Lancashire
Enterprise Partnership

LEP - Lancashire Innovation Board

Meeting to be held remotely via Zoom on Friday, 24th July, 2020 starting at 10.30 am

Agenda

Part I (Items Publicly Available)

1. Membership and Terms of Reference of the Board (Pages 1 - 6)

2. Declarations of Interest

Board members are asked to declare any interests they may have in relation to items on the agenda

3. Origins, Context and Role of the Innovation Board (Pages 7 - 198)

4. Date of Next Meeting.

To be determined.

5. Exclusion of the Press and Public

The Board is asked to consider whether, under Section 100A (4) of the Local Government Act 1972, it considers that the public should be excluded from the meeting during consideration of the following items of business on the grounds that there would be a likely disclosure of exempt information as defined in the appropriate paragraph of Part I of Schedule 12A to the Local Government Act 1972 as indicated against the heading to the item.

Part II (Private and Confidential)

6. Innovation Plan Delivery - Work to Date (Pages 199 - 234)

LEP - Innovation Board

Private and Confidential: No

Date: Thursday, 30 July 2020

Membership and Terms of Reference of the Board
(Appendix 'A' refers)

Report Author: Mike Neville, Tel: (01772) 533431, Senior Democratic Services Officer
mike.neville@lancashire.gov.uk

Executive Summary

This report sets out the membership and Terms of Reference of the Innovation Board as approved by the Lancashire Enterprise Partnership Board on the 23rd June 2020 including subsequent updates.

Recommendations

1. That the Board appoint Mr G Baldwin as Chair.

2. That the Board appoint Ms C Whelan as the Deputy Chair.

3. That the current membership and Terms of Reference of the Lancashire Innovation Board, as set out in the report, are noted and will be reviewed after 12 months operation.

Background and Advice

At the meeting on the 23rd June 2020 the LEP Board considered a report on the creation of the LEP Innovation Board which would hold to account the delivery of Innovation activities in the Innovation Plan and set future strategic innovation priorities. A copy of the report and appendices can be viewed **here.**

At that meeting the Board agreed the initial membership as set out in the report and the Terms of Reference attached at **Appendix 'A'** but did not formally appoint a Chair or Deputy Chair.

Following further discussion with the LEP Chief Executive and LEP Chairman Mr G Baldwin, Vice Chancellor of UCLan has been nominated to be the Chair of the Board and it is proposed that Ms C Whelan (LEP Director) be appointed as the Deputy Chair.

The appointment of Mr Baldwin as the Chair will leave a vacancy on the Board for a Skills and International representative. Jane Dalton's role on the Board has also changed from what was originally proposed, leaving a vacancy for a representative for Digital, Creative and Marketing.

Mr T Attard (Non-voting Co-opted member on the LEP Board) joins as a co-opted member to the Innovation Board with experience of textiles and the design sector. Further to this it is proposed that allowing vacant roles and space for additional members will permit the Board to develop and adjust as it's workload emerges.

Any appointments to fill the vacancies on the Board will be subject to approval by the LEP Board.

The current membership of the Board is as follows:

Chair	Graham Baldwin	Vice Chancellor, UCLan
Deputy Chair	Claire Whelan	(Corporate & Finance)
Co-opted LEP Member	Tony Attard OBE	(Corporate & Manufacturing)
Skills & International Rep	Vacancy	TBA
UK RI Rep	Rick Holland	Regional Manager, Innovate UK
Universities Rep	Dion Williams	Director of R&I, Lancaster University
Research & Science Rep	Natalie Jones	Engineering & Physical Sciences Council
Start-up, Micro & SME Rep	Jane Binnion	Growing Club Ltd
Strategy & Branding Rep	Jane Dalton	Groundswell Innovation Ltd
Thematic – Health & Life Sciences	Lorna Green	Innovation Agency (AHSN)
Thematic – Energy & Environment	Lindsay Roche	Westinghouse Ltd
Thematic – Manufacturing & Construction	Pete Lee	Victrex Ltd
Thematic – Digital, Creative & Marketing	Vacancy	TBA
Thematic – Professional & Services	Gaynor Dykes	Grant Thornton

Programme of meetings

The Terms of Reference for the Board state that it will meet a minimum of four times per year for half a day, with a minimum of three members to be in attendance in order for meetings to be quorate. It is proposed that future meetings of the Board will be held in October 2020 and February 2021 and Board members will be consulted on a range of potential dates in due course to identify when the majority of members are available.

Lancashire
Enterprise Partnership

List of Background Papers

Paper	Date	Contact/Tel
N/A		

Reason for inclusion in Part II, if appropriate
N/A

Lancashire Innovation Board

Terms of Reference (June 2020)

Background

The Lancashire Innovation Plan is a central theme in achieving an economic development and local industrial strategy for Lancashire focused on solving economic and societal problems. This objective requires an Innovation Board to act as Lancashire's innovation-related strategic advisory, prioritisation and advocacy body.

Guiding principles

- Ambitious long-term aims with a focus on solving societal problems
- Best practice and world-class standards with the aim of validation of measures
- Collaborative approach across sectors, types of organisation and common goals
- Enabling science, applied innovation and investment to drive productivity and achieve strategic economic objectives
- Input supporting the LEP's Strategic Economic Plan and emerging Local Industrial Strategy

Purpose

The aim of the Board is to:

- Set and guide the LEP's strategy to support and grow innovation in Lancashire,
- Monitor progress in achieving the delivery of the current Innovation Plan, advise on its evolution and report on progress and key issues impacting broader economy to the LEP,
- Guide on project development and delivery across institutions to ensure that Lancashire coherently develops research and innovation activities and its competitive advantage in key sectors,
- Advise on and approve evaluation measures for the Innovation Plan and activities and where relevant, related aspects of the wider economic development and industrial strategies,
- Provide advice to the LEP Board on Research, Science & Innovation issues or topics referred to the Board by the LEP and address knowledge gaps within Lancashire that hold back innovation,
- Contribute to regional, national and international debates on innovation to broaden Lancashire's influence,
- Communicate and champion Innovation activities and Lancashire's strategic economic plans with the aim of facilitating strategic networks that foster research, innovation and knowledge exchange to establish Lancashire as an exemplar in contributing to the UK's competitiveness and productivity,
- Contribute to high-level institutional and corporate support and problem solving to enable the delivery of strategic economic plans in Lancashire,

Structures and Quorum

The governance structures will be as follows:

- The Innovation Board shall consist of up to 15 members and will meet a minimum of four times per year for half a day, with a minimum of three members to be in attendance to be quorate.
- The Innovation Board will be supported in delivery by an executive team including the Innovation and Digital Lead at Lancashire County Council / Lancashire LEP, the Lancashire Universities Innovation Manager.
- The LEP Company Secretary (or their nominee) shall act as clerk to Innovation Board meetings.
- The Innovation Board will be expected to take detailed advice and guidance from Advisory Working Groups with clear objectives as required. Membership of the Working Groups will be approved by the chair and may include Innovation Board members and wider co-opted members.
- The Innovation Board will take guidance from by an annual public meeting as part of a regionally important event, drawing on a wide range of input from stakeholders to inform the County's strategic innovation aims and feedback achievements.
- Agenda Papers and Minutes shall be published in accordance with the LEP Assurance Framework.

Membership

- At least four members of the Board should comprise Lancashire registered SMEs and two should comprise large Lancashire sited companies to provide at least six private sector members. In line with wider LEP priorities, the Board should aim to have a 50/50 gender split and also account for other areas of diversity including geography and ethnicity.
- Membership of the Board is not remunerated.
- Substitutes may occasionally attend meetings if nominated members are unable to attend Board meetings, this shall be by exception and only where prior notification is given to the Company Secretary. Formally nominated substitutes shall be considered to act with full powers to act on behalf of their respective nominated member and shall therefore be entitled to vote on agenda items.
- Other observing/presenting members may be invited to specific meetings or on a standing basis by the Chair, LEP Board Rep and officers; however any such attendees will not be eligible to vote on proposals or constitute part of the quorate requirement.

LEP - Lancashire Innovation Board

Private and Confidential: No

Date: Friday, 24 July 2020

Origins, Context and Role of the Innovation Board
(Appendices A, B, C, D, E, F and G refer)

Report Author: Andy Walker, Tel: 01772 535629, andy.walker@lancashire.gov.uk

Executive Summary

This report and the accompanying presentation (to be delivered at the board) provide the context for the formation of the Innovation Board, its key activity areas and how it operates within the wider strategic framework of the LEP.

Recommendation

The Board is asked to note the contents of the report as context for the further development of the Innovation agenda within Lancashire.

Background

Between 2017 and 2018 the Lancashire Enterprise Partnership (LEP) commissioned the production of an Innovation Plan to bring a more informed and structured approach to its existing assets in this thematic area.

The plan came forward at a time when the LEP had already invested heavily in a range of a range of innovation assets, providing capital resource for the construction and fit out of new buildings through a succession of Growth Deals and revenue and running costs via European Structural Funds.

The Innovation Plan set out five strategic aims:-

1. To stay ahead in sectors and areas of work where the County was already world class.
2. To create new route ways to excellence, recreating the economic base and creating new USPs.
3. To broaden the innovation base and be less dependent on a limited number of larger companies.
4. To create an enabling infrastructure for innovation and commercialisation across Lancashire.
5. To Let the World Know – by telling Lancashire's innovation story better.

The innovation Plan Strategic Aims are also set out in **Appendix 'A'**.

Work has continued across partners to advance this agenda, amassing some shared resource to progress these actions, however, the formation of an Innovation Board marks a further step change and acceleration in this process.

Innovation remains at the heart of the LEP's refreshed Strategic Framework and provides one of the cross cutting themes which supports the increased focus on working with key sectors.

Why Develop a Lancashire Innovation Plan?

The Lancashire Innovation Plan is designed around the principal that innovation matters and will increasingly be an imperative for how Lancashire 'works'.

In 2017 innovation was increasingly viewed as a key driver to improving productivity across the UK. Businesses that innovate grow faster than those that do not, and innovating economies are more resilient to market and technology change, and better equipped to plot their futures than those that do not. Innovation was front-and-centre of the launch of the UK Industrial Strategy, whilst the Northern Powerhouse identifies it as one of its key enablers.

Internationally, work by the Organisation of Economic Development and Cooperation (OECD), has done much to highlight the importance of innovation, as technology brings once distant markets increasingly close to one another.

Against the economic context of Lancashire, innovation still has a significant part to play. Lancashire has many strengths and assets to build on to move our productivity efforts forward. We are home to leading global businesses at the cutting edge of innovation in Advanced Manufacturing, supported by a supply chain cluster of high-tech small and medium-size enterprises (SMEs). Our long standing and well-known strengths in Aerospace, Automotive, and Energy industries sit alongside exciting, emerging strengths in sectors such as Digital and Applied Healthcare. And through our high performing universities and Further Education providers, working closely with national centres of research excellence and knowledge transfer partnerships, our excellence in deep thinking and research provides us with crucial competitive advantage. Yet our Gross Value Added (GVA) per head, the commonly used measure of productivity, across Lancashire's local authority geographies ranges dramatically, from £31,494, (amongst the top 50 districts in the UK and within the top 20 outside London and the South East) to £14,524 (380th of 395 areas).

The Lancashire Innovation Plan sets out how we will use innovation more widely, deeply and, importantly, visibly, to drive the resilience and productivity of our economy to enable Lancashire to achieve its full economic potential and establish a pivotal role both regionally and nationally by 2030.

Our top priority was to use innovation to help improve the productivity performance of Lancashire's sub-areas to the levels of our county's best. Designed with flexibility

at its core, the Lancashire Innovation Plan is not a set of rules or regulations, but rather a route map to how we want to build and embed innovation across the County. In the face of challenges posed by technology and market changes, the Plan aims to support a more dynamic response to key requirements, such as infrastructure, and provides the impetus to harness the power of our existing industrial strengths and identify new, emerging pathways to innovation for the benefit of businesses, people and communities.

Development of the Plan

The formal implementation of Lancashire's Innovation Plan began with identifying the key aspects of Lancashire's innovation activity and development.

To do this, the LEP consulted with over 70 individuals from over 50 organisations from within, and out with, the County. Supported by Steer Economic Development a series of 'scoping calls' to key senior Stakeholders from across private and public sectors were conducted. These included representatives from the Advanced Manufacturing, Aerospace, Automotive, Nuclear, Digital, and Health Sectors, plus thought leaders and local 'innovation champions'. Further stakeholder workshops provided additional data analysis and market futures research to enhance the evidence base.

A comprehensive analysis of socio-economic and innovation datasets, econometric projections and a formal 'Call for Evidence' from key stakeholders in Lancashire was undertaken and an asset list of Lancashire's innovation assets was developed. This 'Asset List' is a live document which will be maintained on an ongoing basis.

Together, this research formed a comprehensive evidence base which fed into the development of an 'Action Agenda', which has driven the delivery of the Innovation Plan so far.

The Evidence Base (**Appendix E**), SWOT analysis (**Appendix F)** and Asset List (**Appendix G**) which supported the development of the Innovation Plan itself are also attached for information.

A Framework for Action

At the heart of Lancashire's Innovation Plan is a simple framework set around a long-term version and five strategic aims, summarised here and developed in more detail throughout the document. Two of our Strategic Aims relate to Lancashire's innovation capability – the ability of existing and new businesses to develop, adopt, and commercialise innovation, whilst the other three Strategic Aims relate to building Lancashire's innovation ecosystem – building the infrastructures, mind sets, and marketing capability across the County necessary for innovation.

Within each Strategic Aim, we set out why the Aim is needed, and outline a series of supporting objectives which define the practical activity required to achieve them.

Those five aims are:-

1. To stay ahead in sectors and areas of work where the County was already world class.
2. To create new route ways to excellence, recreating the economic base and creating new USPs.
3. To broaden the innovation base and be less dependent on a limited number of larger companies.
4. To create an enabling infrastructure for innovation and commercialisation across Lancashire.
5. To Let the World Know – by telling Lancashire's innovation story better
See Annex 1 for further detail.

The Executive Summary of the Innovation Plan is attached as **Appendix 'C'** and the full plan at **Appendix 'D'**

The New Context for Innovation Policy in Lancashire

Since the plan was ratified by the LEP Board in 2018 there have been some significant changes both in the national economy and within the LEP itself.

Productivity remains a key policy driver for the national government, but we see from response to the COVID-19 that other priorities including green growth and the immediate impact on employment are at the forefront of measures to address the impending economic impact of the pandemic.

There is some anecdotal evidence that social distancing measures may be pushing businesses to adapt, adopting technologies to support and or replace staff and using a process of incrementally bringing staff back from furlough as an opportunity to "right size" the business. This process is obviously made more difficult at a time when both markets and the supply chains of businesses have been significantly disrupted.

Sectors like civil aerospace are already predicting a period of up to six years before their orders return to pre-Covid levels and we have already seen a wave of redundancies across some of Lancashire's most significant supply chain businesses.

Supporting businesses to diversify and find new markets at this difficult time means that a strong innovation support system is more important than ever.

Locally, Steve Fogg the LEP Chair has established a new strategic framework to guide the work of the LEP. This new approach is based around six priority sectors / growth pillars with cross cutting enabling activity including Innovation and Commercialisation built around these clusters. The sectors are:-

Advanced Manufacturing
Energy and Low Carbon Solutions
Food and Agriculture

Health
Tourism, Culture and Place
Digital

See **Appendix 'B'** for more detail.

Each of these growth pillars is being driven by a group of businesses and industry specialists who are providing real time information on the issues facing the sectors within Lancashire both in terms of the immediate COVID crisis and in terms of longer constraints on growth. The Innovation Board will need to develop a two way dialogue with these groups looking at what innovation means across these sectors and how existing and future assets can be harnessed to drive growth.

5. Conclusions

Despite the time which has elapsed since the Innovation Plan was written and the changed context in which it is now operating the broad framework of the plan remains a useful framework to consider the innovation landscape and priorities in Lancashire.

As can be seen in later reports, officers have continued to drive forward the activities suggested across the strategic aims set out in the plan but the Innovation Board needs to think how this work can be amplified.

There is an opportunity for Board members to inform the work programme moving forward but it is suggested that the Board needs to continue to focus on:-

- Ensuring the innovation asset mapping is up to date.
- Ensuring those assets and services work as an integrated eco-system
- Preparing a pipeline of future projects informed by business need, and
- Telling the Lancashire innovation story better
- Articulating the role that Innovation Board can play in developing and delivering the Strategic Economic Framework
- Identifying the innovation opportunities and challenges, specific to a broad range of industry sectors and ensuring that the Innovation Plan remains attuned to these emerging issues

List of Background Papers

Paper	Date	Contact/Tel
N/A		

Reason for inclusion in Part II, if appropriate
N/A

Appendix A

VISION: by 2030 Lancashire will have positioned itself as a globally connected & resilient innovation ecosystem. The way we innovate will embody excellence & collaboration, feeding through to greater commercialisation, entrepreneurship & competitiveness in our economy. We will have a track record as a centre for globally-competitive knowledge clusters & talent, & as a developer of new solutions to the emerging challenges of our world

Strategic Aim 1

Innovation Capability – Staying Ahead

Rationale

- Lancashire has recognised sectoral strengths & differentiators
- These need to be developed & worked harder to stay ahead of new/existing competitors
- Market & technology change will impact significantly on business models
- Major employment & GVA dependency for county's economy

Objectives

- Maintain Lancashire's distinctive world-class prominence **in priority sectors**
- Develop **supply chain capability & capacity** servicing these sectors, & gap fill
- Identify **innovation inter-dependencies with other geographies**
- Develop **strategic partnerships with Centres of Excellence** outside Lancashire

Strategic Aim 2

Innovation Capability – Routeways to Excellence

Rationale

- Vital for county to keep 'recreating' its economic base, & to build new USPs
- 'Standing start' sectoral development increasingly difficult to deliver
- Connectedness between existing sectoral strengths provides opportunities for diversification & broadening supply chain
- Source of employment & GVA

Objectives

- Build distinctive **cross-over driven strategy** to exploit existing strengths
- Prioritise R&D, ;nor emerging sectoral strengths
- Develop new global **supply chain participation** strategies to scale these new areas
- Identify **innovation inter-dependencies** with other geographies
- Develop **strategic partnerships with Centres of Excellence**, wherever they may be

Strategic Aim 3

Innovation Ecosystem – Broadening the Innovation Base

Rationale

- Dependence on major/global companies for innovation – SME's must be part of the mix
- Long tail of less innovative, less productive businesses
- Further economic shocks & restructuring a certainty, given market/tech change. Resilience is vital.
- Risk of hollow-out by adjacent economies

Objectives

- Greater **diffusion of innovation & adoption** by more businesses to increase **resilience** of local employers/their ability to respond to emerging opportunities & threats
- **Selling the benefits** of innovation for competitiveness & growth
- Enhance innovation **management & leadership skills**
- Prioritise FDI & clustering investment in innovation in Lancashire

Strategic Aim 4

Innovation Ecosystem – Enabling Infrastructures for Innovation

Rationale

- Innovation critically dependent on skills/talents, specialist facilities, knowledge generation, & money
- Significant ongoing investment in innovation infrastructure
- Role of innovation networks & collaboration
- Innovation needs to be pervasive across the private, public & third sectors

Objectives

- Innovation embedded as a **'first nature' behaviour** & mindset for Lancs
- Wider **economic policies** (e.g. SEP, Technical Education) **aligned** with this Plan to drive success
- Enhance **management & leadership skills** around innovation
- **Human capital** development & redeployability prioirtised
- Develop **strategic partnerships** with Centres of Excellence, wherever they may be

Strategic Aim 5

Innovation Ecosystem – Letting the World Know!

Rationale

- Competition between places & economies intensifying
- Lancashire is not instinctively recognised as a place for innovative new solutions
- Lack of clear, coherent, & comprehensive innovation narrative
- Insufficient resources given to promoting/coordinating innovation, given its importance

Objectives

- A new innovation plan & SEP refresh to help establish a **coherent innovation & growth framework** for Lancashire
- A **proactive function to promote & celebrate innovation** in the county
- Clear & expert **leadership on shaping national innovation thinking**
- **Connecting for innovation** – GINs & GVCs

Application-inspired in our R&D & its deployment

Excellence in delivery, driven by *real* evaluation & learning

Collaborating for a competitive Lancashire

Lancashire Enterprise Partnership Strategic Framework

Appendix B

LEP Vision : ***"A benchmark LEP delivering growth and prosperity for Lancashire through Collaboration and Partnership"***

Strategic Actions

- Drive Inclusive Economic Growth
- Support & Enable The Lancashire Plan
- Leverage Internationalisation
- Drive a Culture of Diversity Inclusion & Collaboration

Pillars of Growth

- Food & Agriculture
- Tourism Culture & Place
- Digital
- Advanced Manufacturing
- Energy & Low Carbon Solutions
- Health

Key Enablers

- Education and Skills
- Infrastructure (Digital/Road/Rail/EZ's)
- Finance & Inward Investment
- Mental Health
- Stakeholder Engagement Strategy

Innovation & Commercialisation

Lancashire
Enterprise Partnership

Lancashire Innovation Plan

Innovation Plan Foreword

Edwin Booth

Chairman of Lancashire Enterprise Partnership

From the Spinning Jenny to the development of the jet engine, Lancashire has always been able to build a vibrant economy, based on the innovation of those who work here. In 2018 the challenge has never been greater to harness innovation, to retain our competitive position and imagine Lancashire's industries of the future.

The challenge to increase productivity and match the performance of established and emerging competitors is an issue for the UK as a whole, but Lancashire is well placed to respond. Building on an already strong academic and industry base, Lancashire Enterprise Partnership has directed much of the investment it has won to creating and enhancing a range of innovation assets and centres of excellence which can match the needs of our key industrial sectors.

The commitment of both industry and academia to invest in significant facilities such as the North West Advanced Manufacturing Research Centre, UCLAN's Engineering Innovation Centre, Lancaster University's Health Innovation campus and Edge Hill's Tech Hub are matched by new skills development infrastructure such as Energy HQ at Blackpool and the Fylde College and BAE's own Academy for Skills and Knowledge.

The Lancashire Innovation Plan provides a framework within which we can re-focus our efforts. It explores the immediate challenges which need to be addressed to retain our advantage in key sectors such as aerospace, advanced manufacturing and energy but also challenges us to think about how current capabilities and research capacity can service the industries of tomorrow.

Existing programmes need to be better integrated with key supply chains and small and medium sized enterprises to define the role which new technologies can play in meeting the aspirations of Lancashire businesses.

Finally, we will meet the need to communicate progress both locally and globally through telling our story of innovation in Lancashire and the North of England as a whole. The evidence and assets referenced in the preparation of this plan will be central to our new Strategic Economic Plan and Local Industrial Strategy, illustrating the part we can play in the economic future of the region and beyond.

Executive Summary

The Lancashire Enterprise Partnership's plan for Lancashire is a plan to drive forward innovation across the County. It involves building on Lancashire's existing innovation resources and unlocking our latent potential to create the conditions where successful businesses can emerge and grow. It's objective is to drive productivity, industrial resilience and sectoral agility across the whole County.

The Lancashire Innovation Plan is designed around the principal that innovation matters and will increasingly be an imperative for how Lancashire 'works'.

Innovation is increasingly viewed as a key driver to improving productivity across the UK. Businesses that innovate grow faster than those that do not, and innovating economies are more resilient to market and technology change, and better equipped to plot their futures than those that do not. Innovation is front-and -centre of the launch of the UK Industrial Strategy, whilst the Northern Powerhouse identifies it as one of its key enablers. Internationally, work by the Organisation of Economic Development and Cooperation (OECD), has done much to highlight the importance of innovation, as technology brings once distant markets increasingly close to one another.

Against the economic context of Lancashire, innovation has a significant part to play.

Lancashire has many strengths and assets to build on to move our productivity efforts forward. We are home to leading global businesses at the cutting edge of innovation in Advanced Manufacturing, supported by a supply chain cluster of high-tech small and medium-size enterprises (SMEs). Our long standing and well-known strengths in Aerospace, Automotive, and Energy industries sit alongside exciting, emerging strengths in sectors such as Digital and Applied Healthcare. And through our high-performing universities and Further Education providers, working closely with national centres of research excellence and knowledge transfer partnerships, our excellence in deep thinking and research provides us with crucial competitive advantage. Yet our Gross Value Added (GVA) per head, the commonly used measure of productivity, across Lancashire's local authority geographies ranges dramatically, from £31,494, (amongst the top 50 districts in the UK and within the top 20 outside London and the South East) to £14,524 (380th of 395 areas).

The Lancashire Innovation Plan sets out how we will use innovation more widely, deeply and, importantly, visibly, to drive the resilience and productivity of our economy to enable Lancashire to achieve its full economic potential and establish a pivotal role both regionally and nationally by 2030. Our top priority will be to use innovation to help improve the productivity performance of Lancashire's sub-areas to the levels of our county's best.

Designed with flexibility at its core, the Lancashire Innovation Plan is not a set of rules or regulations, but rather a route map to how we want to build and embed innovation across the County. In the face of challenges posed by technology and market changes, the Plan aims to support a more dynamic response to key requirements, such as infrastructure, and provides the impetus to harness the power of our existing industrial strengths and identify new, emerging pathways to innovation for the benefit of businesses, people and communities.

An Innovative Strategy for an Innovation Economy

The formal implementation of Lancashire's Innovation Plan began with identifying the key aspects of Lancashire's innovation activity and development. To do this, we consulted with over 70 individuals from over 50 organisations from within, and out with, the County.

We launched a series of 'scoping calls' to key senior stakeholders from across private and public sectors. These included representatives from the Advanced Manufacturing, Aerospace, Automotive, Nuclear, Digital, and Health Sectors, plus thought leaders and local 'innovation champions'. Further stakeholder workshops provided additional data analysis and market futures research to enhance the evidence base.

A comprehensive analysis of socio-economic and innovation datasets, econometric projections and a formal 'Call for Evidence' from key stakeholders in Lancashire was undertaken and an asset list of Lancashire's innovation assets was developed. This 'Asset List', presented at Appendix A in the final report, is a live document which will be maintained on an ongoing basis.

Together, this research formed a comprehensive evidence base which fed into the development of an 'Action Agenda' - a list of key aims and actions-from which Lancashire's Innovation Plan has been developed.

Creativity and innovation will underpin our future

A Framework for Action

At the heart of Lancashire's Innovation Plan is a simple framework set around a long-term version and five strategic aims, summarised here and developed in more detail throughout the document.

Two of our Strategic Aims relate to Lancashire's innovation capability – the ability of existing and new businesses to develop, adopt, and commercialise innovation, whilst the other three Strategic Aims relate to building Lancashire's innovation ecosystem – building the infrastructures, mindsets, and marketing capability across the County necessary for innovation.

Within each Strategic Aim, we set out why the Aim is needed, and outline a series of supporting objectives which define the practical activity required to achieve them.

What Success Will Look Like

To make Lancashire's Innovation Plan a reality by 2030, a series of short, medium and long-term actions are proposed for each Strategic Aim.

For Strategic Aim 1 'Staying Ahead', we will:

+ Focus on delivering the Made Smart Review's North West National Adoption Programme Pilot;
+ Connect with Centres of Excellence outside Lancashire, helping to improve our participation in national, and potentially international, innovation networks;
+ Work in collaboration with large employers in the County to strengthen innovation capabilities of their supply chains;
+ Develop a network of Lancashire 'Innovation Ambassadors' to work with local SMEs; and
+ Implement a Lancashire Technology and Market Foresight Observatory.

For Strategic Aim 2 'New Routeways to Excellence', we will:

+ Develop supply chain crossover networks;
+ Encourage an increase in Knowledge Transfer Partnerships (KTPs);
+ Develop Test Beds in new sectors such as Digital, and initiatives such as 'Failure Labs' and 'hackathons', with different sector hubs over time; and
+ Start to analyse rigorously how overlaps and synergies between the activities and technologies of our existing sectors can be drawn out to define new areas of sectoral strengths that we can develop.

