

Reimagining materials and manufacturing



Innovate
UK

Reimagine Materials and Manufacturing Event: Agenda

09:30 **Registration and Exhibitions**

10:00 **Welcome and introduction**

Ajay Kapadia, Knowledge Transfer Manager, Innovate UK KTN

10:05 **About Innovate UK**

Paul Gadd, Deputy Director, Land & Maritime Transport, Manufacturing and Materials, Innovate UK

10:15 **Reimagining materials and manufacturing together – 2050 Vision**

David Elson, Head of Manufacturing and Materials, Innovate UK

10:25 **International opportunities**

Cherie Gardiner, Global Innovation Lead, Innovate UK

10:30 **Major UK funding opportunities**

Chaco van der Sijp, Manufacturing Innovation Lead, Innovate UK

10:50 **Exhibitor Pitches**

Available to all exhibitors

11:20 **Break, networking and exhibitions**



Reimagine Materials and Manufacturing Event: Agenda

12:00 **Inclusive Innovation – how a focus on equality, diversity and inclusion can support innovation success**

Led by Karen Souza Diversity and Inclusion Partner, Innovate UK KTN and to include Shruti Grover, Co-Founder and CEO of Pattern Project and Millie Flemmington-Claire, Founder of Human Beauty.

12:40 **Design in innovation**

Nicole Agba, Knowledge Transfer Manager – Design and Innovation Effectiveness, Innovate UK KTN

12:50 **REforMM Pitch Session**

Available to all attendees

13:30 **Innovate UK KTN support**

Peter Clark, Head of Chemistry and Industrial Biotechnology

Karl McCracken, Industrial Technologies and Manufacturing Team Knowledge Transfer Manager, Innovate UK

Ajay Kapadia, Knowledge Transfer Manager, Materials Team, Innovate UK KTN

13:40 **Lunch, clinics, networking and exhibitions**

16:00 **Formal End and Refreshments**

18:00 **Venue closes**



Reimagine Materials and Manufacturing Event: Housekeeping

There will be photography at the event today which will be used for promotional purposes, if you do not want to be included in these photos, please come and see me at some point today and tell me

Fire exits

Evacuation Points

Toilets

Lift/Stairs

Introduction to Innovate UK

Paul Gadd

**Deputy Director, Land & Maritime
Transport, Manufacturing and Materials**



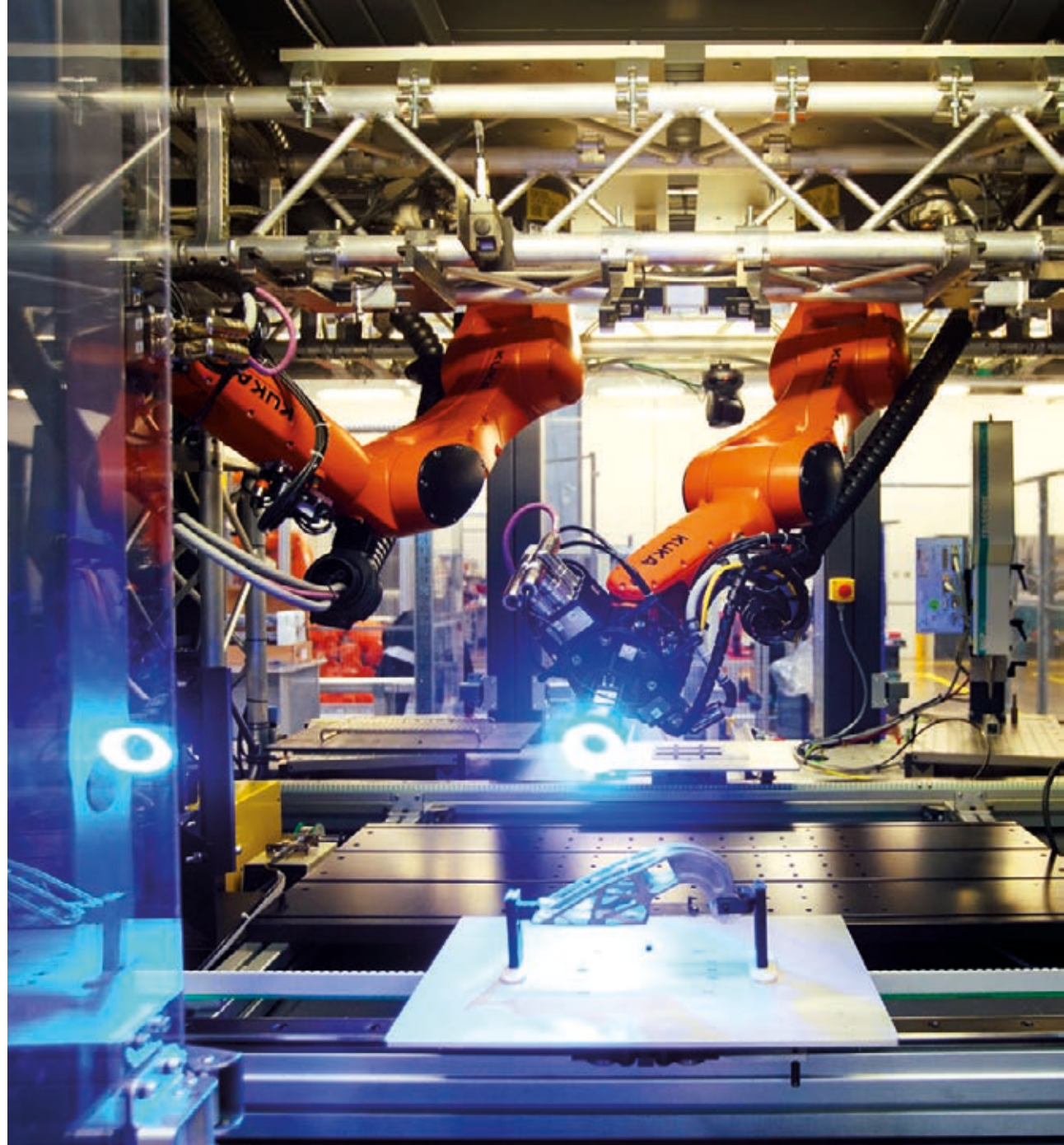
Innovation

The lifeblood of business

- Innovation delivers new or improved products, processes & services
- It is key to UK growth and prosperity

Innovate UK

- We are the UK's innovation agency
- We support business-led innovation in all sectors, technologies and UK regions
- A key delivery body of the Government's Innovation Strategy



Inspire

Make the opportunity
visible and compelling

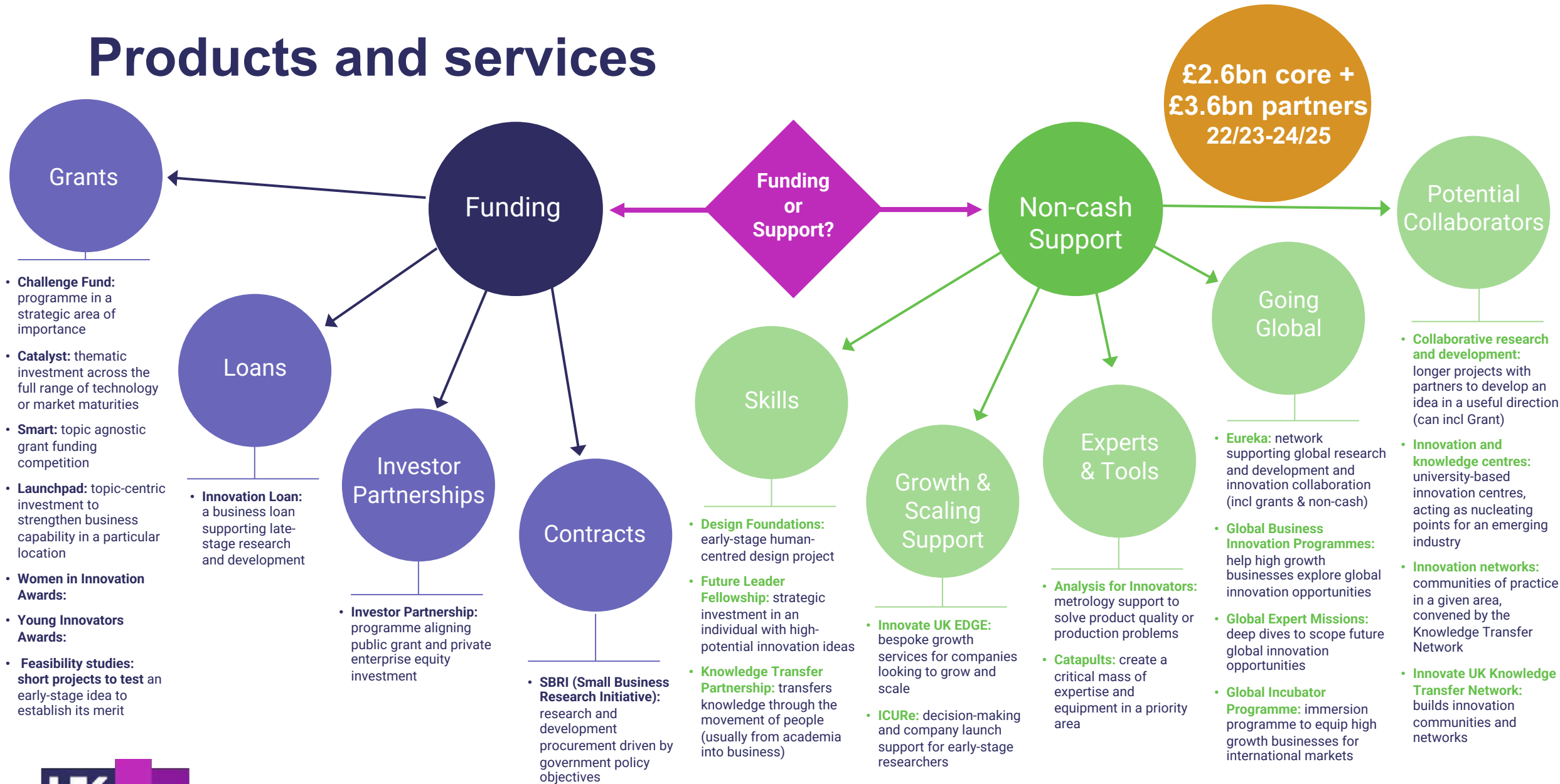
Involve

Bring relevant organisations
and people together

Invest

Convene the resources
needed, including our own

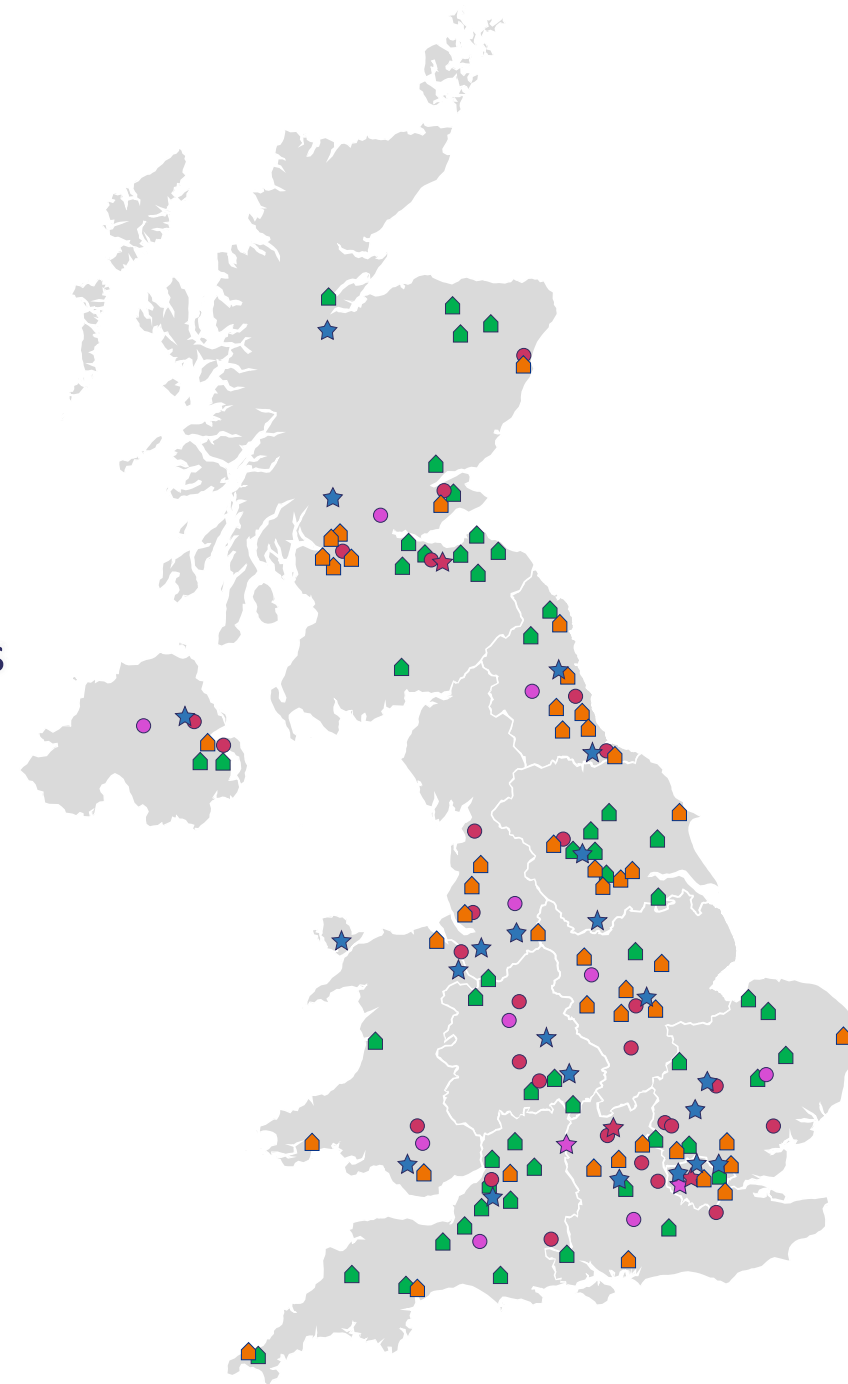
Products and services



UK-wide presence

From funding and advisory services to facility and technology access, Innovate UK supports innovative businesses across every national and region in the UK.

The geographical distribution of our staff and facilities ensures we engage place-based stakeholders and meet regional needs.



Symbols

- Expertise
- 🏠 Facilities
- ★ Offices

Colours

- Innovate UK
- Innovate UK EDGE
- Innovate UK KTN
- Catapults
- Agri-Tech Centres

Plan for Action => Future Economy



Innovate UK Plan For Action was published in Nov '21

The **Plan for Action** has five (5) Strategic Themes and six (6) Strong Foundations

Plan For Action will be delivered through three (3) domain priorities



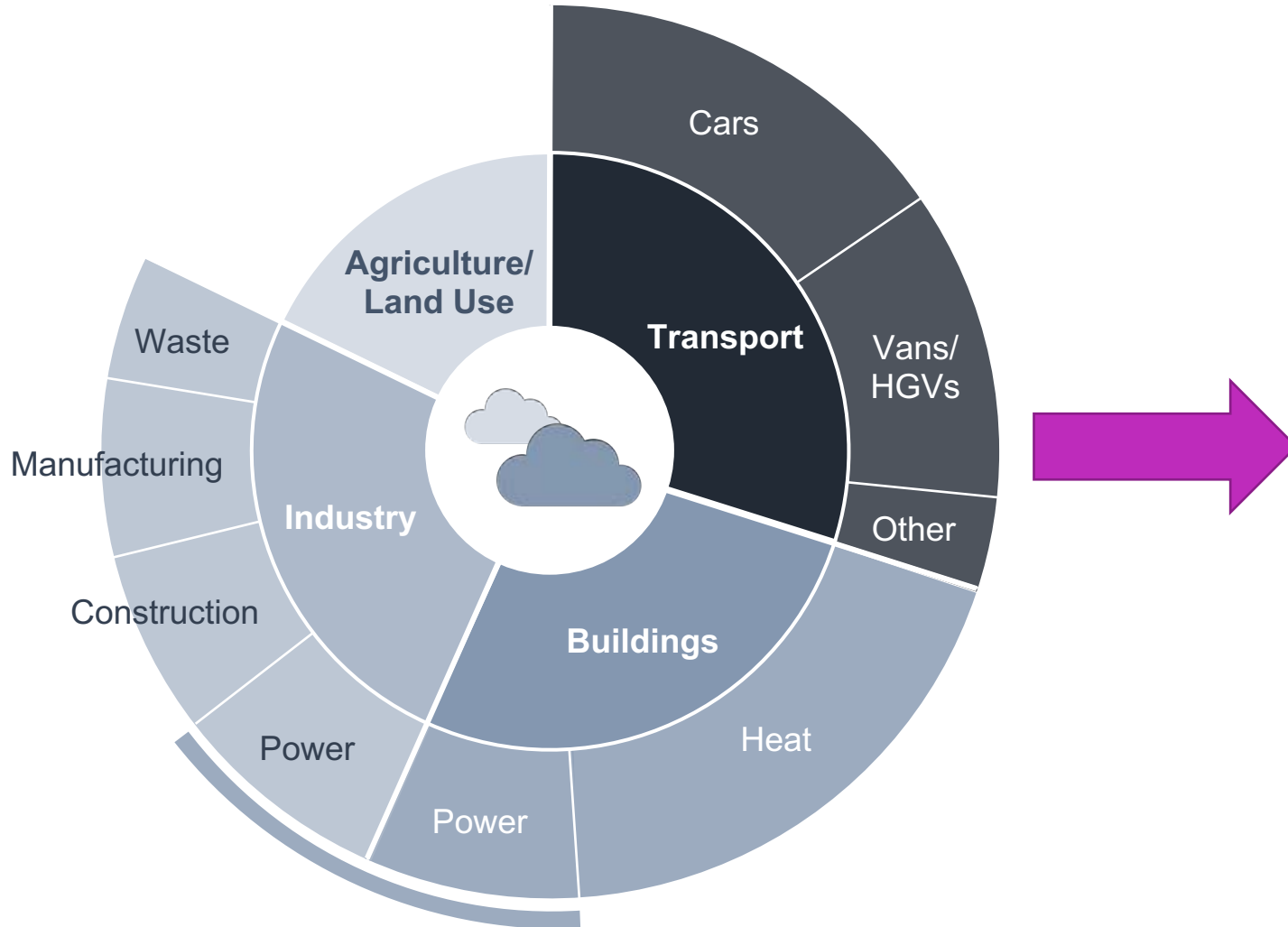
		Net Zero	Healthy Living & Agriculture	Digital and Technologies
Strong Foundations	Science and Research Strengths			
	Design			
	Societal impact and responsible Innovation			
	Innovation talent and skills			
	Equality Diversity and Inclusion			
	Place and Levelling up			
Technology Families	Advanced materials and manufacturing			
	AI, digital and advanced computing			
	Bioinformatics and genomics			
	Engineering biology			
	Electronics, photonics and quantum			
	Energy and environment technologies			
	Robotics and smart machines			

Net Zero: Our Vision



For the UK to prosper from being the fastest transitioning economy to net zero

Current UK emissions



Net Zero Framework

- Heat
- Make & Use
- Mobility
- Power
- [Agriculture and Food]
- Critical circular materials
- Green finance
- Net zero living

Clearly materials and manufacturing underpin the transition and advancement across all these areas

