



From Concept to Commercialisation: The European Perspective

Kris Wadrop

Platform Director, Industrial Biotechnology and Biorefining, CPI





Who are CPI?



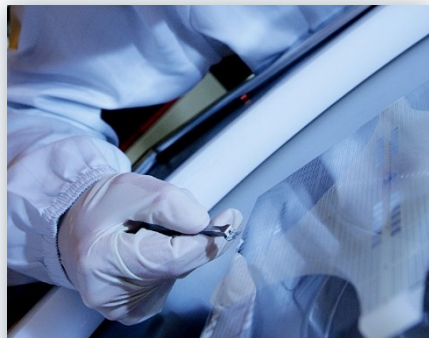
CPI is a UK technology innovation centre and the process element of the Government's High Value Manufacturing Catapult.



We use applied knowledge in science and engineering combined with state of the art facilities to enable our clients to **develop, prove, prototype** and **scale-up** the next generation of products and processes.



Technology Focus



Printable Electronics



**Industrial Biotechnology
and Biorefining**



Biologics



Formulation

CPI works across a distinct set of technological areas that offer the largest potential impact on the future of UK and global manufacturing.

Services



**Product and Process
Development**



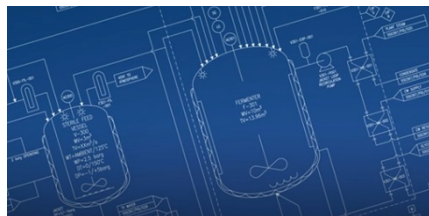
**Prototype, Demo
and Scale-up**