For Strategic Aim 3 'Broadening the Innovation Base', we will:

+ Enhance existing, or building new, leadership development programme activities, ensuring that innovation is given the same priority as wider core business disciplines;
+ Ensure relevant capital developments include provision for incubating innovation-led start-ups;
+ Facilitate networking between innovation and incubation centres within and out with the County to share best practice; and
+ Develop a programme of visits to Lancashire from innovation success stories across the world, helping to stimulate global networking, and bringing best practice to Lancashire's attention.

For Strategic Aim 4 'Enabling Infrastructures for Innovation', we will:

+ Create an 'innovation graduate' placement programme for SMEs;
+ Develop a single point of contact programme of support for innovation-led start-up or early-stage businesses;
+ Explore options for creating a Lancashire Innovation Fund for early-stage funding for innovation-led start-ups;
+ Develop a programme to promote innovation across public and third sectors; and
+ Embed Intellectual Property (IP) management in to innovation initiatives.

To deliver Strategic Aim 5 'Letting the World Know!', we will:

+ Hold an annual Innovation Showcase to celebrate successful innovation in, and across, the County;
+ Develop a Lancashire Innovation Marketing Strategy;
+ Develop and disseminate a portfolio of Lancashire innovation case studies; and
+ Ensure Lancashire is represented in all key national assemblies and debates relating to innovation, so that forward and backward linkages to innovation in our County are promoted and developed.

Making It Happen

Strong leadership, collaboration, and willingness to deliver change are fundamental to making Lancashire's Innovation Plan a reality. So too, is making the most of the County's existing resources. The Lancashire Enterprise Partnership (LEP), will play a central role in driving the Innovation Plan, but we'll also call on leaders from across private and public sectors to come together and work with us to drive and deliver innovation for Lancashire.

We'll set up a new Innovation Board-within the LEP's structure-to provide the strategic leadership and accountability for the Innovation Plan and its delivery. Led by the private sector, with the support and representation of publicly-funded partners and representatives of the key innovation assets in Lancashire, the Innovation Board will integrate and complement existing innovation settings and activities, such as the emerging Higher Education Institution (HEI) Innovation forum (which brings together HEI representatives on common innovation-facing issues), to drive a unified approach to innovation in the County.

Advancing the Future

The Innovation Plan is a plan for the future of Lancashire. A blueprint for the County's evolving DNA and a strategic agenda for innovation in the County through to 2030. Between now and then, much will change. New sectors, technologies, and services will flourish to create conditions that will improve access to new and existing markets and that will empower Lancashire businesses and workforces, enabling them to realise the true value of their services and skills.

Flexibility must become our watchword so that everyone is ready to meet these changes and opportunities as they come into play. We will work with businesses, communities and individuals of Lancashire to champion innovation success wherever we find it and work together to ensure that the benefits of innovation are felt across the County.

Creativity and innovation will underpin our future. The Innovation Plan will be our constant and collaboration will be our driver. Together, we will make Lancashire the very best place to start and grow a business, and cement Lancashire's position as one of the UK's leading innovation economies, resilient to change and fit for the future.

Case Study
Offline Robotic Programming

Esse Engineering

To maintain the highest quality the company assemble each stove by hand. In order to match demand the company were looking to make further investment into robotics, for the use of enamel application and the removal of cast iron flashings. Using robotics in the Advanced Manufacturing Laboratory at UCLan's Burnley campus, the DigitME2 project carried out research into company requirements and available solutions, before simulating methods of flash removal.

To supplement this, DigitME2 provided knowledge transfer to staff providing them with skills to use the companies existing robotics in an offline environment. This allowed staff to write programs for new product models offline, which has led to removing the need to halt the production line, an easier mitigation of risk through offline simulation and a reduced deployment time for new products.

"We were impressed by UCLan's facilities and expertise, we had previously been unaware of the extent of activities taking place at the Burnley campus. We hope to extend the use of robotics within our manufacturing process during the next 12 months.

Martin Ashby,
MD – Esse Engineering

Vision

Strategic Aim 1

Innovation Capability – Staying Ahead

Rationale

- Lancs has recognised sectoral strengths & differentiators
- These need to be developed & worked harder to 'stay ahead' of new/existing competitors
- Market & technology change will impact significantly on our existing business models
- Maintaining County's existing employment & GVA performance

Objectives

- Maintain Lancs' distinctive world-class prominence in existing priority sectors
- Develop supply chain capability & capacity servicing these sectors, & gap fill
- Identify innovation inter-dependencies with other geographies to maintain competitiveness
- Develop strategic partnerships with Centres of Innovation Excellence outside Lancs

Strategic Aim 2

Innovation Capability – Routeways to Excellence

Rationale

- Vital for county to keep 'recreating' its economic base, & to build new sectoral USPs
- 'Standing start' sectoral development increasingly difficult to deliver
- Connectedness between existing sectoral strengths provides opportunities for new diversification
- Source of new employment & GVA

Objectives

- Build distinctive cross-over driven strategy to exploit existing strengths
- Prioritise R&D, innovation, & skills development for emerging sectoral strengths
- Develop new global supply chain participation strategies to scale these new areas
- Identify innovation inter-dependencies with other geographies to build new competitiveness

Strategic Aim 3

Innovation Ecosystem – Broadening the Innovation Base

Rationale

- Major dependence on major/global companies for innovation – SMEs must also be part of the mix
- Long tail of less innovative, less productive businesses
- Further economic shocks & restructuring a certainty, given market/tech change. Resilience is vital
- Risk of hollow-out by adjacent economies as they grow

Objectives

- Greater diffusion of innovation & adoption by more businesses to increase resilience of local employers/ their ability to respond to emerging opportunities & threats
- Selling the benefits of innovation for competitiveness & growth
- Enhance innovation management & leadership skills
- Prioritise clustering investment in innovation in Lancs

Strategic Aim 4

Innovation Ecosystem – Enabling Infrastructures for Innovation

Rationale

- Innovation critically dependent on skills/talents, specialist facilities, knowledge generation, & money
- Significant ongoing investment in innovation infrastructure – exploit better
- Vital role of innovation networks & collaboration
- Innovation needs to be pervasive across the private, public, & third sectors

Objectives

- Innovation embedded as a 'first nature' behaviour & mindset for Lancs
- Wider economic policies (e.g. SEP, Lancs Technical Education etc.) aligned with this Plan to drive success
- Enhance management & leadership skills around innovation
- Human capital development & re-deployability prioritised
- Develop strategic partnerships with Centres of Excellence, wherever they may be

Strategic Aim 5

Innovation Ecosystem – Letting the World Know!

Rationale

- Competition between places & economies intensifying
- Lancs not instinctively recognised as a place for innovative new solutions
- Lack of clear, coherent, & comprehensive innovation narrative for the County
- Insufficient resources given to promoting/coordinating innovation, given its importance

Objectives

- This Plan, SEP refresh, and a new Local Industrial Strategy together create a coherent innovation & growth framework for Lancs
- A proactive function to promote & celebrate innovation in the County
- Clear & expert leadership on shaping national innovation thinking – Lancastrians in all the key national fora
- Connecting for innovation – GINs & GVCs

By 2030, Lancs will have positioned itself as a globally connected & resilient innovation ecosystem. The way we innovate will embody excellence & collaboration, feeding through to greater commercialisation, entrepreneurship, & competitiveness in our economy. We will have a track - record as a centre for globally-competitive knowledge clusters & talent, & as a developer of new solutions to the emerging challenges of our world.

Application - inspired in our R&D & its deployment

Excellence in delivery, driven by real evaluation & learning

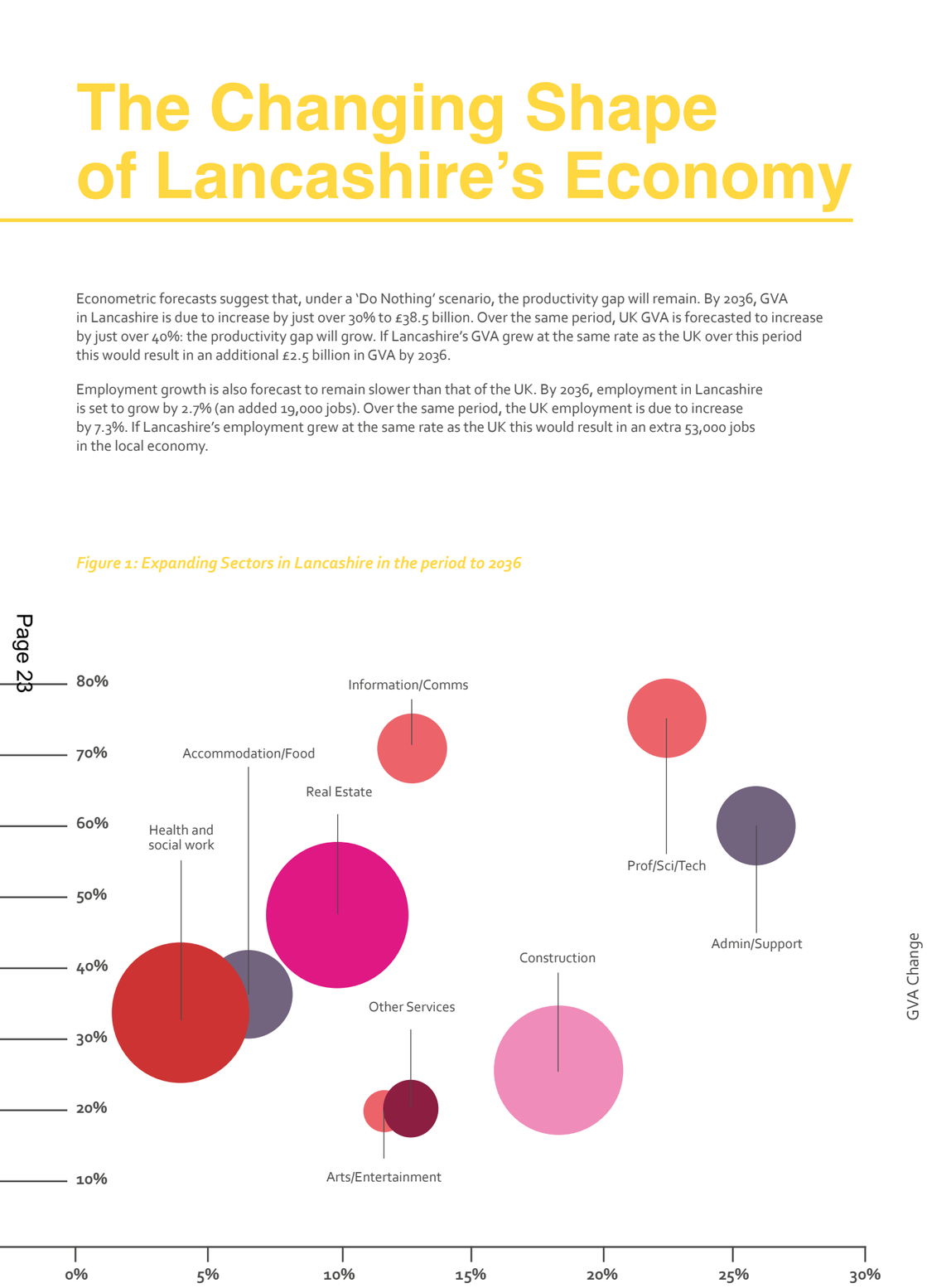
Collaborating for a competitive Lancs

The Changing Shape of Lancashire's Economy

Econometric forecasts suggest that, under a 'Do Nothing' scenario, the productivity gap will remain. By 2036, GVA in Lancashire is due to increase by just over 30% to £38.5 billion. Over the same period, UK GVA is forecasted to increase by just over 40%: the productivity gap will grow. If Lancashire's GVA grew at the same rate as the UK over this period this would result in an additional £2.5 billion in GVA by 2036.

Employment growth is also forecast to remain slower than that of the UK. By 2036, employment in Lancashire is set to grow by 2.7% (an added 19,000 jobs). Over the same period, the UK employment is due to increase by 7.3%. If Lancashire's employment grew at the same rate as the UK this would result in an extra 53,000 jobs in the local economy.

Figure 1: Expanding Sectors in Lancashire in the period to 2036



Source: BRES and ONS, Regional Accounts, 2015

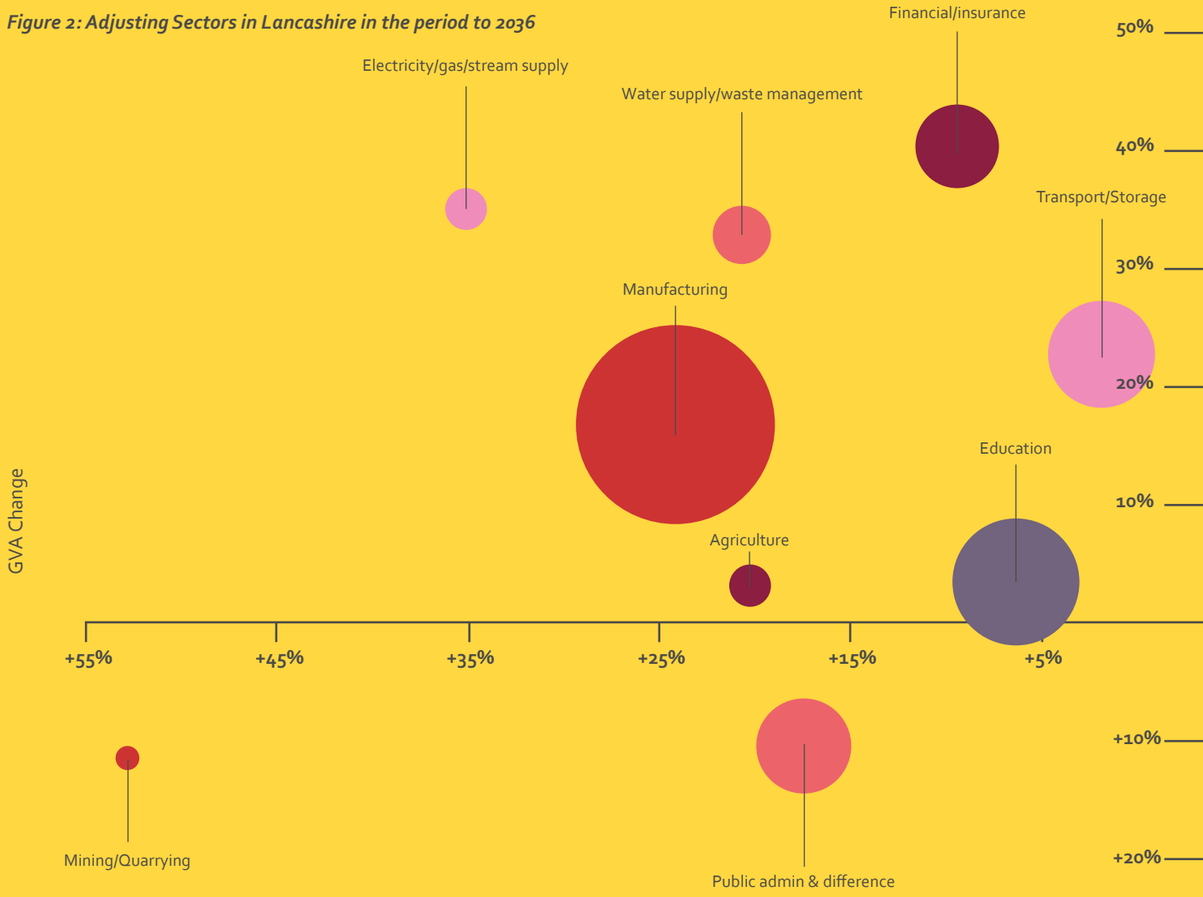
Moreover, Lancashire's economy will experience significant change over the next two decades. Sectors are expected to perform in one of two ways:

+ Expanding sectors which are forecasted to grow in both GVA and employment; and
+ Adjusting sectors where GVA will increase but employment is likely to decrease.

Figure 1 shows the Expanding sectors. Significant growth in both GVA and employment is forecasted in service sectors such as Professional/Scientific/Technical, Administration/Support (including Technical Support), and Information/ Communications. Most sectors are forecasted to grow in GVA and employment. These data are at a broad sectoral level, which can miss the nuances and variety of job roles within each sector.

Figure 2 below shows the Adjusting sectors. Most significantly, the current key employment sector of manufacturing is forecast to decline in employment by 24% (c.20,000 jobs) by 2036. This trend is expected nationally, however, is expected to be more keenly felt in Lancashire due to the size of the sector in the County. The fact that manufacturing is forecast to grow in GVA despite this points to the productivity opportunities in data and automation that Industry 4.0 presents. It is important to remember that these forecasts are 'policy-off', meaning they do not consider different policy scenarios or their implications. Interventions such as those advocated later in this Plan, alongside ongoing actions across the County and North, can address these potential employment challenges.

Figure 2: Adjusting Sectors in Lancashire in the period to 2036



Source: BRES and ONS, Regional Accounts, 2015

Lancashire's Innovation Ecosystem

Through a range of stakeholder consultations, data analysis, and a review of over 40 documents received via a 'Call for Evidence', this section of the study presents the strengths, weaknesses, opportunities, and threats (SWOT) for innovation in Lancashire.

The SWOT was conducted through four lenses. These are:

+ People/Human Capital – covering demographics, mindsets, skills and occupation offer, education, and access to work;
+ Infrastructure/Assets – covering sites, premises, (and the cost and location of these), housing, environment, transport, and national strategic infrastructures (digital/energy/waste/water/flood risk);
+ Knowledge – covering Further and Higher Education, research institutions, innovation systems, networks, and commercialisation processes; and
+ Money and External Business Expertise – covering access to finance, accounting and legal professions, intellectual property management, and marketing.

Lancashire has well established and recognised strengths in the Aerospace, Automotive, Energy, Nuclear, Digital, and Health Innovation sectors. There are strengths in biological sciences, Life Sciences and Healthcare, Advanced Manufacturing and materials, and Digital. Protecting, enhancing, and diffusing these strengths across their supply chains and across sectors will be a key feature of the future innovation landscape in Lancashire.

The local HEIs have research strengths in STEM subjects, in particular, Computer Science, Mathematical Science, and General Engineering, and provide significant research and consultancy services (with a total income of £26m from contract research and consultancy services across the four HEIs in 2015/16). There are translational research centres such as the Engineering Innovation Centre at UCLan, the North West Advanced Manufacturing Research Centre at Samlesbury, and the forthcoming Lancaster Health Innovation Campus which can be catalysts for research development and adoption across the local economy and beyond.

Graduate retention rates are good in Lancashire, and strong Further and Higher Education provision is starting to show in the improving rates of residents with higher level skills. Maintaining and continually improving these will be key to ensuring a pipeline of talent to support Lancashire's businesses and innovation capabilities.

Analysis of the IPO patenting data indicates strong intellectual property advances in areas such as Civil Engineering, Mechanical Elements, Medical and Computer Technology, and Thermal Processes. Ongoing analysis of patenting data can provide an indication of emerging innovation specialisms and differentiators. Providing support for businesses in generating and managing their intellectual property can help them to protect their intellectual property assets and maximise the value from them.

Innovation Assets

- Advanced Manufacturing
- Aerospace
- Automotive
- Business Support
- Chemistry
- Construction
- Creative
- Digital
- Eco-innovation
- Education
- Energy
- Engineering
- Health
- International connectivity
- IT
- Maritime
- Mixed
- Nuclear

Lancashire
Enterprise Partnership

Key Contact

Andy Walker

Head of Business Growth & Innovation
Economic Development Service
Lancashire County Council

Tel. 01772 535 629
Mobile 07896 132 251

andy.walker@lancashire.gov.uk

To request a copy of the full report visit the LEP website:
www.lancashirelep.co.uk

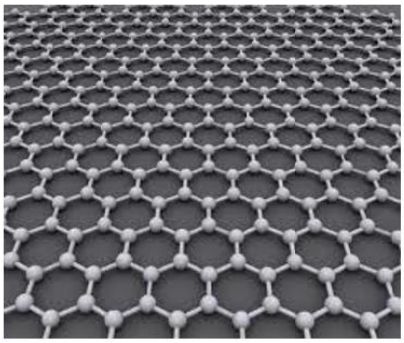
sdg economic development

The Lancashire Innovation Plan

A Final Report
14 March 2018

Lancashire Enterprise Partnership

Our ref: 231-495-01
Client ref: Click here to enter text.



The Lancashire Innovation Plan

A Final Report
14 March 2018

Lancashire Enterprise Partnership

Our ref: 231-495-01
Client ref: Click here to enter text.

Prepared by:

SDG Economic Development
61 Mosley Street
Manchester M2 3HZ

+44 161 261 9141
www.sdgED.com

Prepared for:

Lancashire Enterprise Partnership
c/o 15 Cross Street
Preston PR1 3LT

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Executive Summary

The Commission

A. In Autumn 2017, the Lancashire Local Enterprise Partnership (LEP) commissioned SDG Economic Development (SDG-ED) to develop Lancashire's Innovation Plan, a new Strategic Framework to drive forward innovation across the County. Building on the work done to inform Lancashire and Sheffield's Science and Innovation Audit in 2016, the Plan provides a practical analysis of the economic role and contribution of innovation in the County's economy, with an informed assessment of how Lancashire's innovation resources – actual and latent – can be better led and deployed to drive productivity, industrial resilience, and sectoral agility in the County's economy.

Context

B. Innovation is increasingly viewed as a key driver to improving productivity across the UK. Businesses that innovate grow faster than those that do not, and innovating economies are more resilient to market and technology change, and better equipped to plot their futures than those that do not. Sub-nationally, innovation was identified as one of the key enablers of the Northern Powerhouse, and innovation was front-and-centre of last November's UK Industrial Strategy. Internationally, work by the Organisation of Economic Development and Cooperation (OECD) is highlighting the importance of innovation, as technology brings once distant markets increasingly close to one another. So, innovation matters, and must increasingly be an imperative for how Lancashire 'works'.

C. So, what is the local economic context we face? Gross Value Added (GVA) per head, the commonly used measure of productivity, across Lancashire's local authority geographies ranges from £31,494, (amongst the top 50 districts in the UK and within the top 20 outside London and the South East) to £14,524 (380th of 395 areas). So, our first challenge is to use innovation to help drive-up the productivity performance of our sub-areas to the levels of our county's best. Second, we have many strengths and assets to build on to move our productivity efforts forward. We are home to leading global businesses at the cutting edge of innovation in Advanced Manufacturing, supported by a supply chain cluster of high-tech small and medium-size enterprises (SMEs). There are longstanding and well-known strengths in Aerospace, Automotive, and Energy industries and exciting emerging strengths in sectors including Digital and Applied Healthcare. Moreover, the County is home to high-performing universities and Further Education providers, working closely with national centres of research excellence and knowledge transfer partnerships.

D. It is against this background that this Plan sets out how we will use innovation more widely, deeply and, importantly, visibly to drive the resilience and productivity of our economy and enable Lancashire to achieve its full economic potential and role and sub-national and national levels. Informed by evidence and extensive consultation, this Plan has been prepared to support the innovation agenda in the County through to 2030. The Plan is not a set of rules or regulations, but rather a route map on how we want to build, diffuse, and embed innovation. It seeks to develop further what we do well currently, identify and stimulate new routeways to innovation, and develop the infrastructures required to innovate across our economy, for the benefit of our businesses, people and communities. And, as technology and markets do not stand still, this Plan has been designed with flexibility at its core, enabling us to act dynamically in the face of those new challenges that we will face in the coming years.

Plan Process

E. The Plan's development launched with a series of 'scoping calls' with key senior stakeholders from across the private and public sectors. These included representatives from the Advanced Manufacturing, Aerospace, Automotive, Nuclear, Digital, and Health Sectors. The purpose of these calls was to obtain early-stage inputs from well-placed experts on those aspects of innovation activity and development in Lancashire that the emerging Plan needed to address.

F. Alongside these consultations, a comprehensive analysis of socio-economic and innovation datasets, econometric projections was undertaken, together with a formal 'Call for Evidence' from key stakeholders in Lancashire. These analyses were combined to form an assessment of the strengths, weaknesses, opportunities, and threats (SWOT) of Lancashire's innovation 'ecosystem', providing a clear and objective assessment of where we start from innovation-wise, and where we might go to. The data analyses and SWOT assessment were presented at a SWOT workshop to give a check-and-challenge to the data and to augment the initial evidence assessment. In addition to the SWOT analysis and data analysis, an asset list of Lancashire's innovation assets was developed and iterated throughout. This 'Asset List', presented at Appendix a to this report, is a live document which will be maintained on an ongoing basis.

G. Following the SWOT workshop, a draft Strategic Innovation Framework was developed. To test the emerging Framework a second workshop was held with stakeholders from across the County. The workshop provided additional data analysis and market futures research to enhance the evidence base, enabled the draft Framework.

H. A final workshop was held to drive the draft framework from concept into operating reality, with the event focussing on identifying the key actions, both existing and new, that are needed to turn the framework into action. These fed into the development of the 'Action Agenda' which is described later in this document. The evidence base, the strategic framework, and the proposed actions together form our Lancashire Innovation Plan.

I. Overall, the Plan's development involved over 70 individuals from over 50 organisations from within, and outwith, the County. This is the launch platform we start from, and as the Plan is now implemented formally we will develop and build on this.

And the Plan's underpinning framework?

J. At the heart of the Innovation is a simple framework which sets our focus areas for attention as we work to progress innovation in the County. The key components of the framework are:

- A Vision which describes the County's long-term innovation intent;
- Five Strategic Aims which, at a strategic level, define those objectives the Innovation Plan is seeking to realise; These are configured as a '2x3' structure: two of our Aims relate to our *innovation capability* – the ability of existing and new businesses to develop, adopt, and commercialise innovation, and three Aims relate to building *our innovation ecosystem* – building the infrastructures, mindsets, and marketing capability across the County necessary for innovation;
- Within each Strategic Aim, a rationale for why the Aim is needed, and a series of supporting objectives which define the broad areas of practical activity to achieve the Aim; and

VISION: by 2030, Lancs will have positioned itself as a globally connected & resilient innovation ecosystem. The way we innovate will embody excellence & collaboration, feeding through to greater commercialisation, entrepreneurship, & competitiveness in our economy. We will have a track-record as a centre for globally-competitive knowledge clusters & talent, & as a developer of new solutions to the emerging challenges of our world

Strategic Aim 1

Innovation Capability – Staying Ahead

Rationale

- Lancs has recognised sectoral strengths & differentiators
- These need to be developed & worked harder to 'stay ahead' of new/existing competitors
- Market & technology change will impact significantly on our existing business models
- Maintaining County's existing employment & GVA performance

Objectives

- Maintain Lancs' distinctive world-class prominence **in existing priority sectors**
- Develop **supply chain capability & capacity** servicing these sectors, & gap fill
- Identify **innovation inter-dependencies with other geographies** to maintain competitiveness
- Develop **strategic partnerships with Centres of Innovation Excellence** outside Lancs

Strategic Aim 2

Innovation Capability – Routeways to Excellence

Rationale

- Vital for county to keep 'recreating' its economic base, & to build new sectoral USPs
- *'Standing start'* sectoral development increasingly difficult to deliver
- Connectedness between *existing* sectoral strengths provides opportunities for new diversification
- Source of new employment & GVA

Objectives

- Build distinctive **cross-over driven strategy** to exploit existing strengths
- Prioritise R&D, innovation, & **skills development** for emerging sectoral strengths
- Develop new global **supply chain participation** strategies to scale these new areas
- Identify **innovation inter-dependencies** with other geographies to build new competitiveness

Strategic Aim 3

Innovation Ecosystem – Broadening the Innovation Base

Rationale

- Major dependence on major/global companies for innovation – SMEs must also be part of the mix
- Long tail of less innovative, less productive businesses
- Further economic shocks & restructuring a certainty, given market/tech change. Resilience is vital.
- Risk of hollow-out by adjacent economies as they grow

Objectives

- Greater **diffusion of innovation & adoption** by more businesses to increase **resilience** of local employers/their ability to respond to emerging opportunities & threats
- **Selling the benefits** of innovation for competitiveness & growth
- Enhance innovation **management & leadership skills**
- **Prioritise clustering investment in innovation** in Lancs

Strategic Aim 4

Innovation Ecosystem – Enabling Infrastructures for Innovation

Rationale

- Innovation critically dependent on skills/talents, specialist facilities, knowledge generation, & money
- Significant ongoing investment in innovation infrastructure – exploit better
- Vital role of innovation networks & collaboration
- Innovation needs to be pervasive across the private, public, & third sectors

Objectives

- Innovation embedded as a **'first nature' behaviour** & mindset for Lancs
- Wider **economic policies** (e.g. SEP, Lancs Technical Education etc.) **aligned** with this Plan to drive success
- Enhance **management & leadership skills** around innovation
- **Human capital development & re-deployability** prioirtised
- Develop **strategic partnerships** with Centres of Excellence, wherever they may be

Strategic Aim 5

Innovation Ecosystem – Letting the World Know!