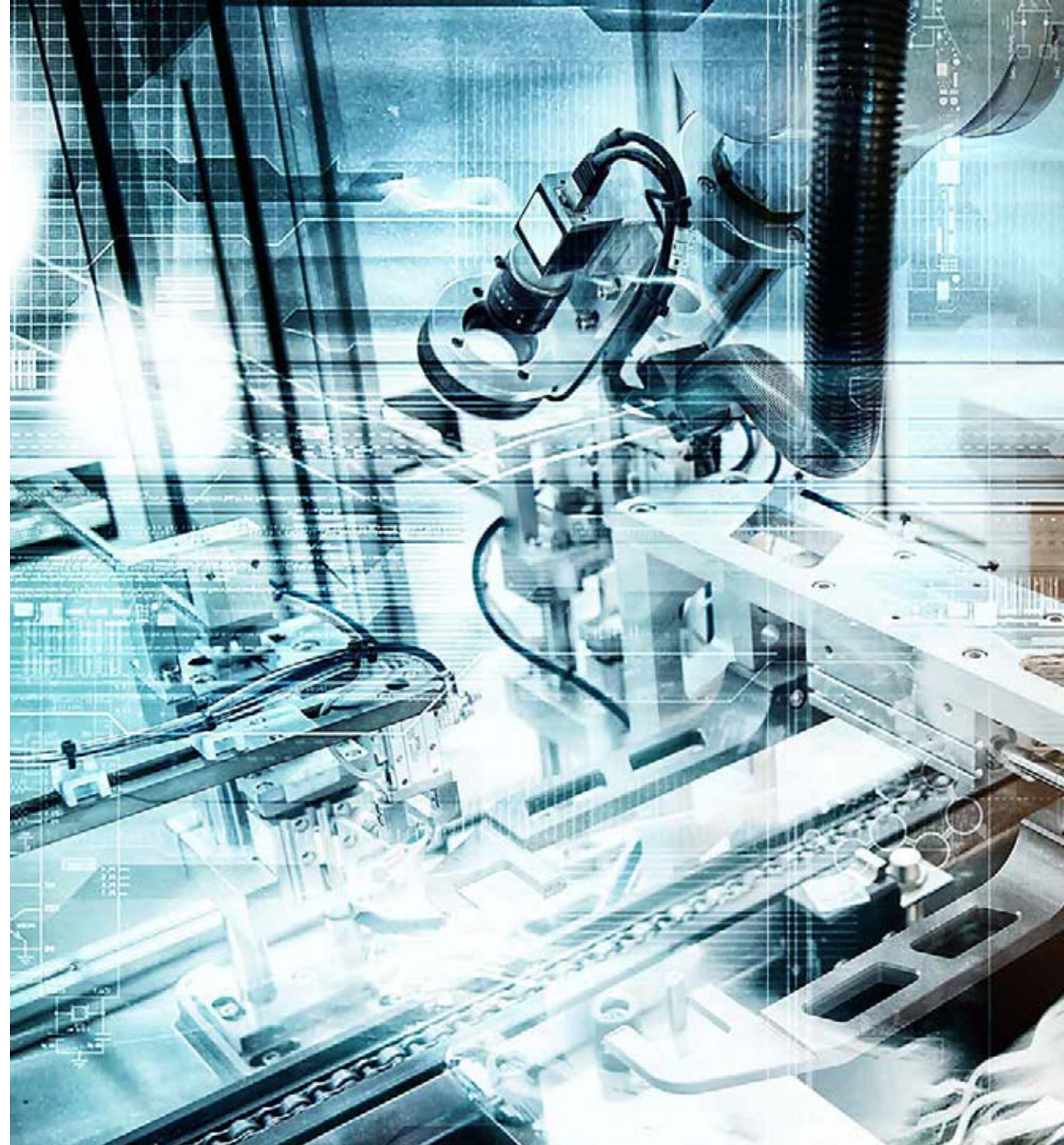
Materials and Manufacturing Vision 2050

David Elson

Head of Manufacturing and Materials

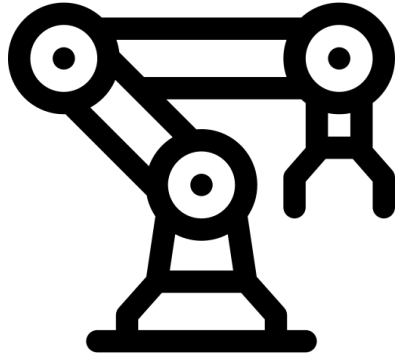


Innovate
UK



Inspire: Materials and Manufacturing

Critical, and changing



Economy

- £203bn GVA
- 45% UK exports
- 2.5m jobs
- 61% UK R&D spend

Emissions

- >15% domestic emissions, 43% consumption emissions

Supply chain resilience

- Change and disruption as the new normal

Technological advancement

- Efficiency, visibility and novel business models

Three strategic imperatives



Net zero,
resource efficient



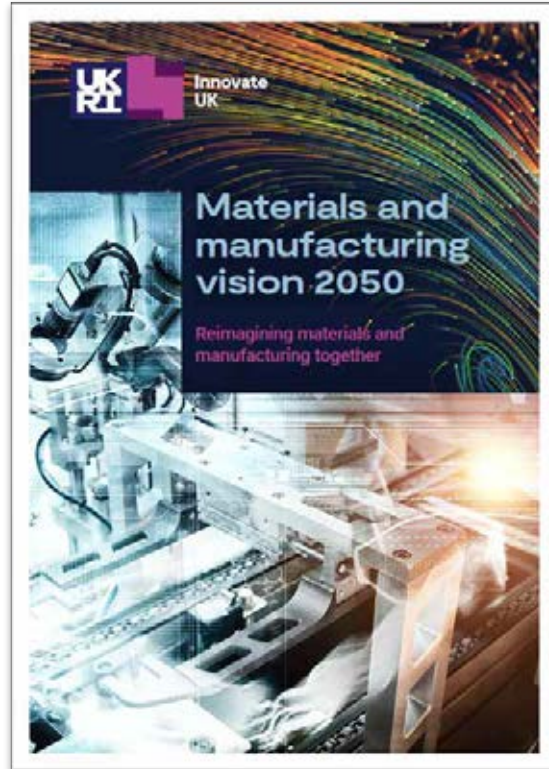
Resilient,
responsive



Technologically
advanced, digital

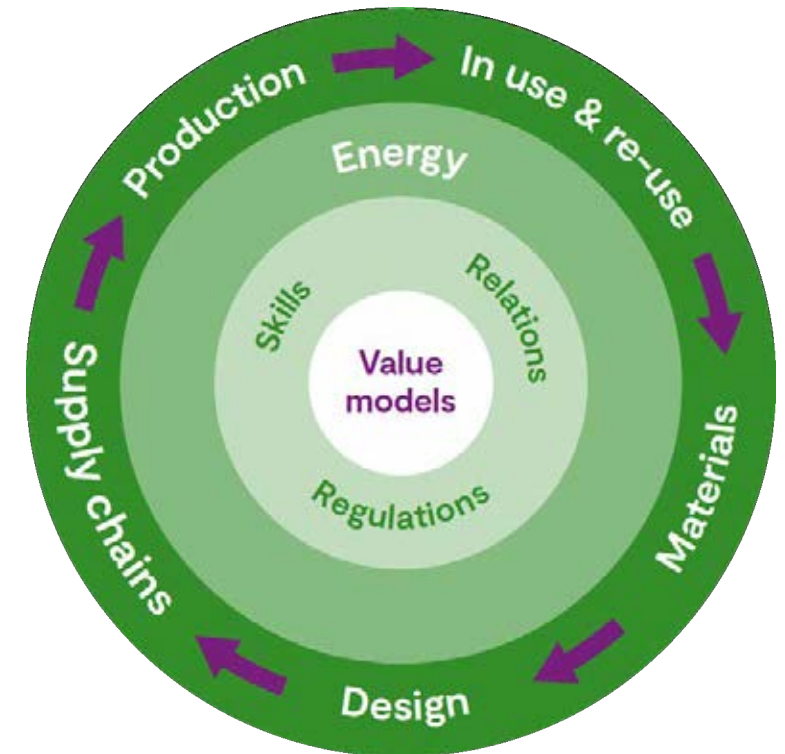
Reimagining materials and manufacturing together

Systems approach



Core areas
future economy materials
smart design
resilient supply chains
world-class production
longer in use & re-use

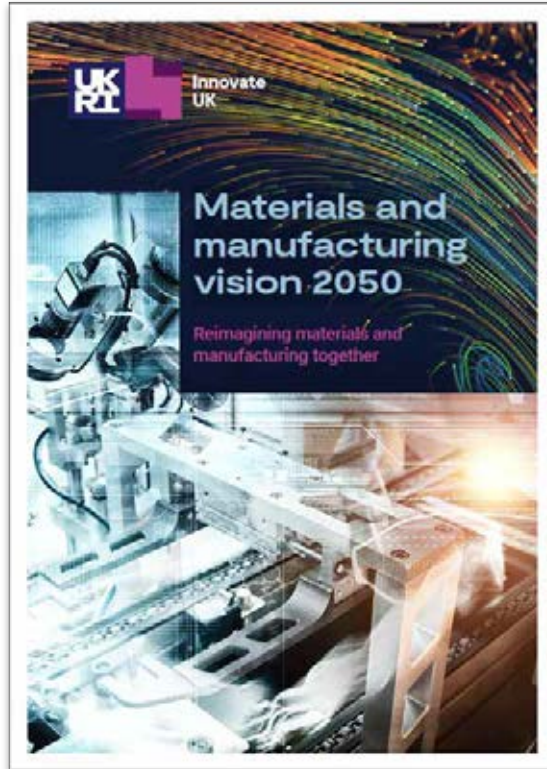
Enabling areas
clean energy
proactive regulations
future skills
networked relations
evolving value models



- ✓ comprehensive
- ✓ sector-agnostic

Reimagining materials and manufacturing together

Systems approach

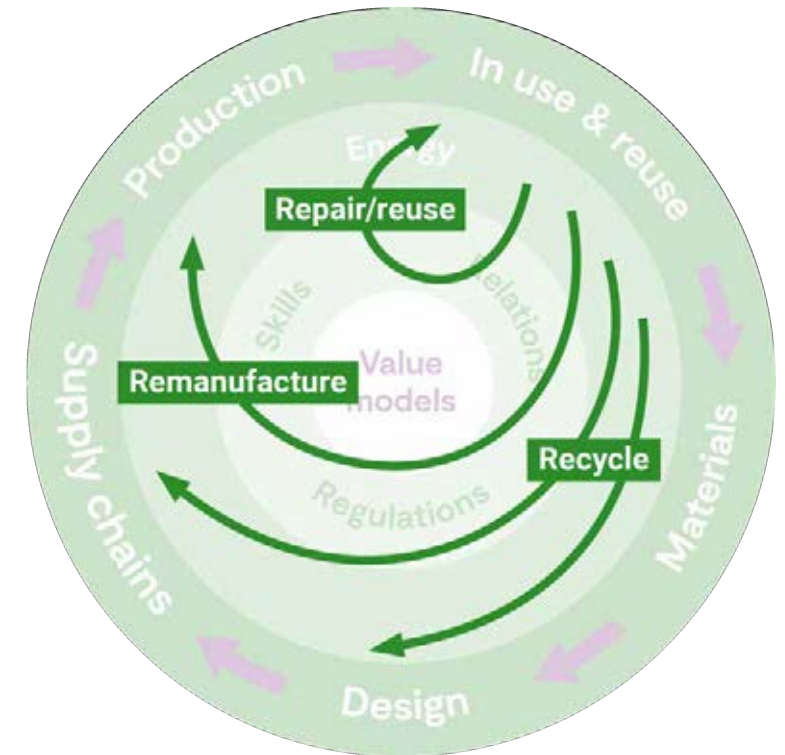


Core areas

- future economy
- materials
- smart design
- resilient supply chains
- world-class production
- longer in use & re-use

Enabling areas

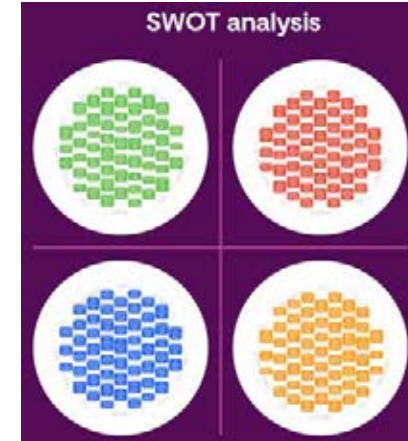
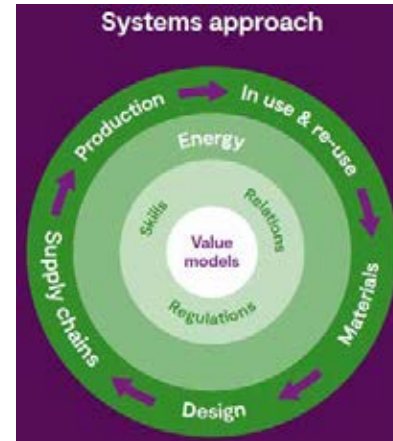
- clean energy
- proactive regulations
- future skills
- networked relations
- evolving value models



- ✓ comprehensive
- ✓ sector-agnostic

Understand & Prosper from the Change

Ensure the UK is internationally competitive



Three strategic imperatives



Net zero,
resource efficient



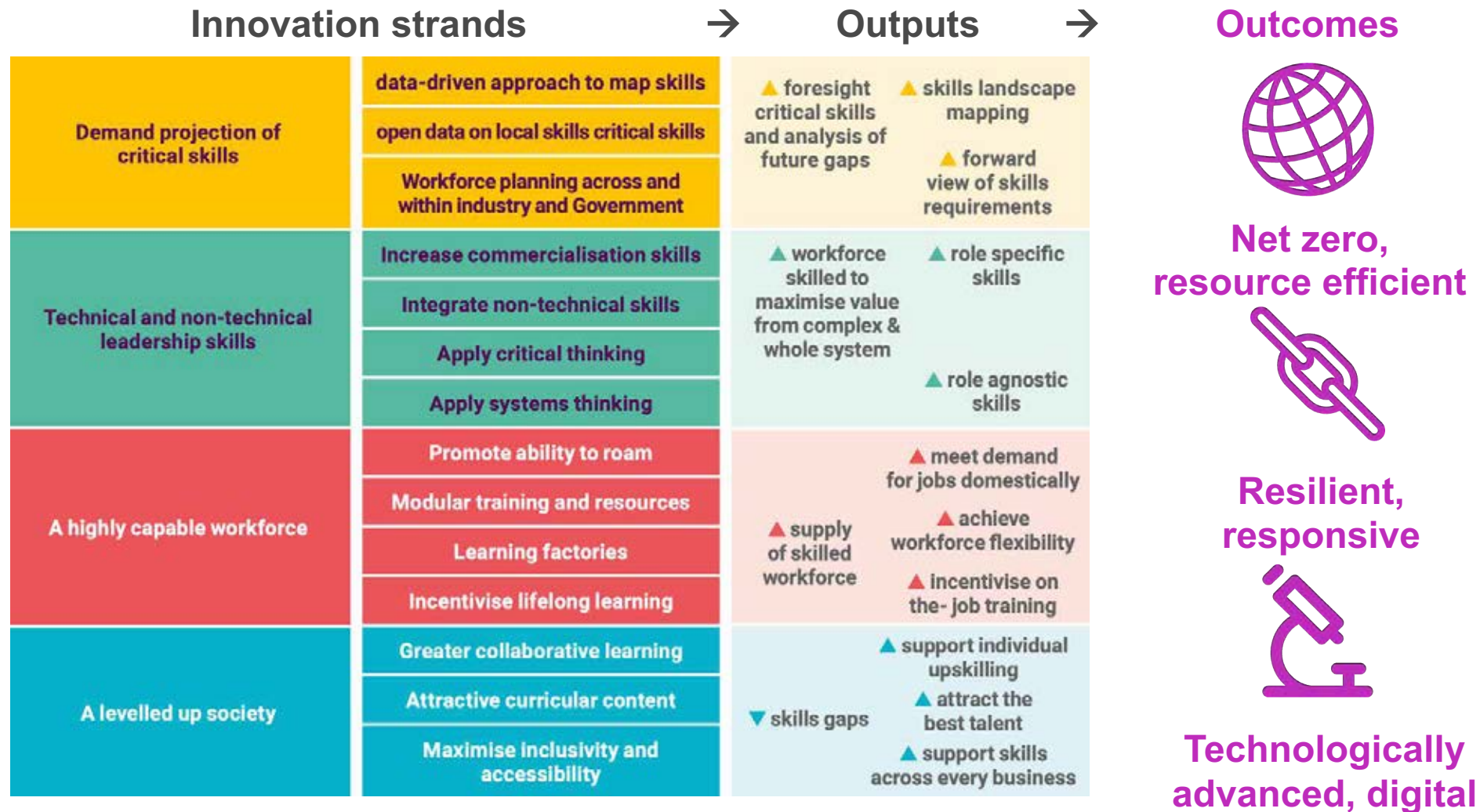
Resilient,
responsive



Technologically
advanced, digital

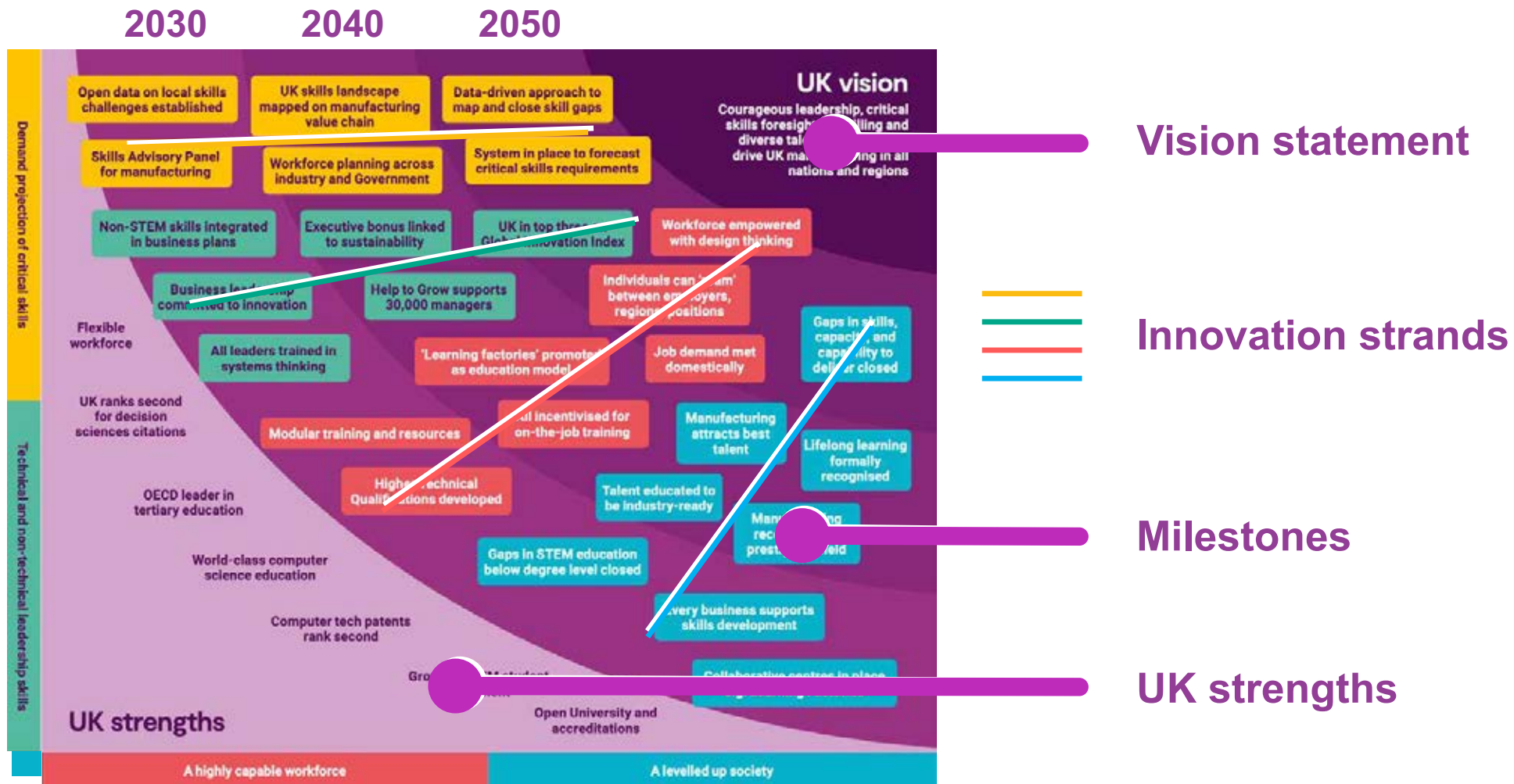
Reimagining materials and manufacturing together

Logic models



Reimagining materials and manufacturing together

Transformation maps



Future skills

Courageous leadership, critical skills foresight, upskilling and diverse talent attraction will drive UK manufacturing in all nations and regions

Global outlook 2050

The nature of work in materials and manufacturing is changing at an unprecedented pace. To ensure resilience, the sectors need the leadership, management and technical capability to anticipate and adapt to multiple challenges. By 2030, the demand for physical and manual skills declines by 30% and the demand for technological and complex cognitive skills rises by 50%, including for high-level social and emotional skills as well as initiative-taking and entrepreneurship¹⁹.

Skills demand is accurately projected

In 2050, accurate systems provide confident detail of future skills demand and allow the workforce and leadership to anticipate and adapt to rapid advances as operations transform and meet increasingly complex and evolving value models. Detailed, objective assessments of need 10 to 20 years ahead are openly available.

Technical and non-technical leadership skills are strong. Business leadership is fully committed to fostering innovation and is skilled in systems thinking. Leaders adapt to constantly changing circumstances, and new

technologies and interpersonal skills allow them to motivate their workforce through transformational change.

