UK universities: Partners that can deliver value

Professor Sumon Kumar Bhaumik

Economics & Strategy Group
Aston Business School
Aston University, Birmingham, U.K.

Structure of the presentation

- Propositions
- Background
  - Unpacking innovation
  - Mapping issues related to innovation
  - Multiple vectors of knowledge transfer
- UK universities
  - Research capabilities
  - Incentives
  - Collaborations
- Case studies
- Changing innovation pathways
  - Modes of engagement with UK universities

Propositions

- Innovation goes well beyond R&D and scientific discoveries
  - Research prowess
  - Management of the process
  - Ability of the employees to implement the changes
- Universities can provide a package that seamlessly integrates the silos
  - Hubs of intangible knowledge that are fungible across uses
  - Ability to transfer knowledge across the board, from science and technology to employee psychology and supply chain management
  - Ability to transfer knowledge via multiple modes
- UK universities
  - Punch above their weight globally with respect to scientific publications
  - History of value-adding collaboration with private sector using a range of modes
  - Global orientation that is suitable for edgy reverse innovation

Background

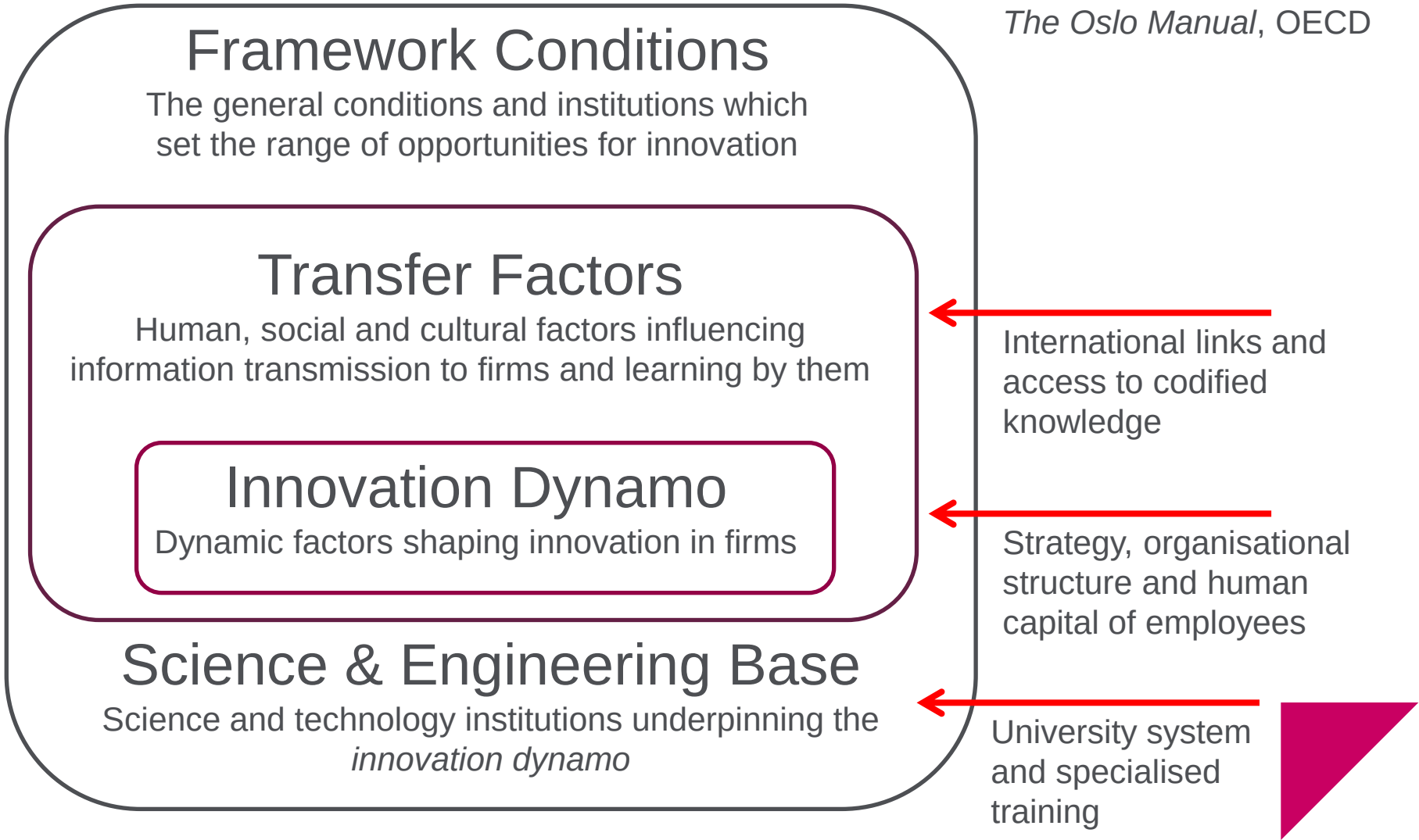
Unpacking innovation

- “A technological product innovation is the implementation/ commercialisation of a product with improved performance characteristics such as to deliver objectively new or improved services to the consumer. A technological process innovation is the implementation/ adoption of new or significantly improved production or delivery methods. It may involve changes in equipment, **human resources**, **working methods** or a combination of these.”