Rationale

- Competition between places & economies intensifying
- Lancs not instinctively recognised as a place for innovative new solutions
- Lack of clear, coherent, & comprehensive innovation narrative for the County
- Insufficient resources given to promoting/coordinating innovation, given its importance

Objectives

- This Plan, SEP refresh, and a new Local Industrial Strategy together create a **coherent innovation & growth framework** for Lancs
- A **proactive function to promote & celebrate innovation** in the County
- Clear & expert **leadership on shaping national innovation thinking – Lancastrians in all the key national fora**
- **Connecting for innovation** – GINs & GVCs

Application-inspired in our R&D & its deployment

Excellence in delivery, driven by *real* evaluation & learning

Collaborating for a competitive Lancs

- A defined suite of actions to progress the Plan. These are a mixture of short, medium, and long-term actions that complement and enhance existing and ongoing actions.

Action Agenda

K. To make the Plan a reality, a series of actions are proposed:

- For Strategic Aim 1 'Staying Ahead', key actions will involve:
  - Focus on delivering the *Made Smart Review*'s North West National Adoption Programme Pilot;
  - Connecting with Centres of Excellence outside Lancashire, so helping to improve our participation in national, and potentially international, innovation networks;
  - Working in collaboration with large employers in the County to strengthen innovation capabilities of their supply chains;
  - Developing a network of Lancashire 'Innovation Ambassadors' to work with local SMEs; and
  - Implementing a Lancashire Technology and Market Foresight Observatory.

- For Strategic Aim 2 'New Routeways to Excellence', key actions will involve:
  - Developing supply chain crossover networks;
  - Encouraging an increase in Knowledge Transfer Partnerships (KTPs);
  - Developing Test Beds in new sectors such as Digital, and initiatives such as 'Failure Labs' and 'hackathons', with different sector foci over time; and
  - Starting to analyse rigorously how overlaps and synergies between the activities and technologies of our existing sectors can be drawn out to define new areas of sectoral strengths that we can develop.

- For Strategic Aim 3 'Broadening the Innovation Base', key actions will involve:
  - Enhancing existing, or building new, leadership development programme activities, ensuring that innovation is given the same priority as wider core business disciplines;
  - Ensuring relevant capital developments include provision for incubating innovation-led start-ups;
  - Facilitating networking between innovation and incubation centres within and outwith the County to share best practice; and
  - Developing a programme of visits to Lancashire from innovation success stories across the world, helping to stimulate global networking, and bringing best practice to Lancashire's attention.

- For Strategic Aim 4 'Enabling Infrastructures for Innovation', key actions will involve:
  - Creating an 'innovation graduate' placement programme for SMEs;
  - Developing a single point of contact programme of support for innovation-led start-up or early-stage businesses;
  - Exploring options for creating a Lancashire Innovation Fund for early-stage funding for innovation-led start-ups;
  - Developing a programme to promote innovation across public and third sectors; and
  - Embedding Intellectual Property (IP) management in to innovation initiatives.

- To deliver Strategic Aim 5 'Letting the World Know!', key actions will involve:
  - Holding an annual Innovation Showcase to celebrate successful innovation in, and across, the County;

- Developing a Lancashire Innovation Marketing Strategy;
- Developing, and disseminating a portfolio of Lancashire innovation case studies; and
- Ensuring Lancashire is represented in all key national fora relating to innovation, so that forward and backward linkages to innovation in our County are be promoted and developed.

Governance

L. Strong leadership, collaboration, and willingness to deliver change are fundamental to making this Plan a reality. Leaders from across private and public sectors will need to come together to drive and deliver innovation for Lancashire. This will need a well governed and appropriately resourced approach to the invitation of this Plan. Making the most of existing resources and re-calibrating these to support the Aims of this Plan will be vital to its success.

M. The LEP has a central role to play in driving this Plan and its success. Accordingly, the Plan proposes a new Innovation Board within the LEP's structure to provide the strategic leadership and accountability for this Plan and its delivery. The Board will be private sector-led, but be representative of publicly-funded partners and representatives of the key innovation assets in Lancashire. The Board will sit below, and report to, the LEP Main Board. Reporting to the Innovation Board, a new Innovation Director will be appointed to coordinate and lead the operational delivery of this Plan, drawing in relevant delivery partners to progress actions. The Innovation Board will integrate and complement existing innovation fora, such as the emerging Higher Education Institution (HEI) Innovation forum (which brings together HEI representatives on common innovation-facing issues), so driving a unified approach to innovation in the County.

Timeline

N. This plan is intended to provide the strategic agenda for innovation in the County through to 2030. Between now and then, much can change, both in terms of technologies and markets. This Plan needs to be able to flex effectively to the changes, but at the same time it needs to give a level of certainty and stability such that innovation increasingly becomes a constant in the way that the County, its businesses, communities, and individuals behave. In a very real sense, the underpinning intent of this Plan is that innovation becomes the County's 'first nature'.

1 Foreword

[NB – PLACEHOLDER FOR FOREWORD FROM EDWIN BOOTH]

2 Why an Innovation Plan for Lancashire?

Introduction

2.1 Innovation is at the heart of the UK's Industrial Strategy, and identified therein as a key driver to improving productivity across the UK. Businesses that innovate grow faster than those that do not, and tend to be more resilient to competition. The desire for innovation to drive productivity is increasingly prevalent across the North and within Lancashire. As the Northern Powerhouse Independent Economic Review showed, the North has significant innovation assets on which to build and develop, which in turn could close the productivity gap with the rest of the UK. As this Plan will show, Lancashire also has substantial innovation assets, and potential, to play a leading role in driving innovation and improving productivity in the North.

2.2 This is an evidence-informed innovation plan for Lancashire, commissioned by Lancashire Enterprise Partnership (LEP), and intended to establish a vision, framework, and action plan for innovation in the County to 2030. It aims to:

- Boost Lancashire's innovative capacity and strengthen its broader innovation ecosystem;
- Stimulate new ideas and thinking around embedding a more innovative culture in Lancashire;
- Set a clear direction of travel for Lancashire's innovation agenda, underpinned by a coherent package of priorities and activities;
- Encourage greater collaboration within Lancashire, and between Lancashire and national and international partners;
- Engage all stakeholders including businesses large and small, universities, colleges, local and national government; and
- Establish a new model for the leadership and governance of Lancashire's innovation agenda.

Talking Terms . . .

2.3 Informed by Nesta, the definition of innovation adopted by this Plan is that innovation is:

- The successful exploitation of new ideas, recognising that innovation need not derive from an advance in science or technology, but radical innovation often does;
- Innovation that does derive from advance in the Science and Technology base needs more than this to achieve commercial success;
- Innovation applies equally to products, processes, services, and business models; and
- Innovation is not just the preserve of the private sector, it is equally appropriate and necessary in the public and community/voluntary sectors.

. . . Strengths to build on

2.4 Importantly, we are not starting with a blank canvas. Lancashire has many innovation strengths and assets to build on. It is home to leading global businesses at the cutting edge of advances in Advanced Manufacturing, supported by a supply chain cluster of high tech SMEs. These high value-add businesses are amongst the most productive in the country. Our strong manufacturing base is spearheaded by Aerospace, Automotive, and Energy industries but we have other key sectoral strengths including Digital and Healthcare. We are also home to high performing Universities and Further Education providers, including national centres of research excellence.

2.5 More generally, we have good and developing innovation links with neighbouring cities and their economic hinterlands, a high quality of life, and a diverse urban and rural environment. We must make the most of these wider assets to attract and retain the people and businesses who will drive our innovation agenda locally, drawing on access to resources and partners nationally.

. . . But challenges too

2.6 Notwithstanding these high-points, we also face significant challenges. Lancashire's economy as a whole is underperforming compared with the national average, although this masks some areas of high productivity: GVA per head across Lancashire's local authorities ranges from £31,494, (amongst the top 50 districts in the UK and within the top 20 outside London and the South East) to £14,524 (380th of 395 areas). We also face great uncertainty in wider national and global contexts - Brexit looms large and the pace of technological change is transforming where, and how, business is done. Of course, we are not unique in facing these challenges but we must find our own, place- and people-specific solutions for dealing with them.

2.7 The recent national Industrial Strategy, and its accompanying Sector Deals represent a new chapter in how we as a country take a more proactive and interventionist approach to growing our economy. This Innovation Plan represents a central plank in Lancashire's response to this new national agenda, sitting as part of the County's overarching economic strategy, and it will without doubt be influential on our proposed new Local Industrial Strategy. The Plan is designed to help boost productivity, raise R&D investment, grow local businesses, and attract new firms, create new and better jobs. Ultimately, the Plan needs to embed an innovation culture which allows the County to 'punch above its weight', enhance our resilience, and enables us to capitalise on change and opportunities in the global economy.

An Appetite for Change

2.8 The context of the Industrial Strategy, alongside the launch of this Innovation Plan, provides a momentum for driving forward the agenda which must not be lost. The engagement provided by local stakeholders in developing this Plan is a clear demonstration not only of the capacity and expertise that exists locally but also the appetite for a more visible, purposeful, and impactful innovation agenda in Lancashire. We must raise our level of ambition and back this up with the right leadership arrangements and resources. This Plan provides us with the basis for achieving these aims.

Structure of this Plan

2.9 The structure and content of the rest of this document are as follows:

- Chapter 2 sets out the global innovation trends that are impacting on Lancashire's economy and more widely. It summarises the implications of this Plan and Lancashire's innovation agenda of key policies at Lancashire, the North, and UK levels;
- Chapter 3 presents an analysis of relevant literature, secondary data, and econometric forecasts to identify the core components of Lancashire's economic and innovation landscape;
- Chapter 4 then assesses the strengths, weaknesses, opportunities, and threats characterising Lancashire's innovation ecosystem at present;
- Chapter 5 presents our Vision for how Lancashire's innovation economy can look in 2030;
- Chapter 6 presents the Strategic Framework for this Plan, setting out the five Strategic Aims and three Cross-cutting Themes, as well as the Rationale and Objectives for each Aim;
- Chapter 7 presents our 'Action Agenda', where we set out the practical actions required to support delivery of the Strategic Aims. These are a mixture of 'quick wins', medium-term programmes, and long-term culture change; and finally
- Chapter 8 looks at the Governance structures needed for effective and ongoing management and leadership of innovation in Lancashire.

3 Innovation Trends and Policy Context

This Section sets out the trends, policies, and future market and technology changes within which this Plan sits, and which it must respond to.

Global Innovation Trends

3.1 Lancashire's economy is one piece in a regional, national, and global jigsaw. This Innovation Plan plugs into this wider economic and policy context, building on key initiatives such as the recent Industrial Strategy, the Northern Powerhouse, and the Science and Innovation Audits.

3.2 In term of global trends, Global Value Chains (GVCs) and Global Innovation Networks (GINs) have become a central feature of world trade, encompassing developing, emerging, and developed economies. The process of producing goods is increasingly carried out wherever the necessary skills and materials are available. How Lancashire's businesses can connect into these value chains and innovation networks must form a key component of Lancashire's innovation offer.

3.3 Rapid market and technology change has been a key feature of all economies and shows no signs of slowing down. The 'Eight Great Technologies' identified in 2012 by the then Chancellor still hold significant relevance today. They are:

- Advanced Materials and Nanotechnology;
- Agri-Science;
- Big Data and Energy-efficient computing;
- Energy and its storage;
- Regenerative Medicine;
- Robotics and autonomous systems (also a key feature of the recently published Industrial Strategy White Paper);
- Satellites and the commercial applications of space; and
- Synthetic biology.

3.4 As explored in Section 5, Lancashire has well established and recognised strengths in a number of these areas.

3.5 In addition to new technologies, new business models will continue to change the way we work. These models revolve around a number of themes that are relevant across multiple sectors. These include:

- An ageing workforce, working longer;
- Increasingly complex and connected markets, with increased risks;
- Vertical integration and distributed collaboration;
- Outsourcing and the automation of rote-type activities;
- Migration to the web, and leverage of 'long-tail' markets;
- Employment being dominated progressively by 'non-routine' activities which cannot be automated – such as innovation, leadership and sales;
- 'Creativity' being the most important leadership competency for future successful businesses; and
- Intelligence, agility, and responsiveness being the key characteristics of business performance.

3.6 With the details of post-Brexit Britain's economic landscape continuing to emerge, many uncertainties remain. However, one thing is certain, innovation will need to be a fundamental part of local economic growth and in driving productivity increases. Business-as-usual will not tackle the existing challenges, or capitalise on the opportunities, or mitigate the risks of Britain's new trading relationships. As with the GVC and GIN connectivity touched on above, adopting an international trading perspective will be an important part of growing Lancashire's innovation capability and commercialisation.

UK Policy

3.7 The recent *Industrial Strategy Building a Britain fit for the future* White Paper sets out a more interventionist approach to stimulating the economy and driving productivity across the UK. Several proposed initiatives are of direct relevance to this Plan and are in areas in which Lancashire is well-positioned to capitalise on.

3.8 The *Made Smarter Review 2017* focussed on the challenges in industrial digitalisation. The Review acknowledged the opportunities the North West could capitalise on. It also recommends investment in a new National Adoption Programme (NAP). This will accelerate the development and diffusion of Industrial Digital Technologies (IDTS) through focused support to SMEs in the UK regions. As part of the NAP development, a three-year pilot project will be undertaken in the North West. The project aims to increase GVA by 15% over the pilot period, delivering an estimated £70 million benefit. The pilot will support twenty emerging technology start-ups, working directly with industry on new projects.

3.9 The North West was chosen for a pilot NAP partly because of the region's substantial manufacturing output, producing almost 10% of the UK's total exports, and its prominence in several industrial sectors such as Aerospace, Automotive, Chemicals, Biomanufacturing and Agriculture. Lancashire has significant strengths in these areas and should be at the forefront of delivering, and benefiting from, the pilot.

Box 1: The Industrial Strategy

Industrial Strategy Building a Britain fit for the future White Paper

- The *Industrial Strategy Building a Britain fit for the future* White Paper sets out the Government's plan to boost productivity and earning power throughout the UK. Innovation, through ideas generation and adoption, is a fundamental pillar of the plan.
- The White Paper sets out the 'Four Grand Challenges' for the UK economy. These are:
  - Putting the UK at the forefront of the Artificial Intelligence and data revolution;
  - Maximising the advantages for UK industry from the global shift to clean growth;
  - Being a world leader in shaping the future of mobility; and
  - Harnessing the power of innovation to help meet the needs of an ageing society.
- To support the rapid adoption of AI technologies at scale, a new Office for AI will be set up and will work initially with six priority business sectors, most of which Lancashire has considerable strengths in, including Cybersecurity, Manufacturing, Energy, and Agricultural Technology.
- An ambition for Clean Growth will be supported by Government support for Smart Energy systems, innovation in the Low Carbon industry, and innovation in high-efficiency Agriculture. There are considerable County strengths in these areas, which could be harnessed to capitalise on this.
- The £115m 'Strength in Places' Fund looks to support areas to build on their science and innovation strengths and develop stronger local networks. Again, Lancashire should be well placed to access this funding.
- The launch and roll-out of Sector Deals, partnerships between government and industry, aiming to increase sector productivity. The first Sector Deals are in Life Sciences, Construction, Artificial Intelligence, Nuclear and the Automotive sector.

Source: Department for Business, Energy and Industrial Strategy, Industrial Strategy: Building a Britain fit for the future (2017)

3.10 The Department for Business, Energy, and Industrial Strategy (BEIS) has commissioned Science and Innovation Audits help local areas to map their research and innovation strengths and identify areas of potential global competitive advantage. Each Audit has a theme, and a number of these are of direct relevance for Lancashire, including:

- Sheffield City Region and Lancashire – High-Value Manufacturing (see Box 2).
- North West Nuclear Arc Consortium - New Nuclear Technology;
- North West Coastal Arc Eco-Innovation Partnership - Low Carbon Energy and eco-innovation;
- Northern Powerhouse Chemicals and Processing Science – Chemicals; and
- A Northern Powerhouse in Health Research – Precision Medicine and Health-Facing Bioinformatics.

Box 2: Science and Innovation Audit

Sheffield City Region and Lancashire: Science and Innovation Audit

- The *Sheffield City Region and Lancashire: Science and Innovation Audit* will inform investment decisions to stimulate productivity and economic growth across the Lancashire, Sheffield, and the wider Northern Powerhouse; driving the region's contribution to the national industrial strategy and economic growth.
- This document was focussed on driving productivity growth through innovation in high-value manufacturing. The Audit proposes that the technological innovation in automation, robotics, data analytics, and new manufacturing techniques that drive Industry 4.0 are existing innovation strengths in the region. This, coupled with the successful translational research institutions that can drive innovation and skills, can enable Lancashire to position itself as a centre of innovation in high-value manufacturing and drive productivity growth across the County.

Source: Department for Business, Energy and Industrial Strategy, Industrial Strategy: Building a Britain fit for the future (2017)

Regional Strategies

3.11 The Northern Powerhouse Partnership focusses on encouraging cities and counties to work together across the North of England. The priorities for the Partnership are:

- Infrastructure and Assets – including transport, telecoms, housing, and new technology;
- Education and Skills – including basic skills through to higher level and technical skills that support innovation, and the HEI sector;
- International Competitiveness – focussing on fostering an enterprise culture, innovation, trade and international investment; and
- Leadership and Learning – leadership within companies, promoting best practice to civil leaders and Mayors.

3.12 Advanced Manufacturing and Materials, Energy, Digital, and Health Innovation were identified as the four 'Prime Capabilities' of the North by the *Northern Powerhouse Independent Economic Review (NPIER)*. These are the economic agglomerations in which the North of England has the greatest potential global competitive advantage. These are all areas in which Lancashire has significant existing and emerging strengths both in industry and academia, and as such the County is well equipped to play a leading role in strengthening and expanding the North's capabilities in these areas.

3.13 The 11 LEPs in the North of England are looking to develop a Northern approach to innovation – *'Innovation North'*. Building on the recommendation in the NPIER that innovation should be treated as a pan-Northern agenda, this is a fresh attempt to work collaboratively at scale to harness the power and benefits of innovation. The intention is to do this by maximising the industrial and commercial application of the North's significant assets and capabilities. Again, Lancashire is very well equipped to play a frontline role in shaping and driving the emerging Innovation North agenda.

Local Strategies

3.14 Innovation excellence is one of the key objectives of *Lancashire's Strategic Economic Plan (SEP) 2015-25*. To support the delivery of this objective, the Lancashire Growth Deal established a £270m investment framework. Examples of initiatives receiving funding as part of this framework, and which contribute to delivering the innovation excellence objective, include:

- The Centre for Quantum Technology Innovation at Lancaster;
- The Cyber Security Innovation Centre at Lancaster;
- The Engineering Innovation Centre at Preston; and
- Lancaster's Health Innovation Campus.

3.15 These initiatives, alongside a multitude of other assets and actions, display the commitment of local partners in key growth sectors to collaboratively deliver a step-change in innovation in Lancashire, and the sectoral and Smart Specialisation strengths on which this plan seeks to build. A non-exhaustive list of assets and facilities to support innovation in Lancashire is set out at Appendix A.

3.16 The *Lancashire Skills and Employment Strategic Framework* provides the template for public investment in skills and employment activities in the County and outlines the direction skills and employment providers need to take to best address need. It seeks to re-establish Lancashire as an economic powerhouse and a national centre of excellence in Advanced

Manufacturing by maximising its clear competitive strengths and capabilities in the Aerospace, Automotive, Energy and health science-related sectors.

3.17 Driving Lancashire forward as a national leader in the implementation of reforms to Education in England, the recently developed *Lancashire Technical Education Vision* is a framework for a dynamic and high performing post-16 technical education system in the County. With objectives and outcomes linked directly to the Skills and Employment Strategic Framework, the Vision sets out an agenda for transformative change in the delivery of Technical Education across the County. At its core, the Vision will drive new formats of training and learning, which are aligned more centrally to employer demand, so raising skills and developing the talent pool to support key existing and emerging sectors.

3.18 This Innovation Plan builds on and complements these existing strategic plans whilst responding to the opportunities and challenges emerging from the evidence base and stakeholder consultations.

4 Lancashire's Economic and Innovation Landscape

This Section presents the key trends and forecasts to show how Lancashire is performing and is likely to perform, as an economy and as an innovation ecosystem.

The Lancashire Economy[1]

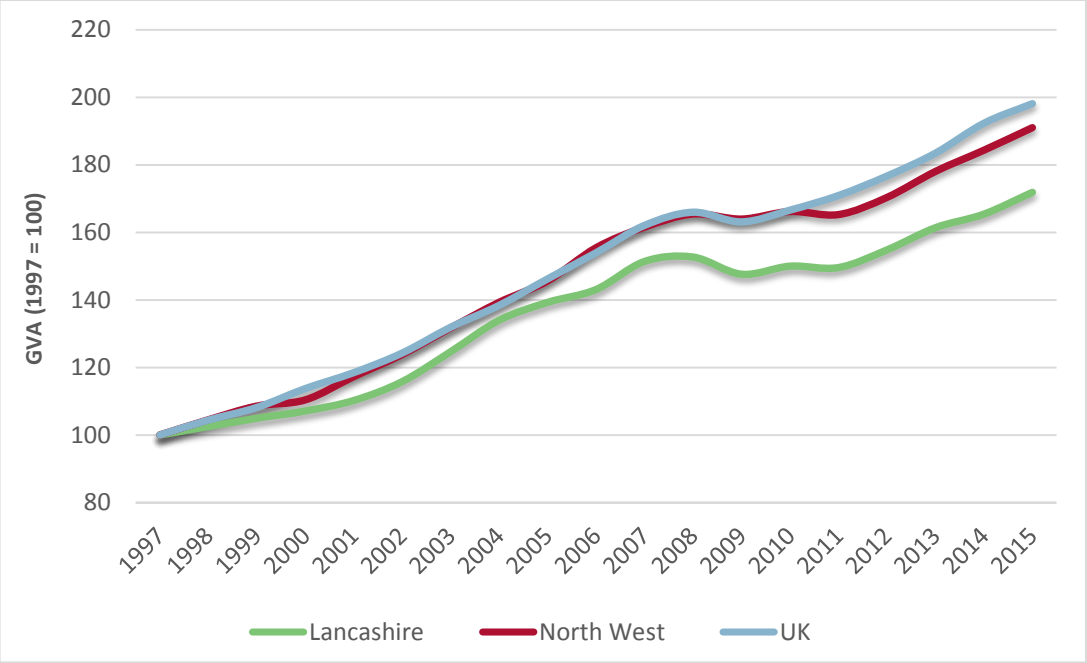
4.1 With a resident population of just under 1.5m, supporting around 630,000 jobs, and containing around 52,000 businesses, Lancashire is a key component of the North West's economy. Lancashire contains globally significant firms in sectors such as Aerospace and Nuclear, including BAE Systems, Rolls Royce, and Westinghouse as well as a significant SME base (98% of businesses in Lancashire employ fewer than 50 people). It also benefits from four universities in the area, providing a valuable mix of research-oriented and applied innovation opportunities. Lancashire experienced a decline in employment between 2007 and 2012 and has since reversed that trend, with employment now above pre-2007 levels. This is a similar trend to the North West and UK, but Lancashire's employment growth is slower than both.

4.2 Despite pockets of high performance and productivity, Lancashire's economy, in common with much of the North of England, is underperforming, and not reaching its full potential. The primary indicator to measure an economy's overall performance is Gross Value Added (GVA). Lancashire generated a GVA figure of £29 billion in 2015, 18.5% of the North West's total. This compares with 21% of the North West's employment, 20% of North West's total business base, and 20% of the North West's working age population. As we have seen, the spread of productivity across Lancashire varies greatly between areas within the County. The average for the County can mask areas of high value and high productivity businesses (such as those at the top-end of the Aerospace supply chain).

4.3 As Figure 1 indicates, although there has been consistent growth in GVA in Lancashire, it is slower than the North West and UK, and that productivity gap has widened in recent years. As shown in:

[1] A detailed SWOT assessment in the form of an extended PowerPoint presentation is available on request from Andy Walker, at Lancashire Local Enterprise Partnership.

Figure 1 – GVA Growth - Lancashire and regional and national benchmarks



Source: Department for Business, Energy and Industrial Strategy, Industrial Strategy: Building a Britain fit for the future (2017)

4.4 GVA per employee in Lancashire was £42,100 in 2015, against a figure of £50,800 for the UK, 83% of the UK average. In 2015, Lancashire's GVA per employee was 83% of the UK average, and this issue of productivity is a long-standing and embedded one. This productivity gap matters: if GVA per employee in 2015 was at the UK level, the Lancashire economy would have generated an extra £3.1 billion. The closing of this increasing productivity deficit remains a key challenge for Lancashire.

4.5 This productivity gap with the UK exists not because employees in Lancashire work less hard than people in other areas, but because of three key drivers:

- Structural change - a shift away from Manufacturing (a historically high employing sector for the County) to lower productivity occupations – often Services and Retail;
- Skills - a legacy of educational underachievement, skills gaps in key sectors, and a relentless need to retrain workforces as new market and technology changes break-in; and
- Innovation and entrepreneurship - characterised by lower levels of R&D expenditure in the County, worsened by low start-up rates and lower inward investment levels.

The Changing Shape of Lancashire's Economy

4.6 Econometric forecasts[2] suggest that, under a 'Do Nothing' scenario, the productivity gap will remain. By 2036, GVA in Lancashire is due to increase by just over 30% to £38.5 billion. Over the same period, UK GVA is forecasted to increase by just over 40%: the productivity gap will grow. If Lancashire's GVA grew at the same rate as the UK over this period this would result in an additional £2.5 billion in GVA by 2036.

[2] Taken from Oxford Economics' *Greater Manchester Forecasting Model (GMFM) 2017*

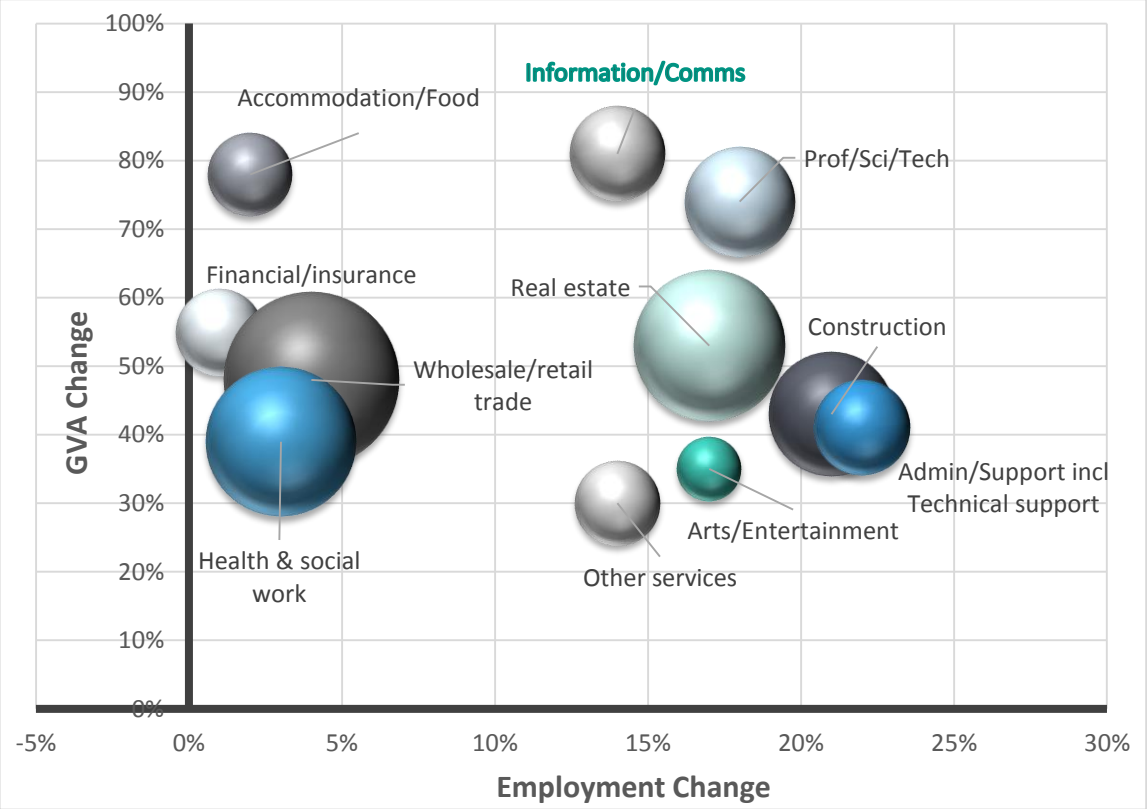
4.7 Employment growth is also forecast to remain slower than that of the UK. By 2036, employment in Lancashire is set to grow by 2.7% (an added 19,000 jobs). Over the same period, the UK employment is due to increase by 7.3%. If Lancashire's employment grew at the same rate as the UK this would result in an extra 53,000 jobs in the local economy.