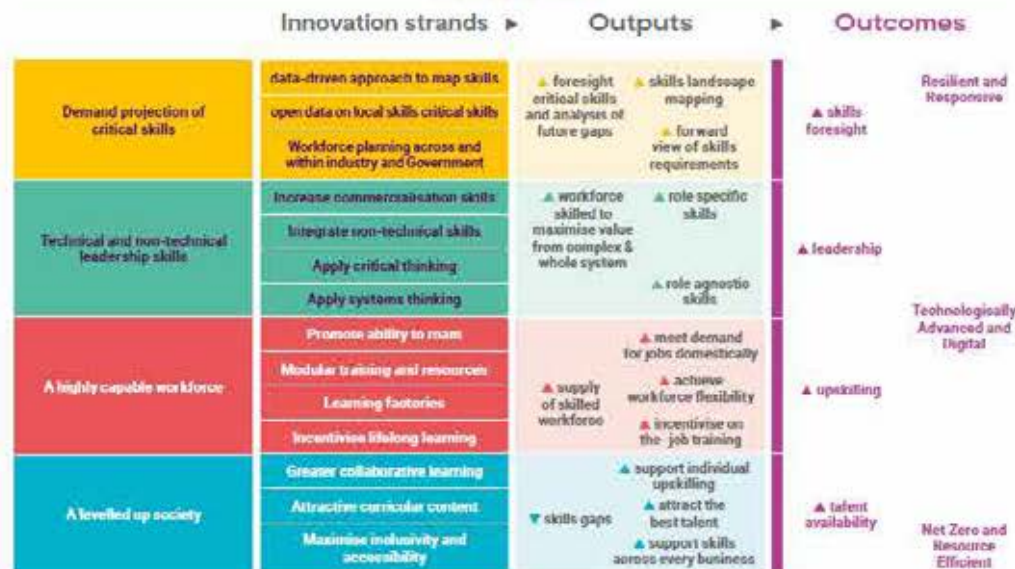
Workforce is highly capable

Training and use of strategic partnerships and collaboration to close gaps in skills, capacity and capability ensure an adaptable workforce. An incentivised lifelong learning culture that supports upskilling and reskilling is widespread. It introduces variety, increases job satisfaction, and attracts the best talent. The workforce is open to change and equipped to adapt to new and changing technologies and working methods.

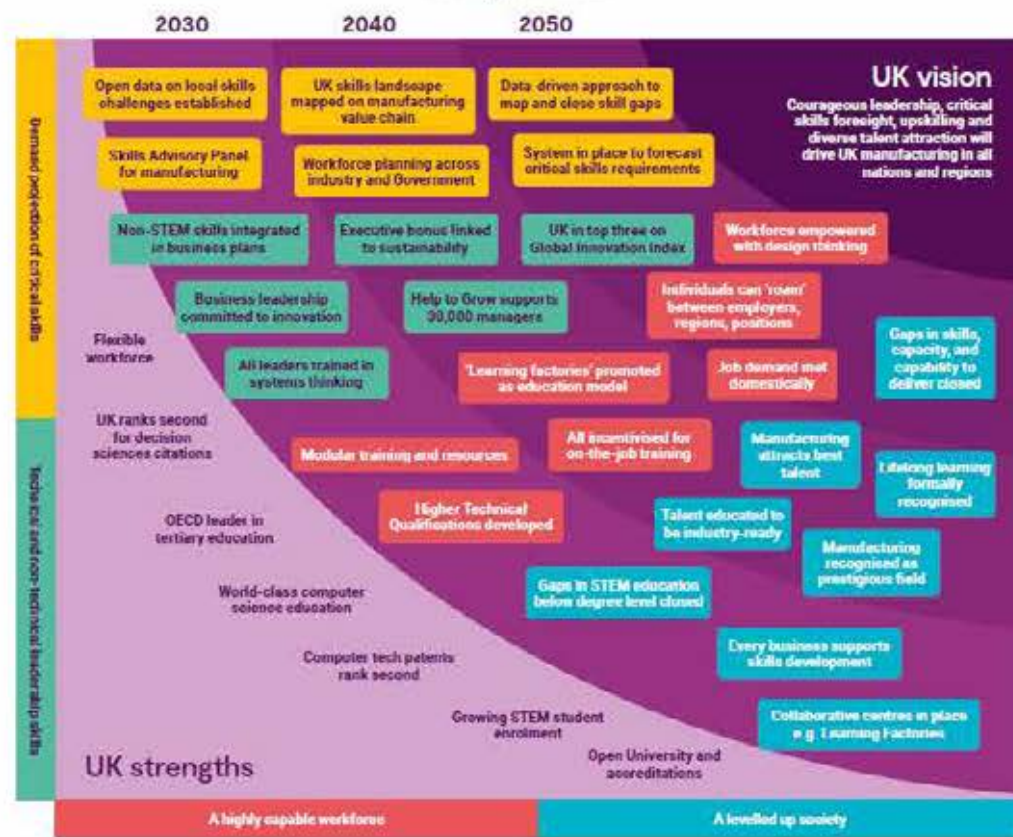
Working in materials and manufacturing is highly attractive

In 2050, materials and manufacturing sectors are universally recognised as prestige and highly professional fields in which to work. Highly skilled, globally mobile innovation talent prefers the sectors. A work environment that seamlessly blends advanced technology with uniquely human skills (critical thinking, creativity, and people management) ensures retention. Clear foresighting of skills helps the education sector provide the education and technical knowledge the workforce of tomorrow needs to maintain success across sectors.

The logic model



UK opportunities



Skills demand is accurately predicted and technical and non-technical leadership skills are strong. The nature of UK employment will change where digitalisation drives employment by work packages and deliverables rather than by large permanent workforces. The UK can take advantage of an excellent research base in decision sciences to link business priorities with data analysis, design and behavioural understanding. This will support the development of tools for foresighting that help to close gaps in skills and understand future needs. Building on existing programmes, opportunities to strengthen this pipeline through apprenticeships and technician training will be readily available and appealing. This development of skills will be a vital part of making UK manufacturing competitive.

Workforce is highly capable and attracted to materials and manufacturing. Student enrolment is growing in science, technology, engineering and mathematics. This can provide a strong pipeline of skilled people able to adopt increasingly complex and evolving value models. Ultimately, the demand for jobs can be met domestically. Distributed, collaborative and flexible working can be developed to provide the right balance to attract the best and most innovative talent. UK companies are well placed to broadly adopt a culture of caring commitment to their people, offering flexibility and opportunity. The UK can become a global reference point for the quality of its manufacturing workforce and its approaches to developing the workforce across all sectors and stages of career.

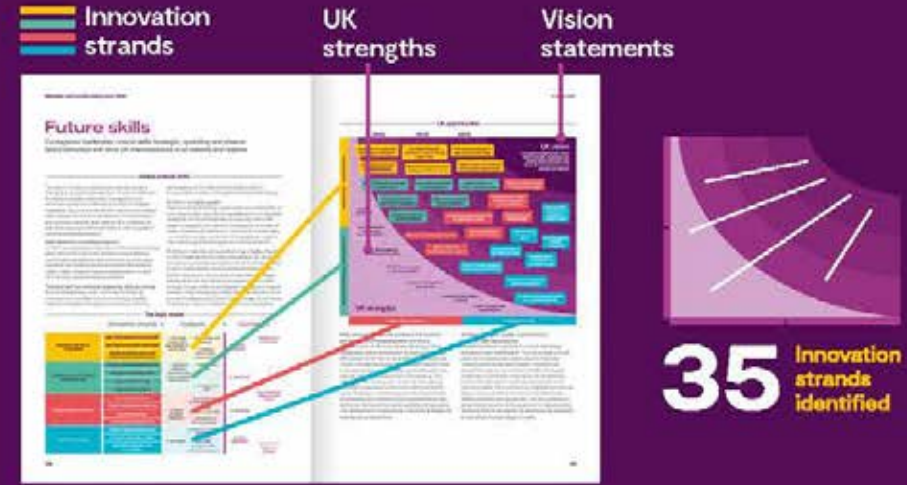
In summary



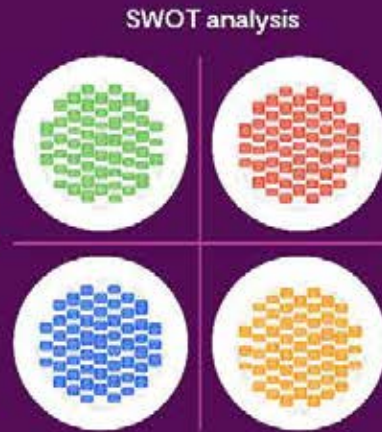
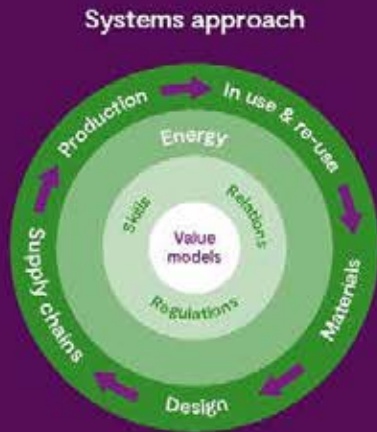
170+
Recent documents
researched



100+
Individual stakeholders
consulted



Sector agnostic vision



10 connected logic models



35 innovation strands



Reimagining materials and manufacturing together

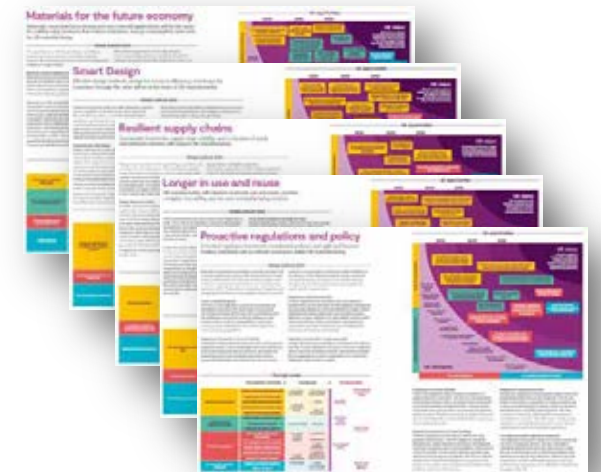
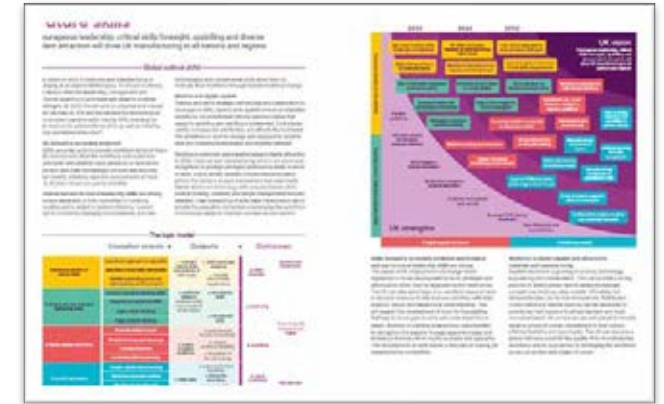
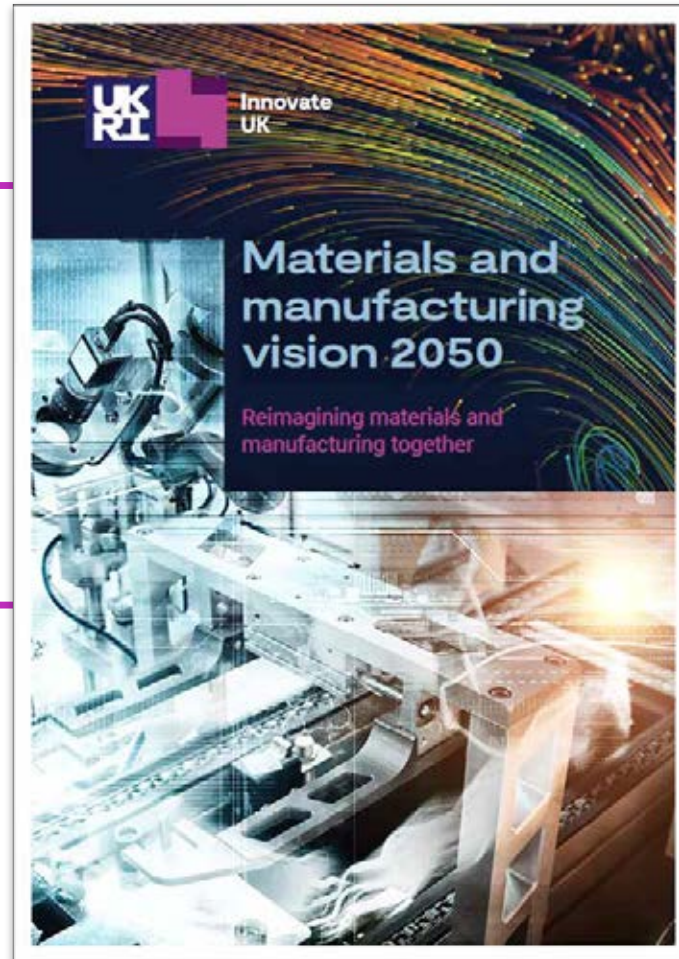
UK Materials and Manufacturing Vision 2050

The report is:

- An aspirational and realistic future
- A significant, comprehensive and inclusive vision

The report will:

- Inform Innovate UK's strategy and investments
- Influence investment and actions of others
- Stimulate discussion and increase alignment



UK Materials and Manufacturing Vision 2050

Now is the time to reimagine materials and manufacturing



Scan to download the report



Learn more about this significant report here www.ukri.org/reimagine-manufacturing

International Opportunities

Cherie Gardiner
Global Innovation Lead



Innovate
UK

Going Global

Innovate UK can support you to grow and scale your business globally, helping you to access knowledge, develop new partnerships and explore international innovation opportunities.

- Global Expert Missions (GEMs)
- Global Business Innovation Programmes (GBIPs)
- Global Incubator Programmes (GIPs)
- Eureka
 - Eureka Eurostars
 - Eureka Network Projects
 - Eureka Globalstars
- Horizon Europe



Global Expert Missions – GEMs

- Innovate UK's Global Expert Missions, delivered in partnership with the Innovate UK KTN, build strategic partnerships and provide deep insight into the opportunities for UK innovation globally.
- Each mission produces a public report summarising the information and insights gathered.
- The report can be used to inform our future global portfolio.
- Recent GEMs
 - Canada
 - Israel
 - South Korea
 - Turkey



Global Business Innovation Programmes – GBIPs

- Innovate UK's Global Business Innovation Programmes help UK businesses to understand and develop innovation opportunities in new markets internationally and are delivered in partnership with the Innovate UK Edge.
- Up to 15 high-growth innovative businesses are supported in each GBIP to explore and exploit the opportunities that exist in specific markets and technology and innovation areas.
- The programme is designed to help companies find partners, build collaborations and explore R&D and innovation opportunities
- Upcoming GBIPs
 - South Korea
 - Singapore
 - Japan



Horizon Europe

- Horizon Europe (2021-2027) is the EU's key funding programme for **research** and **innovation** with a budget of €95.5 billion.
- The 'Horizon Europe Guarantee' scheme provides funding to researchers and innovators unable to receive their Horizon Europe funding while the UK is in the process of associating to the programme.
 - To be eligible you must:
 - be based in the UK
 - have been successful at applying for a Horizon Europe grant with final submission deadlines on or before **30 June 2023**
 - have been included on the initial grant proposal as a '**beneficiary**' with an assigned budget
- Funding & tenders portal
- CORDIS
- Common mistakes to avoid when applying for Horizon Europe
- Find your UK National Contact Point (NCP)

THREE PILLARS FOR IMPLEMENTATION



Reimagining materials and manufacturing together

International funding opportunities

Innovation Funding Service:

- Eureka Eurostars – Closes 13/04/2023
- Eureka SMART AM – Closes 03/05/2023
- UK-Singapore CR&D – Closes 03/05/2023
- UK-South Korea CR&D – Closes 07/06/2023
- UK-Germany CR&D – Closes 07/06/2023

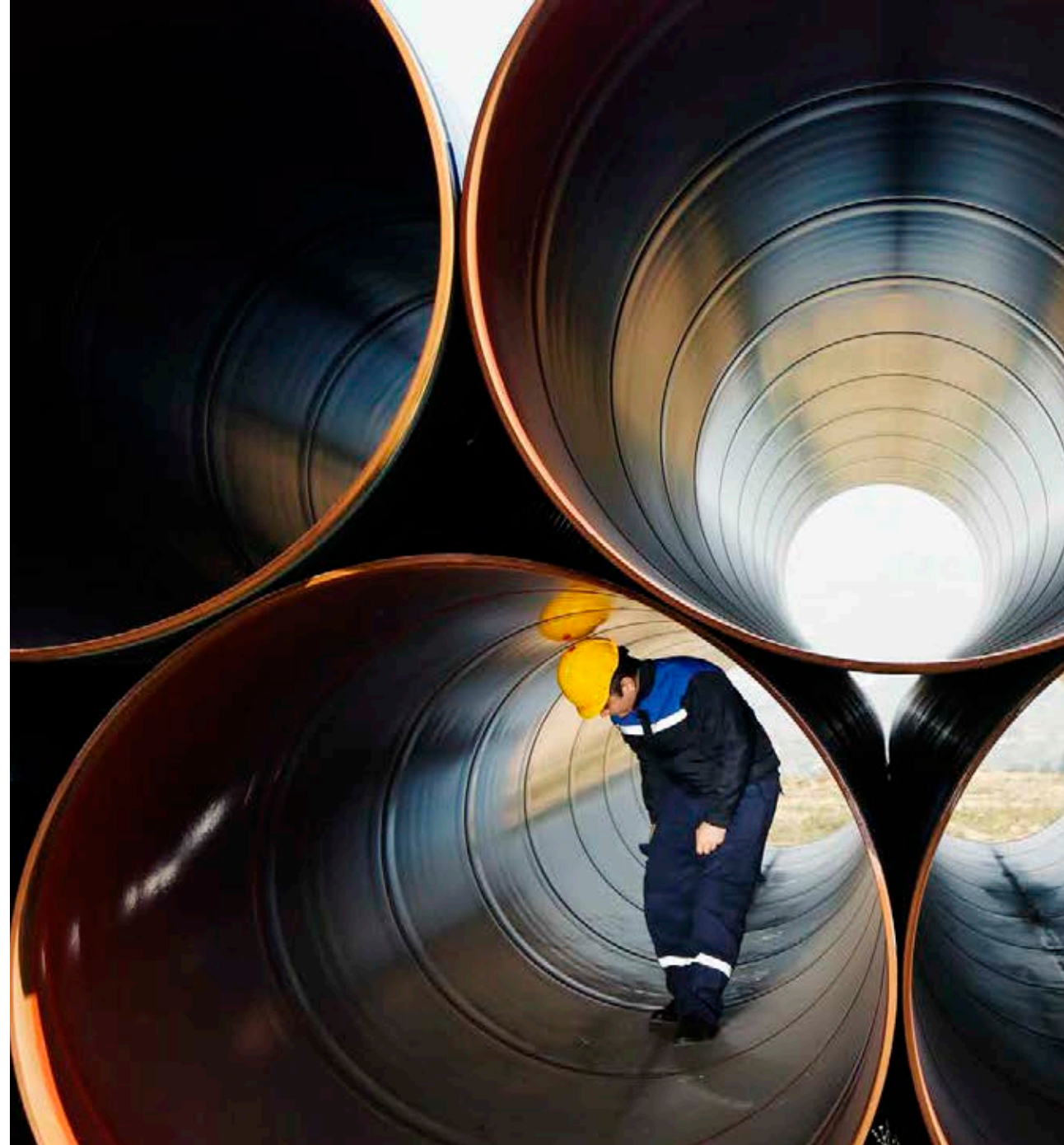
Upcoming:

- UK-Switzerland CR&D – Opens 17/04/2023, Closes 26/07/2023



Funding Opportunities

Chaco van der Sijp
Manufacturing Innovation Lead



Reimagining materials and manufacturing together

Two complementary programmes



Resource Efficiency for Materials and Manufacturing (REforMM)

£15m Innovate IUK funding aiming:

- ✓ The programme aims for the UK to be a **leader** in resource efficiency
- ✓ UK organisations **understanding** the environmental, social and economic impact of the full lifecycle
- ✓ UK organisations **thriving** from adoption of resource efficient solutions which are fundamental to UK and global Net Zero ambitions



Sustainable Bio-based Materials and Manufacture

£14M joint IUK, BBSRC and EPSRC funding aiming:

- ✓ To **enable** UK businesses, academic researchers, and other stakeholders to catalyse and expand research, innovation, and commercialisation in **sustainable biomanufacturing** across the UK
- ✓ To **mitigate** climate change and GHG emissions with credible and scalable bio-based solutions that **displace** fossil or petrochemical materials and products



Delivered by
Innovate UK,
BBSRC and EPSRC

Reimagining materials and manufacturing together

Two complementary programmes



Resource Efficiency for Materials and Manufacturing (REforMM)*

Grant activity £15m (Innovate UK)

- ✓ up to £1m Feasibility studies competition – closed
- ✓ up to £12m collaborative R&D competition – open
- ✓ Investor Partnership programme
- ✓ Feasibility studies competition early 2024



Sustainable Bio-based Materials and Manufacture*

Grant activity £14m (Innovate UK, BBSRC, EPSRC):

- ✓ up to £2m Feasibility studies competition – closed
- ✓ up to £12m collaborative R&D competition – open

Non-grant activities:

Innovation Exchanges and Collaboration Exchanges
International engagement, Innovation Networks, showcasing



Delivered by
Innovate UK,
BBSRC and EPSRC

details subject to change

Reimagining materials and manufacturing together

Two collaborative R&D study competitions

1

Resource efficiency for materials and manufacturing

- Up to £12 million total funding
- Opens 31 March 2023
- Closes 26 May 2023, 11:00

2

Sustainable bio-based materials and manufacture

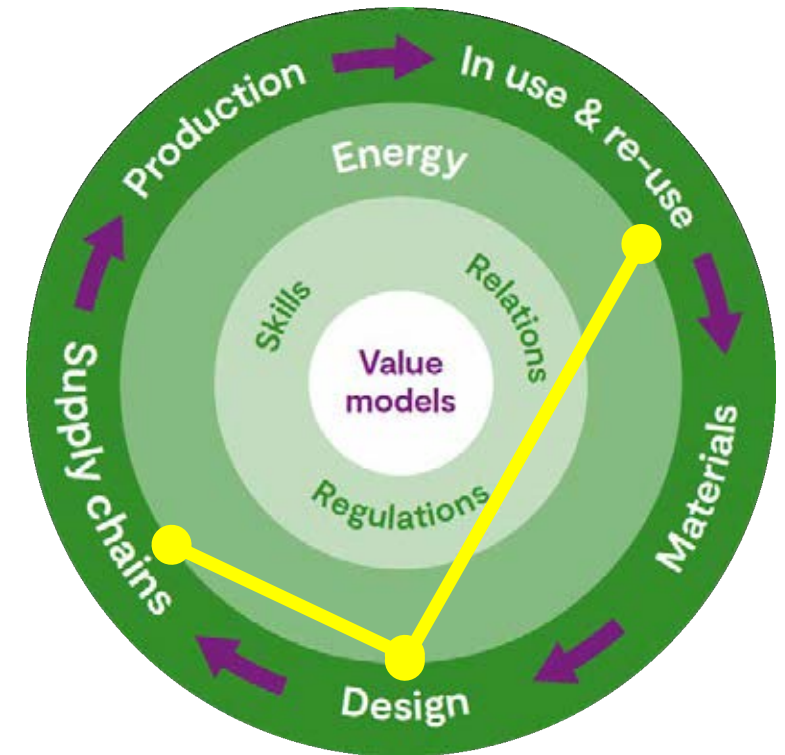
- Up to £12 million total funding
- Opens 7 March 2023
- Closes 3 May 2023, 11:00

✓ Focus on the core areas

future economy materials
smart design
resilient supply chains
world-class production
longer in use & re-use

✓ Do not focus on the enabling areas

clean energy
proactive regulations
future skills
networked relations
evolving value models



- ✓ Join the dots
- ✓ Collaboration is required

Reimagining materials and manufacturing together

Aims

1

Resource efficiency for materials and manufacturing

Which main resource is your opportunity directly aiming to improve its efficiency for?

