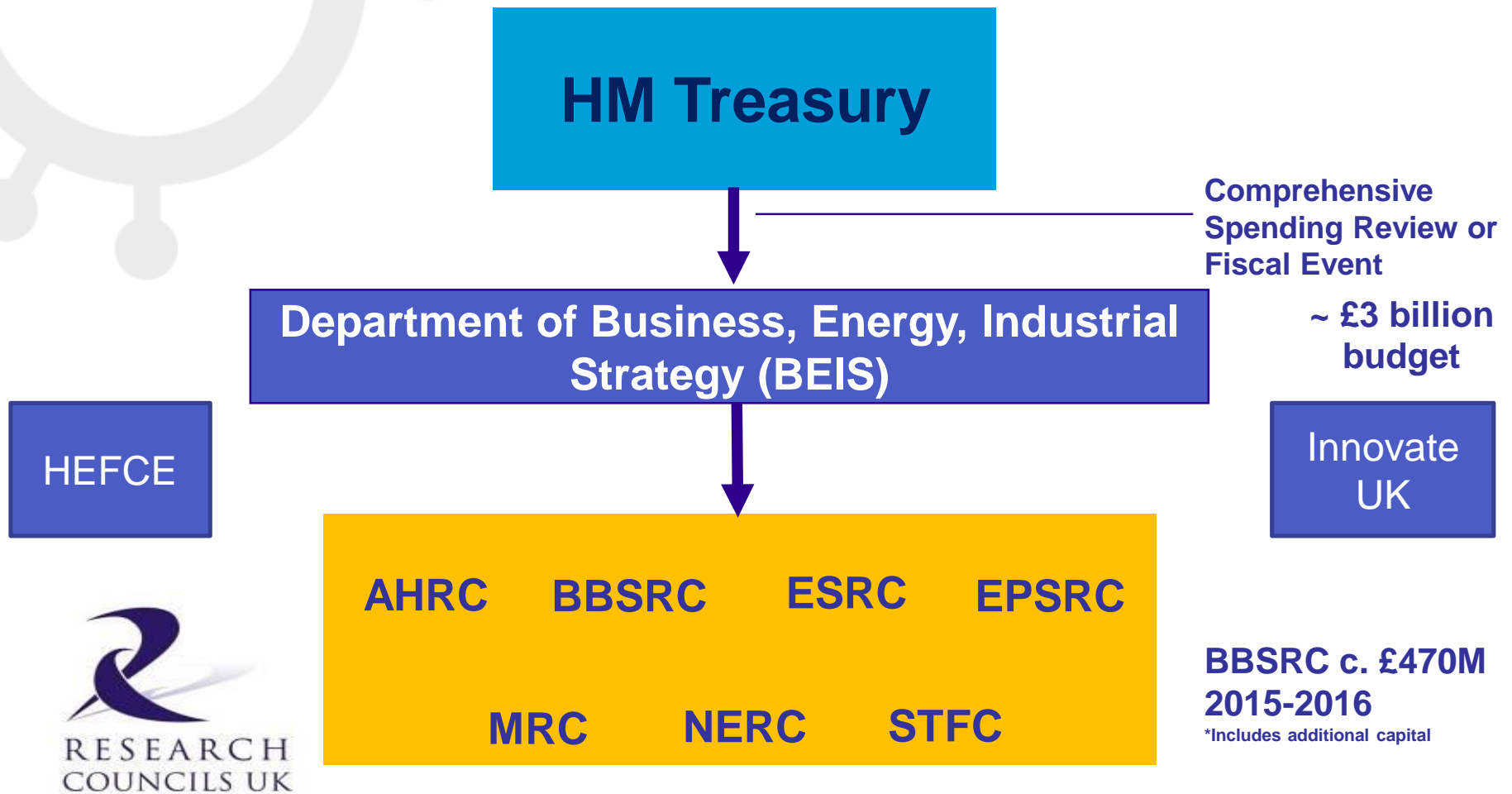
BBSRC Industrial Biotechnology and Bioenergy

Dr Colin Miles

16 March 2017



UK Research Funding (until 2018)



BBSRC Science priorities

Three major strategic science priorities (Grand Challenges)