4.8 Moreover, Lancashire's economy will experience significant change over the next two decades. Sectors are expected to perform in one of two ways:

- *Expanding sectors* which are forecasted to grow in both GVA and employment; and
- *Adjusting sectors* where GVA will increase but employment is likely to decrease.

4.9 Figure 2 below shows the *Expanding sectors*. Significant growth in both GVA and employment is forecasted in service sectors such as Professional/Scientific/Technical, Administration/Support (including Technical Support), and Information/Communications. Most sectors are forecasted to grow in GVA and employment. These data are at a broad sectoral level, which can miss the nuances and variety of job roles within each sector.

Figure 2 – Expanding Sectors in Lancashire in the period to 2036

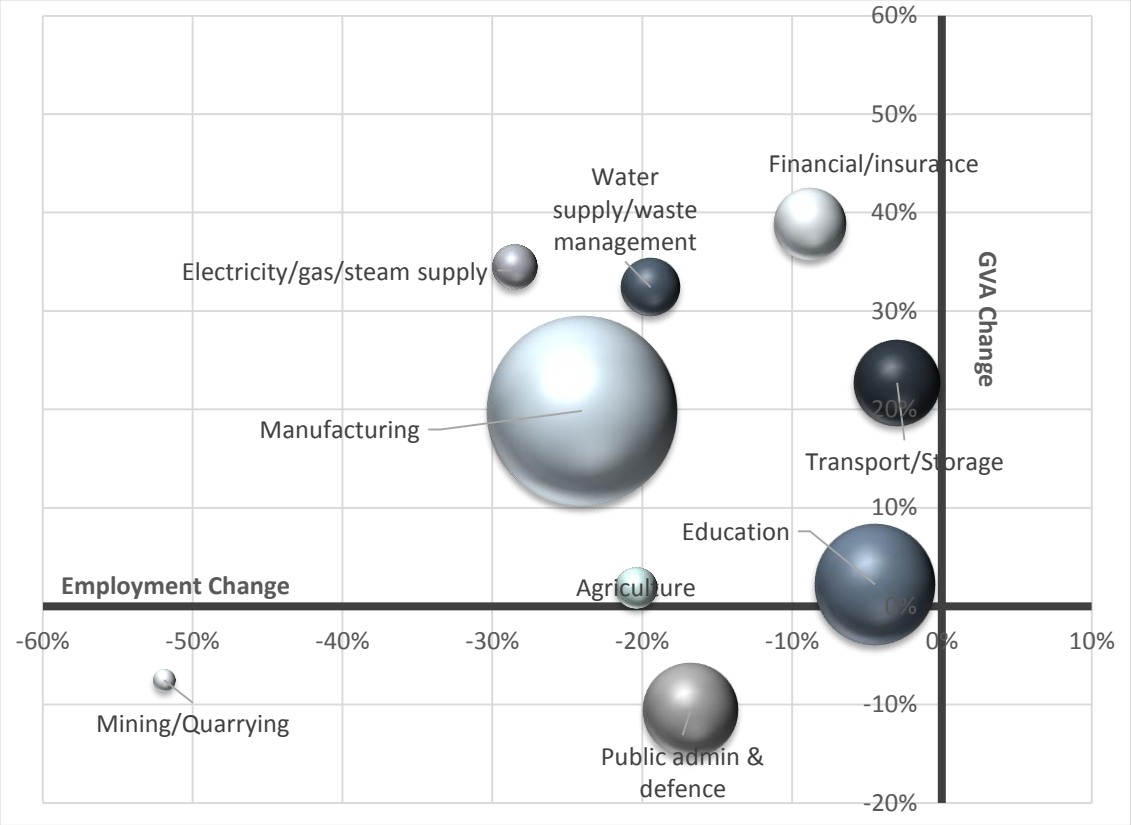


Source: BRES and ONS, Regional Accounts, 2015

4.10 Figure 3 below shows the *Adjusting sectors*. Most significantly, the current key employment sector of manufacturing is forecast to decline in employment by 24% (c.20,000 jobs) by 2036. This trend is expected nationally, however, is expected to be more keenly felt in Lancashire due to the size of the sector in the County. The fact that manufacturing is forecast to grow in GVA despite this points to the productivity opportunities in data and automation that Industry 4.0 presents. It is important to remember that these forecasts are 'policy-off', meaning they do not consider different policy scenarios or their implications. Interventions such as those

advocated later in this Plan, alongside ongoing actions across the County and North, can address these potential employment challenges.

Figure 3 – Adjusting Sectors in Lancashire in the period to 2023



Source: BRES and ONS, Regional Accounts, 2015

Innovation and Knowledge

4.11 Table 1 below gives an overview of Lancashire's current performance on innovation indicators relating to STEM, graduate retention, and R&D expenditures.

Table 1 – Innovation and Knowledge Indicators

Indicator	Lancs LEP	North West	UK	Source/ Date
Graduate retention rates	80%	77% (NW average)	68% (All-LEP average)	HESA 2012/13
Undergrads in STEM/non-STEM	34%/66%	35%/65%	35%/65% (England)	HESA 2013/14
FT Post-grads in STEM/non-STEM	49%/51%	68%/32%	65%/35% (England)	HESA 2013/14
University spin-outs/start-ups since 2000	27 (1% of UK total)	156 (7% of UK total)	2,293	Spinouts UK/2017
Total R&D Expenditure (£ per person employed)	£525	£1,093	£1,070	Eurostat + BRES/2011
of which Business R&D expenditure (BERD)	£388 (74%)	£851 (78%)	£765 (71%)	Eurostat + BRES/2011

Indicator	Lancs LEP	North West	UK	Source/ Date
Employment in Professional, Scientific & Technical (% of all jobs)	5%	7%	8% (GB)	BRES/2015
Residents employed in STEM subjects	6.2%	6.9%	7.2%	APS/2014

4.12 There are positive signs in Graduate Retention rates in the short term, as a higher proportion of graduates remain in the area six months after graduating compared to the national average. The proportion of undergraduates studying STEM subjects is in line with the regional and national picture, suggesting that Lancashire is attracting and retaining graduates in key subjects. Private sector R&D per employee is less than half the national average, however, which could indicate either a low take-up of R&D tax credits by Lancashire businesses or that simply not enough is being spent on private sector R&D in Lancashire.

4.13 The *Research Excellence Framework 2014* showed that the County's HEIs have significant research strengths in several areas. The following subjects were highlighted as being highly rated:

- Allied Health Professions;
- Chemistry;
- Computer Science;
- Earth Systems and Environmental Sciences;
- General Engineering;
- Mathematical Science; and
- Physics.

4.14 Patent data provide one of several indicators of innovation performance, but is subject to biases and limitations created principally by differences between industries in the 'propensity to patent'. This means that the usefulness of patents as a measure of innovation emphasis across different LEPs is limited by the extent to which industries protect their intellectual property using patents. This limitation is however consistent across all LEPs. Firm-specific propensities to patent are commonly assumed to be a weaker source of bias than industry-specific sources.

4.15 Through analysis of patent applications data kindly provided by the Intellectual Property Office (IPO), Lancashire's strong emphasis on Civil Engineering patents stands out. This is broadly in line with, but much higher than, the emphasis on both the rest of the Northern Powerhouse LEPs and all LEPs. Other noteworthy aspects, are prominence in mechanical elements and in thermal processes and apparatus. These areas show relatively high levels of patenting activity in Lancashire.

5 Lancashire's Innovation Ecosystem

This Section sets out the strengths, weaknesses, opportunities, and threats (SWOT) assessment of the Lancashire innovation ecosystem

5.1 Through a range of stakeholder consultations, data analysis, and a review of over 40 documents received via a 'Call for Evidence', this section will present the strengths, weaknesses, opportunities, and threats (SWOT) for innovation in Lancashire.

5.2 The SWOT was conducted through four lenses. These are:

- People/Human Capital – covering demographics, mindsets, skills and occupation offer, education, and access to work;
- Infrastructure/Assets – covering sites, premises, (and the cost and location of these), housing, environment, transport, and national strategic infrastructures (digital/energy/waste/water/flood risk);
- Knowledge – covering Further and Higher Education, research institutions, innovation systems, networks, and commercialisation processes; and
- Money and External Business Expertise – covering access to finance, accounting and legal professions, intellectual property management, and marketing.

Strengths

5.3 Lancashire has well established and recognised strengths in the Aerospace, Automotive, Energy, Nuclear, Digital, and Health Innovation sectors. There are strengths in biological sciences, Life Sciences and Healthcare, Advanced Manufacturing and materials, and Digital. Protecting, enhancing, and diffusing these strengths across their supply chains and across sectors will be a key feature of the future innovation landscape in Lancashire.

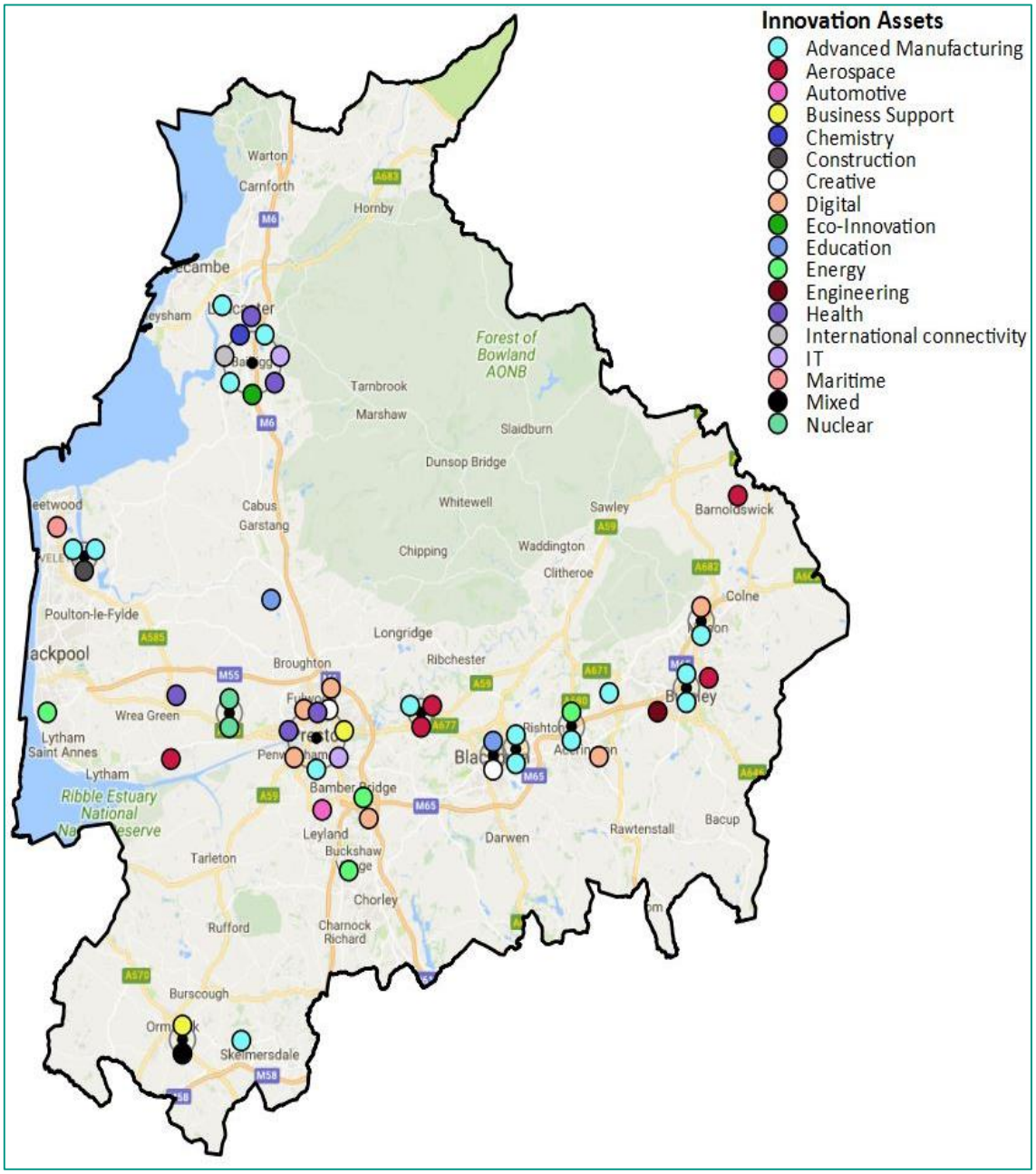
5.4 The local HEIs have research strengths in STEM subjects, in particular, Computer Science, Mathematical Science, and General Engineering, and provide significant research and consultancy services (with a total income of £26m from contract research and consultancy services across the four HEIs in 2015/16). There are translational research centres such as the Engineering Innovation Centre at UCLan, the North West Advanced Manufacturing Research Centre at Samlesbury, and the forthcoming Lancaster Health Innovation Campus which can be catalysts for research development and adoption across the local economy and beyond.

5.5 Graduate retention rates are good in Lancashire, and strong Further and Higher Education provision is starting to show in the improving rates of residents with higher level skills.

Maintaining and continually improving these will be key to ensuring a pipeline of talent to support Lancashire's businesses and innovation capabilities.

5.6 Analysis of the IPO patenting data indicates strong intellectual property advances in areas such as Civil Engineering, Mechanical Elements, Medical and Computer Technology, and Thermal Processes. Ongoing analysis of patenting data can provide an indication of emerging innovation specialisms and differentiators. Providing support for businesses in generating and managing their intellectual property can help them to protect their intellectual property assets and maximise the value from them.

Figure 4 – Lancashire Innovation Asset Map



Source: SDG-Economic Development, 2018

5.7 As Figure 4 above shows, Lancashire also has considerable innovation assets that can be developed, connected, and utilised to support this Plan's innovation agenda. As part of this Plan's preparation, an asset mapping exercise was undertaken through consultation with stakeholders. This map is non-exhaustive, and it is expected that the forthcoming Eco-Innovation Science and Innovation Audit will add to it.

5.8 The summary of this mapping work, which is set out more fully in Appendix A, was as follows:

- The County has 54 assets that support and enable innovation, covering into 16 sectors;
- The most represented sectors include Advanced Manufacturing (15), Digital (6), Energy (5), Aerospace (5), and Health (5);
- There is a concentration of assets along the West to East corridor (M55-M6-M65);
- There is a substantial concentration of assets around the Lancaster University and UCLan Campuses; and
- Digital assets appear to be disparately distributed, with no apparent signs yet of clustering.

5.9 The key message here is that there are significant innovation assets and areas of innovation strength in Lancashire. These need to be supported, developed and expanded to ensure these stay ahead of the competition and play a greater role in innovation and productivity in Lancashire.

Weaknesses

5.10 The productivity gap (Lancashire is at 83% of the UK's level of GVA per worker, and 93% the level of the UK excluding London and the South East), and relatively slow GVA growth are long-standing challenges in the area. Lancashire is not unique in this regard. The focus on the average can mask areas of high value-added businesses, particularly in Advanced Manufacturing. In addition, a lack of inward investment and new office space in key centres has prevented the development of a high performing service sector based around a regional centre, a challenge compounded by Lancashire's geography and location.

5.11 Larger businesses are well connected to higher level skills and export opportunities, SME connectivity to talent and international trade opportunities is more limited. This can restrict the survival chances and growth of smaller businesses. This also contributes to the current lack of innovation diffusion and the long tail of less innovative companies, which was identified as a national problem in the Industrial Strategy.

5.12 Although higher level skills are improving, the proportion of residents with NVQ4 (Graduate level) and above is still lower than the national rate (32.8% compared to 38.2%). Reducing this gap can play a large role in reducing the productivity gap, as lower level skills are cited as a key factor in productivity deficits.

5.13 There is currently a low level of R&D expenditure per person employed in Lancashire, which is just less than half the national average. This could be due to a lack of take-up in R&D tax credits, particularly in sectors other than Manufacturing. Large companies often report R&D spend through their headquarters, meaning a large company with a site in Lancashire, even one that primarily focuses on R&D, will be under-reported in terms of R&D spend. This can lead to Lancashire being under-represented in R&D spend statistics. However, how to increase both R&D tax credits take-up and overall private sector R&D investment, in both time and money, is still a significant innovation challenge for Lancashire.

Opportunities

5.14 Lancashire's strengths in industries at the forefront of Industry 4.0 mean it is well placed to capitalise on the productivity improvements associated with increased automation and adoption of new technology. Developing an innovation corridor in Advanced Manufacturing, as recommended by the Sheffield City Region and Lancashire SIA, is one way the benefits of Industry 4.0 can be maximised.

5.15 The connectedness and adjacency of several high-tech sectors present real sectoral cross-over opportunities for Lancashire. This is the ways in which the different established activities in Lancashire can be brought together to drive new innovations. An example of this is how Automotive and Aerospace technology and Digital Systems are integrated to develop autonomous vehicles. More recently, Preston was successful in its bid to become a national test-bed for the UK's development of drone technology, this building on the work of the 'Civic Drone Centre' established by the University of Central Lancashire with a £250k investment in 2014. This not-for-profit centre brings together expertise and stakeholders including Local Authorities, communities, and businesses, and has developed and demonstrated many novel drone solutions. The Centre is an important part of the new £32m Engineering Innovation Centre opening in Preston in early 2019.

5.16 As the Industrial Strategy is being implemented, there will be opportunities for Lancashire to position itself as a flagship area for some of the key initiatives including cyber security, health innovation, and clean growth. There will be a need to ensure Lancashire is able to articulate its offer in these areas with an emphasis on innovation. There have been considerable, and much needed, investment in capital innovation schemes in Lancashire covering key sectors. The opportunity now is to ensure that these are utilised and their effectiveness is maximised, and the use of these schemes could be a key selling point for Lancashire.

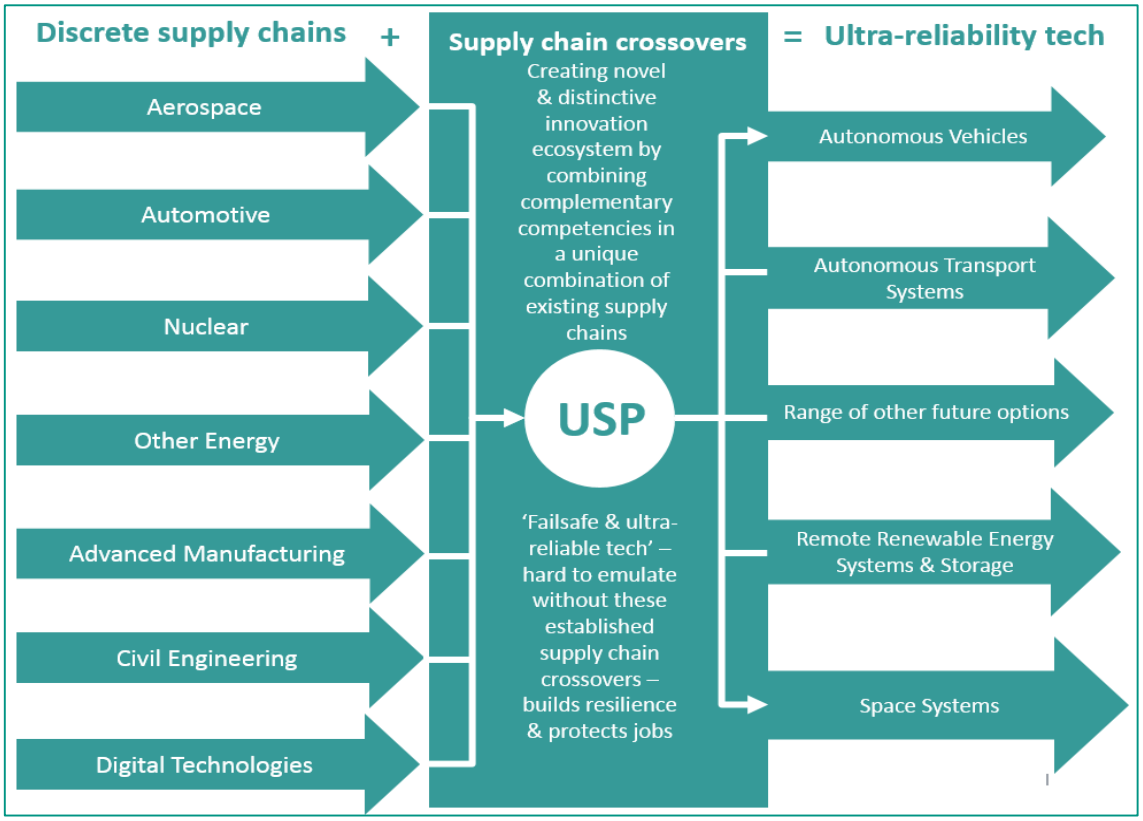
5.17 Partnerships and collaboration between businesses and the knowledge base, as well as with Centres of Excellence both within and outside of Lancashire should be a focus of the coming years. This willingness to work cross-sectorally and beyond the Lancashire boundary will open up new routeways for innovation for Lancashire institutions. These crossovers can provide major opportunities for Lancashire because there is an unusual mix of sectors and supply chains in the County with untapped potential to combine capabilities to open up new competitive opportunities. An example of this is given in the panel at **Error! Reference source ot found.**, this focuses on how Lancashire's existing supply chain strengths might be mixed to produce a new capability in 'ultra-reliable technologies'.

Threats

5.18 Growing competition from overseas, particularly in key sectors such as Aerospace and Automotive, presents an ongoing threat. As developing economies can often produce at a lower cost this presents cost challenges for Lancashire and UK business alike. The ability to remain competitive in these markets will be just as important as being innovative.

5.19 There is a perception currently of a dependence on major employers and multi-nationals for innovation and a focus on key sectors potentially at expense of other, emerging sectors. The focus on diffusion of innovation, in both initial support and in adoption, throughout supply chains and across sectors will go some way to changing this perception.

Figure 5 – Potential Supply Chain Crossovers



Source: SDG Economic Development, 2018

5.20 In uncertain international trading conditions, multi-nationals that have supply chains in Lancashire may look to take these off-shore. Alternatively, multi-nationals with supply chains abroad may look to 'on-shore' these. The challenge for Lancashire will be to protect existing supply chains and being able to 'bid' for any new opportunities that may arise.

5.21 As with much of the UK, Lancashire faces the challenge of replacing an ageing workforce, as well as a forecast employment decline in some key sectors such as manufacturing. There are challenges around re-training and re-skilling those whose roles are affected by increased automation, as well as need to maintain a pipeline of talent to meet this demand. These issues have been explored in detail in the recent preparation of the Vision for Technical Education in Lancashire, and it will be imperative that this Plan and that Vision mesh and work seamlessly together to 'synergise' their innovation and skills efforts.

5.22 Lancashire's location and geography presents ongoing connectivity challenges, and the county can be 'passed by' by key infrastructures. Other areas nearby, such as Sheffield, Manchester, and Liverpool have a stronger 'innovation profile', with a defined leadership and national assets. Both working with these areas to develop stronger links and showing what Lancashire can offer that is unique from them will be an ongoing strategic challenge.

6 Our Vision for an Innovation Economy

Our Vision Statement for Lancashire's Innovation Economy is as follows:

By 2030, Lancashire will have positioned itself as an internationally connected and resilient innovation ecosystem. The way we innovate will embody excellence and collaboration, feeding through to greater commercialisation, entrepreneurship, and competitiveness in our economy. We will have a track-record as a centre for globally competitive knowledge clusters and talent, and as a developer of new solutions to the emerging challenges of our world.

6.1 By 2030, the our Plan's Vision sees Lancashire as an internationally connected innovation ecosystem. This means Lancashire adopts and implements proactively innovations from elsewhere and ideas generated in Lancashire are exported across the globe. By 'doing' innovation better, Lancashire's economy will be more resilient and capable of managing economic shocks, through greater diffusion and adoption of innovation across sectors and throughout supply chains, and ensuring a supply of talent to businesses of all sizes.

6.2 Lancashire will *'collaborate to compete'*, by driving crossovers between sectors to develop new innovation opportunities and markets. Through strategic marketing, business support, and intellectual property management, Lancashire will develop greater commercialisation opportunities, support innovation-led business start-ups, and remain competitive in existing sector strengths and become competitive in emerging sectors.

6.3 Lancashire's existing and new knowledge clusters will operate at a global scale, attracting research talent in key specialisms and developing new research specialisms and commercialisation opportunities. Solutions to emerging challenges in Energy, health, mobility, and data security will be developed in Lancashire.

6.4 Many of the aspects of our vision apply elsewhere. However, this is to be expected given the world's economies are increasingly connected, both digitally and through global value chains and business networks. We do not apologise for defining shared challenges with other places. But in our Plan, we will address these with Lancastrian determination, and invention, making sure we understand what works for our place, our businesses, and our people.

6.5 The next section will outline the Strategic Framework for delivering this vision.

7 Our Strategic Framework for an Innovation Economy

This Section sets out our Strategic Framework, and the Aims that will deliver the vision set out in the previous Chapter.

Framework Structure

7.1 Our Framework for innovation is made up of five Strategic Aims. These are configured as a '2x3' structure: two of our Aims relate to our innovation capability (the ability of existing and new businesses to develop, adopt, and commercialise innovation), and three Aims relate to our innovation ecosystem (building the infrastructures, the mindset, the marketing capability necessary for innovation). This will be delivered through a mixture of 'quick wins', medium-term programmes, and long-term culture change. Quick wins are possible: if Lancashire's businesses matched current best practice (such as in the Nuclear sector and Japanese Advanced Manufacturing) this would immediately result in significant productivity gains. The medium-term programmes and a longer term culture change are the focus of the Plan's Framework.

7.2 Underpinning the five Aims are three 'cross-cutting themes'. These are the key behaviours that will characterise the way this Framework is implemented and progressed.

Innovation Capability

Strategic Aim 1 – 'Staying Ahead'

7.3 Lancashire has recognised sectoral strengths and differentiators that are a core part of the local economy. These are under threat from increased global competition and need to be developed, enhanced, and connected with other sectors to stay ahead of new and existing competitors. Significant market and technology change is coming, and indeed is already underway in many sectors. These changes also present significant opportunities for Lancashire to unlock productivity and participate in new and emerging global supply chains.

7.4 This will impact significantly on business models and employment, and Lancashire's existing sector strengths will need to anticipate these changes to embrace the opportunities and mitigate the risks posed by them. Protecting and enhancing these long-standing sectoral strengths is fundamental for Lancashire as they represent a major employment and GVA contribution to the county

7.5 To maintain these existing capabilities, this Strategic Aim will focus on:

- Maintaining Lancashire's distinctive world-class prominence in priority sectors;
- Developing supply chain capability and capacity servicing these sectors, and gap fill;
- Identifying innovation inter-dependencies with other geographies; and
- Developing strategic partnerships with Centres of Excellence outside Lancashire.