Pilot Production



**Feedstock and Materials
Investigation**



**Manufacturability,
Process Modelling and
Simulation**



**Process Economics
and Evaluation**



**Identification and
Engagement of Key
Collaborators**



**Commercialisation
Support and Incubator
Space**



Market Focus



Healthcare



Energy



Materials and Chemicals



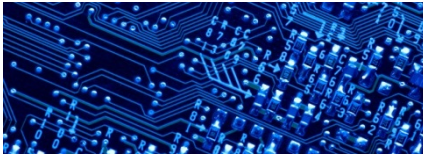
Food and Drink



Consumer Goods



Personal Care



Electronics



Transportation



Built Environment



High Value Manufacturing Catapult

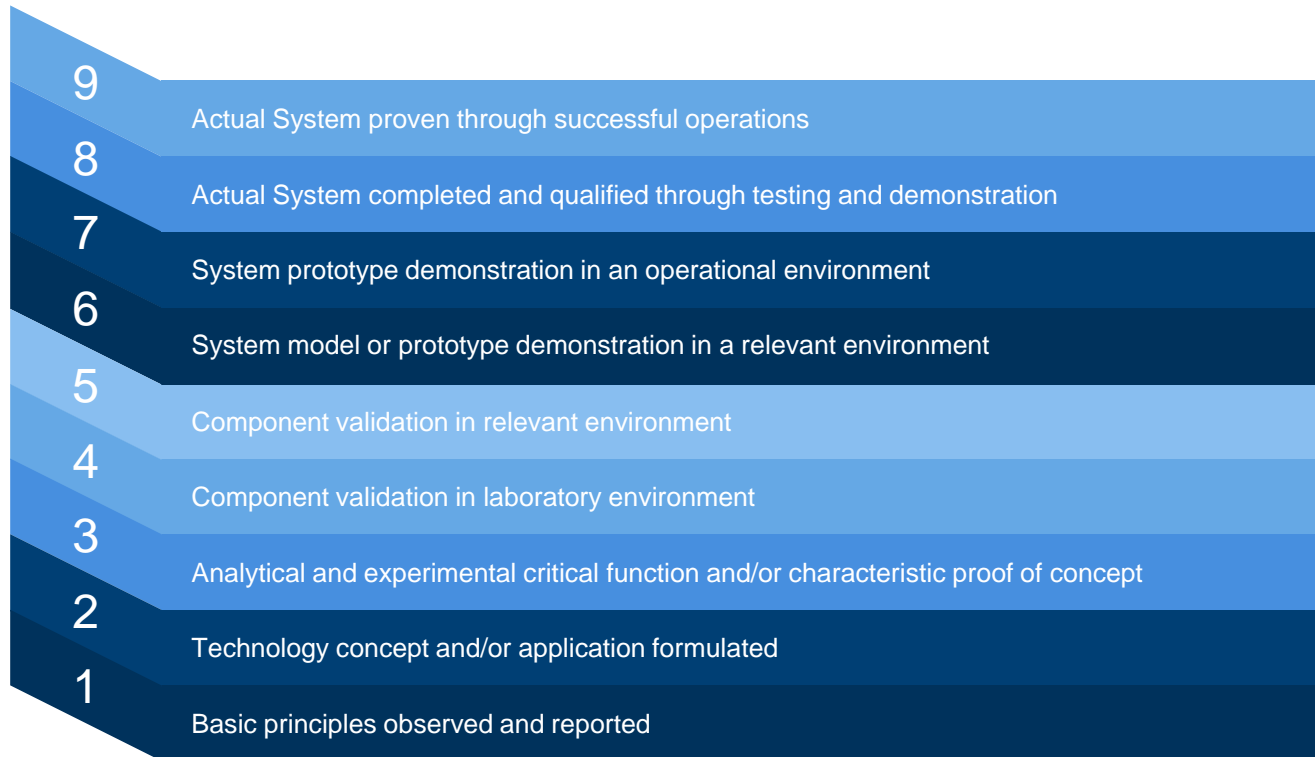


A catalyst for growth and success in the UK

Seven UK-based centres for excellence, covering high value markets, and sharing **expertise and knowledge** to create a robust support network for advanced manufacturing in the UK.



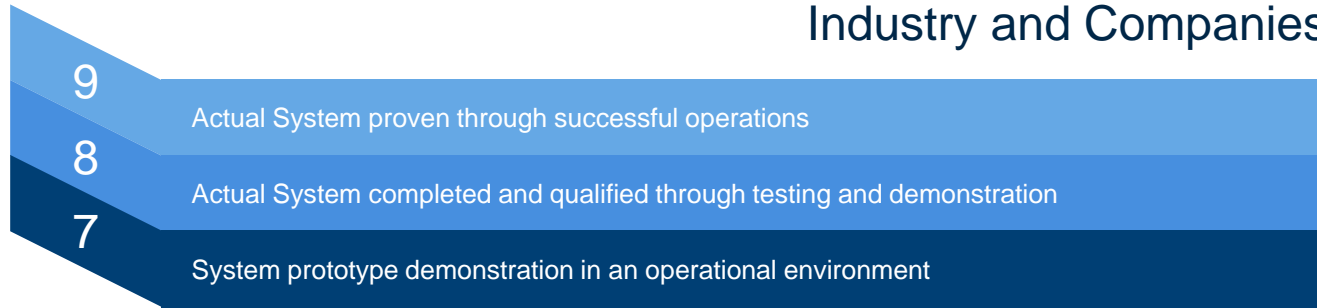
Technology Readiness Levels (TRL)



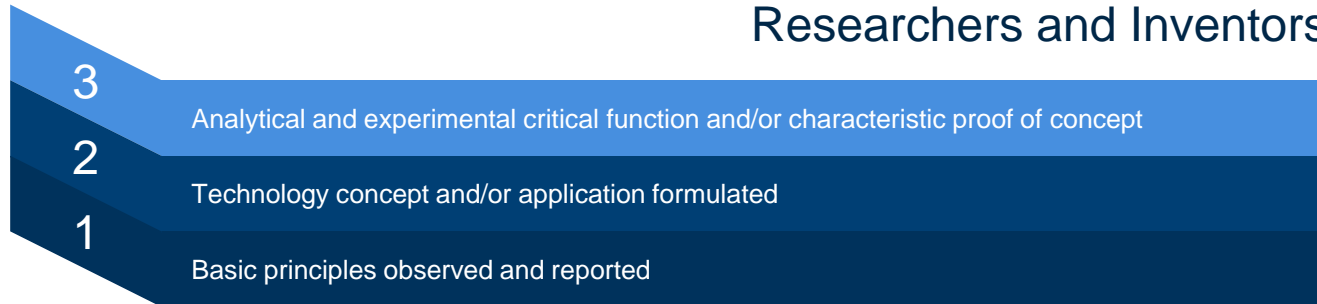
Technology Readiness Levels (TRL)



