



Funded by
UK Government

Innovation Challenge Launch:

Leading the way in innovative, sustainable manufacturing

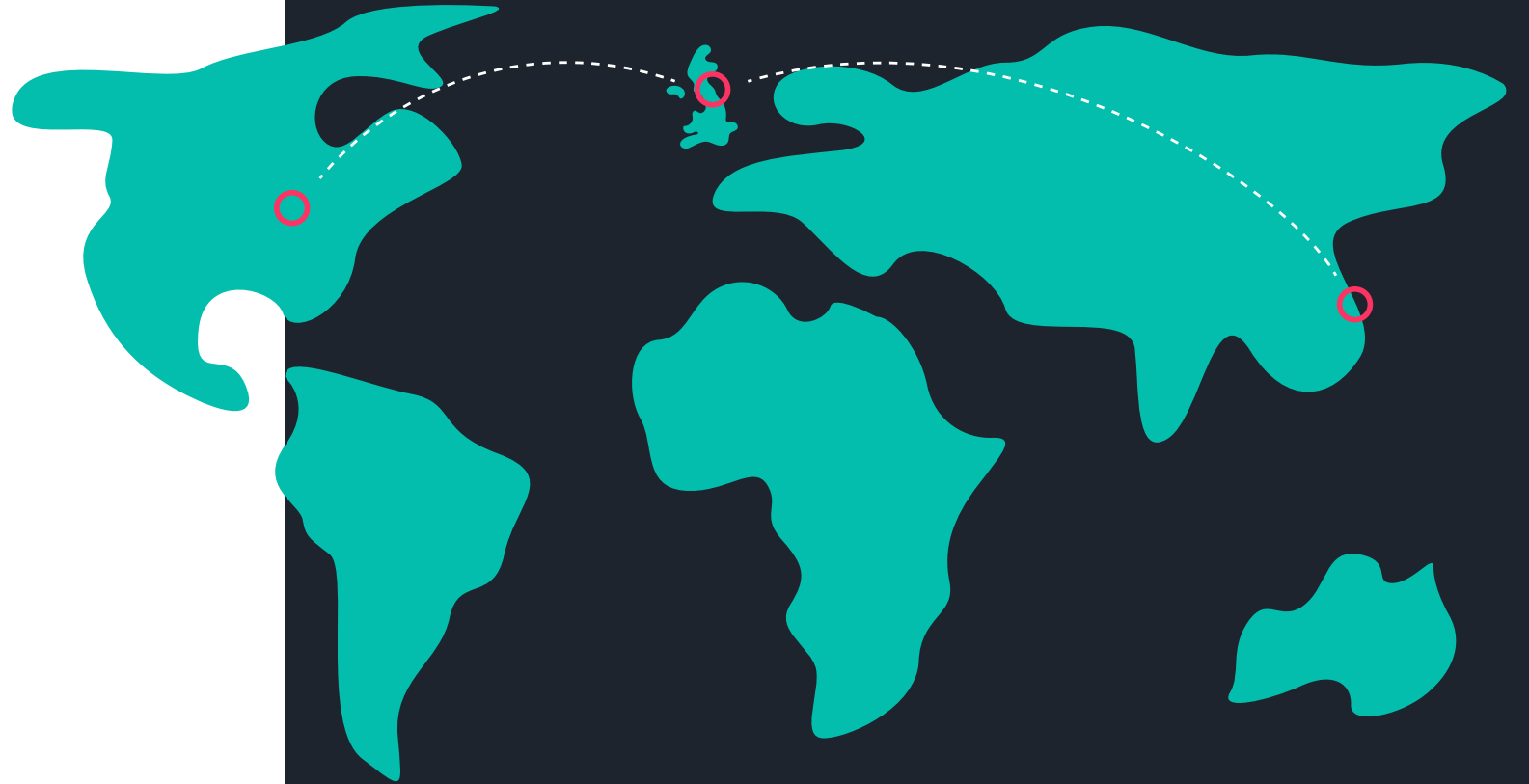
September 2024



Edge is North-East based, but delivers innovation from Chicago to Shanghai...

Our track record includes successful
delivery of innovation projects with:

- Local businesses
- Universities
- Local government and NHS trusts
- Multinational clients in diverse industries



About our approach...