Strategic Aim 2 – 'New Routeways to Excellence'

7.6 In addition to these existing strengths, it is vital that Lancashire continues to develop and recreate its economic base, and create presence and expertise in new sectors, allowing the County to exploit market and technology change. Sectoral development is increasingly difficult to deliver from a 'standing start', and emerging sectors need to be identified and nurtured at an early stage. Connectedness between our existing sectoral strengths provides opportunities for the diversification and broadening of the supply chain and can provide expanded or new sources of employment and GVA.

7.7 To develop these routeways to excellence, this Strategic Aim will focus on:

- Building distinctive cross-over driven strategy (where different sectoral strengths 'cross-over' into new sectors) to exploit existing strengths;
- Prioritising R&D, innovation, and skills development for emerging sectoral strengths;
- Developing new global supply chain participation strategies to scale these new areas;
- Identifying innovation inter-dependencies with other geographies; and
- Developing strategic partnerships with Centres of Excellence, wherever they may be.

Innovation Ecosystem

Strategic Aim 3 – 'Broadening the Innovation Base'

7.8 To combat the current perceived dependence on large and multinational companies for innovation, SMEs must be seen as an integral part of the innovation mix across all sectors. This will tackle the problem in Lancashire, and indeed the UK as it was pointed out in the Industrial Strategy White Paper, of a long tail of less innovative and less productive companies.

7.9 With further economic shocks and economic restructuring, a certainty given the rate of market and technology change, resilience is vital to the ongoing success of an economy. By broadening innovation capacity and capability across the whole of the local economy, the effects of an economic shock to one of the large companies in Lancashire can be better absorbed. Without a broader innovation base, there is also the risk of a hollowing out of the Lancashire economy to adjacent economies.

7.10 To broaden the innovation base, this Strategic Aim will focus on:

- Creating greater diffusion of innovation and adoption across the local economy to increase the resilience of local employers and their ability to respond to emerging opportunities and threats;
- Selling the benefits of innovation for competitiveness and growth;
- Enhancing management and leadership skills around innovation; and
- Prioritising FDI and clustering investment in innovation in Lancashire.

Strategic Aim 4 – 'Enabling Infrastructures for Innovation'

7.11 Innovation is critically dependent on a mix of skills and talent, access to specialist facilities, knowledge and ideas generation, and funding. These are required for innovation to be

developed, adopted, and commercialised. As part of this, there has been significant investment in innovation infrastructure in Lancashire, developing facilities in key sectors.

7.12 This is about having the 'soft' infrastructures in place utilising innovation networks and collaboration across private and public-sector organisations. Ultimately, innovation needs to be a pervasive mindset and behaviour across organisations of all sizes in the private, public, and third sectors.

7.13 To enable infrastructures for innovation, this Strategic Aim will focus on:

- Ensuring Innovation is embedded as a 'first nature' behaviour and mindset for Lancashire;
- Ensuring wider economic policies (e.g. SEP, Lancashire's Technical Education Vision) are aligned with this Plan to drive success;
- Enhancing management and leadership skills around innovation;
- Prioritising human capital development and re-deployability; and
- Developing strategic partnerships with Centres of Excellence, wherever they may be.

Strategic Aim 5 – *'Letting the World Know!'*

7.14 Competition between places and economies is intensifying, and with new global trading relationships to be shaped and developed, this is likely to continue. Lancashire is not instinctively recognised externally as a place for innovative, can-do solutions. We know what we are good at, others do not.

7.15 This is partly due to the lack of a clear, coherent, and comprehensive innovation narrative. There are innovation success stories in Lancashire but these are yet to be pulled together to show Lancashire's innovation offer. This has resulted from insufficient resources given to promoting and coordinating innovation. Increasing the visibility of the importance of innovation in Lancashire will correct this.

7.16 To let the world know, this Strategic Aim will focus on:

- Developing this innovation plan and SEP refresh to help establish a coherent innovation and growth framework for Lancashire;
- Developing a proactive function to promote & celebrate innovation in the county;
- Providing clear and expert leadership in shaping national innovation thinking; and
- Connecting for innovation – through Global Innovation Networks and Global Value Chains.

Cross-Cutting Themes

7.17 Three cross-cutting themes will underpin and set the culture and delivery approach to the Strategic Aims. These are as follows:

Application-inspired in our R&D and its deployment

- This theme is about the application of R&D and innovation, not just its creation. Lancashire will be a place that adopts innovation generated within Lancashire and beyond, putting ideas into action. R&D in Lancashire will focus on practical solutions to emerging and large-scale challenges. These ideas will be commercialised and exported to different markets both domestic and international.

Excellence in delivery, driven by *real* evaluation and learning

- We understand that delivery of this Plan will be challenging. We need to understand that the structures and processes that have supported innovation in the past may not be

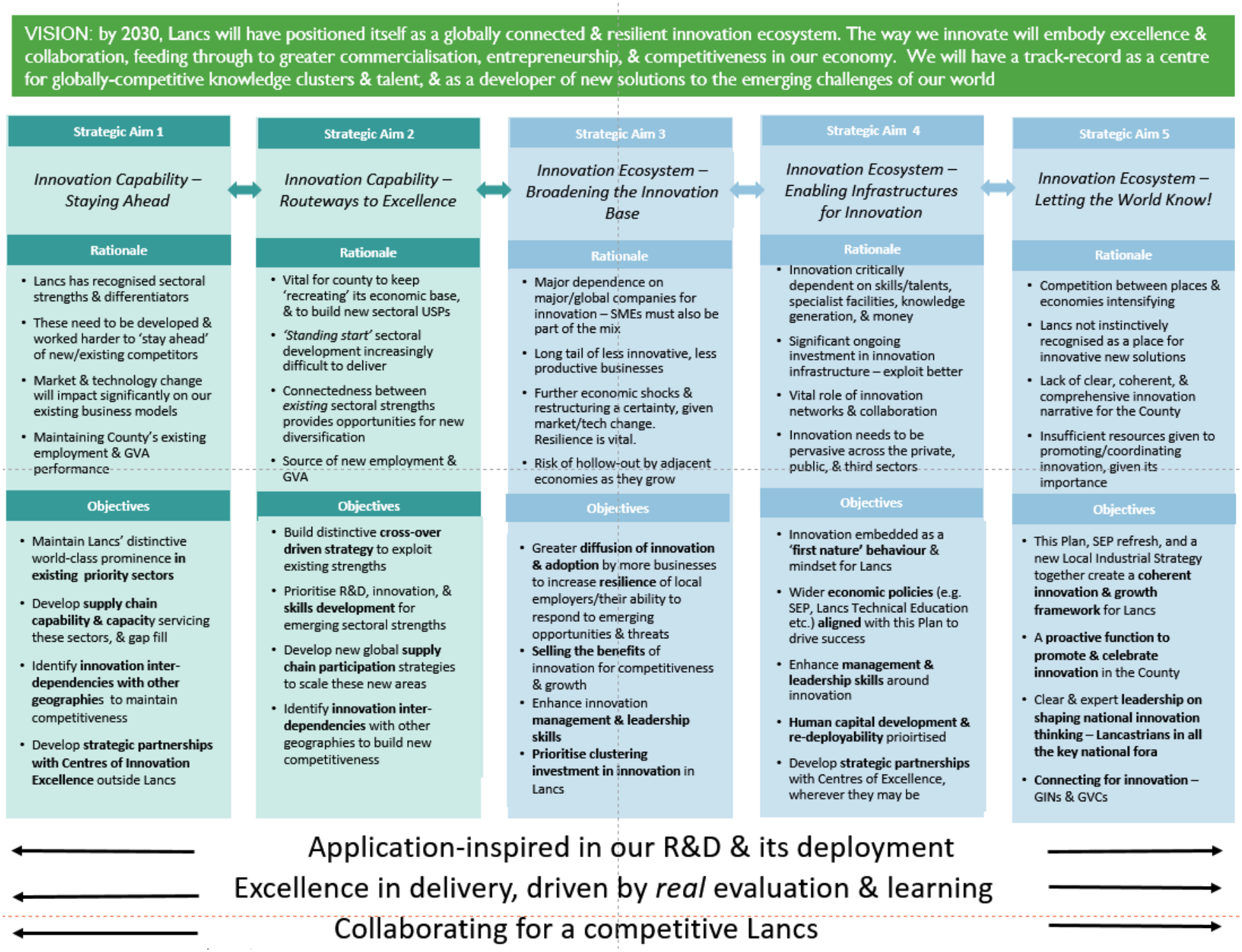
suitable to meet the challenges of the future. In developing, restructuring, and creating new process and structures we need to look to learn from our experiences, and those of other places.

Collaborating for a competitive Lancashire

- As with the ultra-reliable technology crossover example from earlier, there are significant collaboration opportunities for Lancashire's innovators. This can be within and across both supply chains and sectors. This will strengthen existing sector assets and Smart Specialisations, and support new routeways to innovation. Exploiting these crossovers will develop Lancashire's capabilities, infrastructures, and build resilience across the economy.

7.18 Our Plan on a page is in Figure 6.

Figure 6 – The Lancashire Innovation Plan Strategic Framework



8 Our Action Agenda for an Innovation Economy

This Section sets out our Action Agenda, the actions and activities recommended to implement the Vision and Framework.

8.1 Whilst the Vision and Strategic Framework are for the long term, an Action Agenda is typically subject to regular review (e.g. every couple of years). The focus of our Action Agenda is therefore on what can be done over the next few years to progress Lancashire's Innovation Plan; some of these actions are 'stand-alone' and can be completed in the short term, others are contributions to longer-term developments.

8.2 The prime emphasis in this Section is on those new actions, which, in consultation with partners, we judge are of major importance for Lancashire's future innovation capacity and capability. They are not, however, the only actions; through partners' ongoing commitments and activities, a wide range of activity is already underway in Lancashire.

8.3 As part of the development of this Action Agenda, high-level, activity mapping work was undertaken to identify existing and pipeline actions that could contribute to the delivery of our Innovation Plan. Below is a selection of key existing and emerging actions that will contribute to our Plan's delivery. These are indicative and not exhaustive.

- **Lancashire Health Innovation Campus** – this multi-phased campus will provide R&D space and facilities for the development of new services and technologies for health-related care. The aim of the development, based beside Lancaster University's Bailrigg campus, is to drive advances in technologies, products and ways of working to improve health and Healthcare. The vision is to create a world-class centre of excellence for innovation and research in population health;
- **The Engineering Innovation Centre** – opening fully in 2019, the Engineering Innovation Centre (EIC) will capitalise on the location of the University of Central Lancashire at the centre of one of the most intensive engineering and manufacturing areas in the UK. The EIC will be equipped to the highest standard with technology demonstration areas and specialist work areas to create an integrated space for teaching, research and knowledge exchange;
- **Edge Hill University Innovation Technology Hub** – the Hub will create new and refurbished, high-quality space for teaching, learning, student employability, enterprise and knowledge exchange activities. The facility will support expansion in Digital Creative

and Food Science (Biotechnology), to include bioinformatics, product design and prototyping;

- **Advanced Manufacturing Research Centre (AMRC)** – based at Samlesbury, the AMRC North West will provide a regional centre tailored to the needs of North West companies, and aims to accelerate and demonstrate innovative technologies, tools, and techniques to competitively manufacture products and components using latest manufacturing techniques; and
- **Lancashire Energy HQ** – located at Blackpool and Fylde College, the Energy HQ is to provide national Energy training headquarters designed to meet the training needs of the Energy and oil and gas sectors.

8.4 These examples and the action mapping that has been undertaken so far shows that there is considerable activity underway across the private and public sectors. The Growth Deal has stimulated many innovation-related initiatives and partners including HEIs, FE providers, Innovate UK, ESIF and of course, the business community has and continues to invest tens of millions in maintaining and growing Lancashire's innovation capacity and ecosystem. Co-ordination and collaboration to join these actions together will ensure opportunities are not missed.

8.5 The remainder of this Section identifies y key actions that can be pursued to deliver the Vision and Framework set out in this Plan. These will be grouped under each Strategic Aim, however, as with existing actions, they are likely to contribute to the delivery of more than one Strategic Aim.

Strategic Aim 1 - Innovation Capability – Staying Ahead

Action	Rationale	Objectives	Outputs	Outcomes
Deliver North West National Adoption Programme Pilot	• Recommended in the *Made Smarter Review 2017* • Lancashire well positioned to play a leading role	• Accelerate development/diffusion of Industrial Digital Technologies through focussed support to SMEs	• Three-year pilot project delivered as per *Made Smarter Review* recommendation	• Leadership maintained and resilience improved • Collaborations with other North West LEPs/innovation assets developed and strengthened
Connect with Centres of Excellence/Sectoral clusters outside Lancashire (both domestically and internationally)	• Lancashire has recognised sector strengths that need to be maintained and developed further	• Identify relevant Centres of Excellence in both the UK and abroad • Develop strategic partnerships with these to develop new opportunities in new markets	• Directory of Centres of Excellence/Clusters • Connections with these centres/clusters made • New opportunities for collaboration identified	• Connections either created or deepened, new markets expanded into • Commercial benefits of new opportunities are exploited
Work in collaboration with large employers in the County such as BAE, Westinghouse, HEIs, the NHS etc to strengthen innovation capabilities of their supply chains in Lancashire	• Significant expertise within Lancashire businesses/public sector • Scope of supply chain capability and capacity to be developed	• Share best practice in innovation development and adoption • Develop capacity and capability in supply chains	• Large employers deliver capacity-building initiatives to their supply chains • Improved innovation in County's supply chains	• Supply chains will have greater ability to innovate • Increase in collaborative innovation initiatives between Tier 1 companies and their supply chains
Develop a network of Lancashire 'Innovation Ambassadors' to work with local SMEs in developing innovation capabilities, and in promoting Lancashire's innovation offer	• Innovation expertise exists in Lancashire and should be utilised • Existing strengths need to be developed continually	• Existing strengths to be publicised more broadly, and lessons diffused and embedded with SMEs • Existing innovation strengths publicised more widely via a coherent and consistent innovation narrative	• A network of ambassadors appointed • Innovation narrative agreed and disseminated	• Lancashire's innovation offer is understood more widely • Lancashire is well-positioned to bid for funding and new Centres of Excellence/Catapults
Develop Lancashire Technology and Market Foresight Observatory	• Lancashire should be driving and shaping market and tech change	• Lancashire stakeholders are informed of market trajectory and tech changes	• Reports and insights easily accessible and available for Lancashire stakeholders	• Lancashire is on the front foot in driving, shaping, and implementing change

Strategic Aim 2 – New Routeways to Excellence

Action	Rationale	Objectives	Outputs	Outcomes
Develop supply chain crossover networks, working to Smart Specialisation model disciplines	• Vital for Lancashire to create new USPs • Connectedness between existing strengths provides opportunities for diversification	• Crossovers between supply chains to be identified and developed • New technologies and innovations developed through crossover opportunities	• New innovation collaborations developed across sectors • New technologies developed and adopted across sectors • New sector potential identified and championed	• Lancashire's sectoral strengths combine to develop new USPs for the County (e.g. ultra-reliable, technologies)
Encourage increase in Knowledge Transfer Partnerships (KTPs) and commercialisation opportunities that flow from these	• Examples of successful KTPs exist across HEIs/businesses • Successful in developing and commercialising innovation	• Double the number of KTPs in Lancashire • Establish KTPs in emerging sectors	• Number of KTPs in Lancashire is doubled • KTPs support existing strengths and are developed in emerging sectors	• Closer connection between HEIs and broader number and range of businesses • KTPs successfully commercialise ideas in new sector strengths
Building on existing Test Beds (e.g. Lancashire and Cumbria Innovation Alliance Health and Care Test Bed), and develop these in new sectors e.g. Digital	• Existing Test Bed examples within Lancashire • Foundations of other Test Beds exist within Lancashire (e.g. Digital cluster in Lancaster)	• Invest in and develop clusters to create Test Beds in emerging sectors • Innovations developed in Test Beds to be commercialised	• Existing Health and Care Test Bed is supported and developed • New Test Beds in areas such as Digital are developed	• Lancashire becomes the 'go to' place for innovation testing • Ideas developed and tested within Lancashire are adopted and commercialised
Rotate monthly initiatives such as "Failure Labs" and hackathons around existing key innovation facilities, with a different sector focus each month	• Investment in a range of innovation facilities • Utilises these in developing innovation across sectors	• Allow businesses to utilise existing facilities for testing and developing innovative ideas • Tackle existing and future problems through dedicated hackathons across sectors	• "Failure Lab" space developed to enable businesses to test and develop new ideas • Monthly hackathon held, at a different location and with a different sector focus each month	• Businesses are supported and encouraged to test new ideas in Lancashire • Lancashire seen as being at the forefront of developing innovative solutions to global problems

Strategic Aim 3 – Broadening the Innovation Base

Action	Rationale	Objectives	Outputs	Outcomes
Enhance existing or develop a new leadership programme focussing on innovation development, adoption, and diffusion	• Innovation skills and leadership are critical in delivering the innovation agenda • Successful leadership programmes have been delivered in Lancashire however they haven't focussed specifically on innovation	• Develop leadership programme specific to innovation, either through enhancing existing programme or developing a new one • Enable/incentivise innovators from SMEs from a range of sectors to access/ complete the programme	• Innovation Leadership Programme to be developed • SMEs from across Lancashire complete the programme	• Innovation leadership and management skills are strengthened across the business base • Innovation in SMEs is more prominent, the 'long tail' of less innovative companies is reduced
Ensure that new and expanded innovation/science parks, and other relevant capital developments, include provision for incubating innovation-led start-ups	• Capital investment in facilities across the County • Space available to provide start-up/incubation space in innovation-led new businesses	• Provide start-up and grow-on space for SMEs in Lancashire • Support business start-ups to grow, further building Lancashire's business base	• Start-ups occupy incubation space within Lancashire's innovation assets • Increase in start-ups and survival for innovation-led businesses in Lancashire	• Lancashire's business base and economy grow through new start-ups in high growth innovative sectors
Facilitate networking between innovation and incubation centres to share best practice and deliver business support	• Innovation assets/incubation space spread across the county • Support/networking between these can be ad hoc and disjointed	• Develop networks between innovation/incubation space to deliver business support • Share best practice via innovation/incubation centres and between SMEs within them	• New networks between innovation/incubation centres are developed • Business support is easily accessible and delivered efficiently	• SMEs are supported to grow and develop • Innovation/incubation centres in Lancashire are highly competitive locations for start-ups across a range of sectors • Innovation business support is tailored and delivered utilising the network
Programme of visits from innovation success stories across the world to Lancashire to celebrate the difference innovation can make	• Innovation successes from across the world not always promoted to SMEs, public, and voluntary sectors • Benefits of innovation not always clearly articulated	• Identify relevant innovation success stories, and coordinate visits from key players involved • The innovation story and the difference it made is clearly articulated	• Visits from relevant innovation success stories co-ordinated and delivered • Attended by representatives from across Lancashire's economy	• Lancashire stakeholders understand and apply lessons from global best practice

Strategic Aim 4 – Enabling Infrastructures for Innovation

Action	Rationale	Objectives	Outputs	Outcomes
Create an innovation graduate placement programme for SMEs to increase the number of SMEs with graduate talent	• Lancashire's graduate retention is good • However, difficulties to recruit to higher-level jobs	• Connect graduate talent to Lancashire's SME base, particularly in key innovation sectors • Create new opportunities for both Lancashire graduates and Lancashire businesses	• Increase in graduate talent from Lancashire HEIs working in Lancashire SMEs • Lancashire SMEs benefit from higher level skills	• Lancashire's SMEs has a higher skilled workforce, becoming more innovative and resilient • Connections between HEIs and SMEs is strengthened
Via Boost, develop a specific, single point of contact programme of support for innovation-led start-up or early-stage businesses,	• Boost already a successful business support programme • Can be expanded to directly support innovation	• Enhance Boost's offer in innovation-specific advice to SMEs • Develop a single-point-of-contact for SMEs to navigate the innovation landscape	• Boost's offer to SMEs will be enhanced with a specific innovation offering • SMEs will access Boost for Innovation support	• Lancashire SMEs are supported throughout the innovation process • The support SMEs need is available from a single point of contact
Explore options for creating a Lancashire Innovation Fund for investing in early-stage funding for innovation-led start-ups, funded by public and private sector partners	• Access to finance, and the disjointedness of the funding landscape, can be a barrier for start-ups	• Identify potential options for a Lancashire Innovation Fund, to provide financial support to innovation-led start-ups • Assess the viability of these options	• Successful investment which attracts further interest from market funders	• Funding is accessible for start-ups and tailored to Lancashire's business needs • Lancashire supports its innovation-led businesses to start-up and grow • Returns on investment for funders
Programme to promote innovation across public and third sectors	• Innovation is often seen as the preserve of large private sector companies • Need for public and community and voluntary organisations to innovate to be more efficient and forward-looking	• Promote the opportunities for and benefits of innovation to public and voluntary sector organisations • Innovation to become pervasive mindset across the whole Lancashire economy	• Public and voluntary sector organisations are aware of innovation opportunities and adopt innovative processes • Innovation is generated not just in the private sector	• Lancashire's whole economy is innovation-focussed • Innovation mindset is pervasive across the private, public, and third sectors
Embed Intellectual Property (IP) in innovation initiatives	• IP a key part of innovation development and commercialisation	• Working with the IPO, develop IP capability and capacity across Lancashire	• Wider and deeper understanding of IP management	• IP in Lancashire is well managed and protected • IP developed in Lancashire is commercialised

Strategic Aim 5 – Letting the World Know!

Action	Rationale	Objectives	Outputs	Outcomes
Holding an annual Innovation Showcase to celebrate successful innovation in the round, share good practice, and provide opportunities to engage with potential investors (sponsored by a local large company)	• Lancashire is a 'well-kept secret' in UK innovation • Innovation success stories not broadcast widely enough	• Hold an annual Innovation Showcase in Lancashire, sponsored by local business, to promote and celebrate innovation in Lancashire	• Innovation successes celebrated • Good practice shared • Potential investors are aware of and can engage with Lancashire businesses	• Lancashire's innovation successes are celebrated and shared widely • Potential investors are clear on Lancashire's innovation offer and target investment in the area
Develop Lancashire Innovation marketing strategy utilising existing assets and opportunities to act as centres for attracting inward investment	• Lack of coherent, strategic marketing narrative about innovation in Lancashire	• Develop a coherent narrative of Lancashire's innovation successes, capabilities, and opportunities • Drive inward investment into Lancashire's innovation strengths	• A marketing strategy, with an agreed and coherent narrative about Lancashire's innovation offer, to be developed • Strategy to be delivered via multiple channels to ensure the widest audience in the UK and internationally is engaged	• Lancashire's innovation offer is understood both domestically and internationally • County's innovation offer to Inward investment is increased and business developed as a result
Develop and disseminate a portfolio of innovation case studies showing how innovation has enabled Lancashire SMEs to grow	• Innovation in Lancashire perceived as a preserve of large companies • Innovation in SMEs and emerging sectors less well known	• Develop case study examples of successful SMEs that have grown through innovation • Share best practice examples to increase awareness and inspire other SMEs	• A suite of case studies developed and disseminated • Innovation in Lancashire's SMEs better understood	• Lancashire SMEs grow through access to new, larger markers • Lancashire's full innovation offer is well known, both domestically and internationally
County setting the agenda in National Forums	• Lancashire not well-represented in national innovation policy-making forums • Lancashire "responding to" rather than "shaping and driving" policy	• Lancashire's voice to be heard in the national debate • Lancashire plays a prominent role in shaping, developing, and implementing national policy	• Lancashire represented in national policy forums	• Lancashire's innovation offer and expertise is well known and sought after • Lancashire drives national policy-making

9 Leadership and Management of this Innovation Plan

This section sets out the governance recommendations to drive and monitor progress in the delivery of our Plan.

9.1 Strong leadership, collaboration, and willingness to deliver change are fundamental to making this Plan a reality. Leaders from across the private and public sectors will need to come together to deliver innovation for Lancashire.

9.2 Innovation, and this Plan, should be at the heart of a local industrial strategy. Utilising innovation to drive forward our existing sectoral assets and develop new routeways to excellence will be key to unlocking Lancashire's substantial productivity potential.

9.3 This will require a well governed and an appropriately resourced approach to implementation. Making the most of existing resources and re-calibrating these to support the Aims of this Plan will be vital to its success.

Functions and Forms

9.4 Drafting strategies and plans are easy; implementing them is hard. The situation will not be any different in progressing this Plan in Lancashire; successful implementation will only come about through drive, commitment, and hard work.

9.5 Lancashire does not start from scratch as it approaches implementing this Plan. There is now a wide body of evaluation experience focusing on what makes for economic, efficient, and effective implementation. As Partners take this Plan forward, these evaluation lessons will give helpful pointers and short-cuts on how to do implementation well. More than any other, clarity on the functions and then the forms of implementation will be the most important consideration.

9.6 In function terms, implementation of Lancashire's Innovation Plan needs to achieve the following:

- **A real understanding of the socio-economic state of innovation and related activity in Lancashire, absolutely and relatively**. The evidence assembled during drafting this Plan provides a firm foundation to build on, but this will need to be refreshed regularly and, crucially, partners will need to move their focus on from the data numbers to the causes and explanations underlying these. Clarity on who is responsible for providing the data and identifying when new data become available for comparison will be important;

- **A long-term vision of where Lancashire should, and could, be as an innovation economy.** This is hard to do within the constraints imposed by public sector spending uncertainty. This said, it is vital in ensuring the stability of the Plan, despite external changes and uncertainty, that the Vision is understood and kept. It is helpful to identify what levers are available and who owns them so that all parties are clear what may be achievable, rather than allowing subsequent actions to become just a wish list;
- **Robustness in making the hard choices resulting from our Vision.** Simply put, 'doing what you've always done gives what you've always got'. If Lancashire is going to move ahead as an innovation economy, then those activities underway that are not contributory must be left behind;
- **Best of class design, implementation, and delivery of actions to take the Plan forward.** This will require looking way beyond Lancashire borders to see how specific innovation and economic challenges have been addressed elsewhere. It may also mean, on occasions, facing up to the fact that delivery capability within Lancashire is not of the calibre or scale needed to tackle the challenges we face, and not being uncomfortable about securing solutions from elsewhere in the UK or further afield;
- **A real commitment to monitoring and evaluation**, so that the relevance and appropriateness locally of Plan actions are constantly reviewed, and delivery impact evidenced and maximised;
- **The continuing enthusiasm of partners**, to ensure that the process of implementation remains consensual and inclusive and that energies and resources are fully captured. Clarity of ownership of the actions proposed by this Plan between partners is particularly important. If there is a clear leader, let them lead. Where there is a collaborative action, we will spell out who will actually be responsible for galvanising activity; and
- **Consistent and influential presentation of Lancashire's innovation agenda**, as set out in this Plan, in local, regional, national, and international for a. This Plan must become established as the definitive statement of innovation in the County. Developing a common language or shorthand for the key actions so that everyone recognises them easily can be important to avoid confusion or unhelpful related actions being developed in parallel by partners.