Food Security



Industrial Biotechnology and Bioenergy



Bioscience for Health

Three crucial enabling themes



KE, Innovation and Skills



Exploiting New Ways of Working



Partnerships

BBSRC and Industrial Biotechnology and Bioenergy

BBSRC included *Industrial Biotechnology and Bioenergy (IBBE)* as part of its Strategic Plan in 2010 to ensure that combining excellent basic bioscience research and industrial need:

- could support the growing demand for bio-based manufacturing including the rapidly-evolving renewables industry.
- could play a role in supporting research in areas of societal concern including climate change and reducing greenhouse gas emissions.

Initially, the investment took three forms:

- Research to support bio-based manufacturing in the **biopharmaceuticals industry** (2005; 2013)
- Research supporting the development of **Bioenergy** in the forms of solid, liquid and gaseous biofuels (2009/10)
- Research on **utilising residues or waste materials** as future feedstocks (2009/10)

Implementation problems: 2012/13

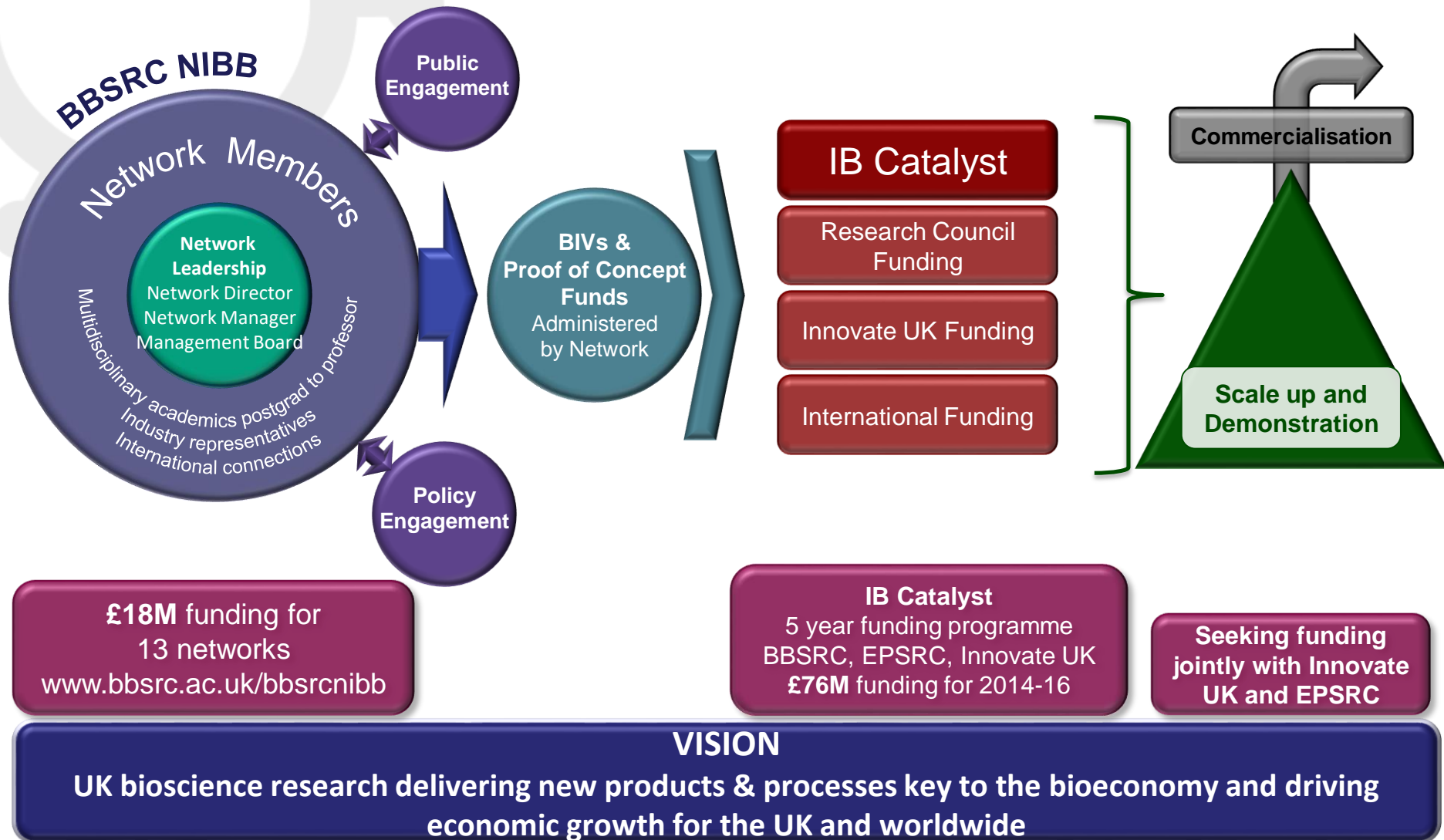
Growing the IBBE portfolio faced difficulties:

- *Low critical mass of researchers and Companies*
- *Cross-disciplinary working was not very effective.*
- *Low investment through standard grants: more preliminary data and proof of expertise required.*
- *Opportunities for scaling experimental work to levels for manufacturing was limited .*

But there is a way forward if we can ...

- *Attract more of the UK's excellent science base researchers*
- *Embed Genomics, Synthetic and Systems Biology.*
- *Attract business from supply chains including scale-up.*
- *Consider societal issues.*

BBSRC IBBE Strategy (starting 2012/13)



BBSRC Networks in Industrial Biotechnology and Bioenergy

- Established in January 2014 and, along with the IB Catalyst, formed the central part of both the BBSRC and subsequent national strategy to support the development of IBBE as a key component of the UK Bioeconomy.
- By October 2016, the 13 Networks had grown to include **over 2600 UK academic members** (from more than **140 UK institutions**).
- Nearly **750 different companies** throughout the supply chains represented (micro-SMEs to multinationals).
- Over **115 community led meetings** have been held.
- More than **£8M** has been invested in small pump-priming projects with this investment leveraging an additional **30% contributions** from industry (cash and in-kind).

BBSRC NIBB (2014-2019)

Biorefining



Bioprocessing



Novel Chassis



HVC/Natural Products



Biocatalysis



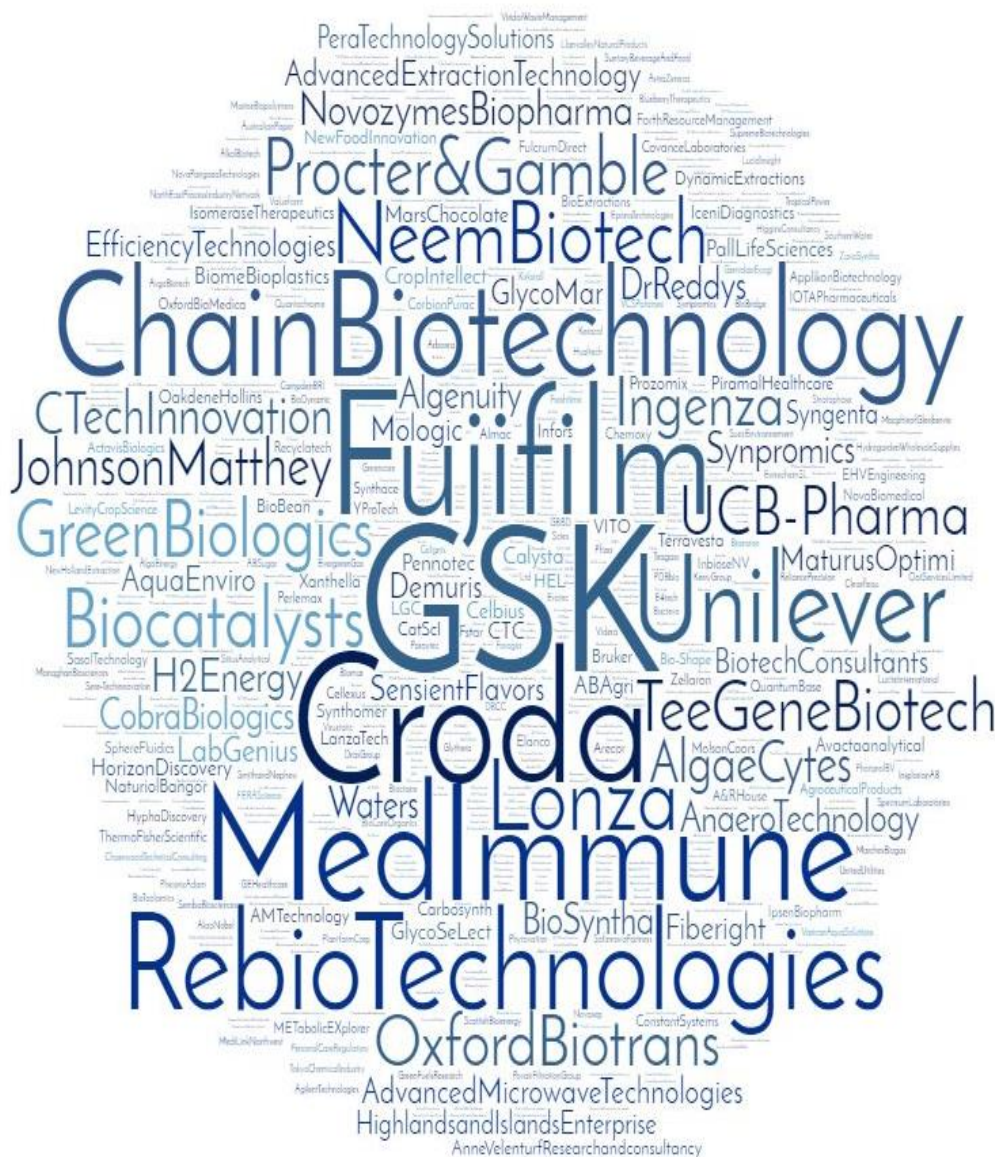
Cross Cutting



www.bbsrc.ac.uk/bbsrcnib | nibb@bbsrc.ac.uk

BBSRC NIBB – Industrial membership

(n=750)



Pump-priming of activities 2014-2016

Proof of Concept funding (PoC)

- Funding for projects to test new ideas for further development (max value £100K, business investment not mandatory).
- 123 projects costing £6.834M leveraging c.£1M business investment (42 of these were new partnerships).

Business Interaction Vouchers (BIV)

- Funding for projects to be undertaken collaboratively with industry (max value £10K but to be match by equivalent sum from business).
- 179 vouchers used leveraging £1.45M from business (94 of these were new partnerships).

Examples of scale-up projects sponsored (indirectly)

- **University of Manchester, CPI and *Oxford Biotrans*:** Understanding membrane transporters that allow feedstocks from sustainable biomass into host bacterial cells for biotransformation (PoC).
- **University of Sheffield CPI and Croda:** Developing new cellular uptake mechanisms based on cell cytotoxicity (PoC).
- **University of Kent and CPI:** Analysis of host cell protein impurities using an in silico approach (PoC)
- **Loughborough University and CPI:** Acoustic detection of proteins for online bioprocess monitoring in real time (BIV)

Securing future support for Networking: What happens next?