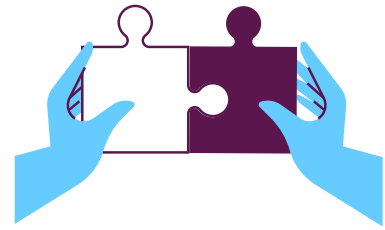
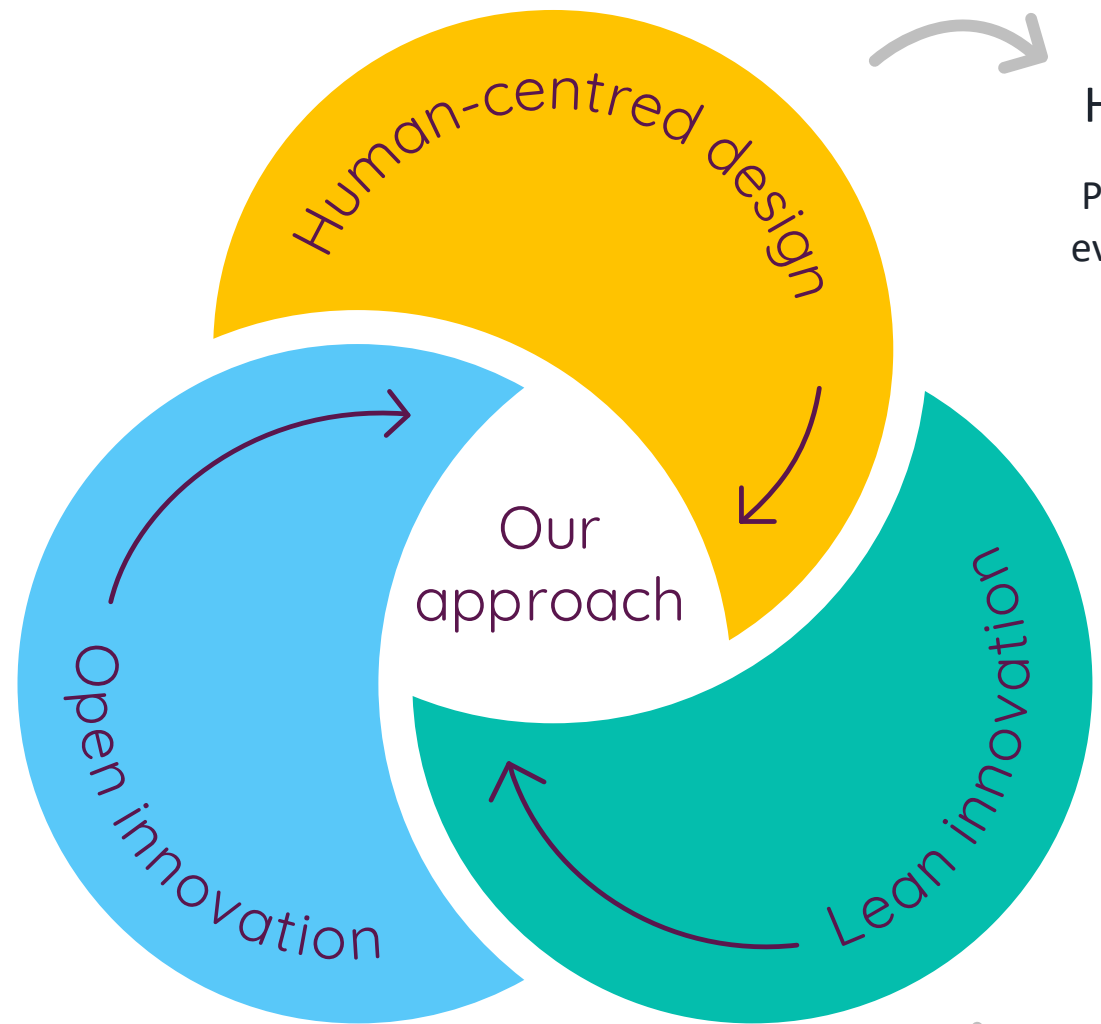
Human-centred design:

Putting people at the heart of everything we do. Based in the belief that insight can come from anyone.



Lean innovation:

Taking a strategic approach, minimising waste and prioritising experimentation to fail fast and cheap.



Open innovation:

Building pathways for collaboration to foster innovation and mutual benefit.