9.7 Having agreed what the key functions demanded of the Plan are, then and only then, should attention focus on defining suitable forms by which these functions can be delivered. All too often, albeit with best intentions, forms for implementation are agreed before functions have been properly specified. Defining the form that implementation should take is a matter for local Partners. Again, however, any form will through its structure need to embody the following:

- **Legitimacy from, and accountability to, the businesses, people, and communities of Lancashire.** Typically, this is realised through a wide partnership group, and in a Lancashire context that will be designed to ensure ownership of, and support for, the Plan from the totality of partners in the County;
- **Strategic Leadership capable of charting the long-term path for the Plan's direction and implementation.** This group will be responsible for the overall strategic direction of the Plan, and for championing Lancashire and its innovation priorities to key audiences. This Plan's recommendation is that a new Innovation Board is established to provide this leadership, bringing together individuals with a well-developed understanding of innovation, and strong familiarity with the wider sub-regional, sub-national, and national

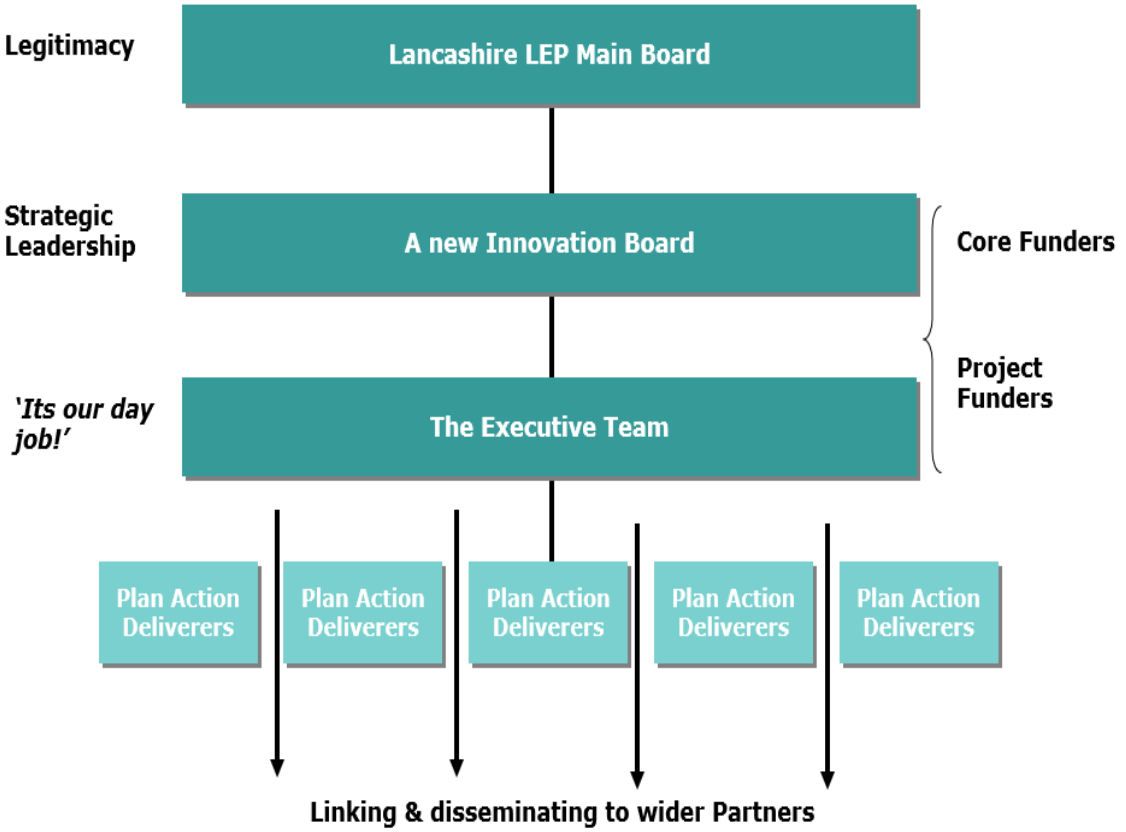
policy contexts. The emphasis on membership of this new sub-board should be the calibre of thinking and experience, not representation;

- **An Operational Executive, which has principal responsibility for overseeing, coordinating, and shaping the practical delivery of this Plan,** and leading its monitoring and evaluation. It will not directly deliver the Plan but would work closely with those partner agencies capable of progressing actions, providing them with resources, support, and encouragement. The Operational Executive will have a crucial role in looking across delivery to make sure the various structural elements of the Plan are coherent and aligned; it will also provide the administrative and secretariat requirements of the wider partnership; and
- **A Delivery Infrastructure, responsible for taking forward those actions defined by this Plan.** As far as possible, these actions will be delivered through the range of existing delivery bodies active in Lancashire. Some of these will be based within the County, others outside but with activities on the ground. As mentioned earlier, it will be important for all partners to be clear about prioritisation and sequencing - some 'quick-win' actions will be pragmatic and achievable quickly, others will be more challenging and will only start to bear fruit in two or three years, and others (around culture and thinking) will be generational.

A proposed governance model for this Plan

9.8 In terms of Governance, we recommend the creation of an Innovation Board, whose remit will be to oversee the delivery of this plan and ensure its accountability. This (sub) board will sit beneath the LEP (main) Board and interact with delivery actors as summarised below:

Figure 7 – Proposed Governance Model



Source: SDG-Economic Development

9.9 The Innovation Board will be private sector-led and be made up of senior leaders who can think openly and freshly about innovation issues. The Board will sit underneath and report to the LEP Board. An Innovation Director will be appointed to coordinate and lead the operational delivery of the Innovation Plan and will report to the Innovation Board.

9.10 The Innovation Board will integrate with and complement existing Innovation/LEP governance structures. This includes the emerging Lancashire HEI Innovation Forum being championed by the County's HEIs, and the dedicated post that HE partners are funding to progress innovation within and across the County

Next Steps

9.11 As this Plan has shown, Lancashire has significant innovation assets in key sectors, as well as the potential for developing strengths in emerging sectors. These are the foundations of a bright innovation-driven future for Lancashire, providing a multitude of opportunities for growing and strengthening the local economy.

9.12 Implementation of this Plan is vital to the growing the productivity of Lancashire, the North West, the wider Northern Powerhouse, and ultimately the national economy. Lancashire's existing innovation assets are key components for unlocking the productivity of the North, and with focus and determination, we can do more. Be it in terms of place, understanding our drivers, and recognising our foundations, through this Plan we can make a real contribution to industrial strategy.

9.13 Now, it is over to you to implement this Plan. With your drive, collaborative spirit, and innovative thinking, Lancashire can become the place for innovative ideas and adoption. Lancashire can a centre for innovation, known not just across the North or the UK, but globally. This Plan comes at a turning point in the UK's economic relationship with the rest of world, and Lancashire can be at the forefront of innovation, creating solutions to global problems and being a driver of UK productivity.

A Lancashire's Innovation Assets – Listing (non-exhaustive)

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
Accrington and Rossendale College	Lancashire Centre for Excellence for Digital Technology and Innovation	Growth Deal Project	Existing	Accrington	BB5 2AW	The Centre is a partnership project between Accrington and Rossendale College, Risual Education Ltd and Microsoft, providing a state-of-the-art learning space equipped with the latest Microsoft technologies. It will enhance teaching and learning and enable students to develop the digital literacy skills they need to be effective citizens and members of the workforce.	Digital	Education// Skills Development	2017
Asahi Glass Chemicals	Asahi Glass Chemicals	Company/ Key Asset	Existing	Thornton-Cleveleys	FY5 4QD	One of the world's leading producers of fluorochemicals and fluoro chemical materials. The UK site at Thornton-Cleveleys, which produces fluoropolymers such as polytetrafluroethylene (PTFE), is the largest that the company operates outside Japan.	Construction	Chemical Manufacturer	1999 onwards
BAE Systems	Samlesbury Aerodrome	Company/ Key Asset	Existing	Balderstone	BB2 7LF	Samlesbury Aerodrome is a disused airfield at Balderstone near Samlesbury. The aerodrome is owned by defence company BAE Systems	Aerospace	Advanced Manufacturing	2012 onwards

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						which uses the site for manufacturing of several aircraft types. The aerodrome is part of Lancashire Enterprise Zone.			
BAE Systems	Warton Aerodrome	Company/ Key Asset	Existing	Preston	PR4 1AX	Warton Aerodrome is in Warton village on the Fylde in Lancashire, England. The airfield is a major assembly and testing facility of BAE Systems Military Air & Information. It is also part of Lancashire Enterprise Zone.	Aerospace	Advanced Manufacturing	2012 onwards
BAE Systems	BAE Systems' Training Academy (Academy for Skills and Knowledge)	Skills & Training	Existing	Balderstone	BB2 7LF	The Academy for Skills & Knowledge (ASK) is 7,400m^2 in size and situated on the Samlesbury Aerospace Enterprise Zone alongside BAE Systems' military aircraft advanced manufacturing centre. It will train all the apprentices and graduates in the Company's military aircraft business as well as providing life-long learning and skills development activities for 13,000 employees for at least the next four decades. The ASK will also act as a collaborative skills-hub for the North West's engineering and manufacturing sector and offer an exciting learning education centre for school children from five to 14 years old.	Aerospace	Education/ Skills Development	Opened December 2016

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
Blackburn & Darwen Borough Council; the Lancashire LEP; and The Arts Council England	Making Rooms - Lancashire's First Fab Lab	Growth Deal Project	Existing	Blackburn	BB1 7JN	The Making Rooms is an independent Community Interest Company (CiC) which aims to: - Help create more jobs in the creative and manufacturing sectors by enabling and supporting new business creation - Improve employability by giving people future creative and technical skills - Increase participation in Science, Engineering, Technology, Mathematics and The Arts - Improve the well-being of Lancashire residents by providing fun, interesting and self-development activities and enabling people to design and make their own products	Creative Industries	Creative of Centre and Innovation	2016 onwards
Blackpool & the Fylde College	Maritime Engineering Facility	Growth Deal Project	Existing	Fleetwood	FY7 8JZ	Specialist marine engineering centre accommodation at the internationally renowned centre of excellence.	Maritime	Education/ Skills Development	2016
Blackpool & the Fylde College	Lancashire Energy HQ	Growth Deal Project	Existing	Blackpool	FY4 2QS	Development of a National Energy HQ to meet the training needs of the energy and oil and gas sector.	Energy	Education/ Skills Development	2017
Edge Hill University	Innovation Technology Hub	Growth Deal Project	Existing	Ormskirk	L39 4QP	The Edge Hill Technology Hub provides high quality space for teaching, learning, student employability, enterprise, and knowledge exchange activities. The facility supports expansion in Digital Creative and Food	Digital Creative and Food Science (Biotechnology)	Education/ Skills Development/ Business Support	2016+

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						Science (Biotechnology), and includes bioinformatics, product design and prototyping.			
Edge Hill University	Business Insight3 (Bi3)/Edge hill Partnership	KTP	Existing	Chorley	PR6 7EN	Bi3 supply security and customer intelligence solutions based on the latest technology available in video analytics, people counting, facial recognition, access control devices, queue management, facial marketing, digital and network storage. Utilising research expertise from Edge Hill's Centre for Data Analysis and Representation this 24-month KTP was designed to develop a holistic software framework that integrates multiple data capture devices, reporting and analysing data from a variety of sources.	Data and Cyber Security	Data and Cyber Security solutions	2014 onwards
Edge Hill University	Productivity and Innovation Centre	Business Support	Planned	Ormskirk	L39 4QP	The Productivity and Innovation Centre is an output driven programme of intensive workshops, with accompanying support from academic subject experts, which takes SMEs through a rapid innovation process to achieve two outcomes: 1. SMEs adopt and embed highly effective rapid innovation processes in their business; a framework	HE Business Support	Skills Development/Business Support	2018

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						of evidence based decision making regarding the business and market case for an (technical/technological) innovation and evidence based practice (need/demand/efficacy based) in product, service or process development. This outcome specifically improves the productivity of SME innovation. 2. The release of new to firm and new to market product, service or process innovations by the SME participants. SMEs participants in the Centre will be identified from the outset on the basis that they have existing innovation assets at Technology Readiness Level (TRL) 2, 3 or 4, and would benefit from support (experiencing barriers and or need to reduce to time to market) to efficiently move those assets through to beyond TRL level 7 ready for commercial release.			
Lancashire and Cumbria Innovation Alliance (LCIA)	Lancashire NHS Test Bed	AHSN	Existing	Wesham	PR4 3AL	The Lancashire and Cumbria Innovation Alliance (LCIA) has been awarded the opportunity to take part in NHS England's Test Bed, a two-year pilot looking at how the use of technology	Health Technologies	Healthcare	2016+

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						can help provide modernised, innovative healthcare. The LCIA Test Bed is one of seven across England. It is hosted by Lancashire Care NHS Foundation Trust and is made up of several partners including Lancaster Health Hub, the Fylde Coast vanguard and the Better Care Together vanguard, as well as several innovators who, led by Philips, bring with them a wealth of expertise in a variety of healthcare technologies. The purpose of this Test Bed is to provide frail and older people living with dementia or other long-term conditions such as Chronic Obstructive Pulmonary Disease (COPD) or diabetes the opportunity to use technology to improve their overall health and wellbeing so they can stay will in the community and avoid unnecessary hospital admissions.			
Lancashire County Council	Advanced Manufacturing Research Centre (AMRC) North West	Growth Deal Project	Planned	Samlesbury	BB2 7LF	Delivery of a new regional hub of the national Advanced Manufacturing research Centre (AMRC) at the Samlesbury EZ site. The proposal is key to lifting productivity and growth in a priority growth sector of local and national	Advanced manufacturing	Advanced manufacturing R&D	

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						significance and will enable Lancashire's businesses to compete and trade internationally. The proposal builds on Lancashire and Sheffield's successful Science and Innovation Audit submission to Government – the Northern Powerhouse Advanced Manufacturing Corridor. The proposal also complements existing Growth Deal investment in UCLan's Engineering and Innovation Centre in Preston.			
Lancashire LEP	Boost Business Lancashire	Business Support	Existing			Lancashire's business growth hub, providing advice and support to businesses across the county, including access to finance, employment, and skills development programmes.	Public Sector Business Support	Business Support	
Lancaster University	Centre for Global Eco-Innovation	ERDF Project	Existing	Lancaster	LA1 4YQ	The Centre for Global Eco-Innovation is the only centre of its kind in Europe and is part financed by the European Regional Development Fund. It brings together the expertise, resources and global contacts of Lancaster University and the University of Liverpool, together with international commercialisation consultancy Inventya Ltd.	Eco-Innovation	R&D	2012+

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						SME-led collaborative R&D partnership with two world-ranking universities underpin the development of new products, processes and services for the global marketplace, which by virtue of their use, manufacture, raw materials, reuse or disposal, deliver positive environmental impacts.			
Lancaster University	Lancaster Health Innovation Campus	ERDF Project/ Growth Deal Project	Planned	Lancaster	LA1 4YW	A multi-phased campus providing R&D space and facilities for the development of new services and technologies for health-related care. The aim of the development, based beside the University's Bailrigg campus, is to drive advances in technologies, products and ways of working to improve health and healthcare. The vision is to create a world-class centre of excellence for innovation and research in population health: - Transforming health care and practice regionally and globally - Achieving significant impact on local health outcomes - Providing major contributions to regional economic development - Supporting service reform	Healthcare	Education/ Skills Training	Scheduled for completion September 2019

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						in the public sector			
Lancaster University	Academic Centre of Excellence in Cyber Security Research - (Security Lancaster Research Centre)	Research	Existing	Lancaster	LA1 4YF	The Academic Centre of Excellence in Cyber Security Research (ACE-CSR) is hosted within the University's flagship cross-disciplinary Security Lancaster Research Centre. Inaugurated by Baroness Pauline Neville-Jones in October 2012, the centre is nationally and internationally renowned for its inter-disciplinary, systems-centred research, that blends computer science and communications aspects of cyber security with approaches from behavioural and social sciences.	Information Technologies	Fundamentals of Computing, Information & Knowledge Management, Networks & Distributed Systems, Software Engineering	2012 onwards
Lancaster University	Advanced Manufacturing Capital for Skills Development & Employer Engagement	Growth Deal Project	Planned	Lancaster	LA1 4YW	The project centres on the purchase of equipment to be situated at both Lancaster University and Lancashire Enterprise Zone (EZ) sites. The environments at both Lancaster and the EZ will provide Lancashire learners with access to unique, nationally leading and highly relevant equipment informed by underlying research expertise.	Advanced Manufacturing	Education/ Skills Development	Financial completion Sept 2017, Project completion Sept 2021
Lancaster University	Collaborative Technology Access Programme	ERDF Project	Existing	Lancaster	LA1 4YB	The Collaborative Technology Access Programme (cTAP) provides businesses access to	Chemistry	Education/ Skills Development/ Business Support	2015 onwards

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
	(cTAP)					facilities and expertise located in the Chemistry Department now unavailable to inward investing businesses within the UK. The facilities include Nuclear magnetic resonance (NMR) spectroscopy, chromatography and mass spectrometry instruments, molecular beam epitaxy machine (which is used to manufacture semiconductor devices), next generation 3D microprinting system with a range of applications including bioengineering, Raman spectrometer, SEM Microscope, FT infrared spectrophotometer, high performance liquid chromatograph, X-ray fluorescence spectrometry, nanoscribe.			
Lancaster University	Lancaster China Catalyst Programme	HEFCE Project	Existing	Lancaster	LA1 4YQ	The Lancaster China Catalyst programme aims to exploit the global links of Lancaster University for the benefit of UK companies. From 2014-2017, with initial investment from the Higher Education Funding Council for England (HEFCE), Lancashire County Council and participating businesses.	International Connectivity	International Connectivity	2014 onwards
Lancaster University	Lancaster Campus	Growth Deal	Existing	Lancaster	LA1 3JD	This project reflects the first phase of investment at	Health Technologies	Healthcare/Education & Skills Development	2017

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
	Teaching Hub (Health and Social Care)	Project				Lancaster to deliver a new latest teaching hub providing staff and students with fully flexible space. The new teaching hub will provide an environment conducive to multi-professional higher-level learning and opportunities to increase community and employer engagement. It will support growth in qualified professionals and deliver CPD to upskill existing workforce.			
Myerscough College	Myerscough College - Farm, Innovation Technology Centre	Growth Deal Project	Existing	Preston	PR3 0RY	A sector leading centre of excellence for industry training and research. A major flagship build for agriculture and associated courses at Myerscough. The FFIT Centre boasts facilities to support food research and development with the aim of creating a resource that both local businesses and students can use to investigate opportunities to process and add value to on-farm produce. Includes specialist teaching, demonstration and research facilities including a teaching laboratory, soil laboratory, instrumentation room, production development kitchen.	Education/ Skills Development	Education/ Skills Training/ Business Support	2017 onwards
National Nuclear	National Nuclear	Company/ Key Asset	Existing	Preston/Warrington	PR4 0XJ/WA3	The National Nuclear Laboratory is a UK	Nuclear Energy	Nuclear Services Technology Provider	2009

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
Laboratory	Laboratory				6AE	government owned and operated nuclear services technology provider covering the whole of the nuclear fuel cycle. It is fully customer-funded and operates at six locations in the United Kingdom. Activities at Springfields (Preston) include: - Nuclear physics and advanced reactors - Fuel Design and Manufacture - Specialist Analytical Services - Process Chemistry NNL's activities in its leased facilities at Springfields (Preston Lab) and Sellafield (Central Lab and Windscale Lab) are operated under Command & Control regimes by Springfields Fuels Ltd and Sellafield Ltd respectively. Activities carried out under those regimes are constrained by the relevant Environmental Permits and Nuclear Site Licences held by Springfields Fuels Ltd and Sellafield Ltd. Activities at Risley include: - Modelling and simulation - Engineering - Project Management - Corporate Functions - Environment			
Nelson & Colne	Advanced	Growth	Existing	Nelson	BB9 7YT	Expansion and remodelling	Engineering/	Educations/ Skills	2016

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
College	Engineering & Manufacturing Innovation Centre	Deal Project				of educational facilities and the creation of new advanced engineering, laboratory, workshop and classroom facilities.	Advanced Manufacturing	Training	
Paccar Ltd	PACCAR (Leyland Trucks)	Company/ Key Asset	Existing	Leyland	PR26 6LZ	Leyland's 710,000-square-foot manufacturing facility features a technologically advanced production system which incorporates electronic work instructions (EWI) to deliver engineering designs, build instructions and quality records to employees by interactive touch screens. Leyland builds the full DAF product range (LF, CF and XF models) for right and left-hand drive markets. The site is also the UK home of the successful PACCAR Parts business, who special in aftersales support and spares distribution across the UK and Europe.	Automotive	Advanced Manufacturing	1998 onwards
Precision Polymer Engineering	Precision Polymer Engineering	Company/ Key Asset	Existing	Blackburn	BB1 3EA	PPE develops novel elastomer materials to meet sealing applications including extreme temperatures and chemically aggressive environments. In addition, PPE can mold rubber seals and rubber gaskets in sizes to suit any sealing application and manufacture them in lead times as fast as 48 hours.	Advanced Manufacturing	Advanced Manufacturing	1975
Rolls Royce	Rolls Royce -	Company/	Planned	Barnoldswick	BB18	Two new engines being	Aerospace	Advanced	Advanced

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
	Advanced and Ultrafan Engines	Key Asset			6DZ	developed: the Advance and UltraFan, predicted for launch in 2020 and 2025. The high efficiency core compression and turbine system incorporated into Advance will deliver the highest overall pressure ratio of any commercial turbofan engine ever-made resulting in greater efficiency and lower CO2 emissions. UltraFan takes the evolution of Advance further, featuring all the same technology and more. This will deliver further fuel efficiency and CO2 reductions, and provide a further significant reduction in engine noise.		Manufacturing	from 2020, Ultrafan from 2025
Safran Nascelles	Safran Nascelles	Company/ Key Asset	Existing	Burnley	BB10 2TQ	Safran Nacelles is one of the two main integrators of aircraft engine nacelle systems in the world. With more than 18,000 equipment in service, Safran Nacelles proposes a range of nacelle systems to suit each type of aircraft: regional jets, business jets and commercial aircraft of more than 100 seats for medium- and long-range travel. Safran Nacelles designs, integrates and ensures	Aerospace	Advanced Manufacturing	2005

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						customer support and services for aircraft engine nacelle systems.			
Sanko-Gosei Ltd	Sanko-Gosei Ltd	Company/ Key Asset	Existing	Skelmersdale	WN8 8EB	Sanko-Gosei specialise in plastic moulding production for air conditioning systems, automotive systems, office automation, precision injection moulding, communication systems, and injection moulding tooling.	Advanced Manufacturing	Advanced Manufacturing	1987
Training 2000	Training 2000	Growth Deal Project	Existing	Blackburn	BB1 3BD	Training 2000 offer training, study programmes & apprenticeships in North Lancs in sectors including digital, engineering, financial services, automotive, and cyber security	Engineering/ Advanced Manufacturing	Skills and Training	2016
Trebor Developments/ Burnley Council	Burnley Vision Park	Growth Deal Project	Existing	Burnley	BB12 0AN?	High quality 5-acre business park to accommodate advanced manufacturing/engineering sectors and to include 46,000 sq. ft. first phase incubator, workspace and grow-on space.	Business space aimed to attract businesses in the advanced manufacturing and digi-tech industries	Business Space	2017
UCLAN	National test bed for the UK's development of drone technology	Research	Existing	Preston	PR1 2HE	Preston was successful in its bid to become a national test-bed for the UK's development of drone technology, this building on the work of the 'Civic Drone Centre' established by the University of Central Lancashire with a £250k investment in 2014. This not-for-profit centre brings together expertise and	Aerospace Digital Society	Demonstrator	2018

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						stakeholders including Local Authorities, communities, and businesses, and has developed and demonstrated many novel drone solutions. The Centre is an important part of the new £32m Engineering Innovation Centre opening in Preston in early 2019			
UCLAN	Engineering Innovation Centre	Growth Deal Project	Planned	Preston	PR1 2HE	Opening fully in 2019, the Engineering Innovation Centre (EIC) will capitalise on the location of the University at the centre of one of the most intensive engineering and manufacturing areas in the UK to create an internationally competitive facility that will bring together the region's expertise from within academia and industry. The EIC will be equipped to the highest standard with technology demonstration areas and specialist work areas to create an integrated space for teaching, research and knowledge exchange.	Engineering/ Advanced Manufacturing	Engineering/Advanced Manufacturing training facilities	2019 onwards
Victrex	Victrex	Company/ Key Asset	Existing	Thornton-Cleveleys	FY5 4QD	Victrex plc is a British-based supplier of high performance polymer solutions. It is a constituent of the FTSE 250. The company's headquarters and manufacturing facilities are based in the UK with	Advanced Manufacturing	Advanced Manufacturing	1993 onwards

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						technical and customer support facilities in multiple markets, serving more than 40 countries. Victrex serves a diverse range of industries including aerospace, automotive, electronics, oil and gas and medical.			
Vinnolit GMBH	Vinnolit GMBH	Company/ Key Asset	Existing	Thornton-Cleveleys	FY5 5LR	Vinnolit produces and markets a wide range of PVC products suitable for all kinds of PVC applications, e.g. in the building & construction sector, in the automotive industry or in the medical sector. Whether the PVC is for window profiles, pipes, rigid film, flooring, wall covering, technical coatings, automotive sealants, cable sheathing or medical applications, Vinnolit can offer a suitable product. Additionally Vinnolit produces and markets intermediates such as caustic soda, vinyl chloride and tin tetrachloride, which are needed in the chemical industry as well as in other branches.	Chemicals/ Advanced Manufacturing	Advanced Manufacturing, R&D	1998 onwards
Westinghouse Springfields Fuels Ltd	Nuclear Fuel Production	Company/ Key Asset	Existing	Preston	PR4 0XJ	Springfields is a nuclear fuel production installation in Salwick, near Preston. The key assets/services/products are nuclear fuel manufacture, uranium recovery, and nuclear	Nuclear Energy	Nuclear Fuel Manufacture	1940s+

Organisation Name	Asset Name	Asset Type	Asset Status	Location	Postcode	Background	Sector	Service Offer	Age
						decommissioning.			

CONTROL INFORMATION

Prepared by	Prepared for
SDG Economic Development 61 Mosley Street Manchester M2 3HZ +44 161 261 9141 www.sdgED.com	Lancashire Enterprise Partnership c/o 15 Cross Street Preston PR1 3LT
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Appendix E

Sheffield City Region and Lancashire

Science and Innovation Audit

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Science and Innovation Audits

Introduction

- This slide deck sets out a range of data for the Midlands Engine consortium area Science and Innovation Audit. The purpose of this document is to provide a 'teaser' of the types of analyses that will be possible using the data provided, and to demonstrate an initial view into the data you have received.

- Note that a full list of LEPs and Local Authorities in the consortium area can be found in the Word document, **section 1.1.** A full list of research organisations (including universities) included in the Word document, **section 2.2.**

Regional Science and Innovation Assets

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Regional Science and Innovation Assets

Human capital and talent

- The consortium area's workforce has a slightly lower proportion of **highly skilled workers** than the national average, with 29% of Lancashire's working age population, and 28% of Sheffield City Region's working age population having **NVQ4 or above.** This compares to the England average of 35%
- A lower proportion of the consortium area's workforce is **employed in science, research, engineering and technology professions** than the England average.

Source: Mapping local comparative advantages in innovation. Department for Business, Innovation & Skills (BIS) (2015).

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Regional Science and Innovation Assets

University researchers submitted to the REF

- The consortium area accounts for 4% of the UK's REF-submitted university researchers. Within the consortium, analysis of those areas that make up a higher percentage than the overall UK proportion would reveal higher performing areas. Those areas that fit this criteria, and are in an area of interest for the consortium, are set out in the table below.
- The University of Sheffield's submission of researchers in Civil and Construction Engineering in particular is a strong area. This submission constitutes 8.9% of the UK's REF-submitted staff in this unit of assessment. Given the nature of the exercise, universities put forward their best staff (for whom they will also submit their outputs) and consequently this indicates that the University hosts almost than 1/10 of the strongest researchers in this area across the UK.

