



# Innovation Centre for Applied **Sustainable** Technologies

# CENTRE FOR SUSTAINABLE & CIRCULAR TECHNOLOGIES



Institute for  
Sustainability



UNIVERSITY OF  
BATH

## Technology Driven Sustainability

*A dynamic, collegiate research community focussed on*

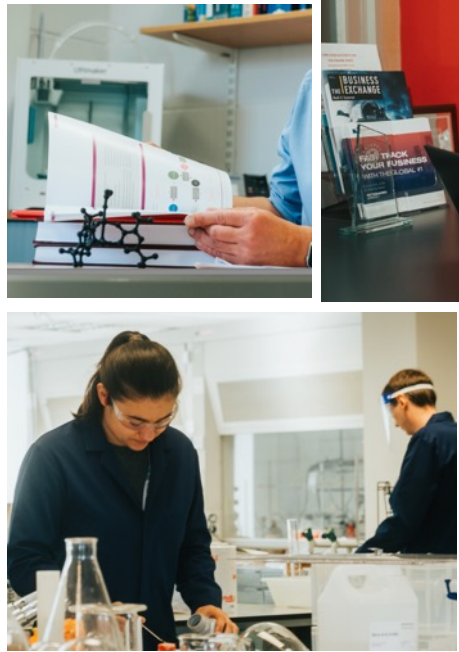
- Sustainable Chemical Technologies
- Sustainable Systems
- Emerging areas in sustainability

*A new £17M innovation hub bringing together industry and academia to translate discoveries in green and sustainable technologies into commercial application.*



Launch, November 2021

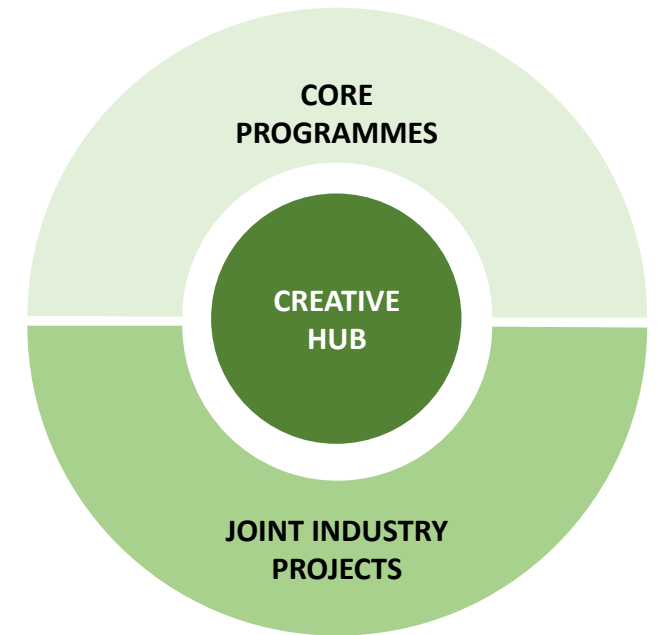
# A new approach to accelerating sustainable technology translation



**Expertise**



**Facilities**



**Mechanisms**

# Core Programmes

*Underpinning iCAST critical mass research areas*

## BIO-BASED FEEDSTOCKS



## SUSTAINABLE ENGINEERING MATERIALS



## CIRCULAR PLASTICS



## SUSTAINABLE MANUFACTURING



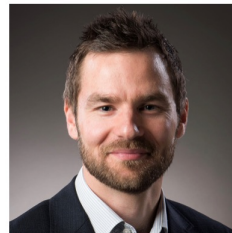
Dr Simon  
Freakley

Programme Lead (Bath)



Professor Ben  
Davis

Programme Lead (Oxford)



Dr Steve  
Allen

University of Bath



Dr Hannah  
Leese

University of Bath



Dr Antoine  
Buchard

Programme Lead (Bath)



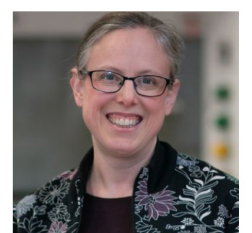
Professor Clive  
Siviour

Programme Lead (Oxford)