- materials
- minerals
- water
- * air
- * land
- * soil
- * food
- * marine resources
- * biodiversity
- * energy

* should not be the primary aim

Part of a £15M IUK funding programme aiming:

- ✓ UK to **lead in resource efficiency**
- ✓ UK organisations to **understand** the environmental, social and economic **impact** of the full product lifecycle
- ✓ UK organisations to **thrive** from the development and adoption of resource efficient solutions which are fundamental to UK and global net zero ambitions

Make more with less

Reimagining materials and manufacturing together

Scope

1

Resource efficiency for materials and manufacturing

Out of scope

- **incremental** improvement
- circularity of rare earth elements
- carbon capture and storage (captured carbon as a feedstock is in scope)
- reduction of industrial energy consumption

These are covered by other programmes

In scope is a **significant** improvement of resource efficiency

Materials for the future economy - new material applications for cutting-edge products that reduce emissions, energy consumption and costs

Smart design - effective design methods, design for resource efficiency, and design for maximum through-life value

Resilient supply chains - sustainable feedstocks, supply chain visibility, and co-location of waste and emission streams

World-class production - flexible production capacity, minimal material waste, high-quality products, high productivity, and full adaptivity

Longer in use and reuse - minimising materials use and waste, practising complete traceability, and using new remanufacturing services

Reimagining materials and manufacturing together

Further Info, Support and Activities

1

Resource efficiency for materials and manufacturing

Further information, including briefing:

<https://iuk.ktn-uk.org/programme/manufacturing-materials-reformm/>



Support

If you require advice to confirm whether your innovation project is a good fit the competition or would like help identifying potential partners, then please contact one of the sector experts from Innovate UK KTN

For projects related to chemistry contact:

- Michael Burnett Michael.Burnett@iuk.ktn-uk.org

For projects related to materials, contact:

- Ajay Kapadia Ajay.Kapadia@iuk.ktn-uk.org
- Christopher Pilgrim Christopher.Pilgrim@iuk.ktn-uk.org

For projects related to manufacturing, contact:

- Luqman Hakim Luqman.Hakim@iuk.ktn-uk.org
- Karl McCracken Karl.McCracken@iuk.ktn-uk.org

Stay up to date

- Check out the Innovate UK KTN [Programme webpage](#)
- Sign up to the Innovate UK KTN [newsletter](#)

Reimagining materials and manufacturing together

Programme Aims

2

Sustainable bio-based materials and manufacture

A joint IUK, BBSRC and EPSRC funding programme aiming

- ✓ To **enable** UK businesses, academic researchers, and other stakeholders to catalyse and expand research, innovation, and commercialisation in **sustainable biomanufacturing** across the UK
- ✓ To support organisations utilising biomanufacturing in the future to be:
 - ✓ net zero and resource efficient
 - ✓ resilient and responsive
 - ✓ technologically advanced



Delivered by
Innovate UK,
BBSRC and EPSRC

Reimagining materials and manufacturing together

CR&D Scope

2

Sustainable bio-based materials and manufacture

Out of scope

- biopharmaceuticals
- microbiomes towards human health therapeutics
- sustainable aviation fuels
- alternate protein sources (food and beverage)

These are covered by other programmes

In scope

Projects must address the challenge of developing innovations in sustainable biomanufacturing processes. This can be by:

- developing **alternative bio-based chemical replacements**
- enhancing the **sustainability profile** of biotechnology processes
- innovative use and reuse of renewable **bio-based feedstocks**
- **biotechnology-based and scalable manufacture processes** for sustainable and circular products



Delivered by
Innovate UK,
BBSRC and EPSRC

Reimagining materials and manufacturing together

Further Info, Support and Activities

2

Sustainable bio-based materials and manufacture

Further information, including briefing:

<https://iuk.ktn-uk.org/programme/sustainable-bio-based-materials-and-manufacture/>

To apply:

<https://apply-for-innovation-funding.service.gov.uk/competition/1496/overview/cb5f44ee-2f65-4960-b2d7-c44a3fb2ddd8>

Support

If you require advice to confirm whether your innovation project is a good fit the competition or would like help identifying potential partners, then please contact one of the sector experts from Innovate UK KTN. Academics are encouraged to apply and can contact BBSRC for further information.

Contact:

- Rajesh Mistry Rajesh.Mistry@iuk.ktn-uk.org
- Dana Heldt Dana.Heldt@iuk.ktn-uk.org
- BBSRC: business.unit@bbsrc.ukri.org

Stay up to date

- Check out the Innovate UK KTN [Programme webpage](#)
- Sign up to the Innovate UK KTN [newsletter](#)



Delivered by
Innovate UK,
BBSRC and EPSRC

Other programmes (examples)

Programme	Link
UKRI Challenge Fund	https://www.ukri.org/what-we-offer/our-main-funds/ukri-challenge-fund/
Circular Critical Materials Supply Chains (CLIMATES)	https://www.gov.uk/government/news/15-million-funding-boost-to-strengthen-supply-of-critical-minerals
Future Economy Investor Partnerships SME round 1	https://apply-for-innovation-funding.service.gov.uk/competition/1519/overview/b03f836c-0427-4cc3-a2ae-e1b26d83de4e
Net Zero Living	https://iuk.ktn-uk.org/news/the-innovate-uks-net-zero-thriving-places-programme-is-opening-soon-register-your-interest/
Transforming Foundation Industries	https://www.ukri.org/what-we-offer/browse-our-areas-of-investment-and-support/transforming-foundation-industries/

General

- <https://apply-for-innovation-funding.service.gov.uk/competition/search>
- <https://iuk.ktn-uk.org/opportunities/>

CLIMATES: Circular critical materials supply chains

Funding competition: Critical materials for magnets

Background:

- CLIMATES is a 2 year, £15M programme for circular rare earth magnet supply chains
- Businesses can apply for a share of £5M for innovative projects
- 2 strands:
 - Strand 1: Collaborative feasibility studies
 - Strand 2: Mid- and late-stage collaborative R&D

Eligibility	Strand 1	Strand 2
Total Project Costs	up to £500,000	up to £1,000,000
Duration	up to 12 months	Up to 18 months
Business-led	Yes	Yes
Collaborative	Yes	Yes
Project type(s)	Feasibility study	Industrial research or experimental development

Scope:

- Mining and up-stream processes
- Mid-stream processes
- Down-stream, magnet manufacturing
- Circular supply chains
- Alternative materials

Key dates:

- 5th April - Briefing webinar
- 11th April – Opens
- 21st June, 11am – Closes
- 21st July – Notifications
- 1st October – Projects start



Transforming Foundation Industries

Opportunities to collaborate

The Transforming Foundation Industries Challenge is a £149m programme, launched in 2020 to support sustainable transformations within the Foundation Industries (glass, paper, cements, ceramics, chemicals and metals).

Groups to support collaboration building across the Foundation Industries:



The Network+, led by the University of Sheffield, holds a vast network of over 540 academic and industrial partners with expertise in Resource Efficiency, Energy Efficiency and next generation processes. <https://tfinetworkplus.org/>



The TransFIRE Hub, led by Cranfield University, comprises 12 research organisations and over 70 project partners from across the Foundation Industries. Expertise includes optimisation of resource flows, improved competitiveness, local community engagement and industrial symbiosis. <https://transfire-hub.org/>



Full project details <https://tinyurl.com/3cybfpwx> or <https://tinyurl.com/yf4n9jk9> or contact the Innovation Lead for the Challenge, Dr Sarah Connolly sarah.connolly@iuk.ukri.org

Foundation Industry Sustainability Consortium

FISC

- EconoMISER is the first project of the Foundation Industry Sustainability Consortium (FISC), **representing a £19.5m investment by UKRI**
- The FISC is a partnership between research and technology centres in the foundation industry sector to **collaborate and combine expertise and R&D capability to solve industry innovation challenges to achieve sustainability** and net zero objectives
- The FISC partners will prepare a detailed strategy in consultation with the sector in Q1 2023

**Centre for Process Innovation | Glass Futures | Henry Royce Institute
Lucideon | Materials Processing Institute**

UK Research & Innovation

Innovate UK is part of a wider family



Arts and
Humanities
Research Council



Biotechnology and
Biological Sciences
Research Council



Economic
and Social
Research Council



Engineering and
Physical Sciences
Research Council



Innovate
UK



Medical
Research
Council



Natural
Environment
Research Council



Research
England



Science and
Technology
Facilities Council



Innovate
UK

EPSRC - Strategic priorities

Mission
Inspired
Research

An effective
ecosystem for
engineering and
physical sciences

The Physical and Mathematical Sciences

Powerhouse: curiosity
driven discovery, with
boundless potential

**Frontiers in
Engineering and
Technology:**
unleashing our
productivity potential

Digital Futures:
the future of
communications,
computing and the
internet

Engineering Net Zero:
decarbonising our
economy and society,
creating an alternative
energy future and
developing truly circular
economies

**AI, Digitalisation and
Data – Driving Value
and Security:** powering
transformative change
and the next industrial
revolution

**Transforming Health
and Healthcare:**
improving quality of life
through innovative
technological solutions

**Quantum
Technologies:** realising
the transformative
impact of this technology
across business,
government and society

International

Talent and
Skills

Place

World Class
Infrastructure

Impact

Business
Engagement

Manufacturing & CE - How do EPSRC support?

Work with colleagues across EPSRC, UKRI, government and the broader landscape, for example

Lead **strategic activities** e.g.

- Manufacturing Hubs (*call now open*)
- Digital Manufacturing and digital circular economy
- Manufacturing sustainability call
- Innovate UK-BBSRC-EPSRC Sustainable bio-based manufacture and materials call(s)
- ISCF Made Smarter Innovation Research Centres: joint with ESRC
- UKRI Plastics Research Innovation Fund
- UKRI National Interdisciplinary Circular Economy Research Programme (NICER)
- EPSRC-BBSRC Sustainable plastics call

Manufacturing and circularity in **research and training** e.g.

- Working with other disciplines on a sustainable ICT priority (call coming)
- Accelerating the Medicines Revolution activity with Healthcare and Physical Sciences (call coming)
- EPSRC community workshops in early 2023

UK Materials and Manufacturing Vision 2050

Now is the time to reimagine materials and manufacturing



Mission Critical for UK and World
Supply | Climate | Economy



Stimulating and Exciting
Opportunity to change the world



Difficult but Doable
Requires the best talent

Thank You

Please get in touch:

reimagine.manufacturing@iuk.ukri.org

 @InnovateUK

 Innovate UK

 Innovate UK

 @weareinnovateuk

Exhibitor Pitches

www.ktn-uk.org



InnovateUK
KTN

Jonathan Smith

Jonathan.Smith@STFC.ac.uk

Science and Technology Facilities Council

– World class experimental facilities

STFC looks after the national synchrotron, neutron spallation source, central laser facility, space lab & UK's involvement in CERN, SKA. Big Computers. Unique validation potential.

What we do (Hartree Centre)

- **Collaborative R&D Projects**
Challenge led applied computational R&D
- **Platform as a Service**
Pay-as-you-go access to our compute power
- **Develop Digital Assets**
- **Training and Skills**
- **Funding/programmes**

Potential Projects / Examples

Deep Decarbonisation

Our team have worked with materials manufacturers to explore the data their machines are collecting enabling them to find optimal operating conditions/ reduce waste.

Data fusion at scale

Our national data-centric computing assets, can ingest and transform large and high volume data for real-time insight.

Visual inspection with ML

We are experienced with developing automated visual inspection to detect anomalies in plant and materials.

Multiphysics / Multiscale HPC Modelling

We develop and exploit software to understand processes on the macro-scale mesoscale and atomistic scale. We integrate them with the latest AI techniques, and make them accessible.

Upskill your organisation

Need access to funded data/digital training or a work direct with specialists in AI and data science, data engineering, supercomputing and quantum computing through HNCDI.



Tun Abdul Razak Research Centre (TARRC)/Rubber Consultants (RC)

Anna Kepas-Suwara

aksuwara@tarrc.co.uk

What we do:

We offer world class **analytical and physical testing of rubber** and other elastomeric materials and products as well as **R&D services** to the rubber industry. We also offer extensive **rubber compounding and processing** capabilities.

Where you sit in the supply chain?

We provide **independent testing & consulting services** on elastomeric materials and rubber products to companies around the world. We can also carry out **Contract Research projects** financed from private or public funds.

What is our project idea or innovation challenge:

We can assist with all aspects of the **development, validation and realisation of your product**, including **process and method development**.

We can also offer a vacant laboratory/workshop at our premises for a start-up company.

Partner(s) required? (Y/N): Y

If yes what type?:

We invite anyone who would like to talk about challenges in their projects and how we can help and bring them to the implementation stage.



Industrial Biotechnology Innovation Centre (IBioIC)

Kim Cameron

kim.cameron@ibioic.com

What we do:

We connect people and resources to support innovation across the bioeconomy.

IBioIC provides technical expertise, networking opportunities, funding, scale up facilities and skills development.

Where you sit in the supply chain?

We are a networking and support organisation for companies seeking to innovate using biotechnology.

What is our project idea or innovation challenge:

N/A

Partner(s) required? (Y/N):N

If yes what type?: N/A



CPI

Your Name: Dr Sohail Hajatdoost

Email Address: sohail.hajatdoost@uk-cpi.com

What we do:

CPI is a leading technology innovation centre; a member of the High Value Manufacturing Catapult. Our National Formulation Centre and Industrial Biotechnology Centre cover a wide range of capabilities such as the development of innovative formulation technologies and formulated products and enabling biotechnology innovation by supporting the design, development, optimisation and demonstration of bespoke manufacturing processes. CPI has a long track record of collaborative projects.

Where you sit in the supply chain?

CPI is a provider of facilities and expertise to help companies to de-risk their process scale-up or development of sustainable materials.

What is our project idea or innovation challenge:

- Developing sustainable materials and formulated products.
- Utilise industrial biotech to produce sustainable chemicals – seeking to replace petrochemical products.
- CPI has the unique capability to use C1 gas feedstocks within gas fermentation.

Challenge

- Improve efficiency and economic viability in order to be competitive against fossil fuel chemicals.
- Bridge the gap between feedstock providers and industrial end users

Partner(s) required? (Y/N): Yes

If yes what type?

CPI is seeking to work with:

- Supply chain partners for alternative sustainable materials.
- Technology providers for new products or processes.
- End users- who can provide product specifications and testing



Advanced Forming Research Centre (AFRC)

Jun Liu

j.liu@strath.ac.uk

What we do:

Developing forging and forming technologies to improve the cost effectiveness of industries supply chains and the inherent capability of their products.

Where you sit in the supply chain?

A specialist centre within the National Manufacturing Institute Scotland (NMIS), we're also part of the HVM Catapult to **take low maturity technology developed within a research environment and deploy it in a manufacturing facility.**

What is our project idea or innovation challenge:

Advanced metal forming technologies, including superplastic forming, stamping, hydro-forming, spinning, etc. to bring a step-change in the productivity, sustainability, cost benefits, and energy consumption for the aerospace and automotive industries.

Partner(s) required?: Y

If yes what type?:

Industrial partners (Material suppliers, Manufacturers, end users, etc.)



The University of Sheffield Advanced Manufacturing Research Centre (AMRC)

Anthony Stevenson

a.stevenson@amrc.co.uk

The University of Sheffield Advanced Manufacturing Research Centre (AMRC) is a world-class centre for research into advanced manufacturing technologies used in the aerospace, automotive, medical and other high-value manufacturing sectors.

The AMRC is uniquely positioned to develop and support supply chain resilience, with expertise and research themes in relevant technologies. We can help our partners to strengthen their supply chains and maintain continuity amongst new demand patterns, supply constraints and logistical challenges.

Innovation challenge

To de-risk and lead on future challenges in advanced manufacturing across all AMRC capabilities.

Keywords: design for sustainability, light-weighting, digital, future propulsion, supply chain resilience.

Partner(s) required?

- ✓ SMEs
- ✓ Large industrial companies
 - ❖ Catapult centres
 - ❖ Universities
 - ❖ Research & Technology organisations
 - ❖ *If funding limit on university/RTO involvement is not breached*



Nuclear Advanced Manufacturing Research Centre

David Anson

david.anson@namrc.co.uk

What we do:

Advanced manufacturing
research

Where you sit in the supply chain?

High Value Manufacturing
Catapult Centre

What is our project idea or innovation challenge:

Use of supercritical carbon dioxide as a coolant in place of oil emulsion in large scale machining is:

- 2.4 x faster
- uses only 17% of the energy
- Produces higher integrity surface

Partner(s) required? (Y/N): Y

If yes what type?: Large scale machining operator



Compound Semiconductor Applications Catapult

Paul Jarvie – South West and Wales DER-IC Lead

paul.jarvie@csa.catapult.org.uk

What we do:

CSA Catapult was set up in 2018 as a research and technology organisation (RTO). Funded by Innovate UK, we help to grow the UK economy for industries using compound semiconductors. We are the Driving the Electric Revolution Centre for the South West and Wales. With a team of technical experts and state-of-the-art equipment, we work to accelerate the adoption of compound semiconductor technologies in applications for Power Electronics, Advanced Packaging, Radio Frequency, Microwave and Photonics.

Where do you sit in the Supply Chain?

As a neutral supply chain convenor, we bridge the gap between academia and industry. We introduce potential project partners, from universities, SMEs, through to large companies to collaborate on technical projects.