Areas of interest	Institution	Unit of Assessment	% of Institution Total	% of UK Total
Advanced manufacturing / Energy	University of Sheffield	Aeronautical, Mechanical, Chemical and Manufacturing Engineering	7.4%	6.5%
Transport	University of Sheffield	Architecture, Built Environment and Planning	3.4%	3.3%
Transport	University of Sheffield	Civil and Construction Engineering	3.5%	8.9%
		As a % of all UK REF-submitted researchers		*4%*

Source: Research Excellence Framework (REF) Results, Higher Education Funding Council for England (HEFCE) (2015)

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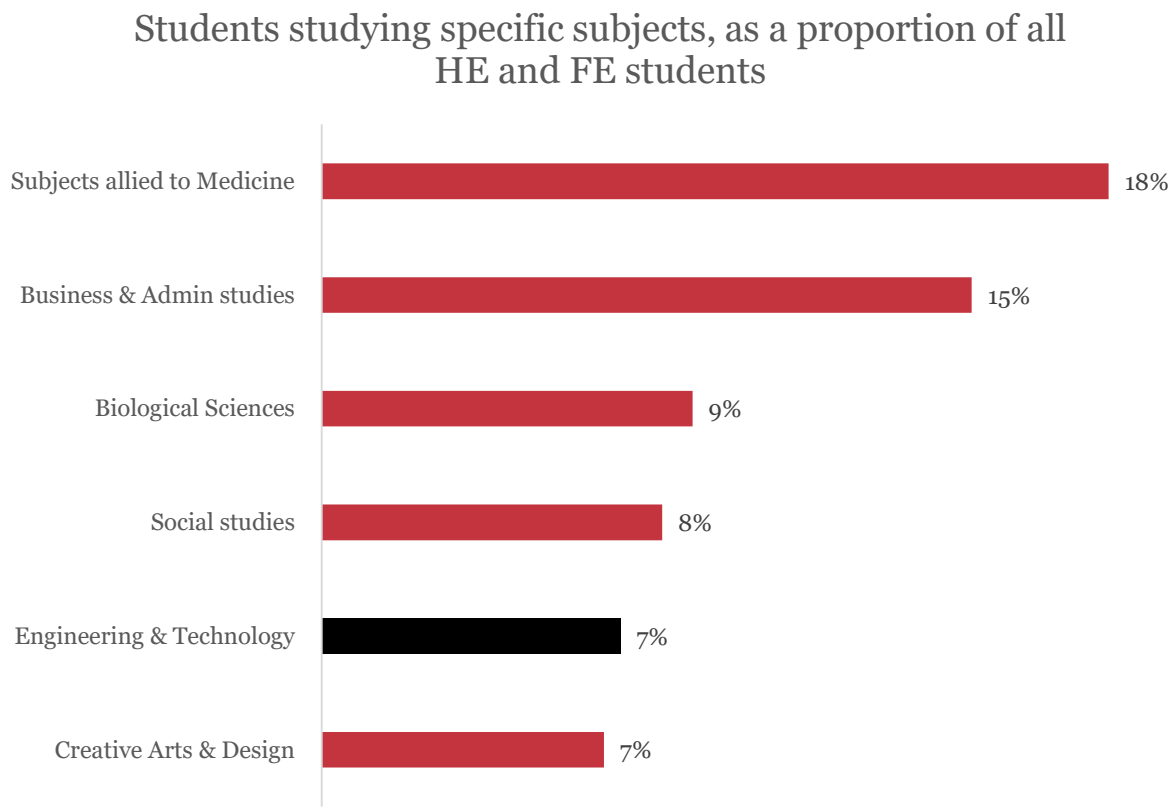
Regional Science and Innovation Assets

Student population



81%

70%

Percentage of the consortium area's **graduate talent retained** in the North West region (top) and Yorkshire and the Humber / East Midlands (bottom). Between 5% and 6% move to London.

The largest proportion of students in the consortium area across both further and higher education study subjects allied to medicine (18%, 87,655). If this subject follows the overall retention average (above) an estimated almost 71,000 would remain in the North West. Engineering and Technology is the area of interest with the highest proportion (highlighted in black).

The consortium area also contributes **5%** of England's doctorates overall, and almost **6%** of England's STEM doctorates.

Source: HESA data, Higher Education Funding Council for England (HEFCE) (2015)

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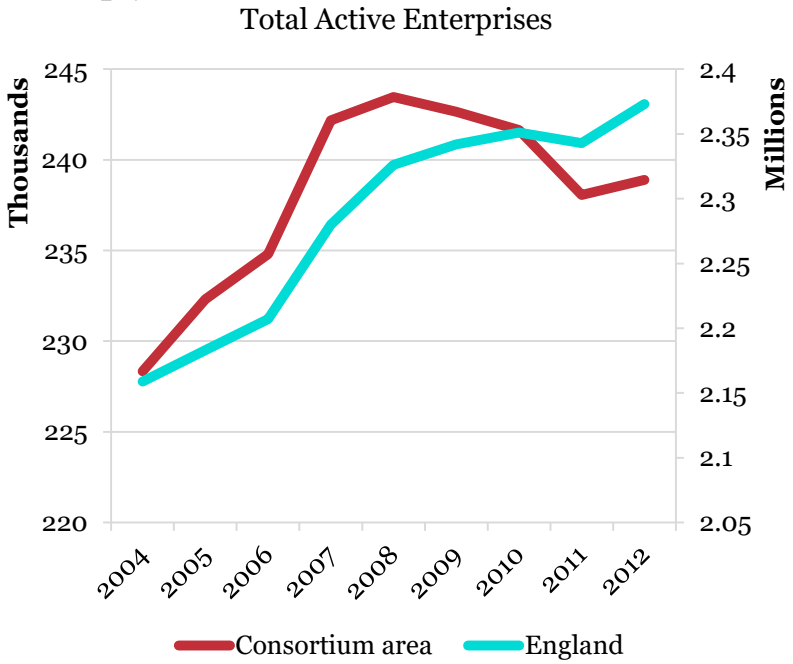
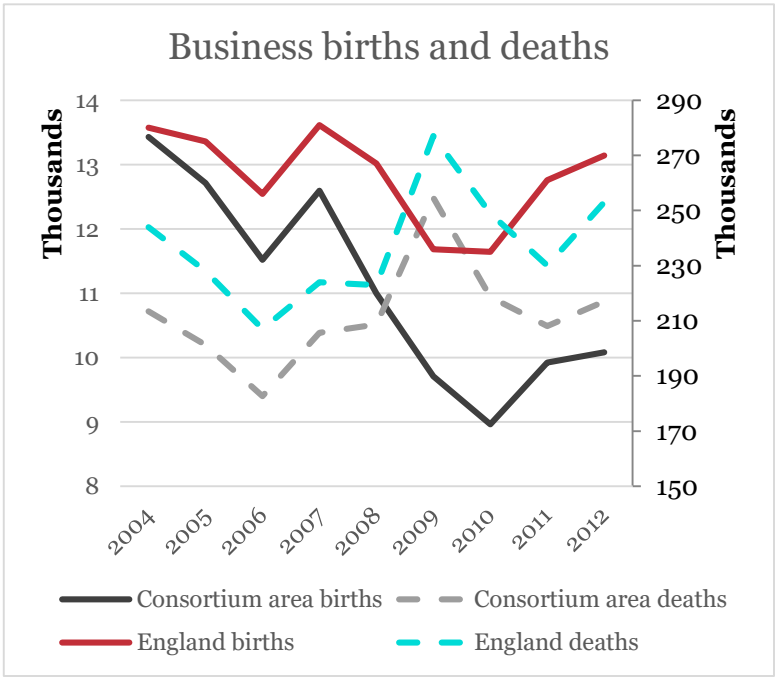
Regional Science and Innovation Assets

Business demography

- The number of active enterprises has begun to grow again after a decline during the recession. However, it has not yet recovered to pre-recession levels and appears to be slower than the national growth rate. Business births are outnumbered by business deaths, and this declined sharply from 2007.





Source: Building Local Advantage. Review of LEP area economies 2014. LEP Network and Athley Consulting (2014).

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Regional Science and Innovation Assets

Productivity

- Measures of labour market productivity show that in the consortium area, **GVA per capita** is significantly lower than the England average of £24,091, being between £16,786 and £17,377.
- Average **annual gross full-time pay** is also lower in the consortium area (between £27,990 and £28,293) than the national average (£34,197), though figures in London and the South East will drive up the national figure

Source: Mapping local comparative advantages in innovation. Department for Business, Innovation & Skills (BIS) (2015).

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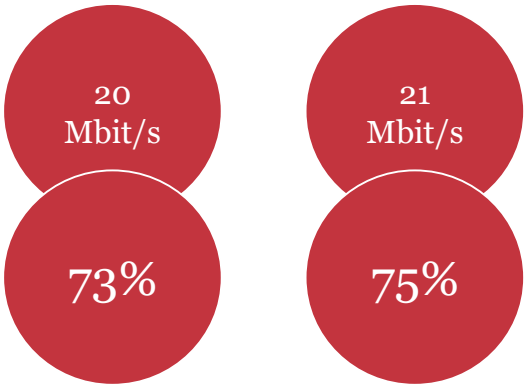
Regional Science and Innovation Assets

Quality of place and life, digital infrastructure

- The consortium area's average travel to work time is **between 25 and 26 minutes**, which is favourable compared to the England average of 31 minutes (42 minutes in London and 26 minutes outside of London)*
- The consortium has slower average download speeds (of between 20 and 21 Mbits per second) than the national average of 29.8 Mbits per second**
- There is less availability of premises with super-fast broadband availability, compared to the national average of 83%**



Average download speed (Mbit/s) by LA

Super-Fast Broadband Availability (% premises)

** National Travel Survey: England 2014 (Dept. for Transport, 2015, p.27 and p.49)*
*** Connected Nation 2015 (Ofcom, 2015, p.4)*

Source: Mapping local comparative advantages in innovation. Department for Business, Innovation & Skills (BIS) (2015).

Excellence in Science and Research

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Excellence in Science and Research

Scientific quality

- An analysis of the proportion of research activity rated 4* (world class in terms of originality, significance and rigour) in the REF quality profile compared to the national average reveals a range of high-scoring areas for the consortium area. This is indicated below for the main areas of interest for the consortium.
- The table shows the difference (in percentage points) between the national average and each university under analysis. Green means the difference is positive (i.e. that the university had more outputs classified as 4* as compared to the national average), and red means the difference is negative.
- For example, in Physics, two institutions in the consortium area achieved a higher proportion of activity rated 4* than the national average (Lancaster University and the University of Sheffield). This is the same for Architecture, Built Environment and Planning (Sheffield Hallam University and the University of Sheffield).

Areas of interest	Unit of assessment	Lancaster University	Sheffield Hallam University	University of Central Lancashire	University of Sheffield
Advanced manufacturing	Electrical and Electronic Engineering, Metallurgy and Materials		-0.17	-0.166	0.0015
Energy	Physics	0.063		-0.118	0.023
Energy / Advanced manufacturing	General Engineering	-0.054		-0.131	0.237
Energy / Advanced manufacturing / Bio-economy	Aeronautical, Mechanical, Chemical and Manufacturing Engineering				-0.0175
Transport	Architecture, Built Environment and Planning		0.064	-0.174	0.118
Transport / Bio-economy	Civil and Construction Engineering				-0.002

Source: Research Excellence Framework (REF) Results, Higher Education Funding Council for England (HEFCE) (2015)

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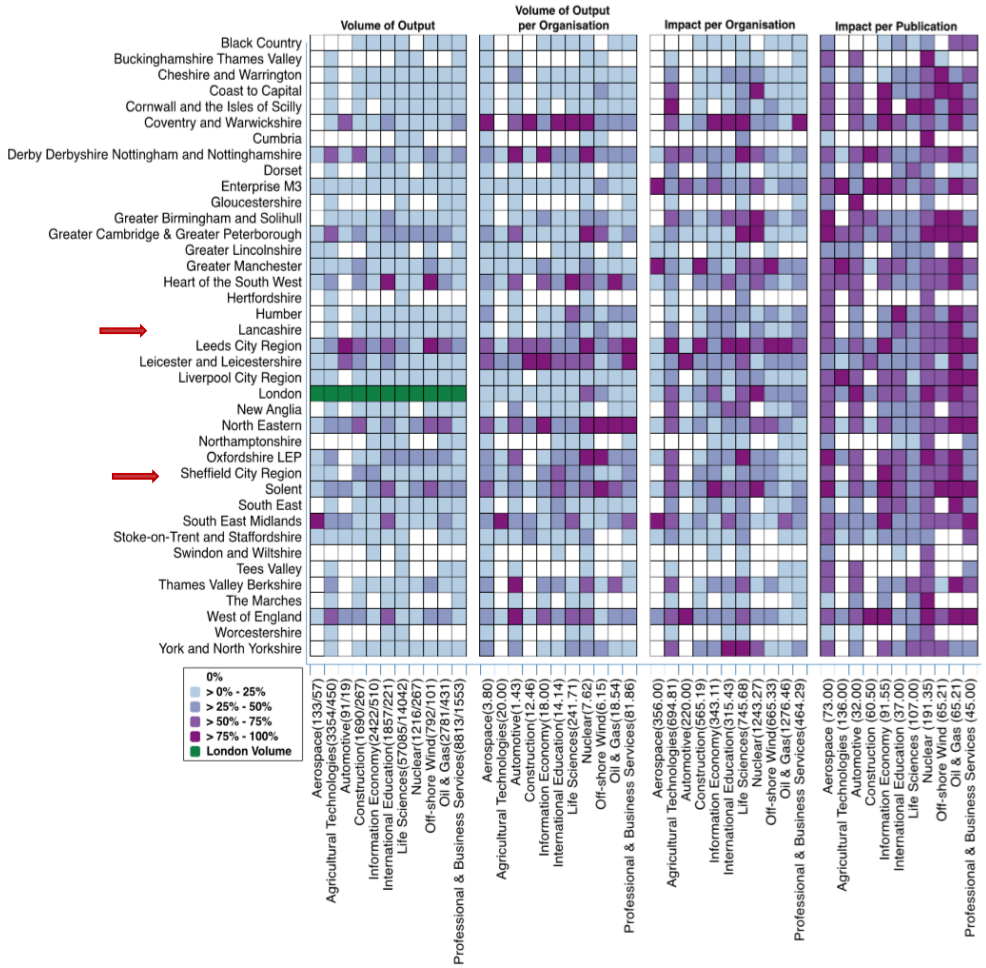
Excellence in Science and Research

Scientific specialisation

- The BIS mapping local comparative advantage report mapped LEPs' publication intensity in UK Industrial Strategy fields*. The chart to the right highlights each LEP's performance in four main dimensions of publication intensity in terms of quartiles. Deep purple squares represent the top quartile (values of 75%-100%).
- Taking impact per publication (the fourth column) as an example, the chart shows that Sheffield City Region is in the highest quartile for publications in the fields of information economy and oil and gas.
- Impact per publication highlights specific areas of research focus and impact, even where publishing volumes may be low.



Source: Mapping local comparative advantages in innovation. Department for Business, Innovation & Skills (BIS) (2015, p.120)

** The report profiled the same for publications in the Eight Great Technologies, Innovate UK Priority areas, and research domains. These are available in the report and tables. The report can be found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/468179/bis-15-344-mapping-local-comparative-advantages-in-innovation-framework-and-indicators.pdf*

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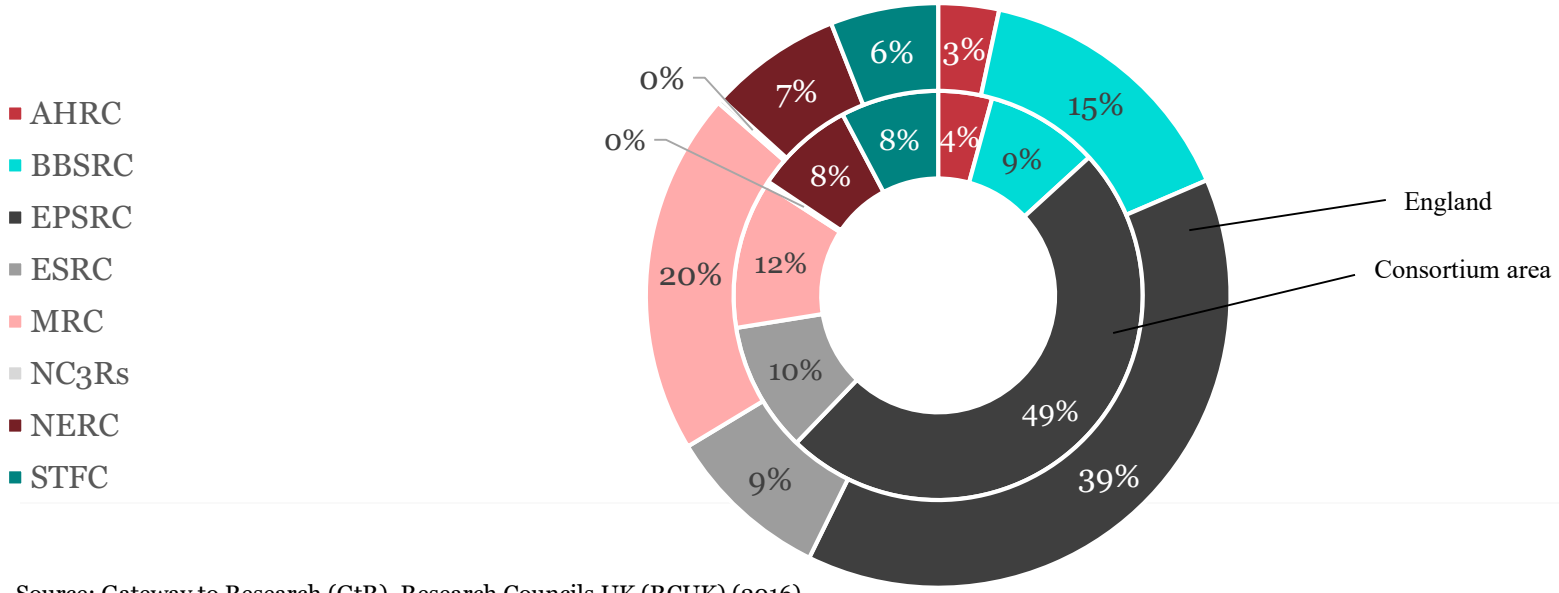
Excellence in Science and Research

Strength and competitiveness in national research funding

- Of the funding received over the period 2010 – 2015, the majority was from the EPSRC (49%, £227.3m). 12% (£54.1m) was from the Medical Research Council, and 10% (£47.7m) from the ESRC.
- By comparing the consortium area's drawdown to the national figures, we can see that the SIA is significantly more competitive in drawing down funding from the EPSRC, and slightly more competitive in drawing down funding from the STFC, NERC and the AHRC.



Source: Gateway to Research (GtR). Research Councils UK (RCUK) (2016).

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Excellence in Science and Research

Strength and competitiveness in international research funding

- The consortium area accounts for 3% of the UK's domestic REF income and 3% of the UK's total international REF income. Within the consortium, analysis of those areas that make up a higher percentage than the overall UK proportion reveals higher performing or more competitive areas.
- The institutions within the consortium area perform particularly well in areas related ro advanced manufacturing and energy – set out below. Those areas that perform well in **both** domestic and international funding are highlighted.

Area of interest	Unit of Assessment	% of domestic income (REF)	% of international income (REF)
Advanced manufacturing / Energy	Aeronautical, Mechanical, Chemical and Manufacturing Engineering	11%	16%
Advanced manufacturing / Energy	Electrical and Electronic Engineering, Metallurgy and Materials	10%	12%
Advanced manufacturing / Energy	General Engineering	4%	3%
Advanced manufacturing / Energy	Physics	15%	5%
	% of all UK REF funding	*3%*	*3%*

Source: Research Excellence Framework (REF) Results, Higher Education Funding Council for England (HEFCE) (2015)

Innovation Strengths

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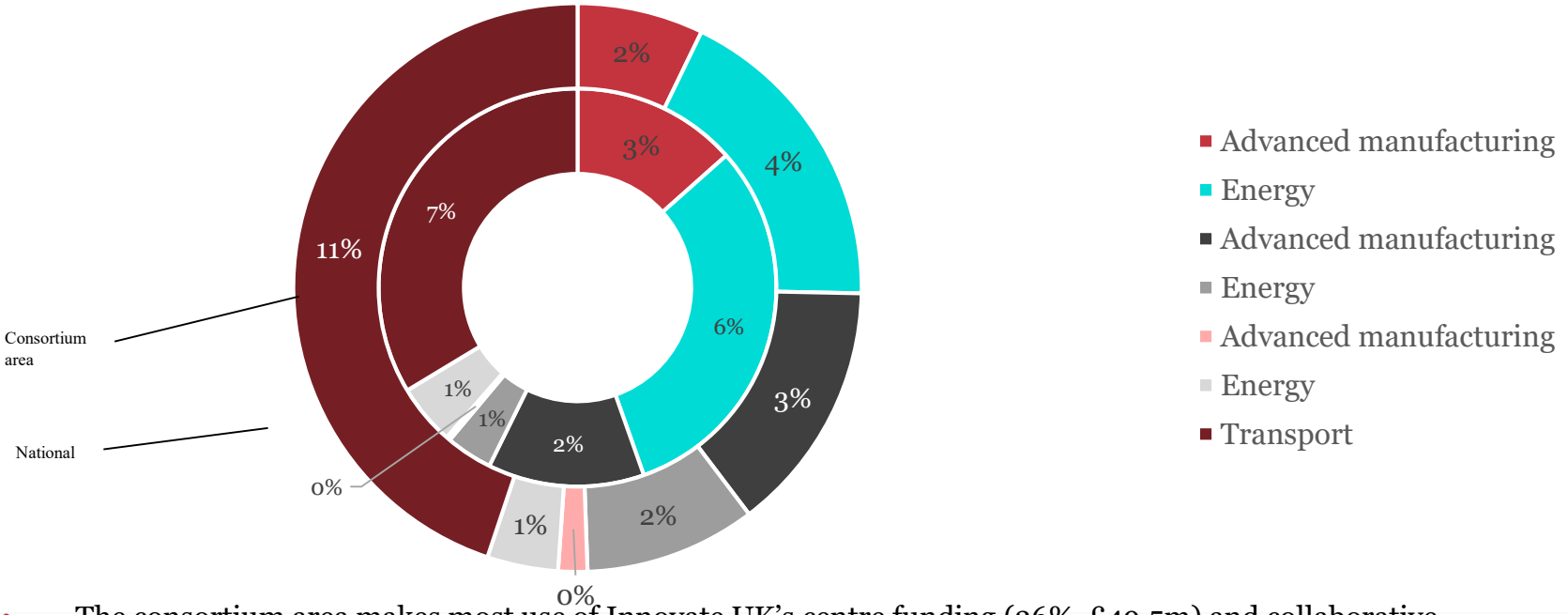
Innovation Strengths

Strength and competitiveness in national research

- The majority of Innovate UK awards received in an area of interest for the consortium area were in the area of transport (7%, £6.7m). The second highest proportion in an area of interest was in energy (6%, £6.2m). The consortium area slightly outperformed the national average in energy and advanced manufacturing. Nor included in this chart is the funding received for Catapult activities, which was by far highest for the consortium area, at £47.8m (47% of InnovateUK funding received) in the period.



- The consortium area makes most use of Innovate UK's centre funding (36%, £49.5m) and collaborative research and development grants (28%, £39.0m).

NB: In order to focus on the areas of interest to the consortium, this chart does not represent 100% of the Innovate UK funding received in the consortium area over the period.

Source: Transparency data. Innovate UK funded projects since 2004. Innovate UK (2016).

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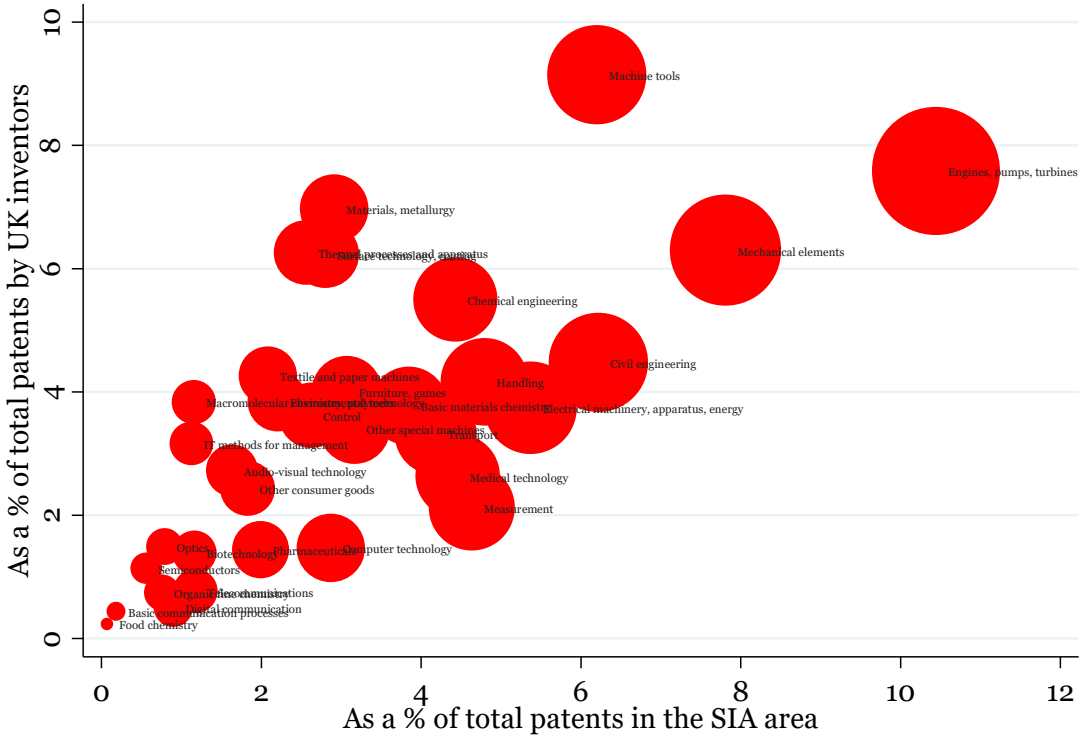
Innovation strengths

- Patent data reveal strengths in several technological areas which show a relative high share of the total patents submitted by UK inventors (overall share: 3%) and represent a relative high proportion within the patent portfolio of the consortium. These areas include: Engine, pumps and turbines, Mechanical elements, and Machine tools.



Source: EPO PATSTAT, 2004-2013

*EPO PATSTAT includes information on patents submitted by UK inventors to application authorities around the globe. Because the analysis focuses on inventors (who tend to be the individuals that worked on the innovation) rather than on applicants (than tend to be the main organisation where the inventor worked), the analysis permits to identify where the invention took place and was developed.

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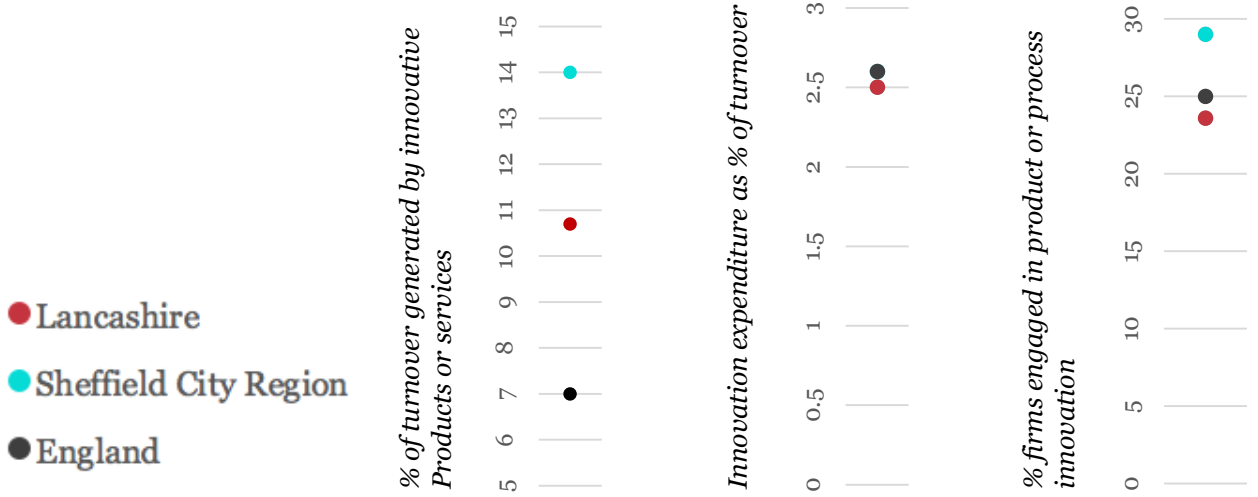
Innovation Strengths

Innovation activities

- The consortium area outperforms the England average in two out of three significant indicators of innovation activity. There are more firms in the Sheffield City Region (though fewer in Lancashire) engaged in product or process innovation, with a much higher average proportion of turnover from product or process innovation. Businesses in Lancashire also out-perform the national average in this second measure. Businesses in the Sheffield City Region are exactly level with the national average of the proportion of turnover spent on innovation, though Lancashire slightly behind in this measure.