Dr Ulrich  
Hintermair

University of Bath

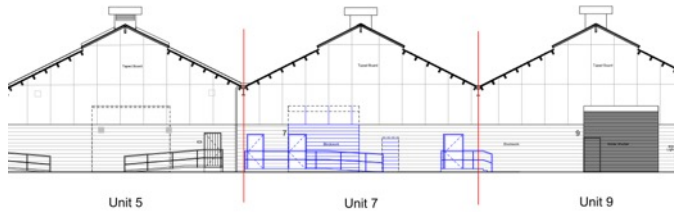
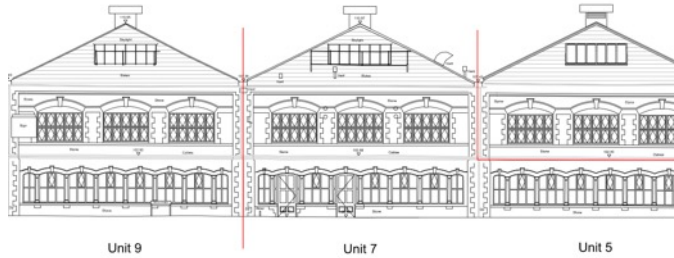


Professor Kylie  
Vincent

University of Oxford

# Creative Hub@The Carriage Works, Swindon

*A place for iCAST company members to meet, work, collaborate and innovate*



**WORKSHOPS**

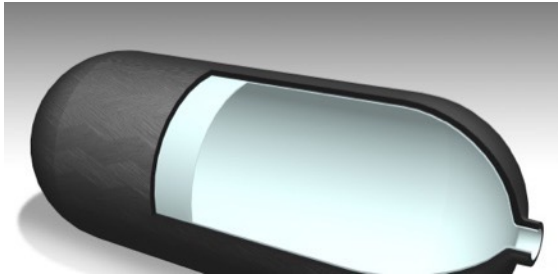
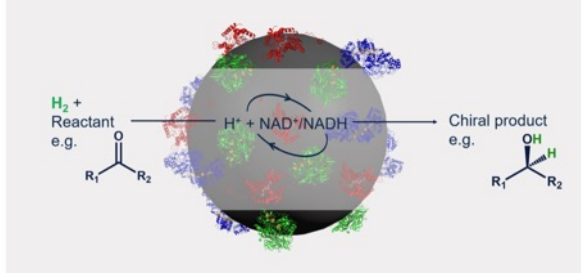
**EVENTS**