The Oslo Manual, OECD

Background

Mapping issues related to innovation



The Oslo Manual, OECD

Background

Multiple vectors of knowledge transfer

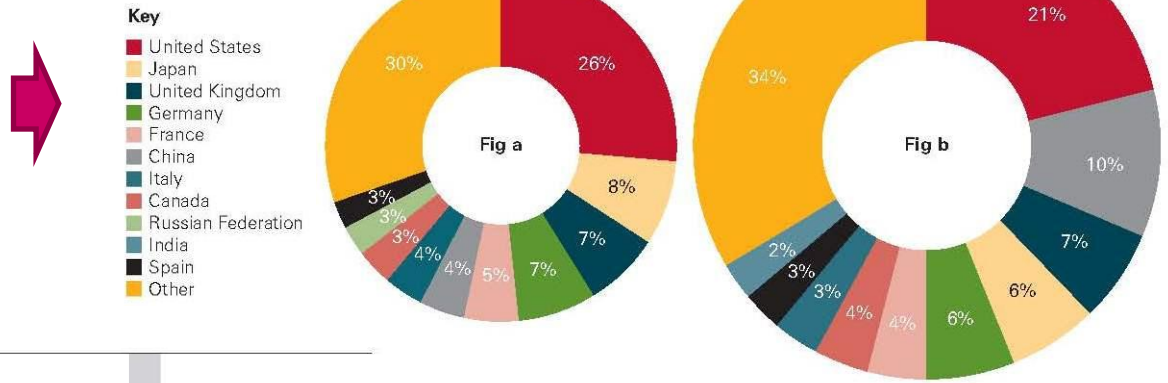
Source: *The World Intellectual Property Report 2011*, World Intellectual Property Organization

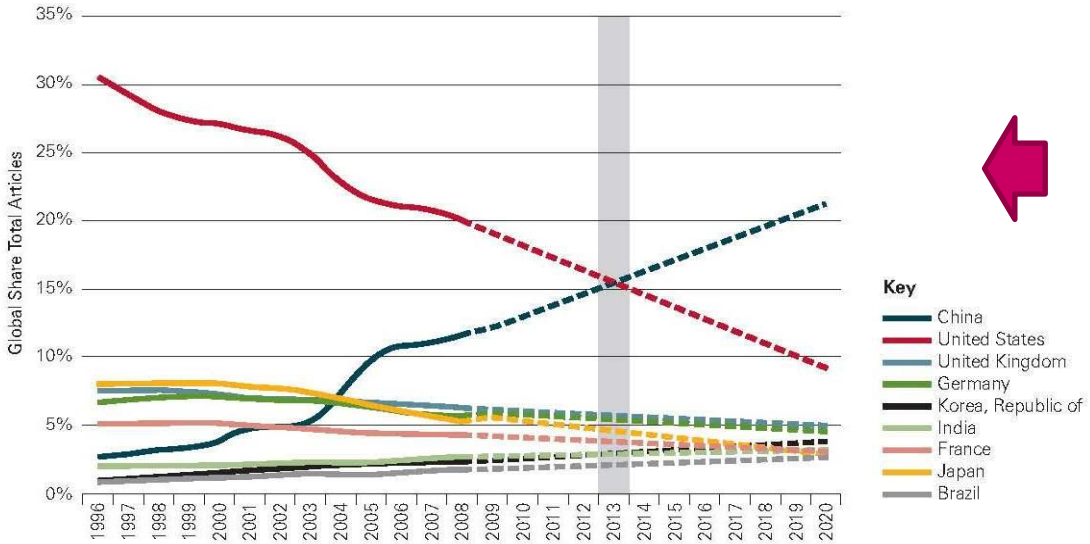
UK universities – research capability

UK holding its own even as developed countries are losing market share for publications

Proportion of global publication authorship by country

Top 10 producing countries in each period are shown. Fig (a) is for 1999-2003, and Fig (b) for 2004-2008.