We want to talk to you about:

- Net Zero enabling technologies (Power Electronics, Machines and Drives), advanced packaging and next generation communications and sensing
- Your material science expertise in applications for chip manufacturing and advanced packaging for semiconductors
- Our state-of-the-art 3D, multi-material, combination printing equipment
- Potential project collaborations to develop next-generation technology for industry

Partners required? Y/N

Yes:

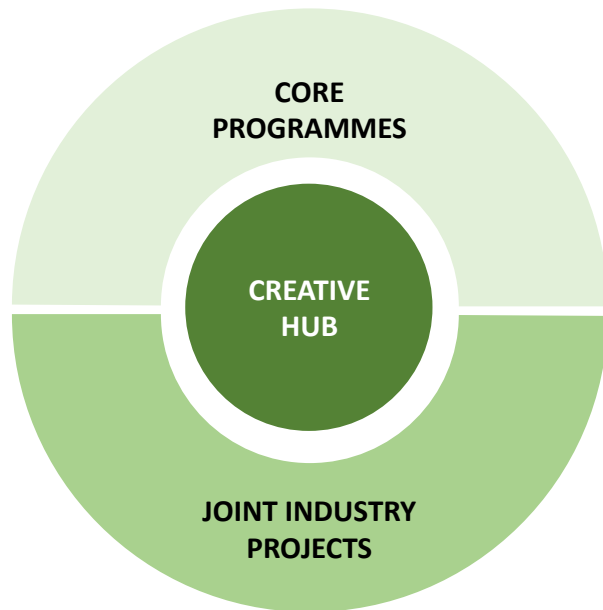
- Innovative SMEs
- Larger TRL 1 companies/OEMs
- End users
- Companies looking to embrace and develop disruptive technologies



A new approach to accelerating sustainable technology translation



Innovation Centre for Applied Sustainable Technologies



Joint Industry Projects (JIPs)

Industry-led proof of principle or feasibility studies.

- Delivered by technology translators funded through the RE grant
- 3-12 months, rapid start up



Dr Zakir Hossain
zh603@bath.ac.uk

Let us introduce ourselves



Grant Funding for Innovation
Alan Kennedy
Innvotek

10+
years in operation

300+
years experience

1500+
ideas supported
£100m+
funding for clients



Agritech
Robotics/AI
Blockchain &
Digital Supply
Chains



Wind Power
Composites
NDT
Predictive
Maintenance

500+
Partners in our
Network

€100 million
+
**Funding for
clients**



Digital Medicine
AI Image Analysis
Diagnostics
Decision Support



Marine
Robotics & AI
NDT
Predictive
Maintenance



**Materials
Processing
Institute**

**Excellence in Materials
and Process Innovation**

**Engaging in collaborative
research & development
(CR&D)**

**Delivering high quality
research projects**

**Leading or partnering on
multiple UKRI funded
projects**



ADVANCED MATERIALS

Research in advanced materials to understand how they can be used more efficiently and effectively and develop new and innovative materials.



INDUSTRIAL DECARBONISATION

Working to reduce carbon emissions through enhanced use of energy to develop a low-carbon future globally.



DIGITAL TECHNOLOGIES

Utilising digital technologies to optimise industrial processes and develop advanced materials.



THE CIRCULAR ECONOMY

Research to minimise resource usage, waste, emissions and energy leakage through improved design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling.

The Northern Ireland Advanced **Composites** and Engineering Centre is the regional **Centre of Excellence** for innovative composites **manufacturing R&T**



E: info@niace.org

T: +44 2896 213 725

Supporting industry and SMEs by advancing and de-risking composite technologies

Research partner to industry in Collaborative R&D programmes



Bio-Composites Focus

- Supporting the development of a natural fibre supply chain capable of supplying into the composites Sector
- Focus on performance characterisation and end use adoption of bio-composites
- Prototyping and demonstrator proof of concept development

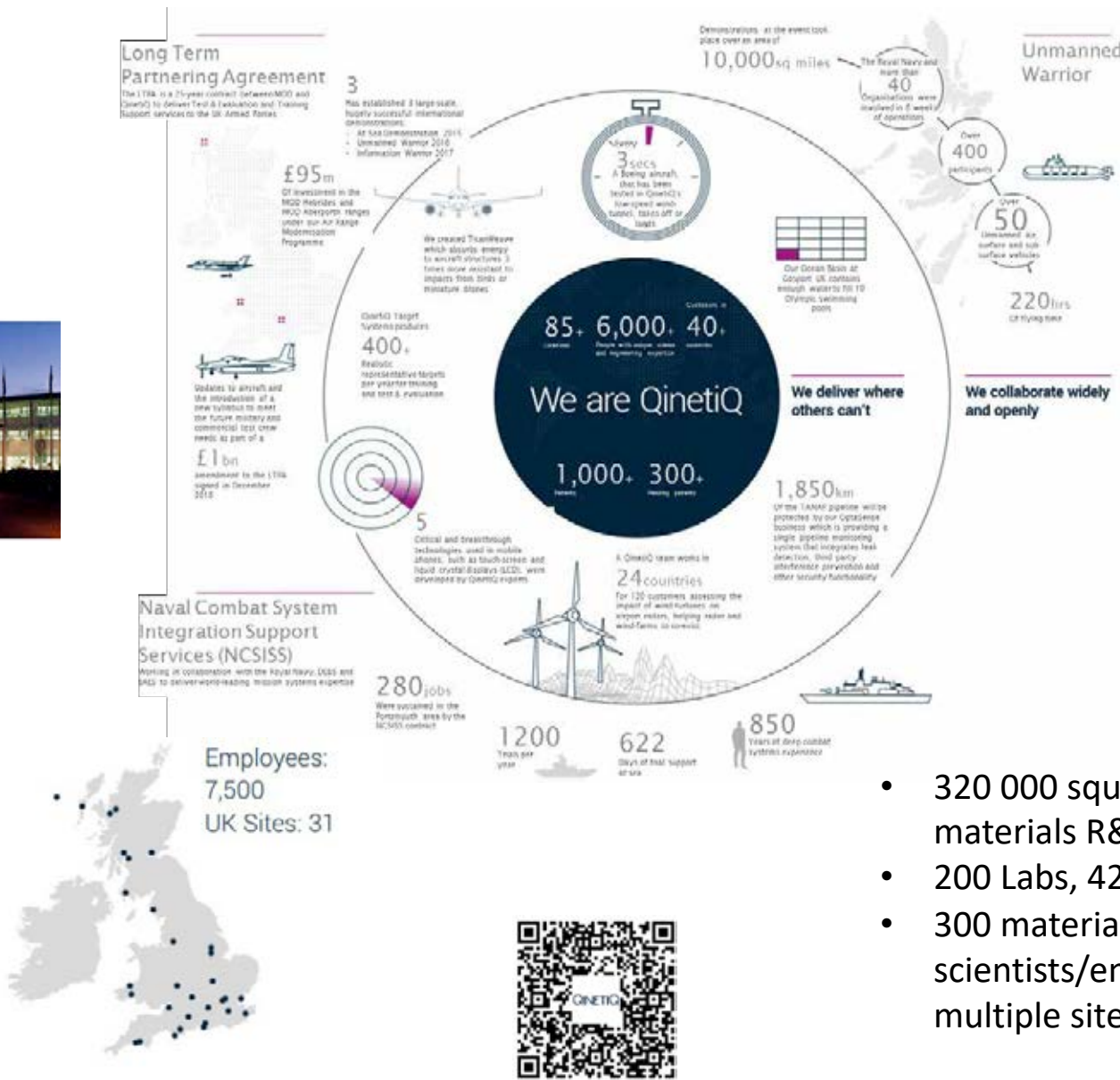
Circular Economy Focus

- Recapture and re-use of raw materials from composite waste streams
- Recycling of Thermoplastic Injection moulded materials
- Re-use of dry fibre waste streams into valuable product streams



Providing a Material Advantage

- Quantum
- Ceramics
- Metallics
- Polymers
- Metamaterials
- Composites
- Textiles
- Multifunctional
- Power sources
- Energy



- R&D
- Design
- Modelling
- Test and Evaluation
- Cleanrooms
- Manufacturing
- Through life assessment
- Certification
- Assurance
- Productisation



- 320 000 squared ft materials R&D
- 200 Labs, 42 Workshops
- 300 materials scientists/engineers on multiple sites



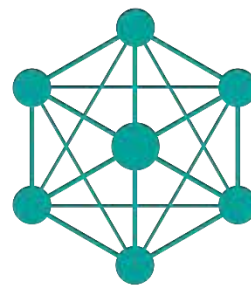
Henry Royce Institute for advanced materials

The Henry Royce Institute is the UK's national centre for advanced materials research and innovation.

Providing world-class equipment, infrastructure, training and outreach, Royce works with the materials community to develop solutions to some of the world's biggest challenges from an ageing population to the transition to a low-carbon economy

Our mission is to support and grow world-recognised excellence in UK materials research, accelerating commercial exploitation, and delivering positive economic and societal impact for the UK.

This is delivered through four key pillars of activity



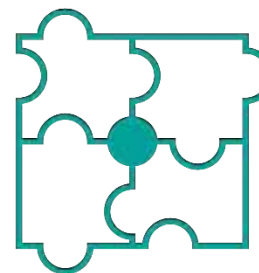
Enabling national materials research foresighting, collaboration and strategy



Providing access to the latest facilities and capability



Catalysing industrial collaboration and exploitation of materials research



Fostering materials science skills development, innovation, training and outreach

Our Services



TBAT

| Innovation



R&D Tax Credits

We bridge the technical expertise gap between you, the client, and your accountant to ensure you submit a robust and successful R&D Tax Credit claim to HMRC.



Capital Allowances

We support in receiving capital allowances on assets owned by the business and used by the business. Capital Allowances can cover things such as building premises, equipment and machinery.



Grant Funding

We identify appropriate funding sources, write applications and technical reports, as well as reviewing and resubmitting previous applications.



SEIS / EIS Support

We support businesses looking for investment, to grow and develop by two generous tax relief schemes which make businesses a more attractive and less risky investment opportunity.



Video Games Tax Relief

Similar to R&D Tax Relief, Video Games Tax relief can be claimed by businesses who are liable to pay corporation tax. We can check your eligibility and support in making a claim.



Patent Box

If you're creating IP within your business that's patented and liable to pay corporation tax, you may be eligible to claim relief on the amount of corporation tax paid by the business.

www.tbat.co.uk

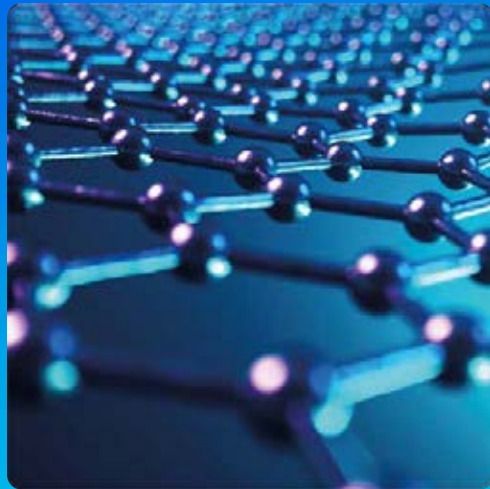
 info@tbat.co.uk

 01332 819740

| **Lucideon Limited:** Providing material solutions through consultancy

A product development and analytical partner with 100+ years of materials science and engineering excellence

Helping to overcome materials and process challenges



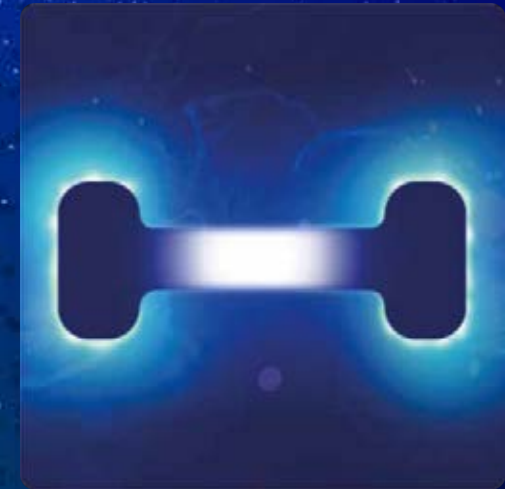
Materials Development
and New Technology



Formulation and
Process Consultancy



Characterisation
and Failure Analysis



Platform
Technologies

CATAPULT

High Value Manufacturing

Dave Curtis

Professor of Subtractive
Manufacturing
University of Sheffield AMRC

Dave Easton

Senior Knowledge Exchange Fellow
NMIS

mtc

Manufacturing
Technology Centre

Matt Thomas
Chief Engineer
MTC



**NATIONAL
COMPOSITES
CENTRE**

James Graham
Chief Engineer – Surface
Transport
NCC

Alex Hale
Advanced Technology
Project Lead
NCC

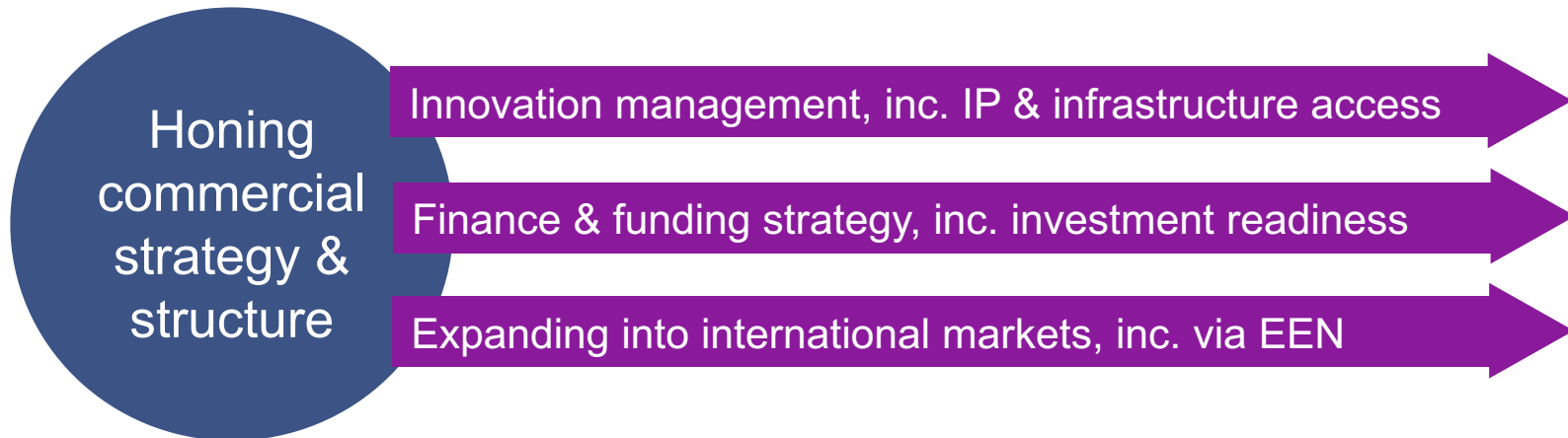
Vicky Summers
Principal Research
Engineer – Sustainability
NCC



Innovate UK EDGE

Tailored support that grows and scales ambitious innovation-focused businesses

350+ innovation and growth specialists embedded in all UK regional ecosystems. We intervene at early, growth and scaling stages, with our core advisory service and enhanced Scaleup Programme, supporting clients in a targeted way with:



Reading Scientific Services Ltd (RSSL)

www.ktn-uk.org



InnovateUK
KTN

Research Centre for Connected Morphing Factories

www.ktn-uk.org



InnovateUK
KTN

Break, networking and exhibition

PLEASE BE BACK AT 12 NOON

www.ktn-uk.org



InnovateUK
KTN

Inclusive Innovation – how a focus on equality, diversity and inclusion can support innovation success

Led by Karen Souza Diversity and Inclusion Partner, Innovate UK KTN

With Panelists:

Shruti Grover, Co-Founder and CEO of Pattern Project

Millie Flemmington-Claire, Founder of Human Beauty.

www.ktn-uk.org



InnovateUK
KTN



Innovate
UK

Equality, Diversity and Inclusion



The case for EDI in innovation



Innovate UK is committed to encouraging diversity and inclusion (EDI) in business innovation



Innovation in the UK should know no limits



- One of the greatest assets we have in the UK is the incredible diverse talent available
- While talent is distributed equally, opportunities to realise that talent are not. There are numerous barriers that prevent people from entering into innovation and being successful in innovation
- Diversity within businesses is proven to contribute to enhanced performance and commercial success
- If we encourage businesses to consider diversity and inclusion in their approach to innovation, the economic and societal impacts that are delivered through our programmes will be maximised



Why this is important



There is a lack of diversity and under-representation in both funding and support

Who are the innovators?
Equity, Diversity and Inclusion at Innovate UK

Innovate UK

Alone, together
Entrepreneurship and diversity in the UK

**THE CORNERSTONE REPORT:
ACCESS TO VENTURE CAPITAL**

Founder journeys and the barriers to inclusive investment

British Business Bank

Innovation Caucus
SUPPORTING DIVERSITY AND INCLUSION IN INNOVATION

Funded by

The 2023 UK LGBTQ+ Founder Report

- 84% SAID THEY DON'T HAVE EQUAL ACCESS TO THE SAME OPPORTUNITIES & RESOURCES AS NON-DISABLED ENTREPRENEURS
- 44% BELIEVE THEY WOULD NOT HAVE A SUPERIOR ACCESS OPPORTUNITY DUE TO UNACCESSIBLE SYSTEMS & PROCEDURES
- 33% BELIEVE INVESTORS ASKED COMPLEX QUESTIONS WITH DISABLED ENTREPRENEURS
- 28% COULD NOT FIND ANY SUPPORT OPPORTUNITIES FOR DISABLED ENTREPRENEURS
- 33% BELIEVE THAT ALL OF THESE FACTORS CONTRIBUTED TO THEIR ABILITY TO OBTAIN CAPITAL
- ONLY 17% OF DISABLED ENTREPRENEURS SAID THEY ARE TREATED EQUALLY TO NON-DISABLED ENTREPRENEURS IN INVESTMENT OPPORTUNITIES
- 0.1% OF SHARE OF VOICE

The Alison Rose Review of Female Entrepreneurship

PROGRESS REPORT 2022

BRITISH BUSINESS BANK

UK VC & FEMALE FOUNDERS

Unlocking the potential of ethnic minority businesses

Tackling barriers to success

**TIME TO CHANGE:
A BLUEPRINT FOR ADVANCING THE UK'S ETHNIC MINORITY BUSINESSES**

Diversity Beyond Gender

The State of the Nation for Diverse Entrepreneurs

Extend Ventures



Why this is important



The UK's innovation skills requirements

Over the last 10 years the number of businesses citing lack of skilled people as a critical barrier for innovation has increased significantly¹

**382,000 R&D workers
will be needed by 2027**

– this includes new positions and replacing leavers in the workforce²

Through supporting the diverse talent available across the UK to join and thrive in innovation, we are helping to meet the skills needs of the sector

¹ [UK Innovation Survey - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/uk-innovation-survey)

² <https://www.gov.uk/government/publications/research-and-development-rd-pipeline>



The vision



Businesses
consider
diversity and
inclusion in
their
approach to
innovation

A connected,
more
inclusive
innovation
system



Plan for action



- Business innovation is essential for UK prosperity and quality of life
- We will help UK businesses and sectors to grow through innovation
- We have a [plan for action](#) that, with our partners, we will implement over the next four years
- Equality, Diversity and Inclusion is a 'strong foundation' underpinning the plan for action

Our 12 commitments to innovating UK businesses

- 1 We will inspire, involve, and invest in innovation
- 2 We will focus on opportunities for the future economy
- 3 We will support companies to grow rapidly
- 4 We will help businesses to succeed on the international stage
- 5 We will make it easier to gain innovation support
- 6 We will help government use its power to support innovation
- 7 We will help UK companies benefit from the excellent research base
- 8 We will help businesses make better use of design
- 9 We will use responsible innovation to take account of wider societal impacts
- 10 We will help companies enhance the capability of their people
- 11 We will be inclusive and fair, and bring in under-represented groups
- 12 We will help build, and help companies benefit from, local strengths



Equality, Diversity & Inclusion



Diverse Innovators

We must increase the diversity of upcoming innovation talent and make innovation support more visible, accessible, and inclusive to all



Business Advice

We will support innovative companies to fully understand the value of EDI and build it into their innovation and growth strategies



Inclusive Innovation

We will encourage companies to improve products and services with a focus on inclusive innovation

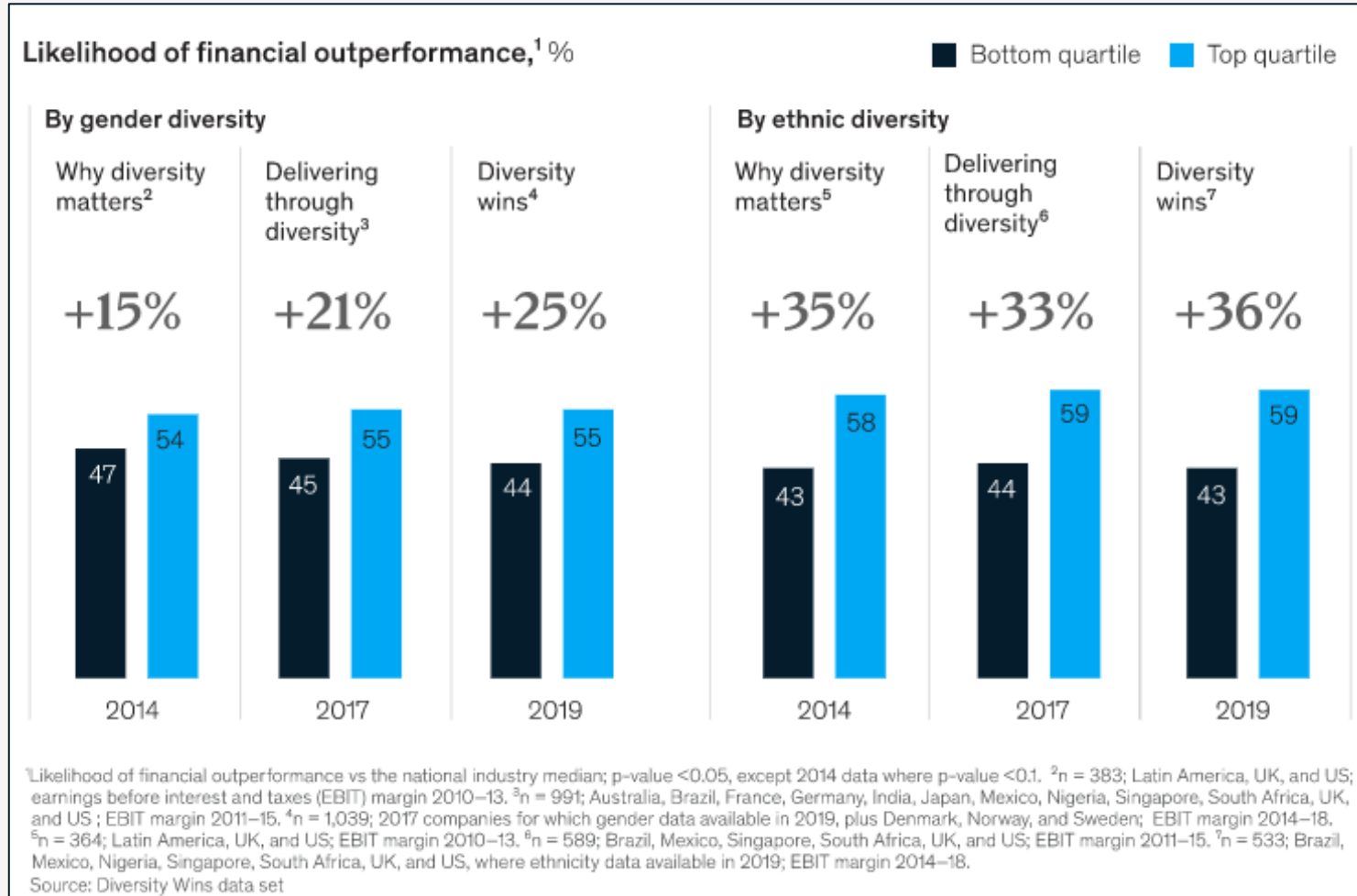


Data Driven Action

We need good data to target action in the right places and monitor impacts and progress



Why does EDI matter in Innovation?