Technology Readiness Level 7-9 Industry and Companies



Technology Readiness Level 1-3 Researchers and Inventors

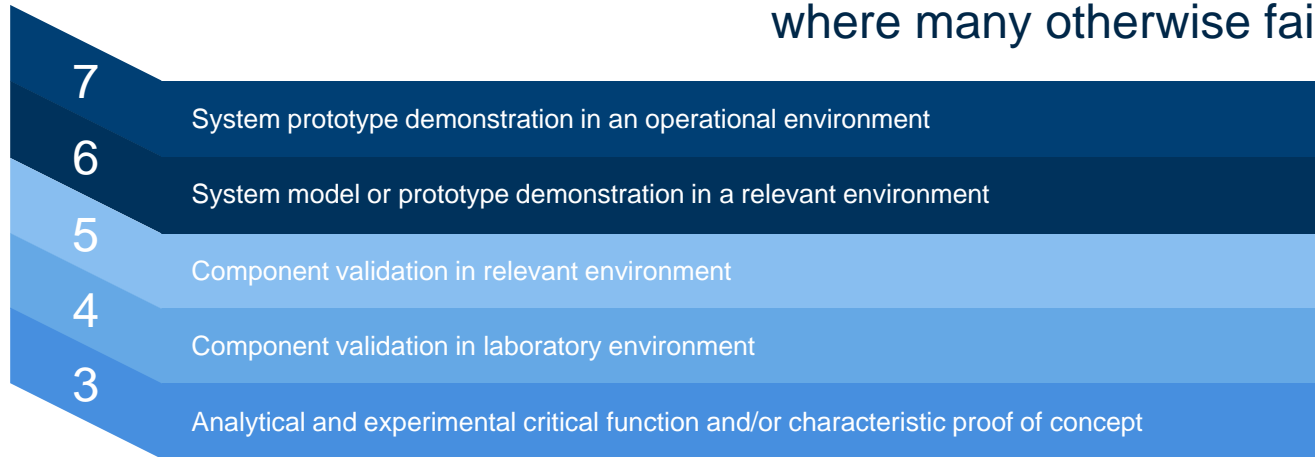


Technology Readiness Levels (TRL)



Technology Readiness Level 3-7 (Valley of Death)

CPI helps companies succeed
where many otherwise fail



The CPI Process



Integrate CPI assets and knowledge to create scalable products and processes that work

Prove that the product or process will meet a market need

Demonstrate the product or process across TRL 3 - 7

Get the product or process ready for production;
reducing risk and providing partners with confidence to invest

Help clients understand their market environment and create options
for their future