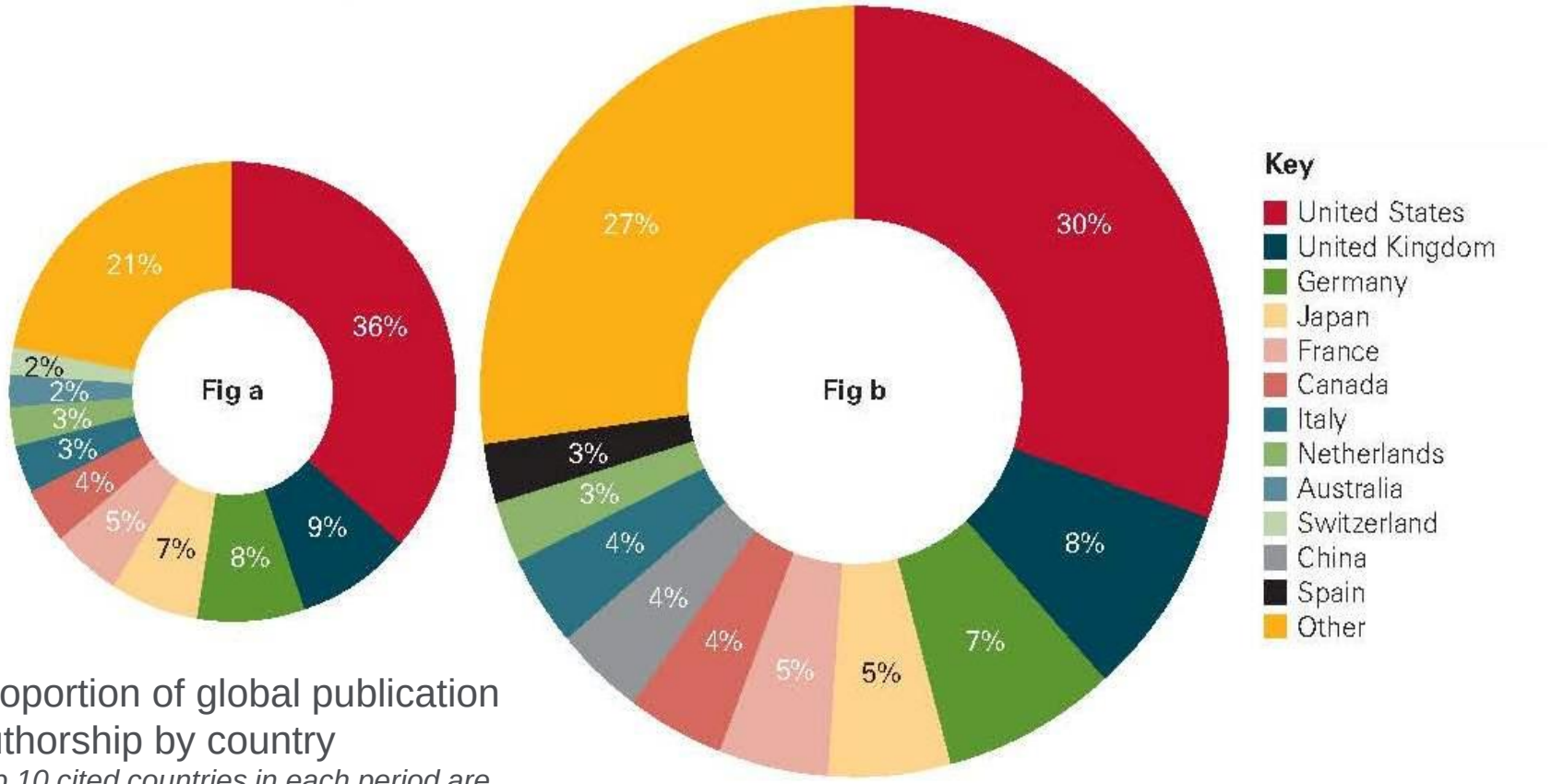
Linear extrapolation of future publication trends

The dotted lines indicate projections

Source: Knowledge, networks and nations: Global scientific collaboration in the 21st century,

UK universities – research capability

And UK punches above its weight in global citations



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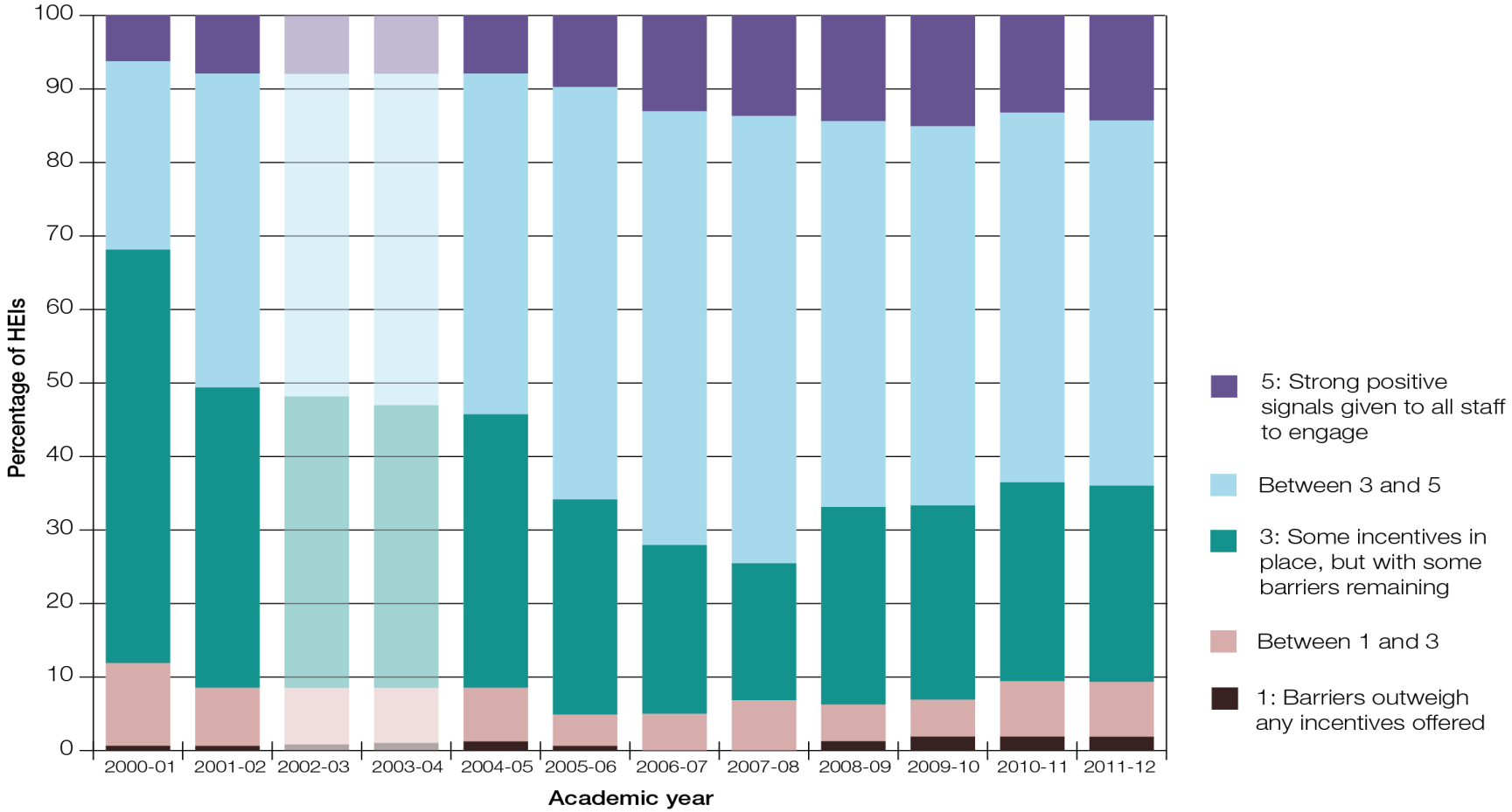
UK universities – incentives