**INNOVATION SPACE**

**CO-WORKING**

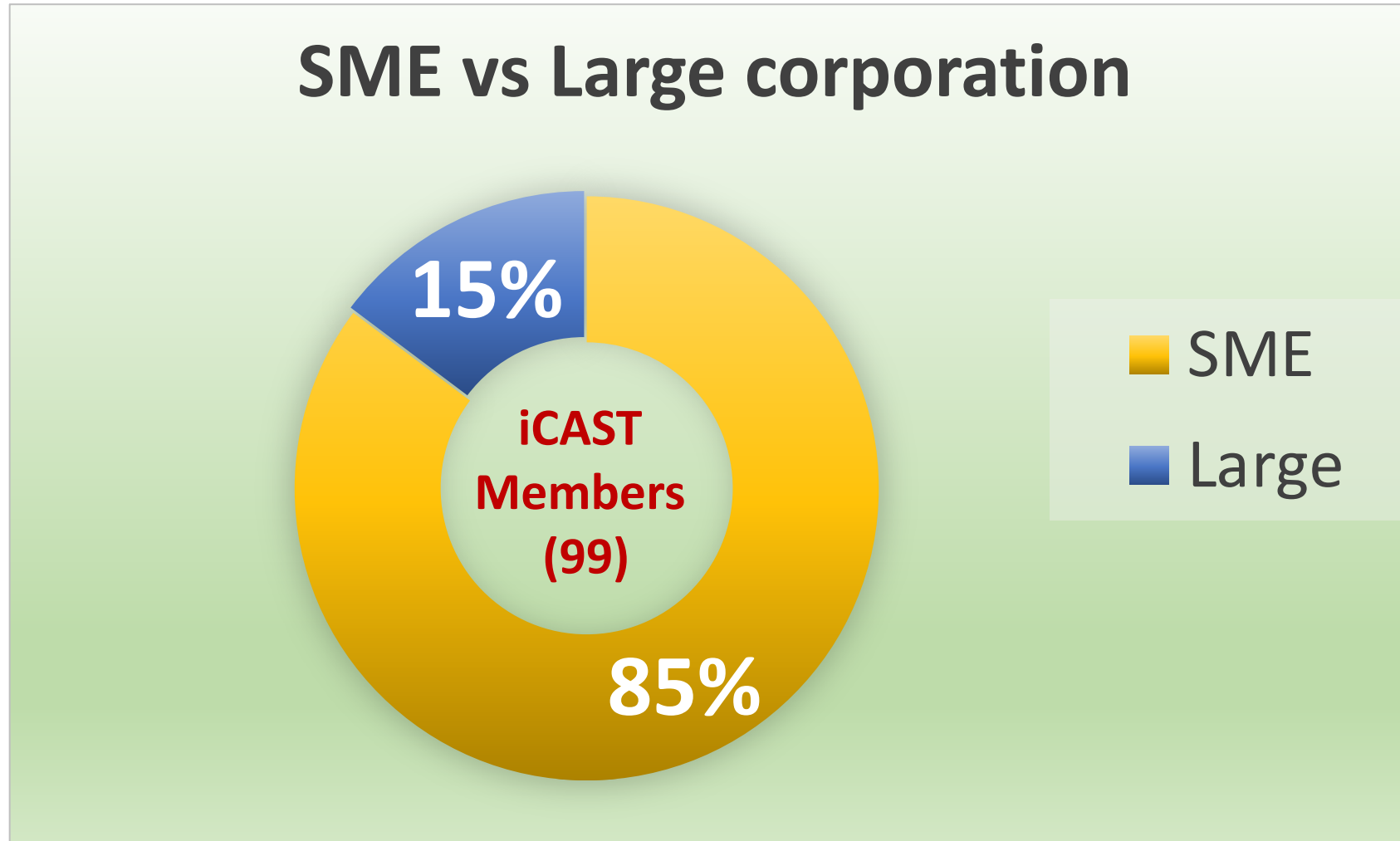
# Joint Industry Projects

*Industry-led proof of principle or feasibility studies*



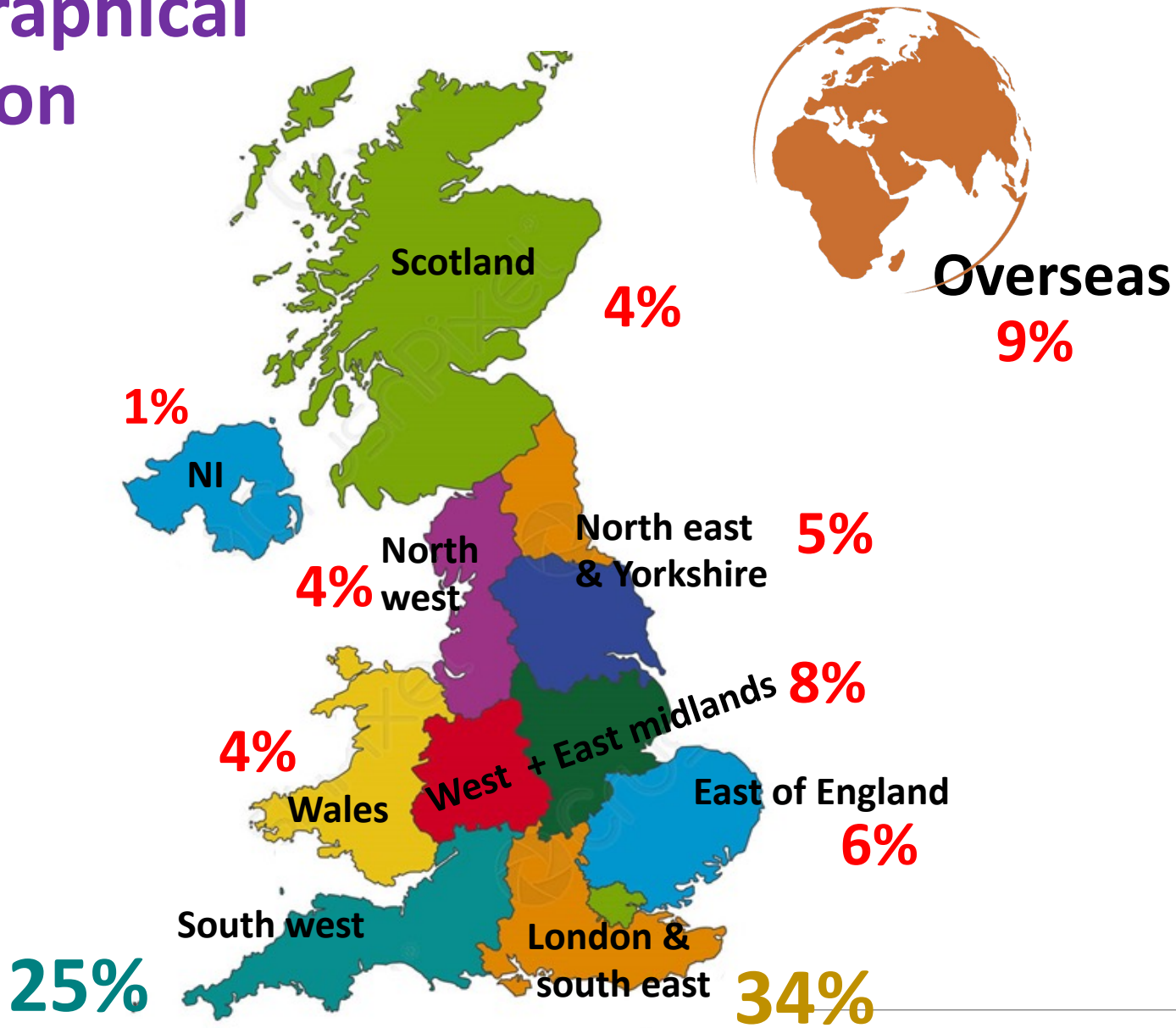
- Delivered by technology translators funded through the RE grant
- 3-12 months, rapid start up
- Industry-led with clear targets
- To develop materials, products or processes towards commercialization