McKinsey
& Company

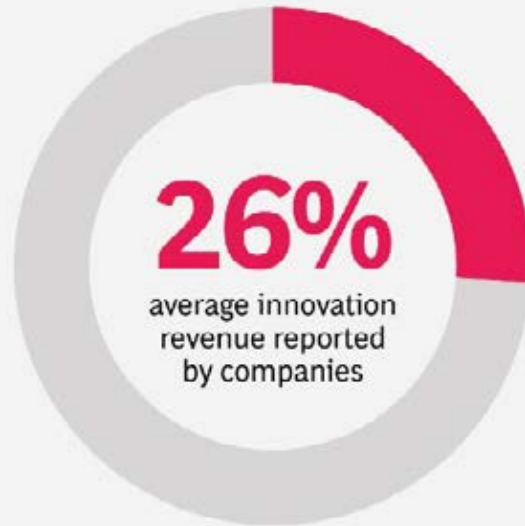


Why does EDI matter in Innovation?

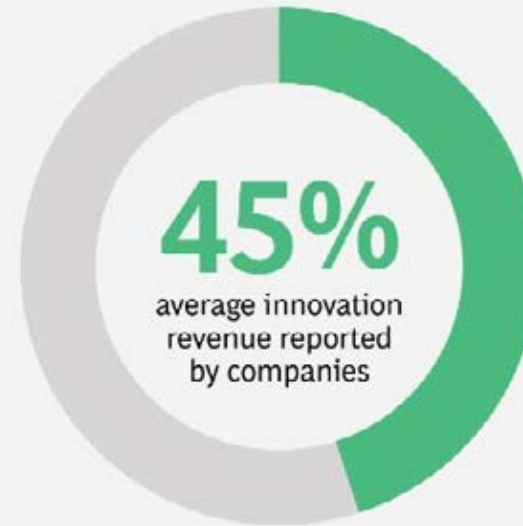


EXHIBIT 1 | Companies with More Diverse Leadership Teams Report Higher Innovation Revenue

Companies with
below-average diversity scores



Companies with
above-average diversity scores



Source: BCG diversity and innovation survey, 2017 (n=1,681).

Note: Average diversity score calculated using the Blau index, a statistical means of combining individual indices into an overall aggregate index.





Why does EDI matter in Innovation?



FIGURE 2 | The case for an inclusive culture

Organizations with inclusive cultures are:



2x

as likely to meet or exceed financial targets



3x

as likely to be high-performing



6x

more likely to be innovative and agile



8x

more likely to achieve better business outcomes

Source: Juliet Bourke, *Which Two Heads Are Better Than One? How Diverse Teams Create Breakthrough Ideas and Make Smarter Decisions* (Australian Institute of Company Directors, 2016).





Why does EDI matter in Innovation?



What Employees Look for In Their Employer, by Generation

Young Millennials & Gen Z: 1989-2001	Older Millennials: 1980-1988	Gen X: 1965-1979	Baby Boomers: 1946-1964
1. The organization cares about employees' wellbeing.	1. The organization cares about employees' wellbeing.	1. The organization's leadership is ethical.	1. The organization's leadership is ethical.
2. The organization's leadership is ethical.	2. The organization's leadership is ethical.	2. The organization cares about employees' wellbeing.	2. The organization cares about employees' wellbeing.
3. The organization is diverse and inclusive of all people.	3. The organization's leadership is open and transparent.	3. The organization's financial stability.	3. The organization's financial stability.

GALLUP



Diversity is a strategic priority for 6 in 10 start-ups



Research among 279 businesses (93% small or micro companies) funded by the Sustainable Innovation Fund:

- 73% say diversity improves company innovation
- 56% say diversity boosts commercial performance
- 66% say diversity is an important part of the company's ethos
- 77% are actively recruiting diverse candidates



What are the consequences of exclusive innovation?



Silent and deadly? The electric car debate



Pedestrians are 40 per cent more likely to be hit by a hybrid or electric car than by one with a petrol or diesel engine in the UK ([Guide Dogs, 2015](#)).

<https://www.nib.org.uk/rnibconnect/silent-deadly-electric-hybrid-vehicles-sight-loss>

NEWS | 15 September 2021 | Correction [16 September 2021](#)

The fight to manufacture COVID vaccines in lower-income countries

Drug companies and wealthy countries are facing increased pressure to partner with firms in the global south but are reluctant to relinquish control.



<https://www.the-scientist.com/news-opinion/biased-evaluation-committees-promote-fewer-women-66355>



What are the consequences of exclusive innovation?



Forbes

PERSONAL FINANCE

A.I. Bias Caused 80% Of Black Mortgage Applicants To Be Denied

Kori Hale Contributor @
I'm the CEO of CultureBanx, redefining business news for minorities.

Sep 2, 2021, 07:48am EDT

<https://www.forbes.com/sites/korihale/2021/09/02/ai-bias-caused-80-of-black-mortgage-applicants-to-be-denied/>



THE CONVERSATION
Academic rigour, journalistic fair

COVID-19 Arts + Culture Business + Economy Cities Education Environment + Energy Health + Medicine Politics



Gender bias in medicine and medical research is still putting women's health at risk

March 7, 2021 7:09pm GMT Updated March 9, 2021 8:29pm GMT

<https://theconversation.com/gender-bias-in-medicine-and-medical-research-is-still-putting-womens-health-at-risk-156495>



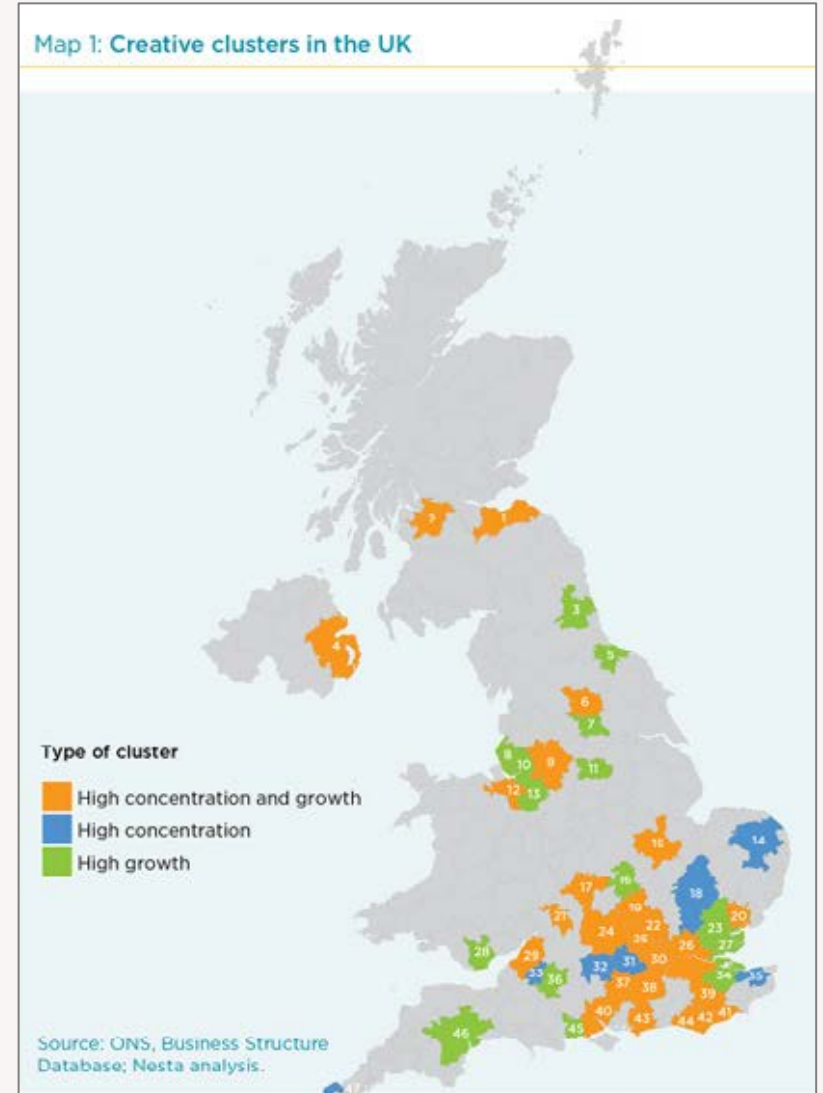
What are the consequences of exclusive innovation?



<https://www.gov.uk/government/publications/creative-industries-sector-deal/creative-industries-sector-deal-html>



<https://wearepurple.org.uk/the-purple-pound-infographic/>





Summary



We know that the UK is currently losing out on economic and societal benefits of EDI

We need:

- Systemic change that enables opportunities for all
- Readily available access to tailored support that enables business success
- A UK Innovation Ecosystem that reflects the UK demographic across all roles and within all sectors
- More inclusive innovations are delivering wider societal benefit and business success

Innovate UK has a huge opportunity to lead change and we are in a strong position to be successful



What are we doing about it?

Inclusive Innovation Triangle



UK RI Innovate UK
Inclusive Innovation Award

UK RI Innovate UK
Inclusive Innovation Platform

UK RI Innovate UK
Inclusive Innovation Network



Inclusive Innovation

UK RI Innovate UK
KTN

£2.5 million investment

Per year, over 3 years

Supporting businesses who are role models in developing innovations that centre on equality, diversity and inclusion in their design and development.

Winners will receive a £50,000 grant each for scale-up of existing, or development of new, work on inclusive innovations.



By 2025

Innovate UK KTN aims to create an online platform that allows users to navigate their own innovation journey by helping them assess their innovation and its inclusivity. There will be varying elements that will help inform, inspire and strengthen the value of creating products, technologies and services that are inclusive.

The online platform will host a bank of interactive resources that help to inform and educate around D&I, it will signpost further information and support connections to diverse networks with a D&I ambition at the heart of their purpose.



Inclusive Innovation Platform



Building a network of advisors and influencers

In order to be truly inclusive in our approach to inclusive innovation we cannot work alone. We aim to build a network of over 200 business and innovators supporting the importance of inclusion when innovating.

This will include an advisory board of key change makers in this space.





Please join our new Lined In group
“Inclusive Innovation Network – Innovate
UK”



<https://www.linkedin.com/groups/12775315/>



Karen Souza

Diversity & Inclusion Partner – Inclusive
Innovation – Innovate UK KTN

Karen.souza@iuk.ktn-uk.org

Or find me on



Design in innovation

Nicole Agba
Knowledge Transfer Manager – Design and Innovation Effectiveness
Innovate UK KTN

www.ktn-uk.org



InnovateUK
KTN

Design in Innovation

Nicole Agba

Knowledge Transfer Manager – Design and Innovation Effectiveness



InnovateUK
KTN

1

What Is Design In Innovation?

- Is a holistic approach
- Considers complexity
- Encompasses smart design

2

Why Is It Important?

- It's foundational to successful innovation
- It solves problems on a systems level
- Design adds value

3

How To Apply It

- To create
- To develop
- To evaluate

4

How We Can Help

- Understand your pain points
- Connect you to the right people
- Resolve them through the innovation canvas

Get in touch:

- IUK KTN stand
- Sign up to our newsletter
- Materials and Design Exchange

Thank you



InnovateUK
KTN

REforMM Pitch Session

www.ktn-uk.org



InnovateUK
KTN

Organisation Name

Your Name: Dr. Yan Wang

Email Address: y.wang5@brighton.ac.uk

What we do:

Intelligent and sustainable manufacturing with a focus on remanufacturing which returns of End-of-life products to like new conditions

Where you sit in the supply chain?

Return End-of-life products back to the supply chain to close the loop

What is our project idea or innovation challenge:

- Channels to collect and sell remanufactured products
- Remanufacturing and Electrification
- Quality assurance and certification for remanufacturing processes/products
- Track and trace of EoL products

Partner(s) required? (Y/N):

If yes what type?:

Yes, business who are interested in remanufacturing



Matterhorn: Your first step in AI-driven materials R&D

Jakob Zeitler, Research Scientist

mail@jakob-zeitler.de

Matterhorn Studio streamlines the **integration of ML in materials laboratory** and makes sure that your scientist can maximally include their hard-earned theory and intuition into the ML process.

Our efficient machine learning saves time, money and most importantly **de-risks your research outcomes**.

Try our 5 minute tutorial today on matterhorn.studio

Where you sit in the supply chain?
Materials and process optimisation

What is our project idea or innovation challenge:
Theory and intuition can get you only so far in your materials R&D. Machine Learning provides a **third dimension to your experimental planning**: it helps you discover the next best experiment that you can learn from the most information. We want to develop dedicated models for different material types and are **looking for partners with exciting materials problems**.

Partner(s) required? (Y/N): Yes

What type?: any materials, but **biobased preferred**

We enjoy working with passionate engineers that are keen to learn how they can make machine learning work in their laboratory. We are looking to work with materials companies that need to develop materials on spec and on time, at the best cost, and see potential in how machine learning can help with that.



frugalpac™

Name: John-Paul Grogan
Product Director

Email Address: jp@frugalpac.com

What we do:

We design and commercialise novel and disruptive packaging formats which have environmental advantages over incumbent packaging types.

Where we sit in the supply chain?

We buy directly and advise our customers to purchase approved:

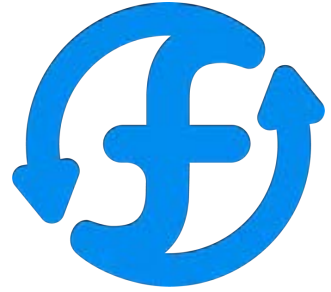
- Paperboards,
- Print inks / coatings
- Adhesives
- Flexibles plastic films
- Barrier Technologies
- Injection moulded plastic parts



Our Innovation Challenge:
We are always looking for:

- Innovations in plastic recycling, sorting & identification.
- Food safe bio-plastics.
- Improved barrier materials.
- Technology which improves strength of recycled paper fibres.

Partner(s) required? (Y/N): No (but never say never)



Composite Braiding Ltd

Steve Barbour

steve.barbour@compositebraiding.com

What we do:

High volume, lower cost, more sustainable structural composites

Energy reduction in production typically of over 95%

(Innovate UK Loan project; Composites UK Sustainability Net Zero Award Nov 22)

Where you sit in the supply chain?

Manufacturer (UK SME, East Midlands)

What is our project idea or innovation challenge:

We have:

- Light weight (up to 70%)
- Low to very high volume (10's to 100k's)
- More sustainable: typical >95% energy reduction; inherently recyclable; re-usable; <1% production waste; award -winning
- Affordable (comparable to metals)

How can we help you?

Partner(s) required? Y:

If yes what type?:

Anyone needing light weighting solutions that are more sustainable and affordable

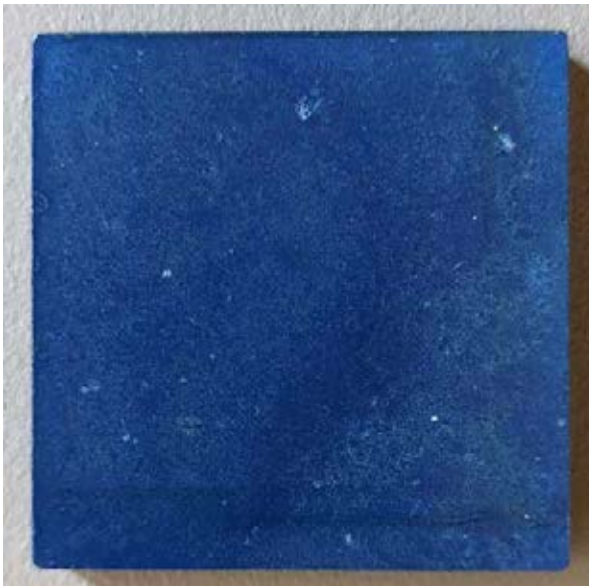


DeakinBio

Aled Roberts

aled@deakinbio.com

What we do:
We make bio-based alternatives to ceramic materials.



Where you sit in the supply chain?
R&D, Manufacturing

What is our project idea or innovation challenge:

We want to use waste biomass from algal biofuels/biomanufacturing to incorporate into our tiles as a binder.

If successful, it will improve the viability of our own business model and also support 3rd generation biofuels production/biomanufacturing by adding value to a low-value co-product.

Partner(s) required? (Y/N): Maybe

If yes what type?:

Algae production specialist (for biofuels or biomanufacturing)



Dr Sikiru O. ISMAIL

s.ismail3@Herts.ac.uk

What we do:

We are Higher Education provider, a University. We also support industries through innovative research and profitable enterprises.

Where you sit in the supply chain?

We support Knowledge Transfer Partnership (KTP), KEEP+ Schemes and joint Research Grants/Funding Applications.

What is our project idea or innovation challenge:

Our project idea lies within application of advanced manufacturing processes and optimisation of properties of sustainable bio-based materials for specific purposes. Hence, relevant industrial supports are required to be successful in grants applications.

Partner(s) required? (Y/N): Y

If yes what type?:

We are looking for industries to solve their problems through KTP/KEEP+ and other relevant schemes. We also need industrial collaborators in joint projects and to support research grants/funding proposals and applications.

Thank you very much.



Aeropowder Ltd.

Your Name: Ryan Robinson

Email Address: ryan@aeropowder.com

What we do:

Aeropowder is a circular materials innovation company driven to produce sustainable textiles from the thousands of tonnes of surplus feather that are produced each year.

Where you sit in the supply chain?

Aeropowder is a manufacturer of feather based textiles.

What is our project idea or innovation challenge:

The processing and mechanical modification of lightweight fibres is currently performed with traditional equipment more suited to heavier, more rigid structures. We want to develop sustainable, modern fibre processing methods that maximise the physical potential of the base material. As experts in waste regeneration, we are looking to partner with a suitable engineering organisation to develop the worlds first hammermill designed with lightweight fibres in mind.

Partner(s) required? (Y/N): Y

If yes what type?:

We want to partner with experts in the hammer mill & granulator industries.



HIGHTECHWELD CO. LTD.