Introducing the Tees Valley Innovation Challenge

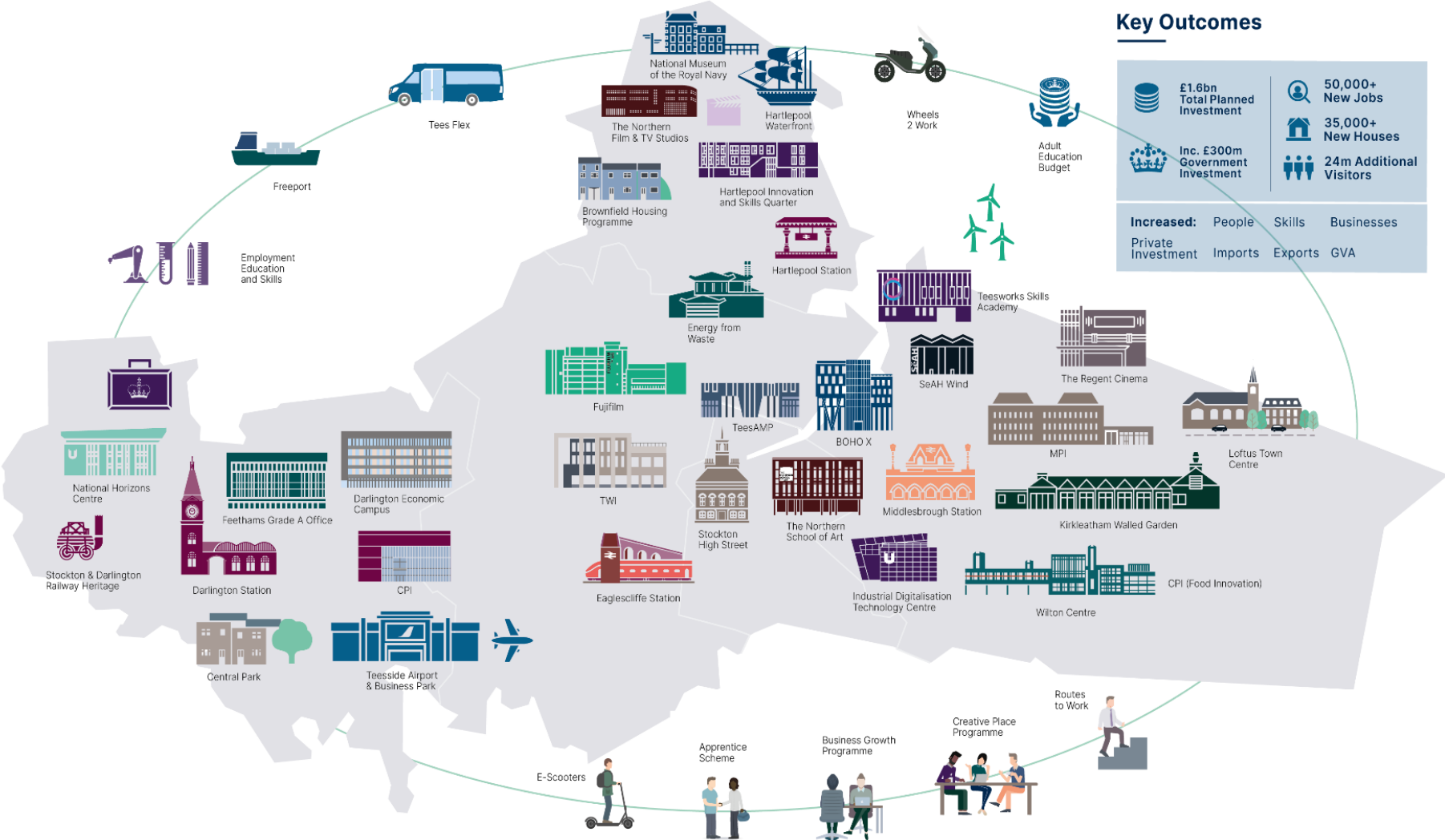
Simon Green, CEO

Edge Innovation



Tees Valley Combined Authority

Securing investment
 Creating jobs
 Transforming Tees Valley



Key Outcomes

- £1.6bn Total Planned Investment
- 50,000+ New Jobs
- Inc. £300m Government Investment
- 35,000+ New Houses
- 24m Additional Visitors

Increased:	People	Skills	Businesses
Private Investment	Imports	Exports	GVA

UK Shared Prosperity Fund (UKSPF) Investment Plan

£46.3M

Supporting Local Business £13m

Strengthening local entrepreneurial eco systems & businesses at all stages

- ▶ Business Start Up, Scale Up & Growth
- ▶ SME Net Zero

- ▶ Finance & Funding
- ▶ Digital: Know-how & investment
- ▶ People: Workforce
- ▶ Supply Chain Opportunities
- ▶ Sector networks and collaboration

▶ Supply chain development

▶ Supporting innovation

Supporting decarbonisation and improving natural environment whilst growing the local economy

People & Skills £8.6m

Intensive wrap around one to one support to help people into employment

Increasing numeracy skills in communities for life & work (Multiply Investment Plan)

Communities & Place £24.7m

Improvements to our Town Centres and High Streets inc. tackling anti-social behaviour & crime

Enhanced support for existing culture & heritage institutions improving the local cultural offer

Support for local arts, cultural & heritage activities

Developing the tourism offer and campaigns to encourage people to visit and explore the local area

Exploring ways to increase digital inclusion across Tees Valley

Choosing Our Delivery Route

- ▶ Open Calls for Proposals
- ▶ Procurement
- ▶ Direct Delivery
- ▶ Co – Design with Partners

Creating & Safeguarding Jobs – Level Up the Tees Valley

Delivery

Our Stakeholder Partnership Group will:

- ▶ Support TVCA to Develop Plans
- ▶ Oversee Programme Management
- ▶ Advise on Strategy & Delivery



Reduce Vacancies in Town Centres



Green House Gas Reductions



New Products & Processes



Safer Town Centres



Increase Employment



Increase in Visitor Numbers & Spend



Increase Numeracy Skills



Increase Footfall in Town Centres



New & Growing Businesses



Increase in Opportunities for Local People



Improved Perceptions of Tees Valley

Challenge Context

What is the Tees Valley Innovation Challenge?



Why?

- Strengthening innovation maturity in the Tees Valley economy
- Support innovative businesses through tailored business support, coaching and mentoring
- Unlock growth potential for Tees Valley organisations



How?

- Provision of tailored business support
- Provision of innovation and design training
- Supporting organisations to develop solutions to defined challenges
- Connecting organisations for mutual growth opportunities
- Promote Tees Valley as an innovation hub



Who?

- Tees Valley organisations
- Large organisations
- SMEs (under 250 employees, less than 50M turnover)

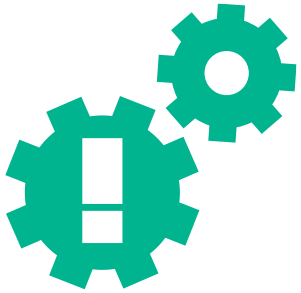


What?