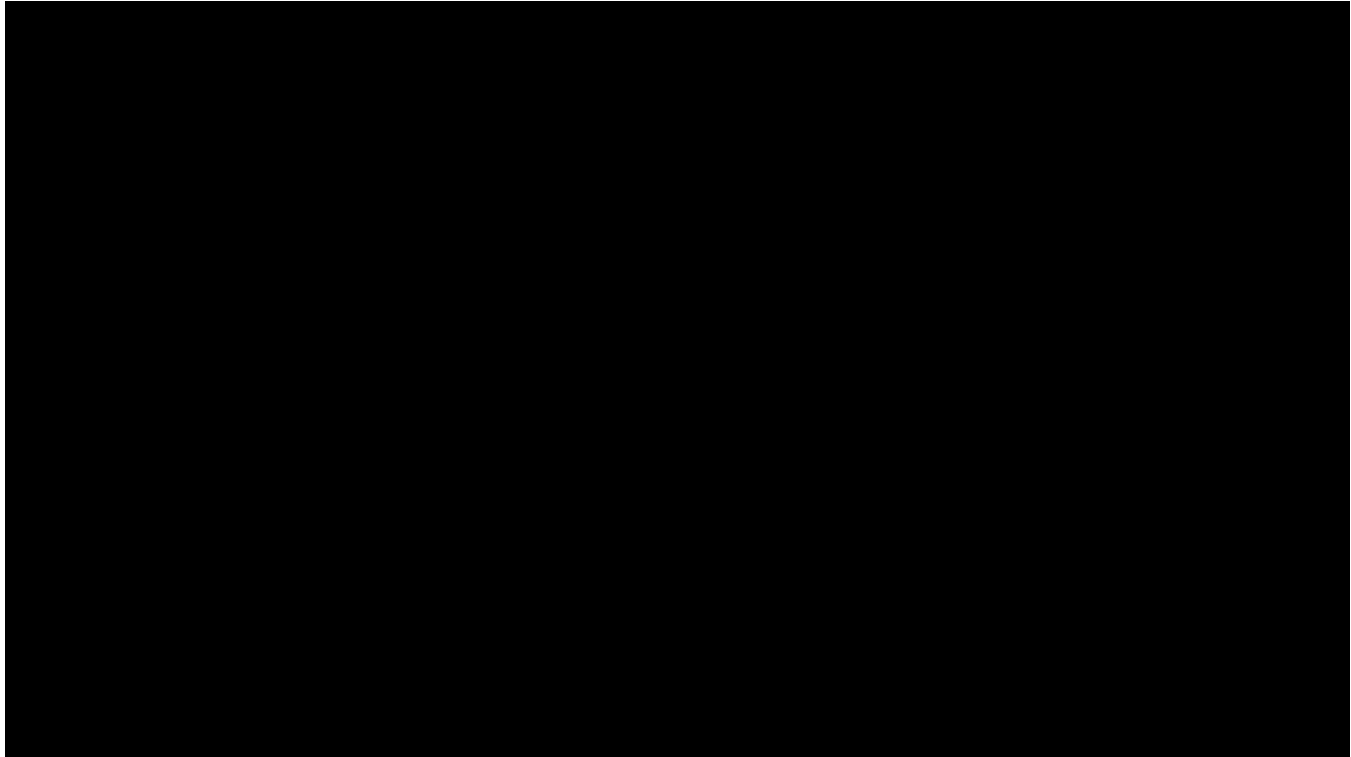
Summary of CPI



Reduce risk before investing large sums of money on new facilities by demonstrating and refining novel technologies

Proof of concept and process scale-up showing that new concepts are feasible before approaching potential investors, stakeholders or funding programmes

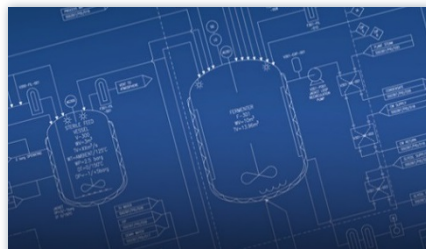
Decrease the time to market for a novel product or process by accessing proven demonstration assets and key expertise