# iCAST members-Company size



***Updated on 7<sup>th</sup> June 2023***

# Geographical location



	No.	%
London & South East	33	34
South West	25	25
East of England	6	6
Midlands	8	8
North West	4	4
North East & Yorkshire	5	5
Scotland	4	4
Wales	4	4
Northern Ireland	1	1
Overseas	9	9
<b>Total</b>	<b>99</b>	<b>100</b>

Updated on 7<sup>th</sup> June 2023

# Joint Industry Project (JIP)– Case Study:

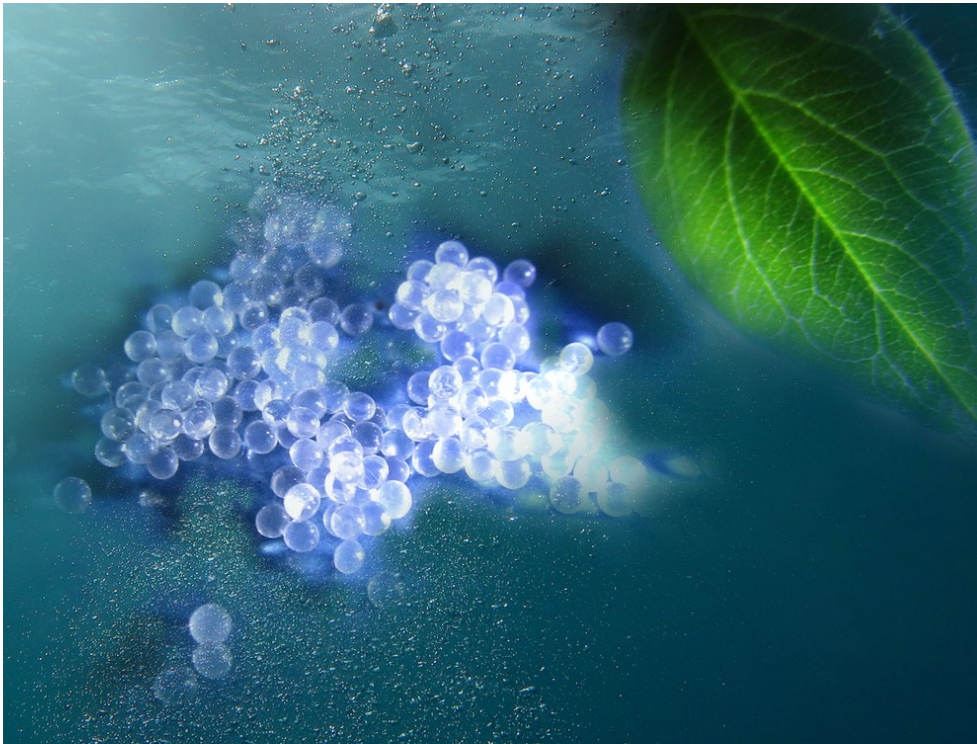
## *Red seaweed polysaccharide-based film for packaging*