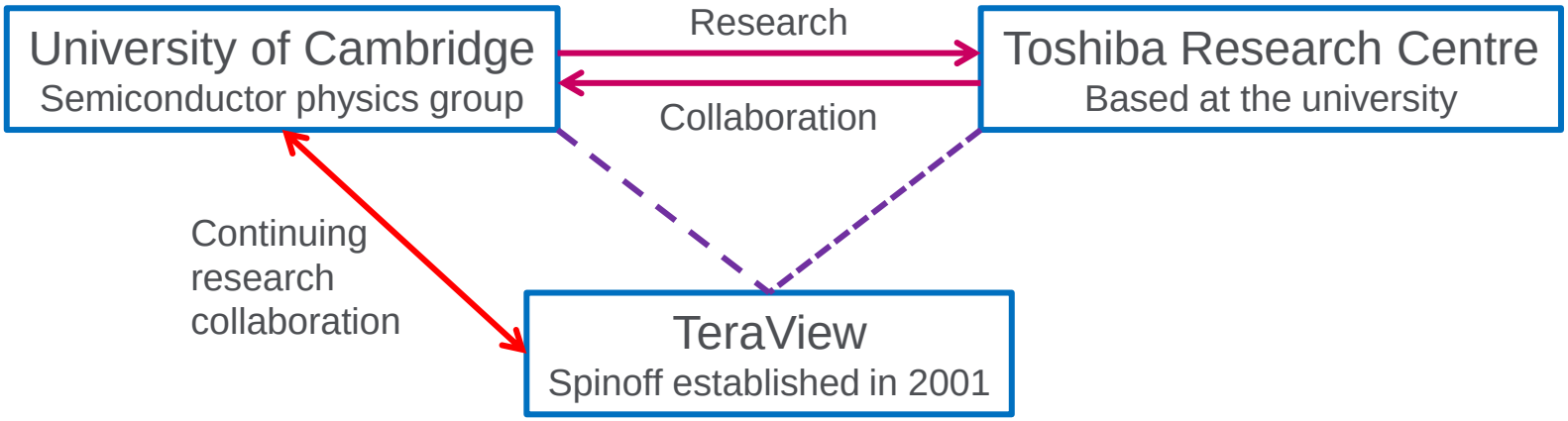
Incentives for staff to engage with business & community 2000-12



Source: Higher Education – Business and Community Interaction Survey 2011-12, *hefce*