- Expert support from the Edge and Health Innovation – North East & North Cumbria teams
- 10 Innovation Challenges
- 7 themes
- £130,000 awarded in grant funding, to 30 SMEs

The Support Routes

Supporting innovation through 4 key activities



Innovation Challenges

30 SMEs receiving financial and advisory support to respond to specific challenges defined by Challenge Holders and the Edge Team.



1-to-1 Support

30 SMEs receiving bespoke business support to accelerate movement towards their organisational objectives.



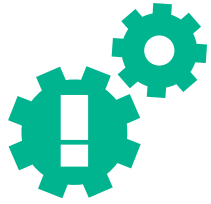
Innovation Training

36 SMEs receiving non-financial, design-led innovation training to create new products, services or processes and unlock growth potential.



Innovation Showcase

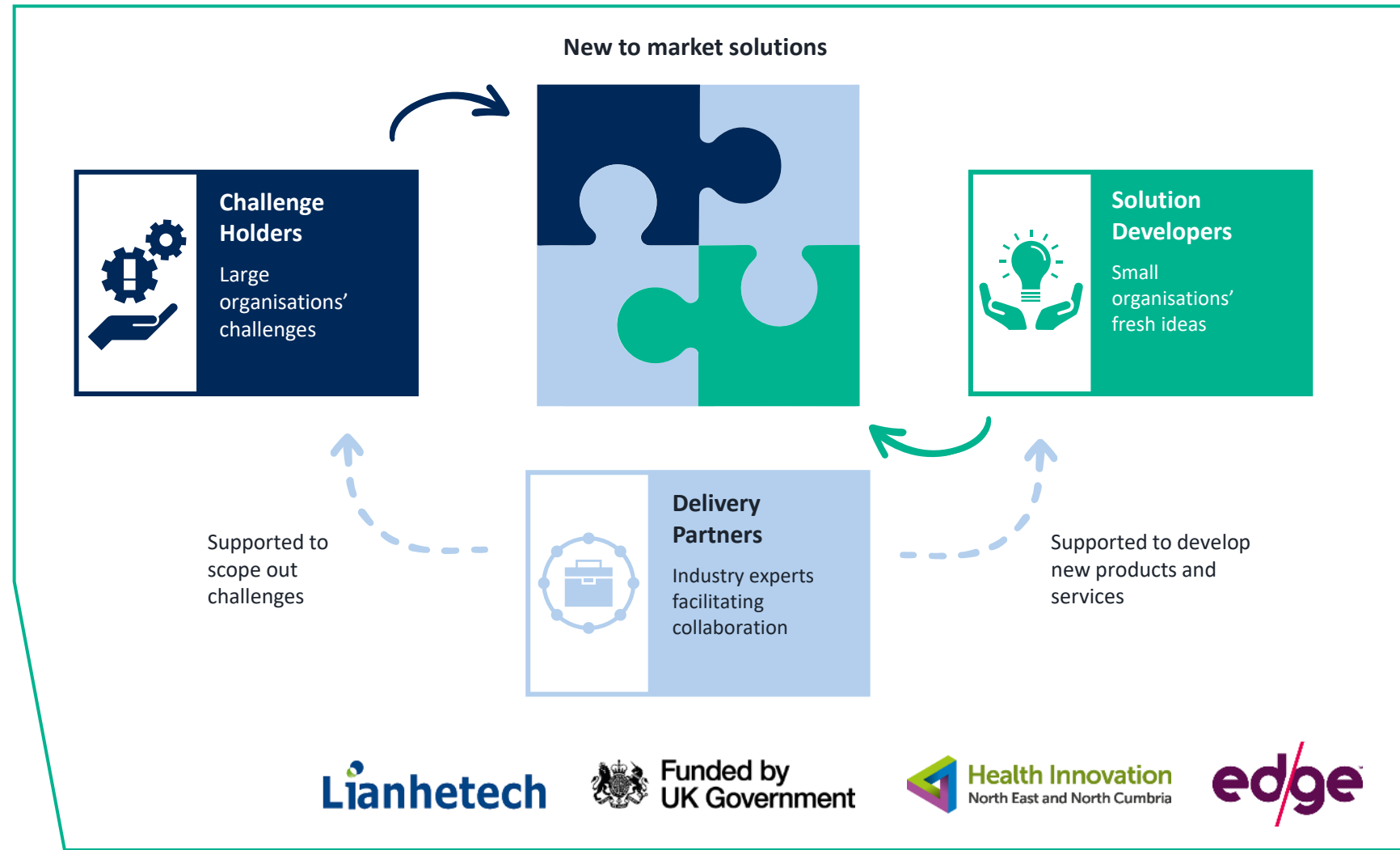
Promote the Tees Valley as an innovation hub, connecting ambitious SMEs with advice, finance, collaborators and potential customers.