Services



**State of the Art
Landscaping**



**Engineering
Assessment**



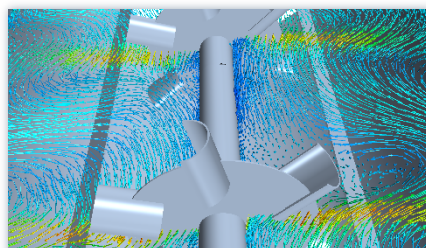
**Scale-up and
Scale-down**



Technology Selection



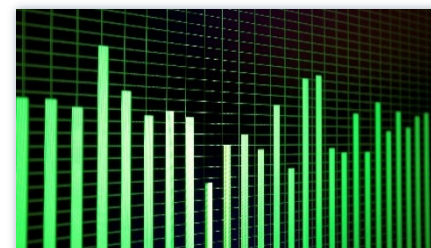
**Techno Economic
Evaluation**



Process Modelling

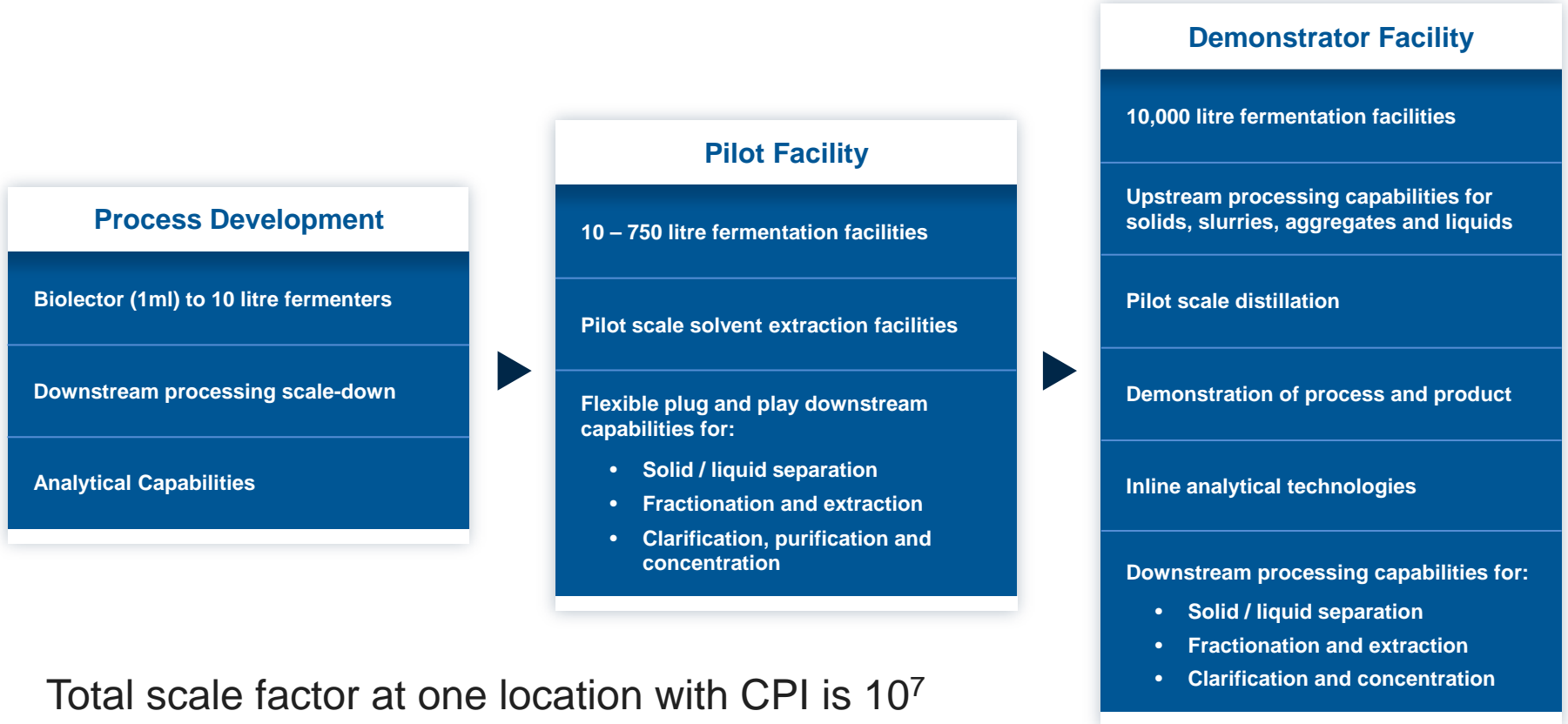


Demonstration



Process Efficiency

Facilities



Total scale factor at one location with CPI is 10^7

Case Study – Project Tees



- Technology transfer;
- Technology development and scale-up;
- Standards and training;
- Analytical development;
- Project Management (Technical and engineering);
- Engineering Scoping and Design;
- Safety Assessments;
- Full Operation and Maintenance contract services for integrated facility;

WP	Description
1	Technical Transfer from Norway
2	Seed process development
3	Hazard Analysis Critical Control Parameters
4	Engineering Design and support
5	Plant operation and Commissioning
6	Overall Technical Transfer
7	Analytical Laboratory and equipment
8	Microbiological QC
9	Project Management
10	Engineering support to commissioning

Innovation Team



- 3-way collaboration between
 - Client
 - CPI
 - Engineering Contractor (Otto Simon Limited)
- Multiple disciplines;
- Complex Multi stream project (tech transfer, tech dev, analytical, HACCP, scale-up/down, engineering, operations)
- Multi £million

Project Timelines



2014 2015 2016

Initial engagement

07/14

10/15 01/16
Phase 1 quote Phase 1 Delivery (Eng feasibility study)

Framework Agreement

05/16 12/16
TT scope Phase 3a: TT Schedule Phase : Technical Transfer and Process Development

Phase 2 Schedule Phase 2 Delivery: Design, Build, Commission.