UK universities – incentives

REF impact case study: Tetrahertz radiation research at Cambridge



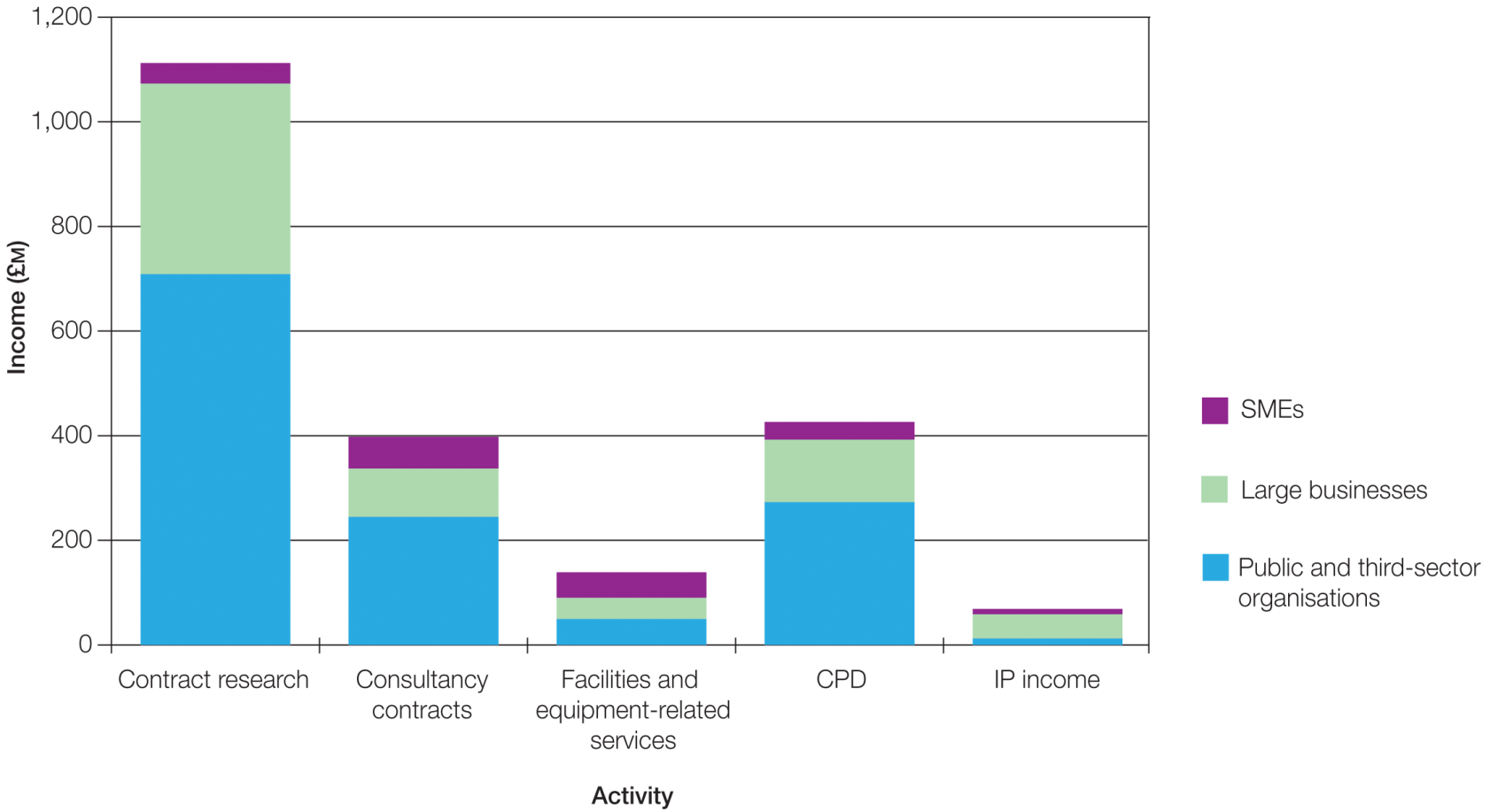
- "The two main applications which have been developed are:
  - Detection of polymorphic changes of active ingredients in tablets
  - Non-invasive imaging of the internal structure of tablets to provide a quantitative assessment of the character of the internal interfaces separating different chemical constituents. This is emerging as a technique of first choice.

  Additionally, the group's investigations into the imaging of teeth and skin cancer as well as drug analysis have enabled the development of applications for terahertz imaging systems of interest to the medical profession as well as to drug companies."

Source: Example pilot case studies from Physics, http://www.ref.ac.uk/background/pilot/

UK universities – collaborations

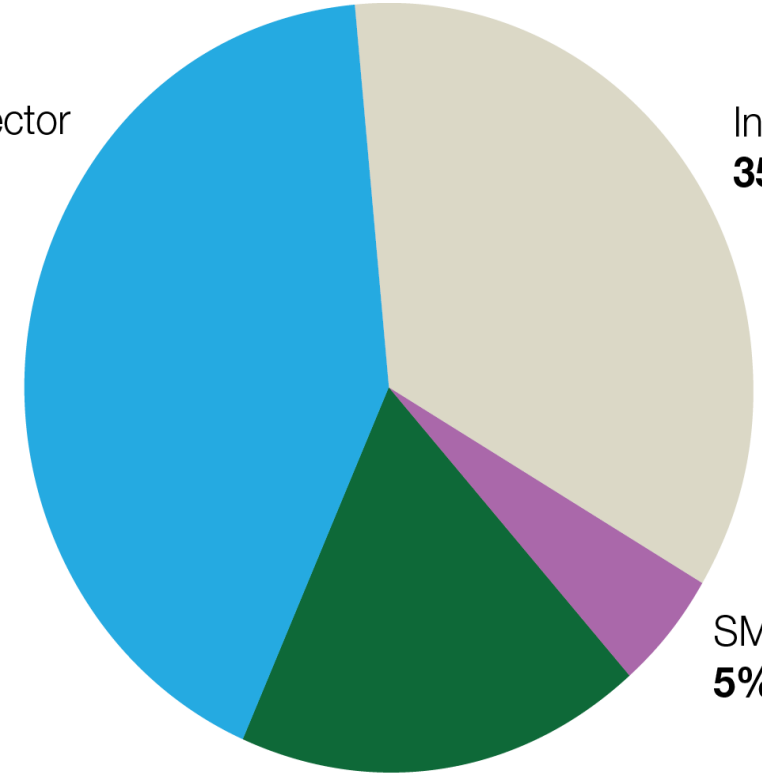
Income by activity and partner 2011-12



Source: Higher Education – Business and Community Interaction Survey 2011-12, *hefce*