- Collaboration with **FlexSea Ltd** (iCAST member)
- Investigated properties of Flexsea's seaweed-based film formulations
- Complete

# Joint Industry Project (JIP)– Case Study:

## *LCA of Naturbeads process*



- Collaboration with **Naturbeads** (iCAST member)
- Naturbeads patented technology of fully biodegradable and sustainable alternative to microplastics.
- Microbeads: wide range of features and flexibility, can be tailored based on clients' demand.
- LCA of Naturbeads patented process

# Joint Industry Project (JIP)– Case Study:

## *Natural lignin in resins for formation of composite cellulosic materials*



- Collaboration with **Bio-Sep Ltd** (iCAST member) and **NCC** (iCAST partner)
- Feasibility study on the performance of Bio-Sep's lignin in Portland cement
- Complete

### Bio-Sep Launches new Joint Industry Project to Fuel the Green Revolution

Bio-Sep has begun an exciting joint industry project which aims to develop renewable, bio-sourced alternatives for existing petrochemically-derived platform chemicals, ultimately helping to meet the worldwide demand for clean technologies and contributing to net-zero carbon goals. The new venture is in collaboration with the Innovation Centre for Applied Sustainable Technologies (iCAST), which includes prestigious institutions such as the University of Bath and the National Composites Centre (NCC).

<https://bio-sep.com/new-joint-industry-project-with-icast-and-the-national-composite-centre/>

# Joint Industry Project (JIP)– Case Study: *Cottonisation and delignification of Industrial Hemp Fibres*



- Collaboration with **Gaiatech Industries Ltd** (iCAST member)
- Sustainable process for delignification and bleaching of Hemp fibres
- Gaiatech aims to unlock a pathway to supply sustainable fibres into the global ethical fashion market
- Complete

# Joint Industry Project (JIP)– Case Study:

## *Pilot scale production of polylactic acid from waste-derived sugars*



## Fiberight

- Collaboration with **Fiberight Ltd** (iCAST member)
- Scaling up the MSW to sugars to PLA process (lactide polymerisation)
- TEA of polylactic acid production process from waste
- Ongoing

# Joint Industry Project (JIP)– Case Study:

*Ambient temperature curable, liquid resin*



- Collaboration with **Scott Bader Ltd** (iCAST member)
- iCAST project focuses on:
  - a liquid resin from bio-based feedstocks
  - Solvent-free vitrimeric resin formulation (self-healable)
- Complete