01/16 01/17

Ops scope Phase 3: Ops Schedule Phase 3 Delivery: Operations



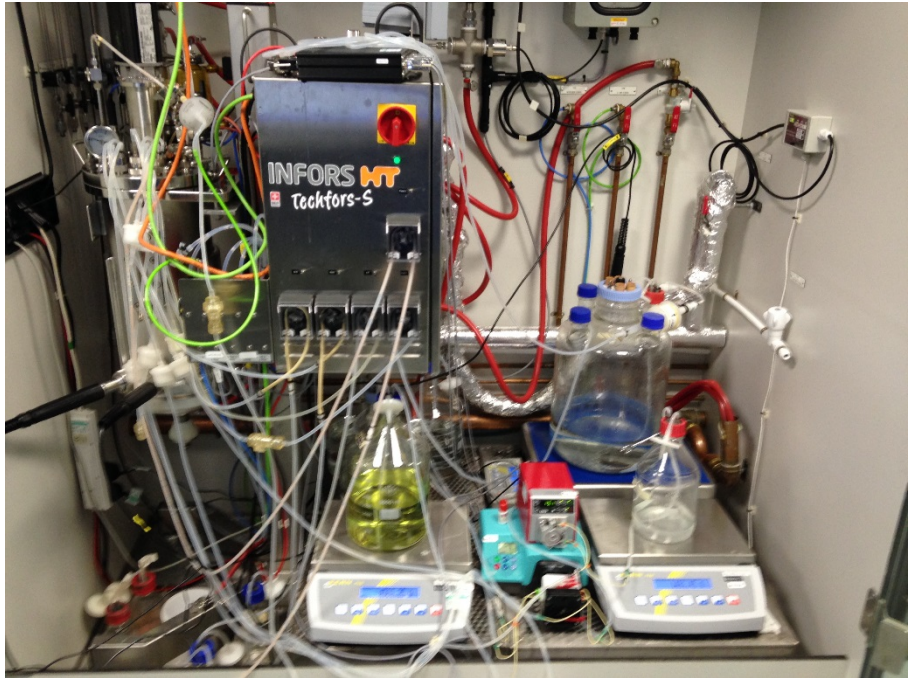
Project Resources



Project Stage	Client Team	CPI Team	Capabilities
Feasibility	1 exec, 1 scientist	2 eng 1 op 3 scientists	Ferm Sci, Chem Eng, Ops
Initial Tech Transfer	1 scientist	4 scientists	Ferm Sci, Microbio,
Process Development	2 scientists (recruited)	8 scientists (24 x 7)	Microbio, Ferm Sci, scale-up/down, Chem Eng
Analytical/ QA	2 scientists (recruited)	1 PM 2 scientists	HACCP, PAT
Process design/build	1 exec 1 eng	5 eng 2 ops 1 scientist	Chem, Elec, Control Eng, Ferm Sci, Ops
Tech Transfer/Start-up	5 scientists	6 scientists	MicroBio, Ferm Sci, PAT
Operation	3 scientists (oversight)	15 ops, 1 eng, 5 scientists (24 x 7)	Chem Eng, Ops, Ferm Sci, PAT, QA
Total Resources	1 exec, 2 eng, 5 scientists + admin	2 PM, 11 scientists, 15 ops, 6 engs	