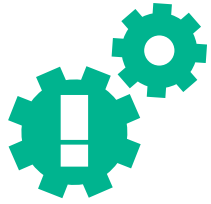


Innovation Challenges

In a nutshell

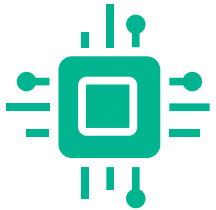
- SME Solution Developers are supported to respond to challenges of larger organisations
- This has mutual benefit and opens up collaboration opportunities
- 10 challenges across 7 key themes
- Grant funding and business support is available for successful applicants
- Solutions are products, services or processes which meet needs of the challenge holder





Challenge Themes

10 challenges relating to 7 key themes



Digital Innovation

Digital technologies and strategies



Healthcare

Wellbeing and patient care



Net Zero & Decarbonisation

Sustainable futures and reduction of emissions



Social Enterprise

Community development and socially conscious innovation



Transport & Logistics

Transport, mobility and supply chain management for goods and services



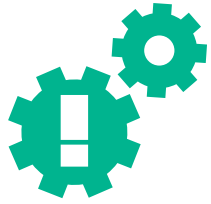
Professional Services

Adding value through innovation in service delivery



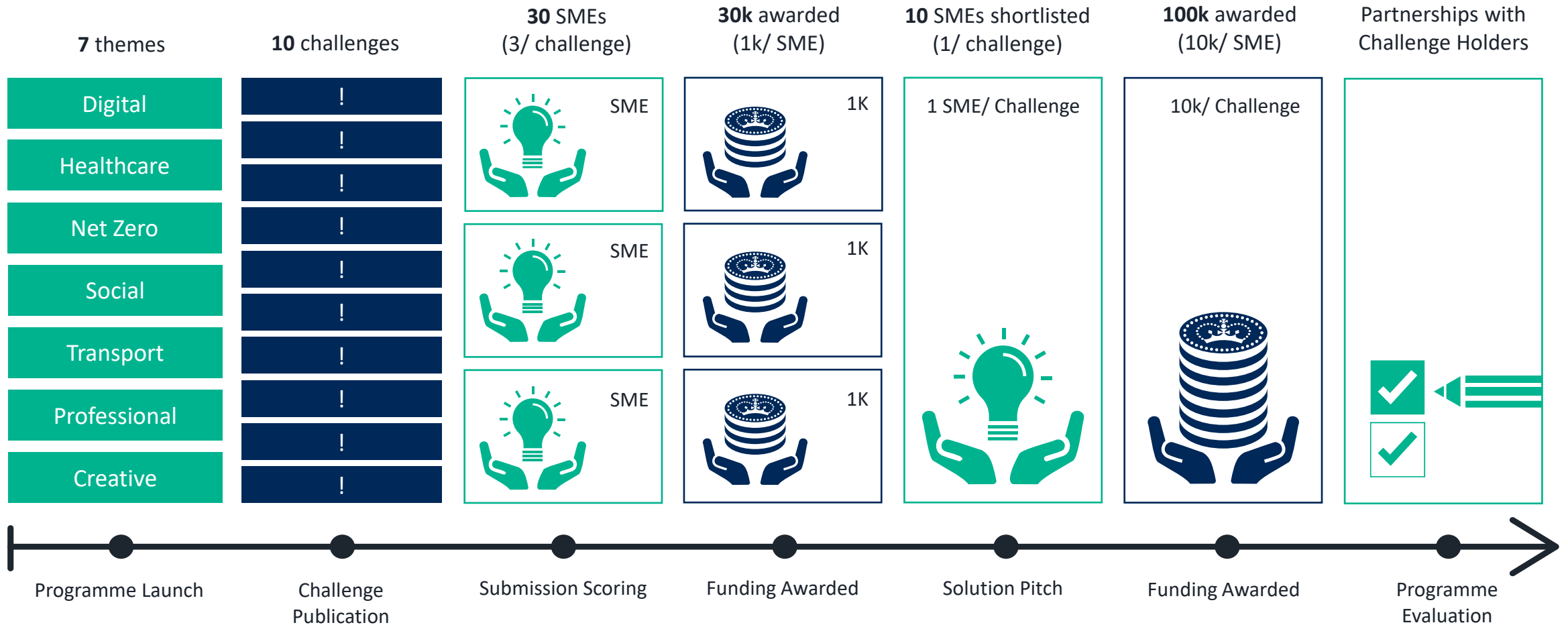
Creative Industries

Application of design, arts and other creative practices



Innovations Challenges - Funding Process

£130,000 to be awarded to 30 SMEs



Introducing Lianhetech Seal Sands

Paul Ladislaus

Manufacturing Technology Manager

Lianhetech Seal Sands



A leading European contract manufacturer of high quality, fine chemicals serving our customers in:

Crop Protection



Pharmaceuticals



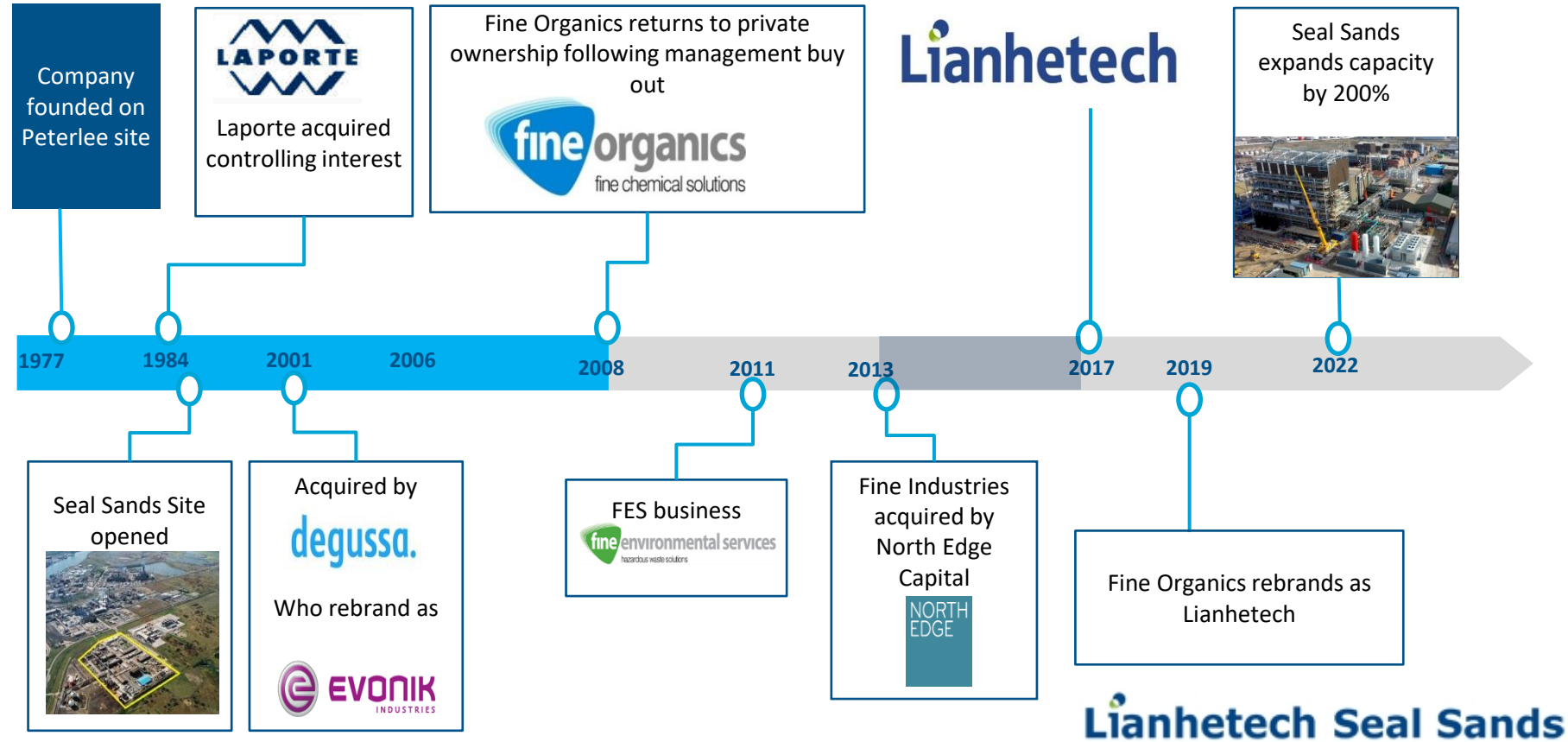
Performance chemicals



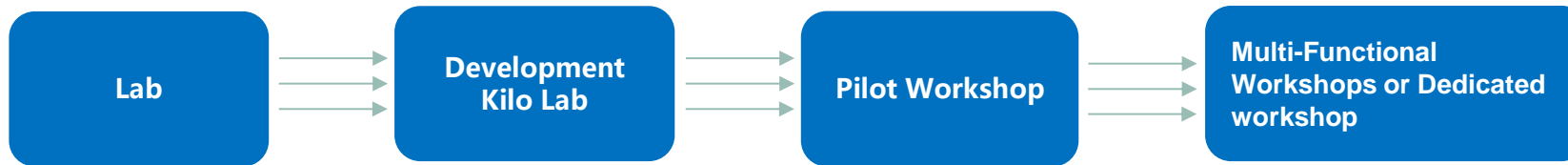
- Over 40 years of experience handling hazardous materials and reactions:
 - We have extensive scientific, engineering and operational expertise on site
 - We have a flexible environmental permit operating under a multi-product protocol
 - We operate a Quality System ranging from ISO 9001 to cGMP (audited by UK MHRA in 2022)
 - We are ISO 14001 and 45001 certified.



Site History – how we got to today’s facility



Focus from development to large scale commercial production



We can handle a range of materials and corresponding chemistries:

FLAMMABLE

Carbon disulphide
Toluene
Methanol
Hexane
Diethyl ether
TBME

VERY TOXIC

Dimethyl sulphate
p-Chloroaniline
Hydrazine
Hydrogen sulphide
Phenol
Sodium Cyanide
Phosgene
Thiophosgene

GASES

Hydrogen
Ammonia
Hydrogen chloride
Hydrogen fluoride
Carbon monoxide
Boron trichloride
Chlorine
Ozone
Ethylene Oxide

OXIDISING AND REDUCING AGENTS

Hydrogen Peroxide
Sodium hypochlorite
Peracetic acid
Nitric acid (to 98%)
Sodium Borohydride
Potassium persulfate