# Joint Industry Project (JIP)– Case Study:

## *Renewable polycarbonate formulation for lightguide materials*



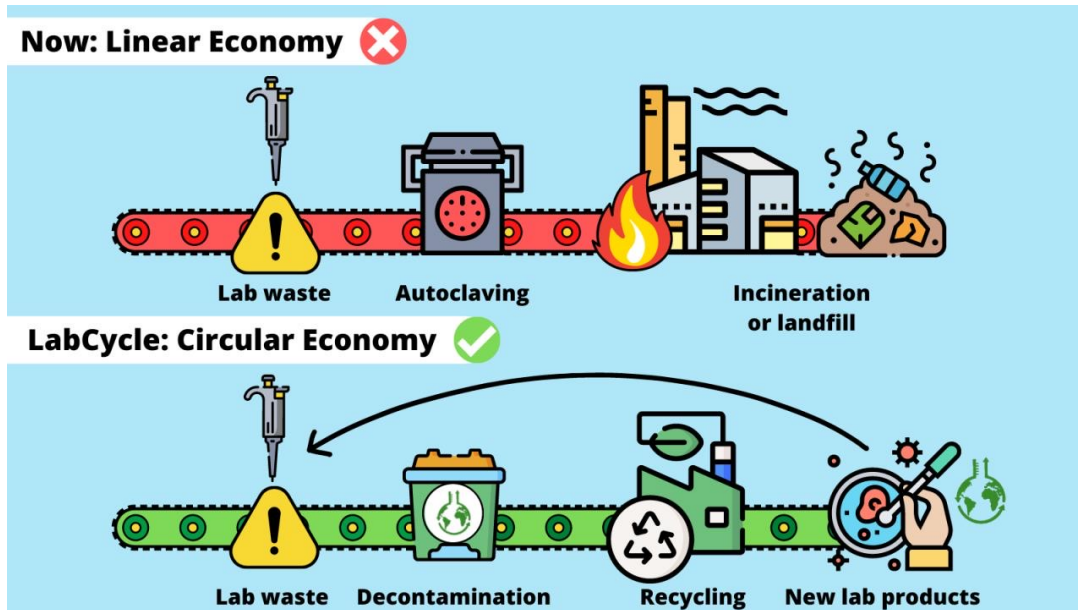
Polestar

- Collaboration with **Polestar UK** (iCAST member).
- iCAST project focused on assessing renewable polymers for light guide applications
- Complete



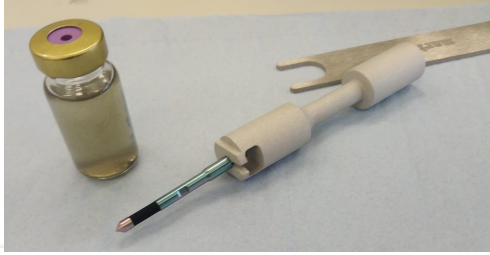
# Joint Industry Project (JIP)– Case Study:

## *Characterisation and evaluation of decontaminated laboratory plastics waste for lab-grade consumables*



- Collaboration with **LabCycle Ltd** (iCAST member).
- LabCycle has developed a validated sorting system and decontamination process to ensure the safe recycling of lab plastic waste.
- iCAST JIP aimed to demonstrate the potential of LabCycle's technology
- Ongoing

# Joint Industry Project (JIP)– Case Study: *Quantification of Carbon Disulphide in an Aqueous Process Effluent*



HN  
YTICAL

Products About

## Measuring Potential Contaminants in Industrial Effluent

Mar 16, 2023 | News & Press

Jim Melling, Senior Applications Specialist from Hiden Analytical, recently visited Carlisle where he carried out a demo of our pQA instrument alongside Isabel Thomlinson from iCAST (Innovation Centre for Applied Sustainable Technologies – University of Bath). The pQA was set up to measure possible contaminants in industrial effluent. The pQA was able to be sited directly above the effluent channel. Power in this case was provided from the mains so the car battery was left in the car!



- Collaboration with **Futamura Chemical UK Ltd** (iCAST member)
- Aimed to develop a reliable, in-house method for analysing the effluent stream to quantify trace levels of CS<sub>2</sub>
- Complete

<https://www.hidenanalytical.com/news-press/measuring-potential-contaminants-in-industrial-effluent/>

## Since Starting iCAST:

- 6 core PDRAs and 9 technology translators in post and working as a team
- £1.2M specialist equipment delivered, commissioned and operational
- Over 105 Industry Members
- Over 20 Joint Industry Project (JIP) delivered to date
  - £2M value (including £1M match £0.6M cash)
  - Strong pipeline
  - Already resulting in investment in iCAST members
- Creative Hub @ the Carriage Works complete and in use (just!)
- Vision is for co-location of academic, catapult industry and investment partners

# iCAST 2.0

- Demonstrated that model works
- Current funding until March '25
- R&D currently distributed in partners' existing facilities
- Underpinning grant applications both through to final stage:
  - EPSRC Sustainable Manufacturing Hub (£12M) – through outline
  - EPSRC Centre for Doctoral Training (£6M) – through outline
- Sustainable business model requires dedicated R&D facility
- Co-location of academic, industry and investment partners
- Incubation facilities for high growth spin outs and SMEs
- ca. 3000m<sup>2</sup> including laboratories
- ca. 50 R&D staff
- ca. £60M investment
- Regeneration around Swindon Railway Station exciting opportunity