UK universities – collaborations

CPD and continuing education 2011-12

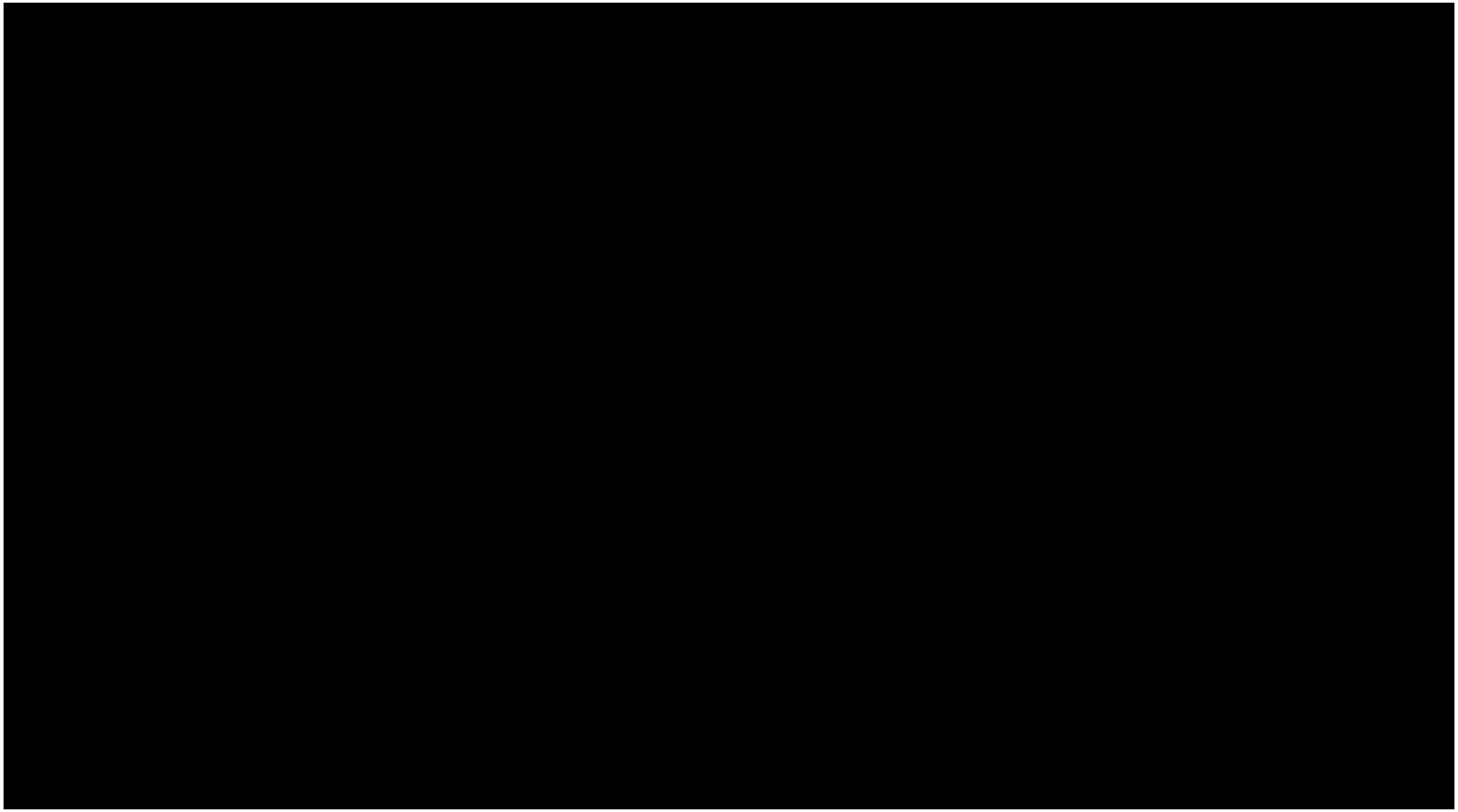


Total = **£651 million**

Source: Higher Education – Business and Community Interaction Survey 2011-12, *hefce*