CORROSIVES

SO₃/Chlorosulphonic
acid
Phosphorous oxychloride
36% HCl
HBr (aq)
Sodium alkoxide
Thionyl chloride



HALOGENATED

Dichloromethane
Chlorobenzene
Bromine
Hydrogen Bromide (in
acetic acid)



- ISO14001 registered
- PPC Licensed for wide range of operations
- Monitoring of emissions to atmosphere
- Continuous monitoring of discharges to bio-treatment
- Solvent recovery option (non-pharma)
- Integrated Waste Management with on-site incinerator
- CHP Energy generation
- Real time energy generation and consumption monitoring

Introducing the Challenge:

Leading the way in innovative,
sustainable manufacturing



Challenge Context

- The production of fine chemicals involves the use of a wide range of organic solvents.
- As a responsible manufacturer, we strive to continually reduce emissions associated with organic solvents
 - These are referred to as volatile organic compounds (VOC) emissions
- These can be either:
 - **Channelled emissions** from abatement systems *or*
 - **Diffuse emissions**, for example from leaking joints in pipework.
- We are looking for **step changes** VOC emissions
 - This requires innovative solutions and technology, alongside existing processes
 - This brings technical, procedural and financial challenges and opportunities requiring innovative thinking and investment.



Challenge Constraints

- We must retain the capability to produce a range of products for multiple uses in a commercially viable manner, whilst meeting future VOC targets.
- We want to work with local partners to assess:
 - New and improved ways to our **existing** abatement equipment to VOC emissions *and*
 - Identify opportunities to trial new technologies and configurations.



The challenge in a nutshell



Problem

Current technologies for VOC emissions abatement may not meet future VOC emissions targets



People

We have limited resources on site and are always on the look-out for new partnerships



Process

We need to identify and assess alternative technologies, being mindful of cost and resource constraints



Progress

The challenge will help the chemical industry to continue to thrive, whilst protecting the environment and remaining profitable



The challenge: People



CURRENT STATE

- We use existing expertise and assets remain in compliance.
- As a responsible manufacturer, we strive to:
 - Reduce emissions to the environment.
 - Comply with future emissions standards.
 - Ensure the Seal Sands site remains viable and competitive into the future.
 - Be a responsible neighbour, mindful of its social and environmental roles.



FUTURE STATE

Our end-state is to:

- Achieve a step changes in VOC emissions.
- Continue to comply with envisaged future emissions regulations.
- Continue with a viable and competitive operation at Seal Sands.
- Closely engaged with local organisations.
- Be seen as a global leader by customers, competitors and regulators.



The challenge: People



CURRENT STATE



FUTURE STATE

The site welcomes the opportunity to bring in external perspectives on the problem to identify new and improved approaches.

A good outcome is to collaborate with local experts and innovators, developing mutually beneficial relationships.

Our regulatory team and the regulators are strongly aligned with this project.

We expect regulators to move further and faster on this issue over the coming years: this will require changes and investment.

Ensure continued compliance with regulatory requirements and continued strong relationships with statutory regulatory bodies, showing leadership in this field.



The challenge: People



CURRENT STATE



FUTURE STATE

Holistically, these issues are common to the industry: viable solutions developed through this challenge would be useful across different organisations.

Lianhetech is a major employer and an important contributor to the local economy.

A successful outcome will ensure the UK's industry remains competitive, whilst achieving the highest possible standards of environmental compliance.

Good solutions could lead to reduced operating costs through greater efficiencies.

We want to ensure that Lianhetech Seal Sands, and the wider local chemicals industry cluster, remains competitive going forward and continues to support significant local employment.



The challenge: Process



CURRENT STATE

Lianhetech Seal Sands operates four manufacturing buildings, with five emissions points. More details will be provided to shortlisted Solution Providers.

Currently, more efficient and effective VOC emission mitigation is limited by:

- Limited options from equipment manufacturers which could allow better VOC control, particularly due to the variability of waste streams resulting from multiple concurrent batch production processes.
- The need to avoid replacing one form of emissions (VOCs) with another (such as CO₂).
- Cost implications and resources required to implement any solutions.



FUTURE STATE

At the end of this work, Lianhetech would like to achieve a step change in reduction of VOC emissions, putting it at the forefront of sustainable and environmentally friendly manufacturing operations. This is likely to require:

- Obtaining and understanding additional data about emissions from our processes.
- Modelling existing processes and abatement systems to better understand what we do well, where improvements could be made and to model the impact of changes.
- Assessing risks, opportunities, costs and other relevant factors.
- Developing roadmaps to VOC emissions reductions in the immediate, medium and long term.



The challenge: Progress



CURRENT STATE

Current risks are around:

- Long term sustainability of the chemical industries in Tees Valley.
- Cost base and competitiveness of chemical industry.
- Environmental impact of operations.



FUTURE STATE

A successful outcome will enable:

- Environmental benefits through reduced VOC emissions.
- Continued competitiveness from the local chemical industry in the global market.
- A new market opportunity for a local SME.
- Leadership positioning for Lianhetech Seal Sands within the industry.