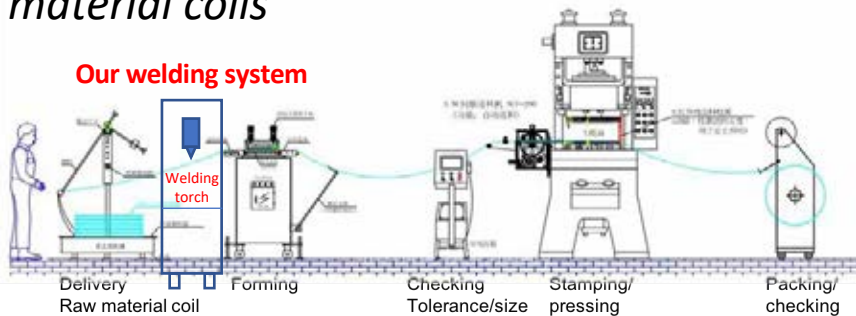
Dr. Williams Nguyen, CEO

info@hightech.co.uk

What we do:

We are a high-tech start-up company that focusing on developing welding systems for manufacturing factory using/making thin and ultra-thin metal coils (0.03 mm to 2 mm).

Where you sit in the supply chain? We support any manufacturers using raw material coils



An example of our solution in a stamping line for manufacturing lead frame of semiconductor!

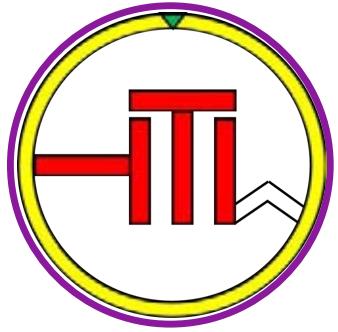
What is our project idea or innovation challenge:

Our idea is a breakthrough and innovate welding solution for butt-joint of ultra-thin raw material coils (up to 0.03mm) in stamping production lines to cutdown up to 90% stopping time and more than 90% the raw material waste.

Partner(s) required? (Y/N): Y

If yes what type?:

- Any organisation to form consortium for public funding and to develop welding system.*
- Any companies using stamping/punching/slitter lines for manufacturing products to be customers*
- Experienced business director to be part of Board of Directors*
- We have secured £200k from angel investors, looking for new investors*



Octoply Ltd

Nithin Rai

nithin@octoply.co.uk

What we do:

On the Thames, we provide marine and hospitality management services.

Mostly to www.tdock.co.uk and www.batterseabarge.com.

In the E. Midlands we provide healthcare management services, mostly to innovahouse.org.uk.

Where you sit in the supply chain?

Service provider, end user with an interest in technology development and manufacturing.

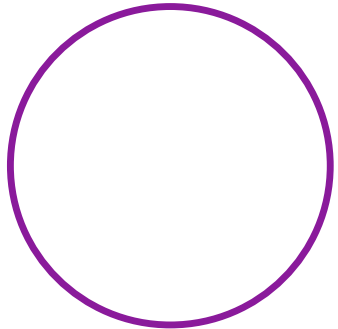
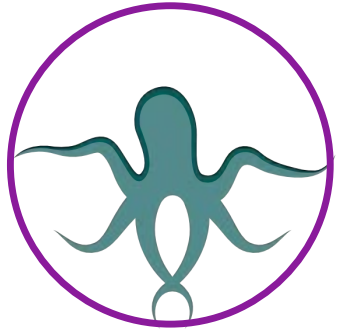
What is our project idea or innovation challenge:

We have an interest in developing the concept of a biological FPSO (Floating Production Storage and Offloading), using biomanufacturing as the primary means of production. This includes the production of liquid fuels from waste and other sustainable sources. Our focus has been on ammonia, biogas and CO2 recovery and management, principally desktop studies modelling biological and chemical engineering processes.

Partner(s) required? (Y/N): Y

If yes what type?:

Broadly those interested in ice, ice composites and low temperature work. Specifically manufacturers of cryocoolers and gas compressors. Generally, anyone that would benefit from the services we provide.



Materiom

Liz Corbin

Liz@materiom.org

What we do: Materiom is an innovation platform specialising in regenerative biomaterials R&D. We support producers and brands to design, produce, and use biomaterials that have a net-positive impact on the planet.

Our database and AI software streamline materials R&D by synthesising, testing, and optimising new biomaterials with minimal human intervention.

Where we sit in the supply chain: We support materials R&D as well as feedstock sourcing.

What is our project idea or innovation challenge: We aim to leverage our database and software to increase the innovative use and reuse of renewable bio-based feedstocks within the production of sustainable and circular products.

In particular, valorising underutilised organic byproducts and waste streams to develop high-performance bio-based packaging materials for the consumer packaged goods industry.

Partner(s) required? (Y/N): Yes

If yes what type?: We aim to partner with material manufacturers and/or consumer brands who would benefit from accelerating their biomaterial R&D processes through the use of our database and AI software.



Glass Technology Services (GTS)

Name: Chris Holcroft

Email: c.holcroft@glass-ts.com

What we do:

GTS is a centre for glass research and development, an independent glass laboratory and consultancy service, accredited to ISO 9001, and ISO 17025 quality standards.

With 300+ years of experience.

Purpose built laboratory facilities and test melting capabilities and associated analytical support

Where you sit in the supply chain?

We provide technical support at all levels of the glass supply chain

What is our project idea or innovation challenge:

Alternative and Secondary Raw Materials for the glass and other industries.

Enabling resource and energy efficiency gains. Recovery, beneficiation recycling and reuse of waste materials.

Partner(s) required? (Y/N): Yes

If yes what type?:

Industry partners with waste materials searching for alternative higher value routes to disposal.

Consortia looking for expertise in glass manufacture and supply chain.



Circular Concept Lab

Anne Prah

anne@anneprahldesign.com

What we do:

Circular Concept Lab is a collaborative innovation platform to accelerate the conception, development and scaling of circular solutions (materials, products, manufacturing processes and business models) for the sports, outdoor and fashion industry and beyond.

Where you sit in the supply chain?

Utilising our extensive industry network, **Circular Concept Lab** supports start-ups, innovators, manufacturers and other organisations on impactful material and manufacturing R & D and industry testing and implementation.

What is our project idea or innovation challenge:

Circular Concept Lab has an growing portfolio of data-driven project ideas and concepts across bio-based and resource-efficient material and manufacturing. Key areas include:

- Reduced environmental impact finishing, colouration & dyeing processes
- Bio-based material feedstock and chemical replacements
- Manufacturing, in-use and end-of-life solution development for circular materials and products
- Design for resource-efficiency (waste reduction/ decarbonisation) and extended use/ reuse

Partner(s) required?: YES

- We aim to partner with material innovators, manufacturers and other organisations to provide design-driven, circular innovation expertise
- CCL can support projects as a partner or subcontractor on existing and/ or collaborative new innovations.



Uplift360

Jamie Meighan & Sam Staincliffe

info@uplift360.tech

What we do:

Uplift360 is a greentech startup working in advanced material circular economy (redesign, reuse, regenerate and recycle), uniquely focused on the defence and security sector. Defence are the largest users of advanced materials, but most in this sector have no end of life plan, with the majority ending up in landfill or incinerated. We create the chemical technology to regenerate these highly complex materials whilst also developing new materials, circular by design and non-fossil fuel derived.

Where you sit in the supply chain?

- ✓ Raw Materials
- ✓ Manufacturing
- ✓ End of Life Processing

Project Idea :

Uplift360 have developed a chemical technology that regenerates end of life para-aramids (e.g. Kevlar). Although early stage, we can put end of life para-aramid through our low energy, chemical process and at the end we can extract new fibres. These fibres are being designed to re-enter the defence and aerospace supply chain. This is a highly novel system that the defence sector are supporting. We would like to further develop the technology and explore collaborations for wider material and product testing.

Partner(s) required?: YES

If yes what type?:

Recycling Organisations
Fibre Manufacturers
Research Institutions
Testing Facilities
Aerospace & Defence OEMs & Primes



Sterling Bio Machines

STERLING
BIO MACHINES

Akshaya Ahuja

Akshaya@sterlingbiomachines.com

What we do:

Novel Bioreactor systems that are more scalable and productive than existing bioreactors for cell-culture and microbial processes

Where you sit in the supply chain?
Bioreactor design and manufacture

What is our project idea or innovation challenge:
Build and test prototypes (physical and digital) of our novel bioreactor concept to demonstrate step change performance improvement over existing systems

Partner(s) required? (Yes):
If yes what type?:

- Commercial design partner - test your bioprocess in our system
- Research partners to develop technical solutions for key enabling components and technologies



Kelpi

Dr Ed Jones, Lead Engineer

ed@kelpi.net

What we do:

Kelpi is a material innovation company. We replace single-use plastics with premium performance biomaterials that harness the novel properties and environmental benefits of seaweed.

Where you sit in the supply chain?

We sit upstream of packaging producers and converters. We work with global brands on co-development projects to develop tomorrow's sustainable packaging.

What is our project idea or innovation challenge:

We have successfully developed novel materials with long-term water-barrier.

We are scaling the chemical synthesis process, and now face the challenge of rapid formulation trials to achieve enhanced performance.

Our challenge now is the industrialization of converting our novel materials to packaging products with techniques such as: coating, casting, and extrusion.

Partner(s) required? (Yes!)

Partners with polymer compounding and formulation experience.

Pilot scale extrusion and co-extrusion of biopolymers.

Continuous coatings applications (e.g. reel-to-reel).

Potential for co-dev with product designers.



Synbiosys

Dr José Videira

jose@synbiosys.co

Software maps material & manufacturing variability & complexity.
Ensures consistent, repeatable end products.

Accelerate by 10-100x:

- Material development, validation & integration.
- Manufacturing optimisation & digitisation.

Increase:

- Yield and throughput.
- Supply chain resilience.

We sit across whole material value chain.

Example innovation challenges:

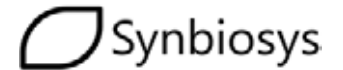
- Evaluation & integration of new, sustainable materials into production lines.
- Validation & qualification of new manufacturing processes e.g. 3D printing.
- Digitising industrial metal processing facilities to increase throughput and yield.

Partners required:

- Startups.
- OEMs.
- Tier 2/3 manufacturers.

Desired industries:

- Industrial metal processing.
- Packaging.
- 3D printing.
- Battery manufacturing.



Enable Manufacturing Ltd

James Reeves

james.reeves@enable.parts

What we do:

Additive Casting®

We manufacture complex metal parts using a hybrid technology of additive and casting together to get the best of both worlds. Complex parts, without tooling restrictions, at a much lower cost than other metal additive processes.

Where you sit in the supply chain?

Tier 2:

We supply metal parts, finished machined, typically supply into Tier 1 companies.

What is our project idea or innovation challenge:

Reducing resources used in manufacturing complex metal parts.

Our process can reduce the amount of metal in a part, through design optimisation, whilst also significantly reducing the waste normally associated with additive manufacturing. We also use up to 90% less energy than other additive processes

Partner(s) required? (Y/N): Y

If yes what type?:

An OEM/Product company

We are looking for companies who want to find a better way of making metal parts. Improving the performance of the part whilst also reducing the material use. By collaborating on the design and manufacturing process we can have a huge impact on the use of resources.



Organisation Name

Tom Williamson

TW@Atomising.co.uk

What we do:

ASL produces gas and water atomised powder in house in Sheffield, using advanced technology developed ourselves. We also sell metal powder production equipment worldwide.

Where you sit in the supply chain?

We supply metal powders (Fe, Ni and Cu based primarily) into the additive manufacturing, metal injection moulding and filter markets.

What is our project idea or innovation challenge:

We have plans for a next generation gas atomiser, to produce powder more efficiently with reduced carbon emissions. The design will give powder that is more spherical and cleaner, perfect for the additive manufacturing and thermal coatings industries.

Partner(s) required? : Yes

If yes what type?:

We are looking for partners to help develop this technology through testing powder, investing in a potential plant, and supporting design of downstream processing.



Net Hero Solutions



Gizem Akgun

info@nethero.app

What we do: We exist to enable cities to be living systems where human and natural capital coexist in harmony. Our prop-tech planning software brings forward the consequences of cost and embodied carbon into the earliest possible building design stage.

Where you sit in the supply chain?
We use AI and industry wide material benchmarking to integrate with the normal workflow and software(s) of all early stage stakeholders. We sit between the developers and designers, and also the buyers and sellers of green building supplies.

What is our project idea or innovation challenge:
Developers and asset owners need to set the level of sustainability targets that would best mitigate their shareholders' risk. Our software then simplifies sustainability decision making by visualizing the effects of each goal throughout the initial design and planning process, preventing late changes to cost and program.



Partner(s) required? (Y/N): Y
We are looking to forge long term relationships with the following stakeholders in the built environment:

- **Design Partner:** An agile, forward thinking Developer and/or Sustainability Consultant to build and test our MVP with us.
- **Advisor:** An experienced proptech networker who can connect us with VC's, incubator programs and potential customers.
- **Industry expert:** Material data expert & Life Cycle Analysis Assessor to ensure regulatory quality.



AERAMINE LTD

Alex Lapis

a@aeramine.com

What we do:

Aeramine is a UK scientific, medical & nuclear SME that is developing ultra-high purity copper (5N grade, 99.999% pure), which is remarkably ductile and has superior thermal and electrical conductivity at cryogenic temperatures. It is perfect for specialist applications in aerospace, medical devices and nuclear.

Where you sit in the supply chain?

Aeramine is a raw material supplier.

What is our project idea or innovation challenge:

Aeramine has a proprietary process for copper rod zone refinement, that makes large, ultra-high purity copper production commercially viable. The copper ingots are compatible with most industrial forging or wire-drawing post-processing.

Partner(s) required? (Y/N): Yes

If yes what type?:

A novel process or product that would benefit from the ultra-high purity copper.

Post-processor of ultra-high purity copper, such as wire drawing.



Coventry University

Yuze Huang

yuze.huang@coventry.ac.uk

What we do:

We are focusing on developing high-speed and wire/powder additive manufacturing process and laser welding by using physics-informed modelling, data-driven monitoring and control:

- (I) Process development for high-speed wire/powder additive manufacturing.
- (II) Physics-informed modeling for defects reduction in laser metal additive manufacturing and welding.
- (III) Data driven online monitoring (optical, acoustic, photodiode) for high-quality additive manufacturing and welding.

Project idea:

High-speed wire/powder laser metal additive manufacturing for near-net-shape parts

Challenges:

- Inconsistent quality due to the fast laser-metal interaction.
- Few study on the advanced particle-reinforced wires AM
- Random defects (e.g., pores, cracks) without controlling

Partner(s) required? (Y/N): Yes

If yes what type?:

- Lead organisation (UK materials and manufacturing organisations)
- Research and technology organisation (RTO)
- Business of any size in metal powder/wire manufacturing.
- Academic institution.



University Of Cambridge

Pippa Horton

Pmh49@cam.ac.uk

What we do:

Our research group is called the Use Less Group, we identify emission reduction opportunities through using less material. Our work in resource efficiency focuses on the bulk materials and the products & processes which use them.

Where you sit in the supply chain?

Our research covers the whole supply chain from material production, component manufacturing and end use. We develop resource efficiency ideas from proof of concept, to industrial demonstration and commercial application in practice.

What is our project idea or innovation challenge:

We have created a detailed map (called PROBS) of the UK manufacturing system. We can view how material produced, imported, exported, transformed into components and assembled into final goods. This gives us valuable insights into opportunities for material efficiency across the supply chain. We would like to collaborate with other researchers who would find this information useful, as well as industrial partners who would like to use our insights to implement resource efficiency opportunities within their organisations.

Partner(s) required? (Y/N):

If yes what type?:

Since our focus is broad, we are interested in collaborating with partners from all sectors, both research institutions, RTO's and industry.

THE
USE | LESS
GROUP



InnovateUK
KTN

Glyndwr Innovations Ltd.

Professor Caroline Gray OBE

c.gray@glyndwr.ac.uk

What we do: Design, Manufacture and Test optical systems and payloads for space and near space platforms and applications.

Specialists in design and optical metrology of complex systems with unique manufacturing capability of complex optical surfaces up to 2m in size. With research areas in composite material manufacture and design.

Where you sit in the supply chain?
Glyndwr Innovations is a commercial spin out from Wrexham University delivering high specification optical components, systems and subsystems up to 2m in size.

What is our project idea or innovation challenge:

To further develop our delivery and capabilities through partnership with materials and systems manufacturers or developers

Partner(s) required? (Y/N):

If yes what type?:

Yes
academic or commercial

Happy to talk to potential academic or commercial partners wanting to add or develop payloads to their capabilities



HAL Robotics

Sebastian Andraos

s.andraos@hal-robotics.com

What we do:

Flexible, adaptable robot
reprogramming software.

Where you sit in the supply chain?

Technology provider and
turnkey robotic solution
provider.

What is our project idea or innovation challenge:

Adaptable robotic solutions for high-mix,
low volume manufacturing.

Partner(s) required? (Y/N): Yes

If yes what type?: End-users who require flexible and
adaptable robotics.



Luffy AI Limited

Obi Zaher

obadah.zaher@luffy.ai

What we do:

Adaptive AI Control Systems

- We help customers improve productivity, safety and sustainability through intelligent control systems.
- Our AI controllers are trained on a digital twin of your manufacturing process, and through adaption at the edge, will self-optimize once deployed.
- AI techniques can uniquely target key value drivers, allowing manufacturers to maximise the potential of their equipment.
- Trial results on an OEM composites process achieved a 10% energy reduction and 33% drop in compressed air use. Adaptive AI improved their overall energy and resource usage.

Where you sit in the supply chain?

- Software supplier

What is our project idea or innovation challenge:

- Use digital twins & adaptive AI control systems to optimise your manufacturing process. Targeted improvements:
 - Reduce energy usage
 - Resilience to variable feedstocks (increased use of recycled materials)
 - Increased yield and profitability
- Example processes include: composites, metals, cement glass, plastics.

Partner(s) required? (Y/N): Yes

If yes what type?:

- Manufacturers, OEMs and catapults.



Sarah Karmel

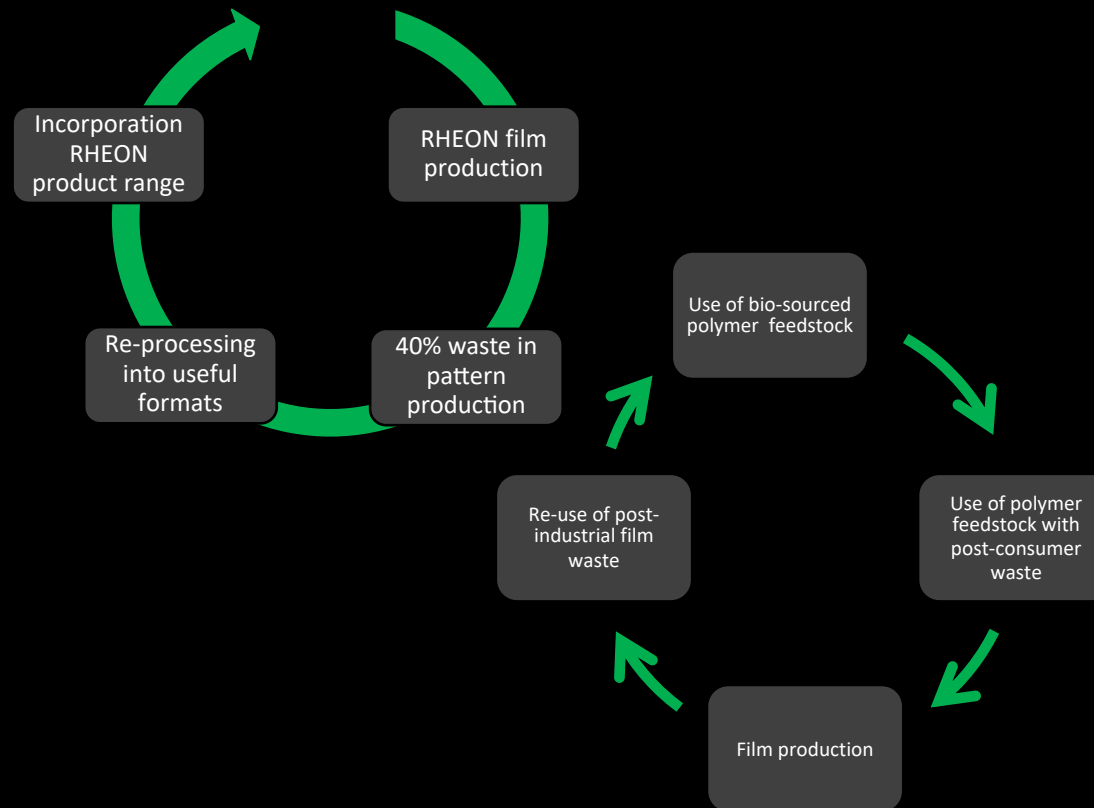
Sarah.karmel@rheonlabs.com

What is RHEON

- RHEON™ is an ultra-high energy-absorbing polymer.
- It is soft and flexible in its natural state but absorbs high levels of energy by stiffening when subjected to force.
- The technology has made breakthroughs in impact protection (e.g. helmets) & in active muscle control (e.g. sport bras).