Case study 1

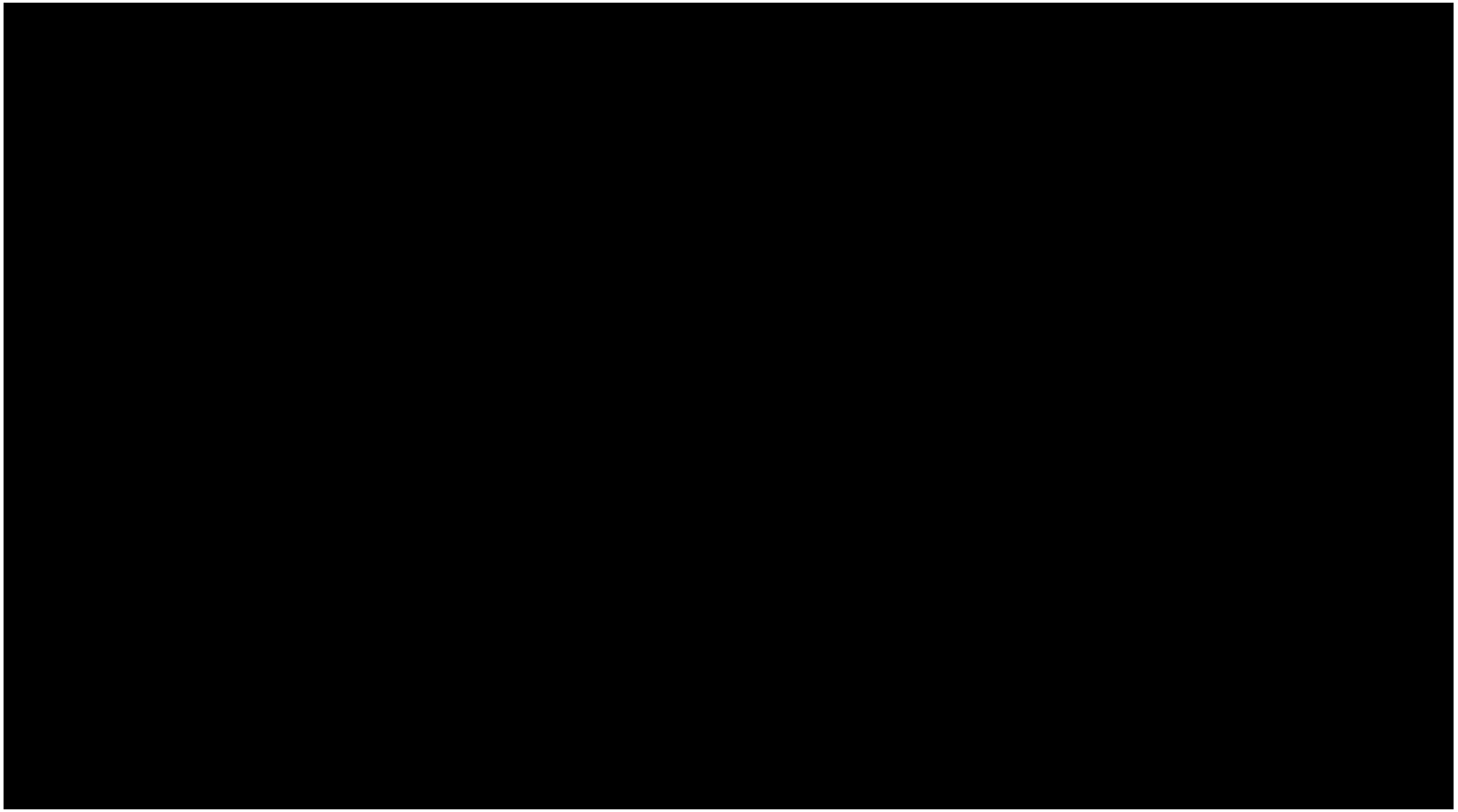
University of Manchester's KTP project with Numerical Algorithms Group



Source: The University of Manchester. Downloadable from
http://www.manchester.ac.uk/business/ke/casestudies/numerical-algorithms-group/

Case study 2

Reinsurance research at Aston University (now at City University)



Source: Economic and Social Research Council. Youtube link http://youtu.be/rl5aAuHFBsc

Case study 3

Aston University's KTP project with Salts Healthcare – I

Salts Healthcare Ltd
Birmingham-based manufacturer and supplier of stoma care and orthotic products for sale worldwide.

Family run business since the 1700's making it one of the oldest family run businesses in the UK

Long-standing relationship with Aston generating
3 Knowledge Transfer Partnerships (KTPs)
2 funded PhD studentships
Salts licensing Aston Intellectual Property

Timeline

2001-2003 1st KTP to develop a new skin adhesive using polymers.

2003 PhD studentship
'Development of adhesives for use in ostomy applications'

2004 Salts win Lord Stafford Award for Innovation

2005 Salts are finalists in National Business Awards

2007-2010 2nd and 3rd KTP to develop innovative materials for use in stoma and wound care

2009-10 PhD studentship
'The Design and Development of Advanced Hydrocolloids for dermal applications'