Project Tees – Technology Transfer

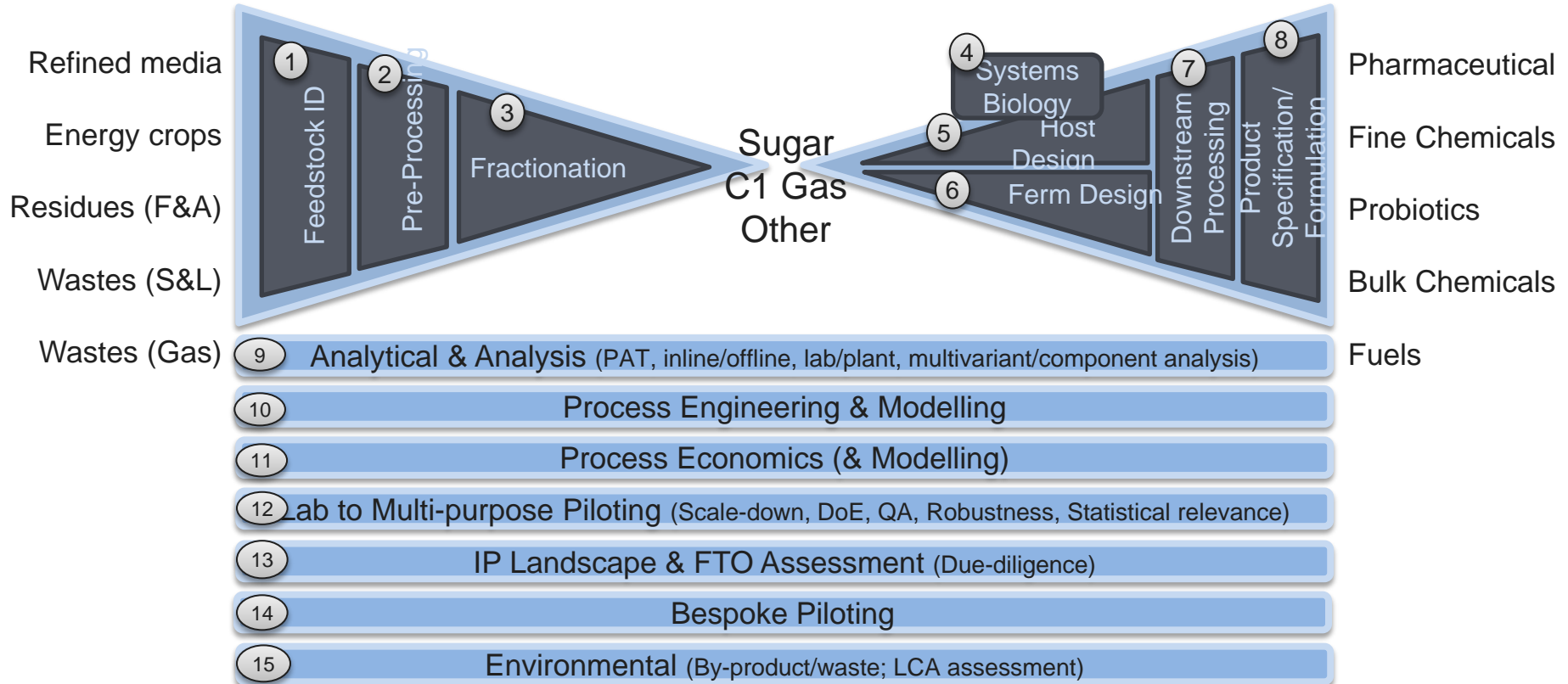
- Technology transfer from Client to CPI;
- Reconfiguration and modification of CPI lab hardware (Rand 1.1m);
 - Mass flow to gravimetric flow regimes;
 - Controller reconfiguration
- Two scientist team working with client;
- Reproducible and repeatable results



Project Tees – Engineering design and construction



Science of Scale-Up and Commercialisation



The Alliance of Open Access Biorefining Centres

Our Vision

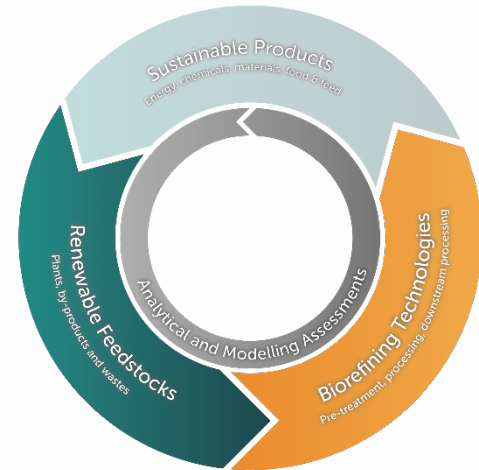
The UK as a global leader in biorefining technology development and bio-based product manufacture within a sustainable high-value bioeconomy.

Our Mission

A stable, integrated, cost-effective pilot and process development service

Increase UK knowledge and capabilities in biorefining and industrial biotechnology (IB).

Nurture the development of SMEs to support the growth of UK bio-based value chains



SmartPilots – Interreg Europe

Improving policies in support of shared pilot facilities to increase their impact on the Key Enabling Technology Industrial Biotech and the European Bioeconomy

Partners

- Bio Base Europe Pilot Plant (Belgium) PROJECT LEAD
- Department of Economy, Science and Innovation – Flemish Government (Belgium)
- Centre for Process Innovation (United Kingdom)
- VTT Technical Research Centre of Finland Ltd (Finland)
- Bioprocess Pilot Facility (Netherlands)
- Province of Zuid Holland (Netherlands)
- Innovhub SSI (Italy)

Case Studies

- Fraunhofer Institute for Chemical-Biotechnological Processes (Germany)
- ARD - Agro-Industrie Recherches et Développements (France)



European Union

European Regional
Development Fund

Thank you...

For more information visit www.uk-cpi.com

Email: info@uk-cpi.com

Twitter: [@ukCPI](https://twitter.com/ukCPI)

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