What is our project idea or innovation challenge:



Partners required:

- Renewable polymers
- Long term testing
- Recycling



2M Group Ltd – Building a better world for tomorrow

James Nelson

jnelson@2m-holdings.com

What we do:

- Global chemical supply and distribution into a broad range of material and life science industries.
- Speciality Chemical manufacturing, storage and distribution
- Formulation development of personal care and HI&I products and applications.
- Contract manufacturing service in the personal care and HI&I industries

Where you sit in the supply chain?

- Chemical manufacturer for major CPG brands and Industry
- Chemical supply and distribution for major industry principles.
- Chemical storage, blending and mixing
- Personal care and HI&I manufacturing for CPG brands

What is our project idea or innovation challenge:

We are working with our partners to replace many of the products in our current portfolio over the next 10 years with sustainable alternatives and to scale up our manufacturing business. This will help many of our customers in the life and material science areas transition their product development and R&D efforts into more sustainable products. We see the potential to help innovators scale new technologies that are in development and offer a partnership approach that can include manufacturing, supply, distribution and joint R&D leveraging our existing expertise across many industries as well as our extensive customer and supply network.

Partner(s) required? YES

- Looking for partnerships with Innovators / Start ups / who would like support scaling up manufacture and distribution or finding routes to market for personal care or packaging applications.
- Interested in research that explores the use of natural protein and polysaccharide complexes or that uses micro-organisms (or their component parts) to break down waste materials, or synthesise renewable raw materials into commodity or speciality chemicals.



KS Composites

Alastair Trimmer

alastair.trimmer@kscomposites.com

What we do:

KS Composites is a leading independent manufacturer of Carbon Fibre and GRP structures and components.

Where you sit in the supply chain?

We are a Tier 1 Manufacturer completing Engineering, tooling and components in-house.

What is our project idea or innovation challenge:

We have space, capacity and a desire to work on a new challenge to develop a process, integrate new or sustainable materials into a component that is needed for everyday use.

Partner(s) required? (Y/N): YES
If yes what type?:

We are open to work with new partners or re-establish previous relationships.



University College London

PROF NGUYEN TK THANH, FRSC FInstP FIMMFRSB

ntk.thanh@ucl.ac.uk, <http://www.ntk-thanh.co.uk>

What we do:

- Synthesis of nanomaerials**
- Physico-chemical characterization of Nanomaterials**
- Preclinical Studies of Nanomaterials**

Where you sit in the supply chain?

- Academic institution**

What is our project idea or innovation challenge:

Novel nanomaterials for diagnostic and treatment of cancers

Partner(s) required?: Y

If yes what type?:

-**Academic institutions**

- [Advanced Manufacturing Research Centre \(AMRC\)](#)
- [Manufacturing Technology Centre \(MTC\)](#)
- [Lucideon](#)
- [Centre for Process Innovation \(CPI\)](#)
- [Innovate UK Edge](#)
- [TBAT](#)
- [Materials Processing Institute \(MPI\)](#)
- [Northern Ireland Advanced Composites and Engineering Centre \(NIACE\)](#)
- [Reading Scientific Services Ltd \(RSSL\)](#)

The UCL logo, featuring a small crown icon to the left of the letters 'UCL'.

Senergy Innovations Ltd

Sean Duffy

sean@senergyinnovations.co.uk

What we do:

- Thermal conductivity thermoplastics
- Moulding and extrusion
- Research and Development

Where you sit in the supply chain?

- Research, product development and manufacturing.

What is our project idea or innovation challenge:

- Affordable hot water
- Improved properties of thermoplastics
- Heat sinks and heat exchangers
- Replacement of traditional materials

Partner(s) required? (Y/N): Yes

If yes what type?:

- Automotive
- Heat exchangers
- Partners who are interested in thermally conductive polymers



PCL Ceramics Ltd

David Pooley

dpooley@pclceramics.com

What we do:

PCL Ceramics design, engineer, and install, innovative high pressure casting ceramic solutions for the sanitaryware, tableware and advanced ceramic industries.

Where you sit in the supply chain?

PCL Ceramics are both primary and secondary stage manufacturers.

Primary – Chemical Processing/Engineering

Secondary – Machine Fabrication & Installation

What is our project idea or innovation challenge:

PCL are looking at two ideas:

1. To create a mould from polymeric material which is workable and shaped by a CNC type process, rather than fabricated using multiple mesh type materials which are then encased in the porous polymeric material.
2. Produce a mould material which can be used for high pressure casting ceramic bricks and pipes

Partner(s) required? (Y/N): Yes

If yes what type?:

1. University/Academic Support
2. Producer of ceramic bricks/Pipes or Refractory type products
3. Catapult/RTO i.e. CPI



CAE Tech Limited

<https://cae.tech>

Peter Harman

peter.harman@cae.tech

What we do:

Software for manufacturers of **build-to-order** and **mass-customisable** products, from online **configurators** to automation and optimisation of the manufacturing.

Where you sit in the supply chain?

We support the manufacturer with their interfaces with customers (B2C or B2B) and suppliers (B2B)

What is our project idea or innovation challenge:

Consumers are unable to make **informed** choices to minimise the **impact** of their purchases. We want to enable **configurator** software with continuous feedback on the **material usage and efficiency** of choices made.

Partner(s) required? (Y/N):
If yes what type?:

Manufacturers of build-to-order or customisable products, such as offsite-construction, interiors (furniture, lighting, joinery), healthcare & mobility, transport (bicycles, boats, goods vehicles)



Alloyed

Rory Rose

rory.rose@alloyed.com

What we do:

We deliver next generation performance for metal components through the development and production of superior and customised alloys for traditional and additive manufacturing using our world leading platform for computational alloy design

Where you sit in the supply chain?

Technical consultants and additive component manufacturer

What is our project idea or innovation challenge:

Alloyed wants use it's computational platform to design the next generation of performance cast green aluminium alloys with high recycled content for the automotive sector.

Partner(s) required? (Y):
If yes what type?:

Automotive OEMs and recycled metal merchants



ANTONYM LTD

Rev N Murugesan

rev@antonym.tech

What we do:

Antonym is a Leeds-based advanced manufacturing company that is hyper-localising manufacturing to tackle COVID-19 induced supply chain shortages and Climate Change.

Where you sit in the supply chain?

Antonym is a contract manufacturer for high-value industries like aerospace, defence, & healthcare.

What is our project idea or innovation challenge:

Scope: Resilient supply chains & world-class production.

A “factory-in-a-box” cloud-connected micro-factory solution for high-value industries, helping them re-shore critical metal parts manufacturing. Leveraging Cloud computing, Metal AM, and Robotics to ensure supply chain resiliency against unforeseeable disruptions, as well as advancing British manufacturing capabilities at home and abroad.

Partner(s) required? (Y/N): YES

If yes what type?:

High-value manufacturing partners within Metal Additive Manufacturing & Automation to co-build a pilot micro-factory that will be powered by a proprietary cloud-based FactoryOS software that Antonym has developed. The cloud factory integrated solution will aim to be as a faster, cost-effective, and greener alternative to off-shore parts manufacturing.



James Cropper

Rich Burnett

richard.burnett@cropper.com

What we do:

Manufacturer of

Advanced non-wovens

Speciality Paper

Moulded Pulp products

Where you sit in the supply chain?

What is our project idea or innovation challenge:

Recycling of textile blends (specifically polyester & cotton)

Partner(s) required? (Y):

If yes what type?:

Supply Chain partners – collection / sorting / preparation of textiles.

Academia



Minviro

Sahin Alacacayir

sahin@minviro.com

What we do?

Minviro is a UK-based consultancy and technology company - offering a deeper level to sustainability through high quality life cycle assessment (LCA).

Where you sit in the supply chain?

Minviro has worked with over 150 companies internationally from mining operators to battery manufacturers to quantify and help reduce environmental impacts related to critical commodity and product supply chains.

What is our project idea or innovation challenge:

We want to transfer our deep understanding of sustainability in the raw material sector into hydrogen, solar power and other clean energy technologies to develop tools to guide companies quantifying their environmental and overall sustainability impacts.

Partner(s) required? (Y/N): If yes what type?:

We want to create collaborations with research institutes and industry players in energy and manufacturing sectors that can help bridging life cycle and sustainability thinking with manufacturers.



Metalysis

David Hawkins

david.hawkins@metalysis.com

Metalysis reduces metal oxides to metal powders, alloy powders and high entropy alloy powders using an electrolysis reduction process. Electrolysis heats rather than melts, using less energy (50% less for the reduction of titanium alloys), reducing metal oxides to remove their oxygen leaving the metal which can be easily post-processed into powder.

We can therefore alloy metals which are traditionally too expensive or technically challenging to alloy – eg scandium alloys or the new generation of complex alloys - high entropy alloys - which consist of 5 metals or more.

Metalysis is a midstream player - capable of processing critical metals and rare earth metals - from across 49 elements of the periodic table, and is capable of processing blended oxides: refined ores, mined ores and secondary raw materials, and can repurpose additive manufacturing powders

Metalysis produces an aluminium scandium master alloy at 36% scandium loading - for use in electronics - whilst the scandium level can be reduced to suit the requirements of the aerospace and automotive sectors for heat exchangers, jet engines and fuselage components. Scandium's lightweighting properties, combined with its high strengthening qualities means that small amounts of Sc bring transformatory capabilities to a new material.

Our lightweight refractory high entropy alloys – eg $\text{Al}_{20}\text{Mo}_{10}\text{Nb}_{20}\text{Ta}_{10}\text{Ti}_{20}\text{Zr}_{20}$ are aimed at the heat exchanger market and Metalysis is capable of alloying tantalum with aluminium and titanium – metals with vastly different melting points. High entropy alloys have the potential to revolutionise material science. These lightweighting HEAs when applied to the aerospace and automotive sectors can reduce emissions, lower energy consumption and bottom-line costs.

Metalysis is looking for further commercial partners to apply its aluminium scandium master alloy, as well as commercial partners to develop bespoke high entropy alloys – across the 49 elements of the periodic table.

www.metalysis.com



Tensei Ltd

Annabelle Cox

Annabelle@tensei.co.uk

We develop new bio based materials from crop residues and food and drink biowaste. We call this waste or rather new material feedstock, The Second Harvest. Tensei are a licensed based company pioneering the Second Harvest.

We are upstream as the R&D company.

The innovation challenge is the adoption of Second Harvest as a mainstream raw material. It requires behavioural change within the supply chain to create inflexion. To help this we need to develop:

- A local and consistent supply of processed raw material from The Second Harvest.
- Proof that these next gen materials offer best in class solutions within minimal operational disruption.
- A market willing to purchase these new bio based materials.

Partner(s) required? (Y/N): Yes

- Investors
- Academic partners and labs
- Material Manufacturer eg paper mill/ masterbatch producer/adhesive and chemical
- Raw material processor eg pulp producer/ milling and drying companies
- Companies interested in developing materials with Tensei for their own customers or markets
- Similar R&D companies we can collaborate with.



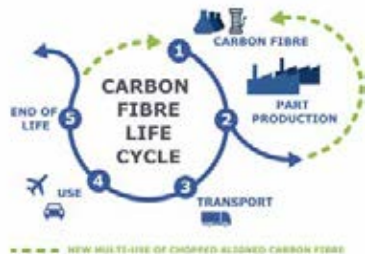
Lineat Composites Ltd

Gary Owen

Gary.owen@lineat.co.uk

What we do: We take waste and EoL carbon fibre and instead of that being produced into low grade material or landfill. Lineat re-aligns through its patented technology and produces a technical material that retains nearly 90% of the original composite properties. Making More from Carbon Fibre

Where you sit in the supply chain?



What is our project idea or innovation challenge:

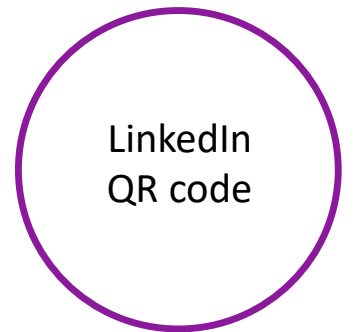
SCALE UP

PILOTLINE – INDUSTRIAL

ACCURATE FEEDSTOCK SUPPLY

Partner(s) required? (Y/N): yES

If yes what type?: Manufacturing Innovators



Algreen Ltd

Zhixuan Wang

zwang@algreen.tech

What we do:

Algreen provides the most sustainable solutions to petrol-based polyurethanes. Polyurethanes represent 8% of world plastics. They are widely used in cosmetic, packaging and fashion industries for making cosmetic microplastics, packaging films/coating/adhesives, sequins, shoes/bra foam, shoes/underwear adhesives and waterproof coating. Conventional polyurethanes come from carbon intensive petrol refineries and end their life in landfill, releasing microplastics or are incinerated generating significant Greenhouse Gases.

Algreen invents fully biobased and biodegradable polyurethanes designed to eliminate petrol-based polyurethanes. The global polyurethane market will be 29.2 million tons (2029). By replacing 1% of petrol-based polyurethane, Algreen eliminates 88bn kgCO₂eq annually.

Where you sit in the supply chain?

Technology provider

What is our project idea or innovation challenge:

Algreen provides the most durable coating materials for outdoor wear applications. And globally, an estimated 92 million tonnes of textiles waste is created annually. Algreen waterproof coating can provide enhanced performance on outdoor wear product durability and correspondingly reduce fashion waste generation and increase resource efficiency.

Partner(s) required? (Y/N): YES

If yes what type?:

Any potential connections would like to support us 😊



University of Hertfordshire, Hatfield. England. UK.

Dr Oluseyi Adeyemi

Email Address: o.adeyemi5@herts.ac.uk

What we do:
Research and Development,
Commercial Projects, and
Knowledge Transfer Partnerships.

Where you sit in the supply chain?

Production and Operations Management
Lean Six Sigma Quality Management

What is our project idea or innovation challenge:
Adopting decision support systems for
operations management.

Influence of Industry 4.0 technologies on
decision making processes.

Partner(s) required? (Y/N): Y
If yes what type?:
Large enterprises
Medium enterprises
Small enterprises



Compound Semiconductor Applications (CSA) Catapult

Paul Jarvie – South West and Wales DER-IC Lead

paul.jarvie@csa.catapult.org.uk

What we do:

CSA Catapult was set up in 2018 as a research and technology organisation (RTO). Funded by Innovate UK, we help to grow the UK economy for industries using compound semiconductors. We are the Driving the Electric Revolution Centre for the South West and Wales. With a team of technical experts and state-of-the-art equipment, we work to accelerate the adoption of compound semiconductor technologies in applications for Power Electronics, Advanced Packaging, Radio Frequency, Microwave and Photonics.

Where do you sit in the Supply Chain?

As a neutral supply chain convenor, we bridge the gap between academia and industry. We introduce potential project partners, from universities, SMEs, through to large companies to collaborate on technical projects.

We want to talk to you about:

- Net Zero enabling technologies (Power Electronics, Machines and Drives), advanced packaging and next generation communications and sensing
- Your material science expertise in applications for chip manufacturing and advanced packaging for semiconductors
- Our state-of-the-art 3D, multi-material, combination printing equipment
- Potential project collaborations to develop next-generation technology for industry

Partners required? Y/N

Yes:

- Innovative SMEs
- Larger Tier 1 companies/OEMs
- End users
- Companies looking to embrace and develop disruptive technologies



Innovate UK KTN support

Peter Clark, Head of Chemistry and Industrial Biotechnology
Karl McCracken, Knowledge Transfer Manager, Industrial Technologies and Manufacturing Team
Ajay Kapadia, Knowledge Transfer Manager, Materials Team

www.ktn-uk.org



InnovateUK
KTN

Innovate UK KTN Support

Peter Clark
Head of Chemistry and Industrial Biotechnology

www.ktn-uk.org



Innovate UK
KTN



About Us

Innovate UK KTN (IUK KTN) exists to connect innovators with new partners and new opportunities beyond their existing thinking – accelerating ambitious ideas into real-world solutions.



Our Network



46,229
Unique
Organisations



72%
Small

15%
Medium

13%
Large



234,478
innovators



Every university in
the UK

What support can you expect from Innovate UK KTN

- Recordings from both SusBio and REforMM Briefing Events up on KTN website
- All pitches (exhibitor and delegate) from this event – shared via our website – more welcome
- Dedicated 1-2-1 support from specialist Knowledge Transfer Manager – specialists in their fields - to support you in:
 - (1) Making Introduction to potential partners
 - (2) Helping form collaborations
 - (3) Reviewing funding applications
- We have access to +250,000 innovators within the Innovate UK KTN's Network – talk to us if you want to find a partner!
- Assistance with Inclusive Innovation and Design aspects to your project
- Keep an eye out on social media and via our newsletters for further announcements regarding networking activities throughout the year!



Support from the Chemistry and Industrial Biotechnology Team

www.ktn-uk.org



Innovate UK
KTN

Chem and IB Team and Priority Activities



Dr Peter Clark
Head of Chemistry & Industrial Biotech.



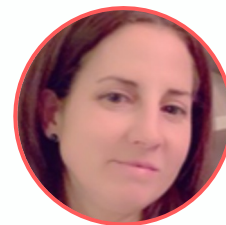
Dr Juan María González Carballo
KTM – Chemistry



Dr Catherine Mort
KTM – IB



Dr Sheena Hindocha
KTM – Materials Chem.



Debra Jones
KTM – Chemistry



Dr Dana Heldt
KTM – Synth. Biology



Dr Matthew Reeves
KTM – Materials Chem. & Formulation



Michael Burnett
KTM – Process Manufacturing



Rajesh Mistry
KTM – IB

Cross-Sector Priority Areas

Materials

(Critical Materials, Batteries, Hydrogen, TFI, Plastics)

Energy & Infrastructure

(Hydrogen, Batteries)

Transport

(Sustainable Aviation Fuel Innovation Programme, Hydrogen)

Health

(Sustainable Processes, Digitalisation)

Net Zero

(Circular Economy Innovation Network, Circular Carbon, Chemical Recycling)



InnovateUK
KTN

If you need help finding partners from within the Chemistry & IB Community...



Dr Peter Clark
Head of Chemistry
& Industrial
Biotech.



Michael Burnett
KTM – Process
Manufacturing



Dr Catherine Mort
KTM – IB



**Rajesh
Mistry**
KTM – IB



Dr Dana Heldt
KTM – Synth. Biology

You can contact us at
Firstname.Surname@iuk.ktn-uk.org

Support from the Industrial Technologies and Manufacturing Team

Karl McCracken
Knowledge Transfer Manager

www.ktn-uk.org



Innovate UK
KTN

Industrial Technologies & Manufacturing Team



Paul Huggett



Simon Yarwood



Mat Wasley



Karl McCracken



Sven Knowles



Liqun Yang



Raluca Popovici



Luqman Hakim



Megan Ronayne
Head of Industrial
Technologies &
Manufacturing

*Photonics, Sensors, Semiconductors, Electronics, Computing and
Advanced Manufacturing*



InnovateUK
KTN

For THIS current CR&D funding call

We can help you find suitable partners from our manufacturing community



Karl McCracken

**KTM – Advanced
Manufacturing**

<https://calendly.com/karl-mccracken>



Luqman Hakim

**KTM – Industrial
Technologies and
Manufacturing**

<https://calendly.com/luqman-hakim/iuk-ktn>



Megan Ronayne

**Head of Industrial
Technologies &
Manufacturing**

<https://calendly.com/megan-ronayne>

Support from the Materials Team

Ajay Kapadia
Knowledge Transfer Manager – Advanced Composites

www.ktn-uk.org



InnovateUK
KTN

Materials Team

Our mission

We facilitate cross-sector collaboration to accelerate materials innovation and adoption across academia and industry.

About us

Like materials, we are involved in a wide range of areas and each member of the team has their specialist area. But we work together to contribute and complement each other's projects. As such, where there is innovation in materials or the way they are used, someone in our team will be involved.



Robert Quarshie
Head of Materials /
Interim Deputy
Director



Sally Beken
KTM Polymers



Neelam Mughal
KTM Advanced
Materials



Ajay Kapadia
KTM - Composites



Denise Goldsmith
KTM Marine
Plastics



Stephen Morris
KTM Smart
Materials
& Technical Textiles



Christopher Pilgrim
KTM Materials

Contact Details

We can help you find suitable partners from our materials community



Ajay Kapadia
KTM – Advanced
Composites

<https://calendly.com/ajay-kapadia>



Sally Beken
KTM – Polymers

<https://calendly.com/sally-beken/support-for-innovate-uk-re-imagining-materials-competitions>



**Christopher
Pilgrim**
KTM Materials

<https://calendly.com/christopher-pilgrim>





Thank you



Lunch, clinics, networking and exhibitions

16:00 Formal End and Refreshments

18:00 Venue closes

www.ktn-uk.org



InnovateUK
KTN