Scope for products and services



OUT OF SCOPE



IN SCOPE

Your solution should not:

- Involve redesign of core production processes
- Impose operational limitations – eg by limiting the range of processes that can be carried out on site
- Require technology which is at a low Technology Readiness Level
 - –We will consider piloting novel solutions under controlled conditions
- Replace one form of emissions with another
- Incur capital or operational costs that would make the site uncompetitive on global markets

Your solution should or could:

- Comply with best practice
- Improve our modelling of VOC emissions to assess the most efficient and effective treatment approach
- Consider concentration of waste streams to allow more effective treatment
- Consider improved use of existing processes for greater effectiveness or efficiency
- Comply with regulatory requirements around emissions monitoring
- Improve monitoring of VOCs going into emissions treatment assets
- Include to new / improved equipment, reconfiguration of existing equipment, monitoring, data capture and analysis and/or offline data modelling.

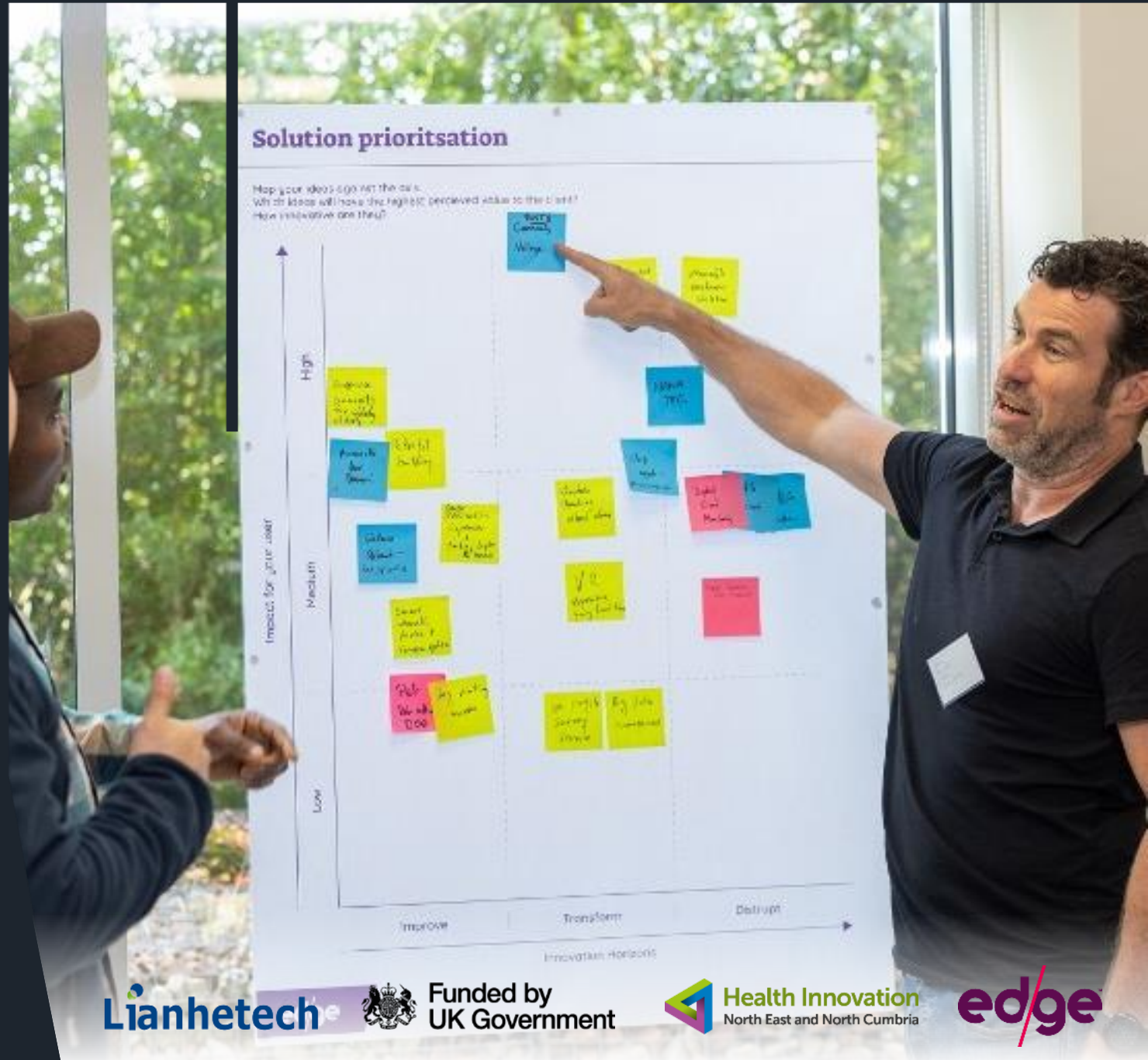


Lianhetech Seal Sands Challenge Timeline

Leading the way in innovative, sustainable manufacturing

Application Deadline:	Thursday 19th September 2024 at 5pm
Phase 1 Application Review Panels:	25 th September 2024
Grant application outcome notification:	End September 2024
Phase 2 Pitch:	w/c 18 th November 2024
Project close:	31 st March 2025

Questions?



Thank you

Sign up to the
Lianhetech challenge:



<https://bit.ly/TV-CHALLENGES>

Register your interest to be notified of
future challenges:



<https://bit.ly/TV-IC>