Case study 3

Aston University's KTP project with Salts Healthcare – II

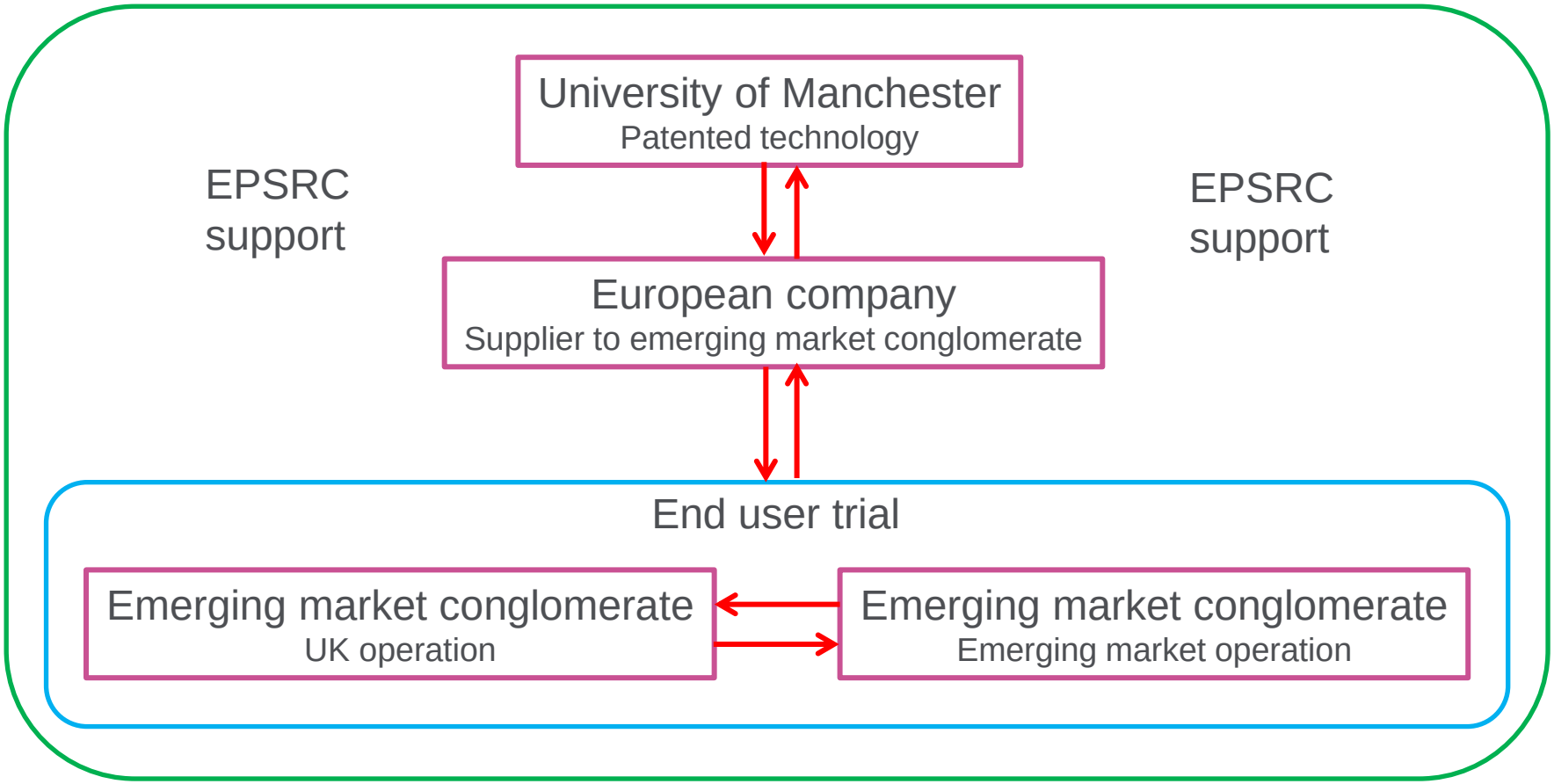
- Dealing with a weakness
  - Salts Healthcare had taken over their supplier of stoma care products
  - The manufacturing of complex hydro-colloid material was based on experience rather than on a scientific approach, and hence output quality was uneven
  - The KTP with Aston University enabled the company to establish precise formulations and manufacturing conditions to produce an optimised product of even quality, and resulted in a 50% reduction in the mean manufacturing time

- Dealing with a threat
  - At the mid-point of the 2 year project one of the key raw materials was withdrawn from the market
  - The understanding of the chemistry gained enabled Salts to re-formulate their adhesives using new materials

- Cementing an advantage
  - Salts' competitors did not have the scientific background that had been embedded in Salts of the academic team at Aston University
  - Salts could use the KTP to assess the equipment necessary for Salts to invest in laboratory facilities to maintain quality and develop enhanced products

Changing innovation pathways

University of Manchester's collaboration with emerging market conglomerate



Changing innovation pathways

Developing energy solutions in India: Aston's collaboration with IIT Ropar

The Pyroformer™ converts waste products and residues (e.g., husk and straw) into oils, gas and biochar.

The Pyroformer™ is housed in a container unit that can be transported between villages and will be operated by the villagers themselves.

- The European Bioenergy Research Institute (EBRI) at Aston University in Birmingham, UK has developed a new renewable energy technology for biomass conversion that is transforming the lives of farming communities in rural India.
- Benefits:
  - Adding value to "waste"
  - Better air quality
  - Decentralised energy source for rural communities
  - Use of biochar as a fertilizer
- Funding from Aston University and the Oglesby Charitable Trust has enabled EBRI to work closely with the Indian Institute of Technology (IIT) in Ropar to make this innovative technology available as a pilot phase in three villages of Ropar District.