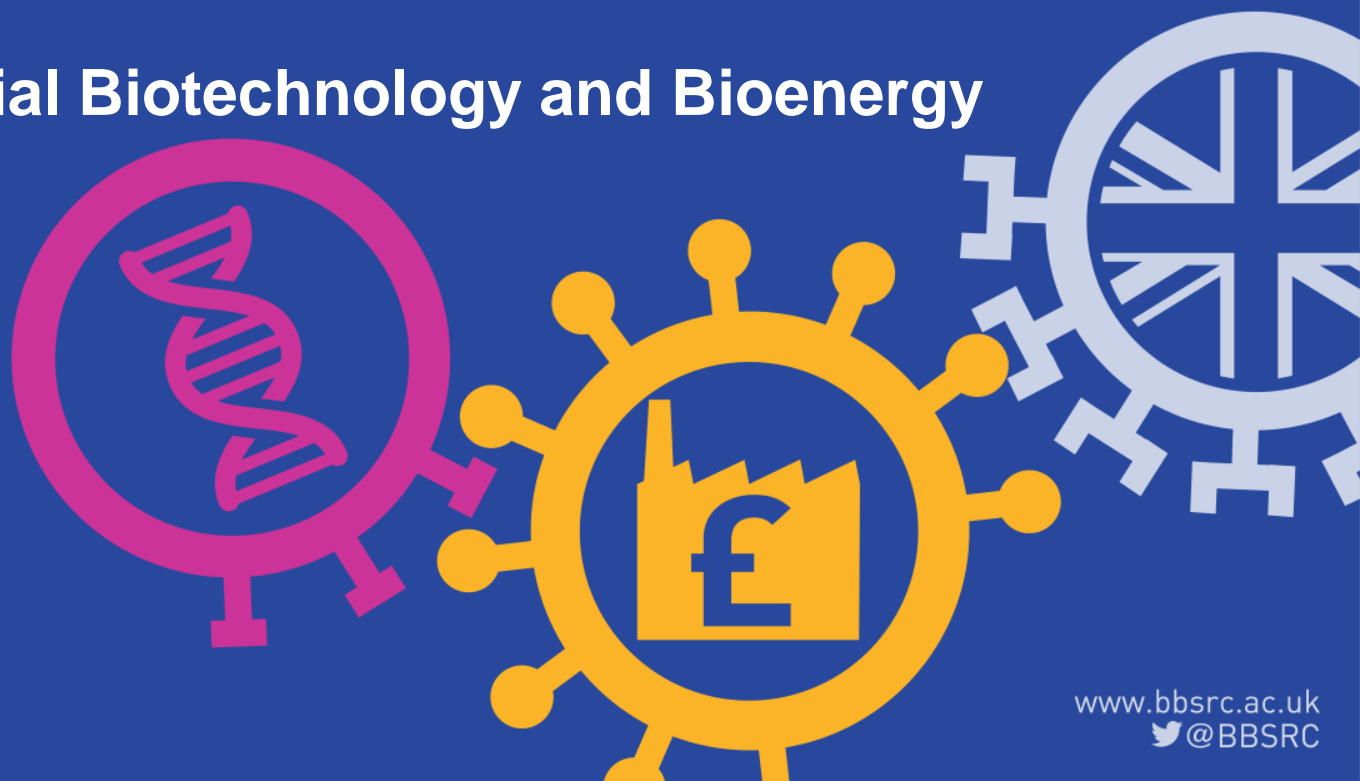
- Networks are at the mid-point in their lifetimes: need to decide on future activities post 2019.
- Review of activities: evidence of progress made (2014-present).
- Discussion of future options with BBSRC Executive and identification of future resources required.
- Community-based discussion on the next phase (2019-2023/24)

SmartPilots meeting: Indirect Support Mechanisms

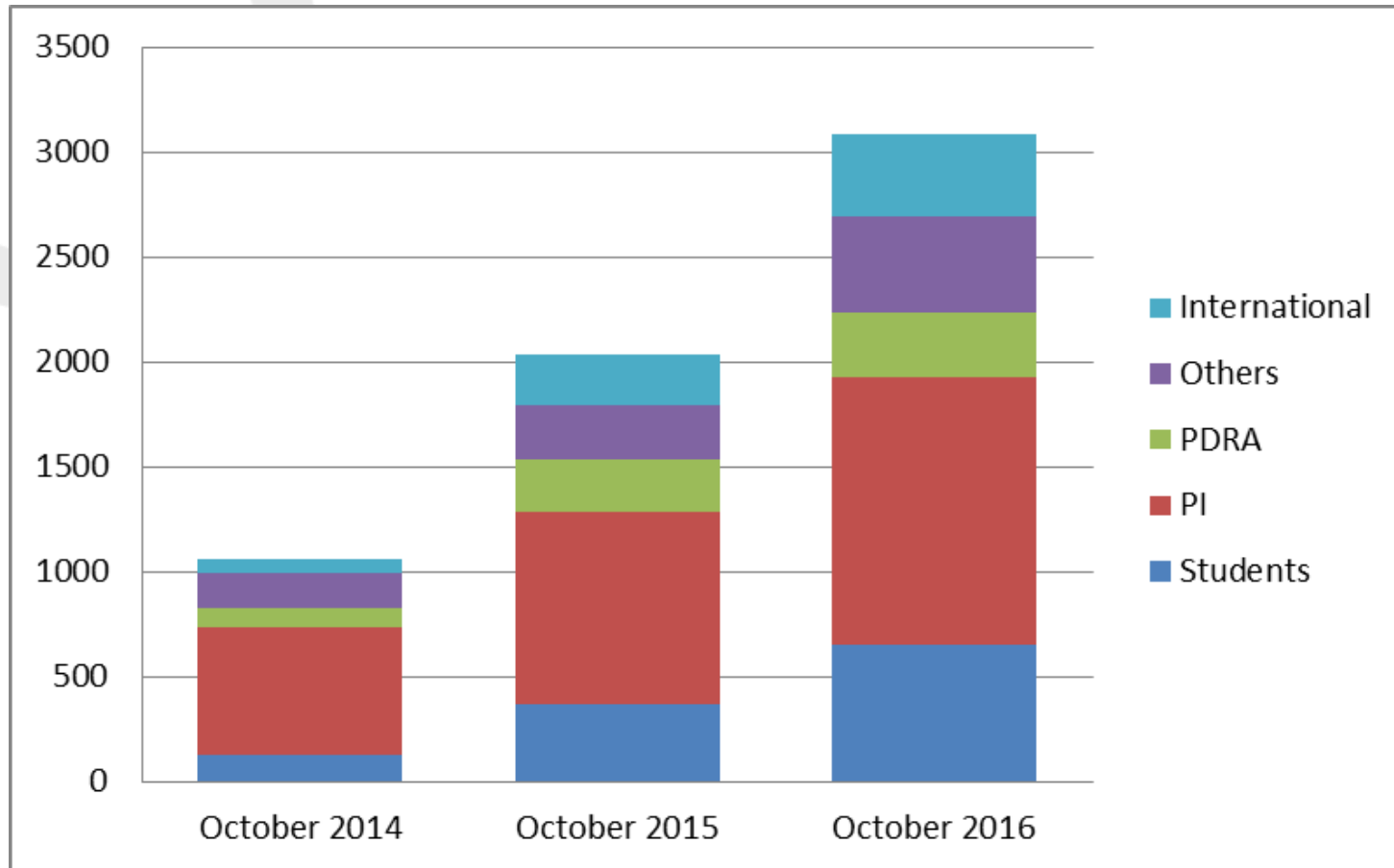
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BBSRC NIBB – Academic membership



The BBSRC NIBB are successfully engaging across the career stage and beginning to attract international attention

BBSRC NIBB - testimonials

“The BBSRC NIBB membership ... has opened up a whole new world of biotechnology companies and whole new pocket book of new industrial contacts. A [BBSRC NIBB] workshop ... allowed me to connect with IBBE professionals who were very interested in my work and were able to frame it in an industrial context like never before.”

Professor Frank Sargent, University of Dundee

“The BBSRC NIBB program for me is an exemplar of how things should be done if we want to deliver financial returns for UK Plc, for far too long ‘applied’ research has been shunned as a second class citizen in comparison to ‘fundamental’ research. The BBSRC NIBB however are helping to change these views by getting academia and industry to pull in the same direction.”

Will Cannon, Croda

BBSRC NIBB: Reasons for Success?

Socioeconomic landscape

- Political challenge for low carbon technologies/ renewables was gaining global traction (UK Climate Change Act 2008).
- UK public interest in sustainable opportunities: consumer pull on technology and market advantage through companies' green credentials.

Scientific landscape

- Genomic, systems and synthetic biology offered increased speed/options.
- Community built on chemical biology, enzymology, structural biology, metabolism, microbial and plant science where UK traditionally strong/World-leading.

Funding landscape

- Pump-priming helped new people into the area to try out ideas for the first time (academic-company partnerships).
- Attraction of significant grant funding and company-led opportunities (IB Catalyst): strong motivator to interact, fuelled by community meetings.
- Facilities for scaling up already existed and were waiting for opportunities.