Source: Mapping local comparative advantages in innovation. Department for Business, Innovation & Skills (BIS) (2015).

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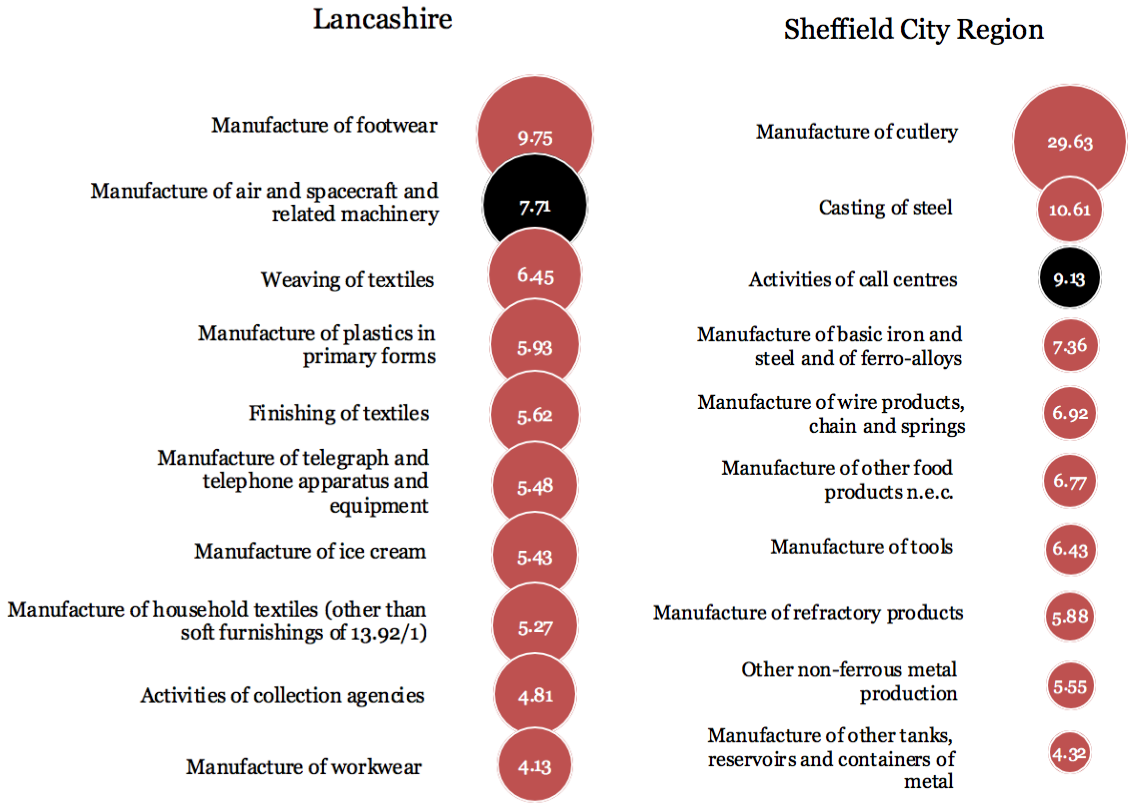
Innovation Strengths

Established Industrial Capacity and Growth Points

- The bubble charts show industrial concentration within the two LEP areas in this consortium. The size of the bubbles indicates the concentration of that sector in that particular LEP.
- Black spheres indicate a high proportion of employee jobs within the specified sector(in the particular LEP) in comparison with the national average. This indicates where that industry may be considered a driver of employment, as well as an industrial specialism.
- Two areas of industrial specialisation in the consortium area are also drivers of employment, highlighted in black in the chart. These are shown to be manufacture of air and spacecraft and related machinery, and activities of call centres



Source: Localisation of Industrial Activity across England's LEPs: 2008 & 2012. Enterprise Research Centre (ERC) (2013).

National and International Engagement

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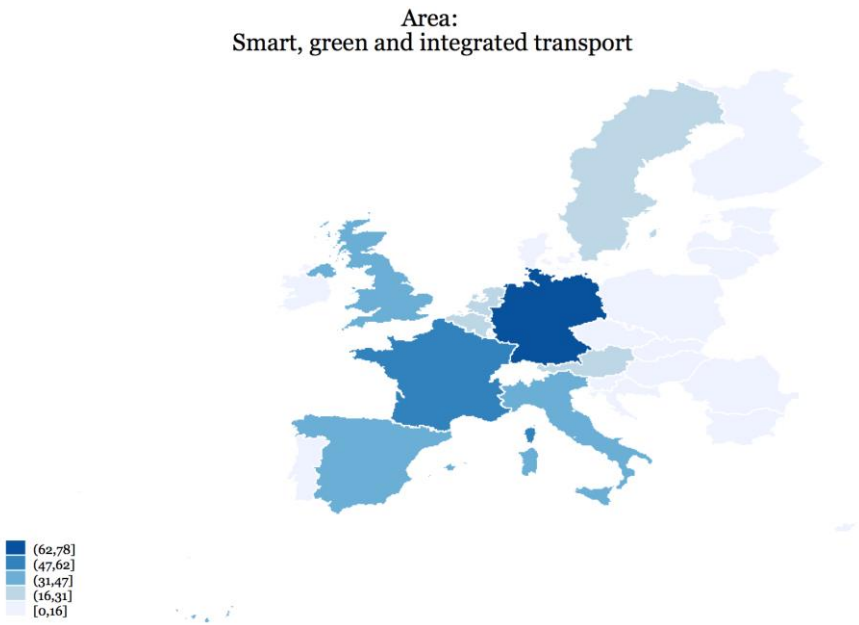
National and international engagement

Analysis of the 8th European Commission Framework Programme (H2020) shows the consortium's participation in European competitive funding. There are three areas where drawdown is high and participation is relative high in comparison with the overall participation of the consortium in H2020 (4%): Transport, Security and other societal challenges.

Within the Transport programme, the consortium collaborates mostly with organisations in Germany. They also collaborate nationally (with other UK organisations situated outside the consortium area) and with organisations in France, Spain and Italy and to a lesser extent with Austria, The Netherlands and Belgium.

	Relatively high participation (based on EC Contribution)	Top 5 (based on EC contribution)
Access to risk finance	0%	
Advanced manufacturing and processing	2%	0.84
Advanced materials	2%	0.36
Biotechnology	0%	
Climate action, environment, resource efficiency	2%	1.72
Europe in a changing world	12%	4.35
Food security, sustainable agriculture	5%	3.36
Health, demographic change and wellbeing	1%	2.76
Industrial Leadership - Cross-theme	2%	0.35
Information and Communication Technologies	3%	5.84
Innovation in SMEs	0%	
Nanotechnologies, Advanced Materials	2%	0.55
Secure societies - Protecting freedom	9%	5.77
Secure, clean and efficient energy	3%	5.72
Smart, green and integrated transport	11%	8.88
Societal Challenges - Cross-theme	51%	5.06
Space	2%	0.70

Total EC Contribution	46.26
Relative overall participation	4%



Appendix F

I'd be happy to give you innovation thinking.
What are the guidelines ?

The Lancs Innovation Plan

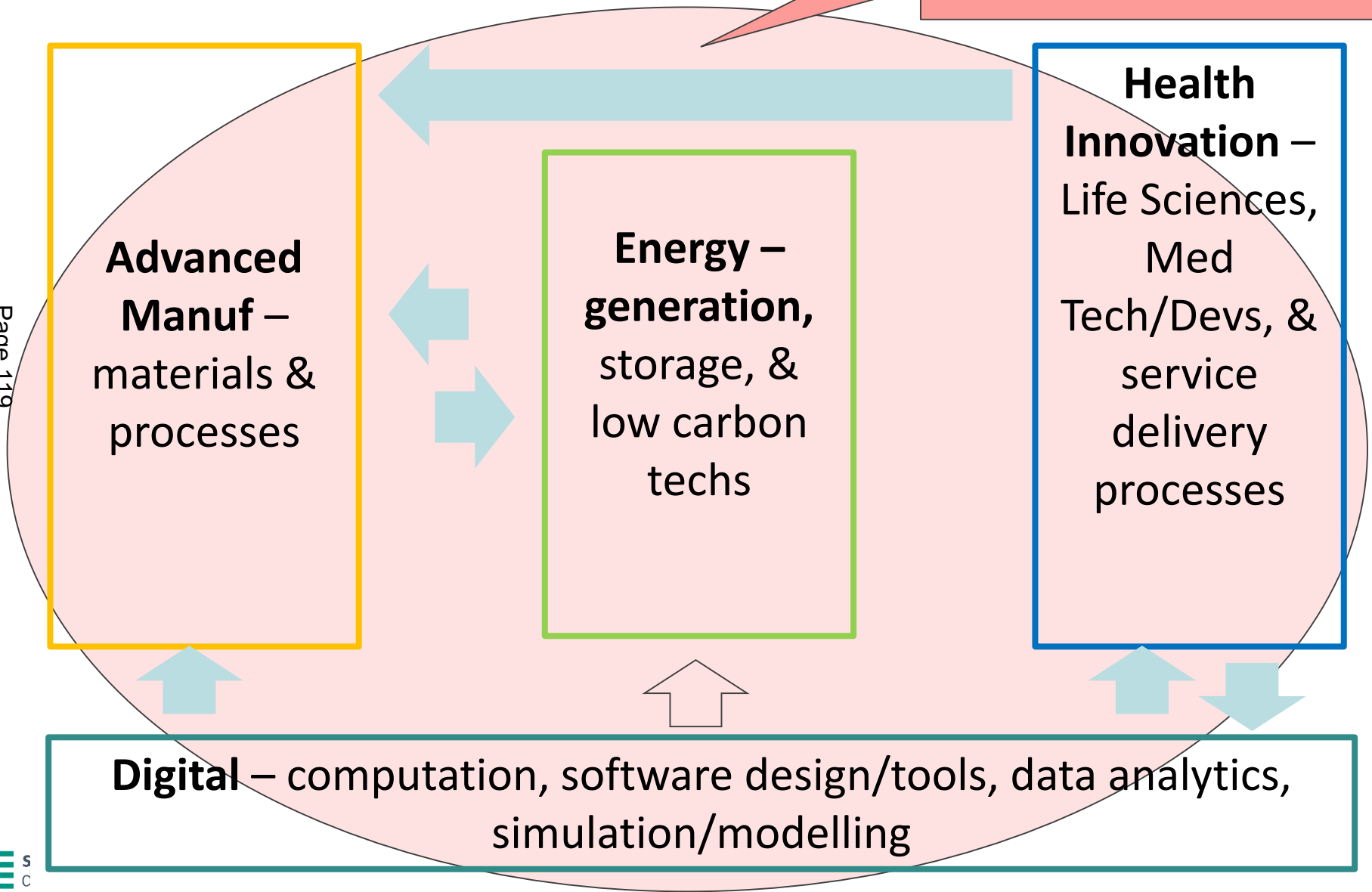
SWOT-ing Lancs' Innovation Ecosystem

22 August 2017

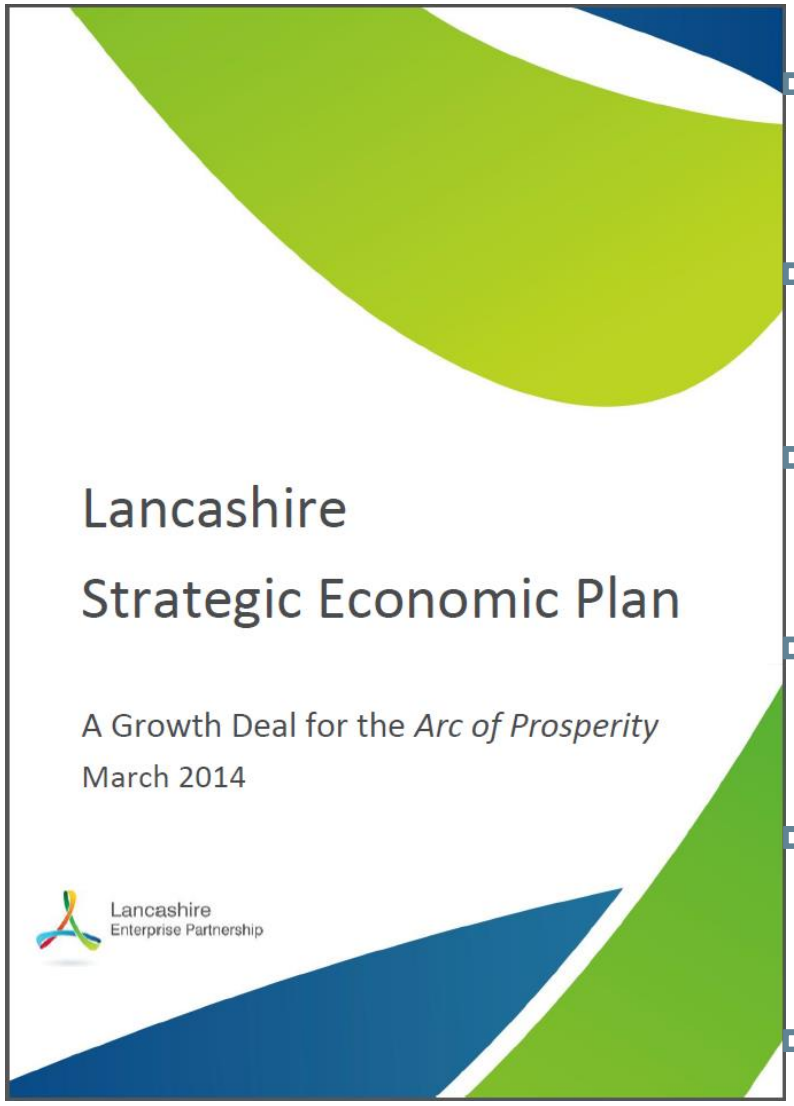
Purposes

- **For the study overall**
  - The need for a more competitive, dynamic, & larger 'innovation economy' in Lancs
  - Evidence-based Innovation Plan (& process) for LEP & partners - clear objectives & priorities for action
  - Owned by, & committed to, by us all

Building on Foundations - NPh IER



Building on Foundations - SEP



- Sector Development & Growth
- Innovation Excellence
- Skills for Growth
- Releasing Local Growth Potential
- Business Growth & Enterprise
- The Renewal of Blackpool

Building on Foundations – SIA

Vision

- Creating a "Northern AdvMan Innovation Corridor"
- Bringing existing, emerging & new science/innovation assets & programmes into collaboration with industry
- Driving productivity growth in AdvMan & key linked sectors across the region to world-class levels

Recommendations:

Building on Success:

- NW AMRC in Salmesbury
- BAE Systems/TWI/ Lancaster Joining Tech Centre
- Development of AdvMan Innovation Districts

Scaling Up:

- Skills for manufacturing in digital era
- Northern Powerhouse Productivity Academy
- Collective Innovation Programmes
- Northern Powerhouse nuclear supply chain
- Internationalisation

Workplan & Milestones

Launch & Scoping

Evidence base & summary
SWOT review -
August 2017

Data analyses
Call for Evidence
Document review
SWOT Workshop – today!

Vision & Strategy Development –
September 2017

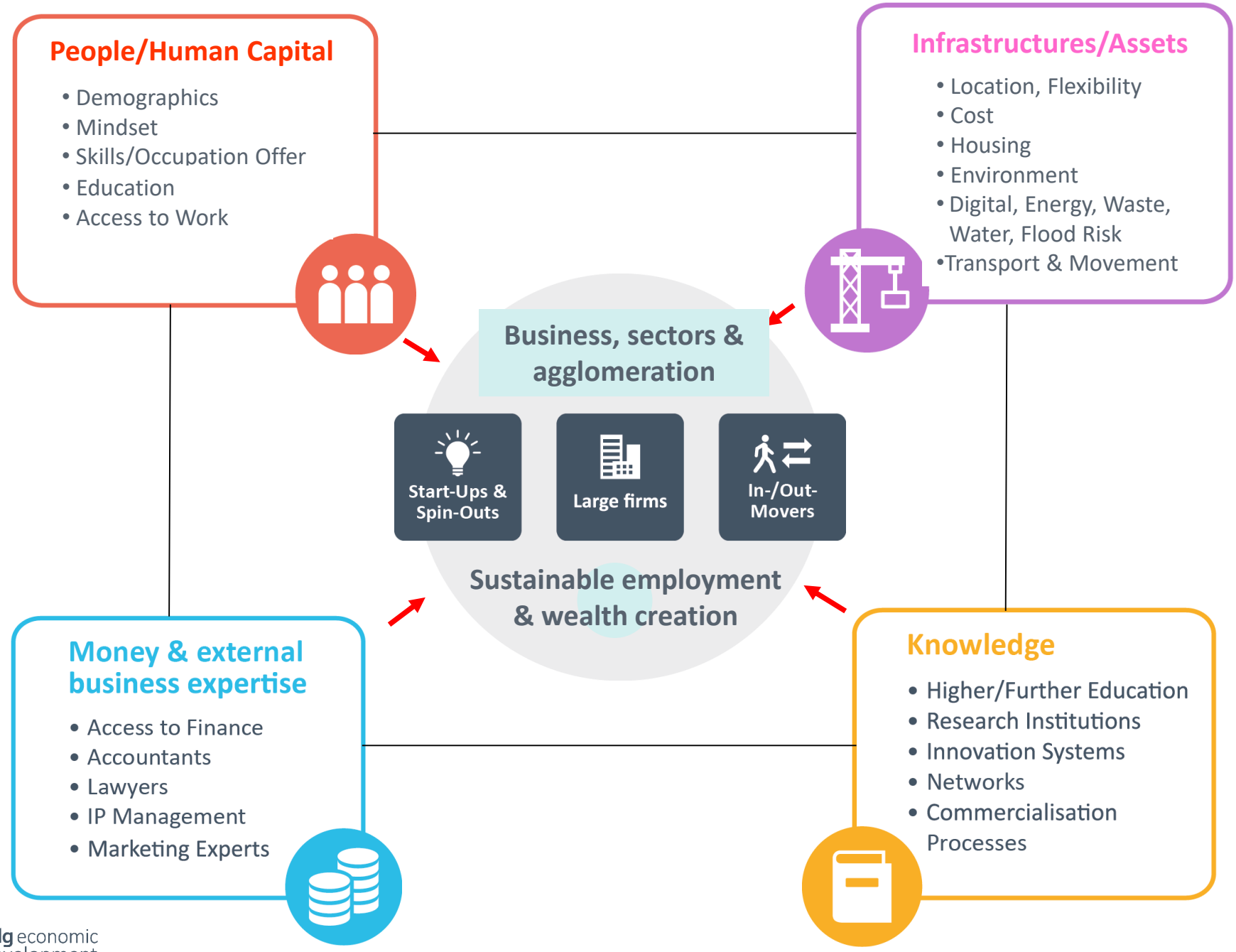
Prioritisation of strategic objectives
Strategic Framework & Vision
Strategy Workshop – 26 September

Action Planning – October 2017

Action planning
Playback workshop
Governance & implementation
Action Workshop - TBA

Implementation –
November 2017 onwards

Our thinking framework



Work Done

- Inception
- Scoping Calls
  - 12 semi-structured interviews with key stakeholders from a cross-section of industry, public sector, & academia
- Call for Evidence
  - Review of c.40 documents reviewed through 4 lenses of:
    - Businesses, sectors & agglomeration
    - People/Human Capital
    - Infrastructures/assets
    - Knowledge
- Secondary Data
  - Time-series analysis & review across all domains of the innovation ecosystem
- Econometric Projections
  - Historical & future analyses of GVA/employment using GMFM data

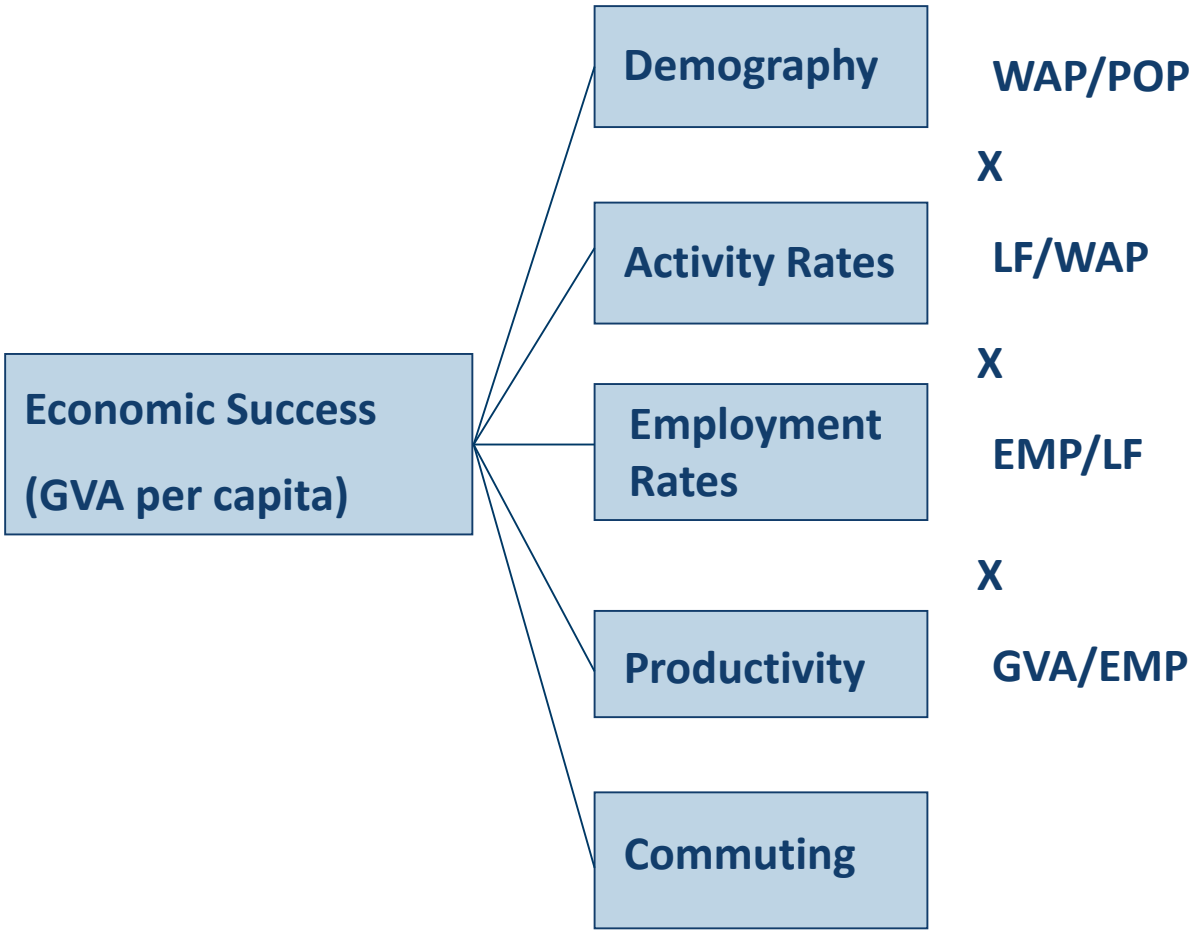
sdg economic development

1. Talking terms . . .

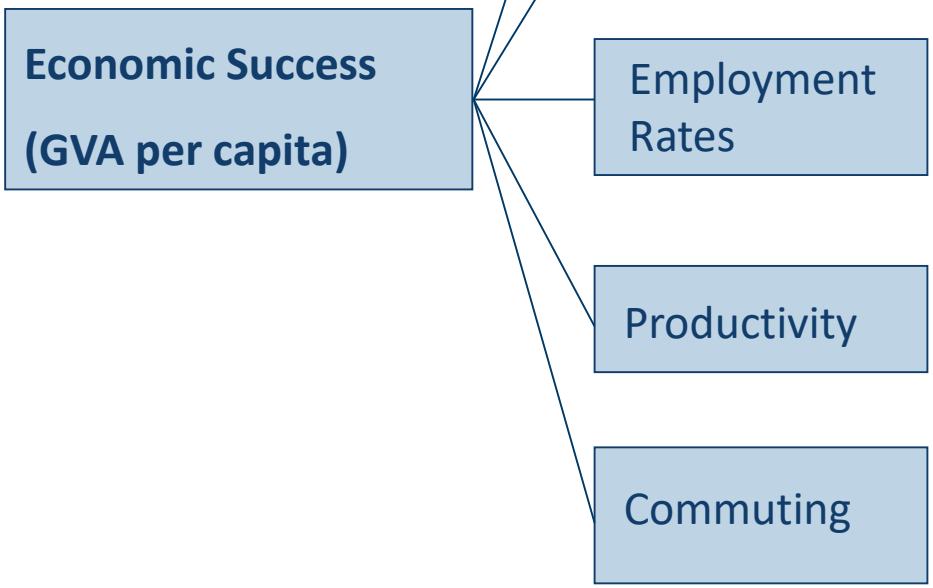
Talking Terms . . .

- Informed by Nesta, SDG's starting point
  - Innovation is . . . the successful exploitation of new ideas, recognising that
    - Innovation need not derive from an advance in science or technology . . . but radical innovation often does
    - Innovation that does derive from an advance in the S&T base needs more than this to achieve (commercial) success
    - Innovation applies equally to product, process, service, & business models
    - Innovation is appropriate . . . & needed . . . equally in the public & ComVol sectors

The Core Determinants of Economic Success

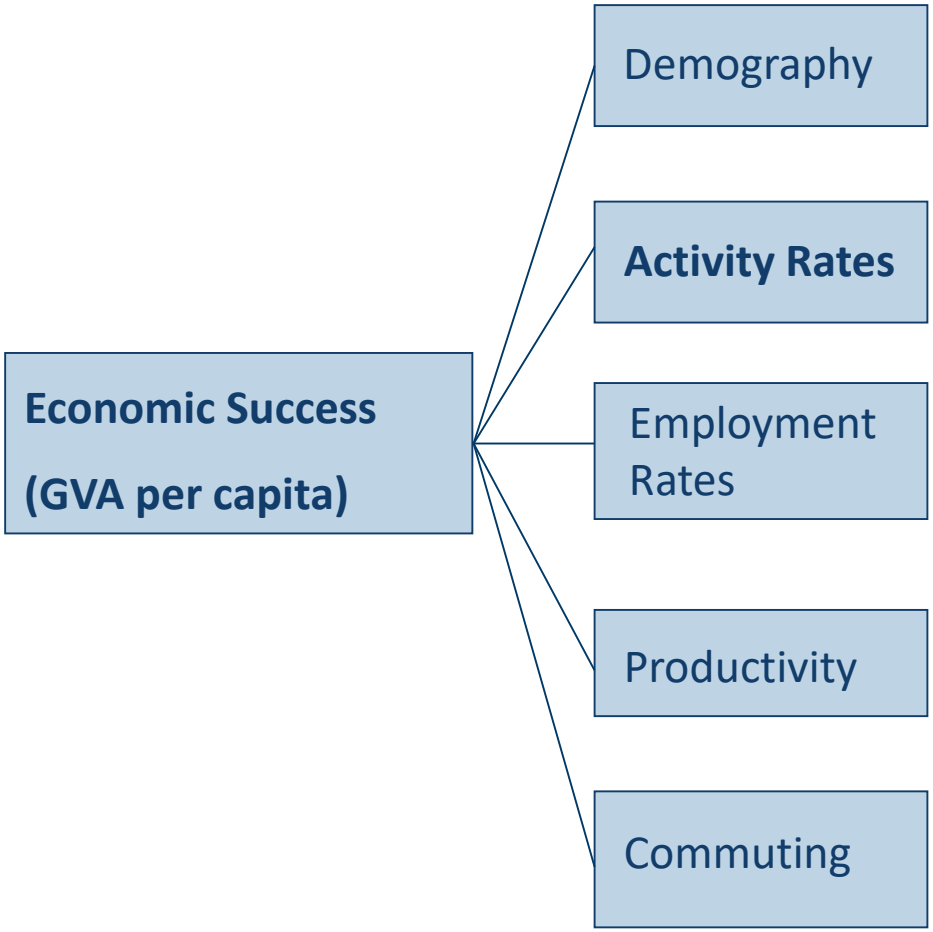


The Core Determinants of Economic Success



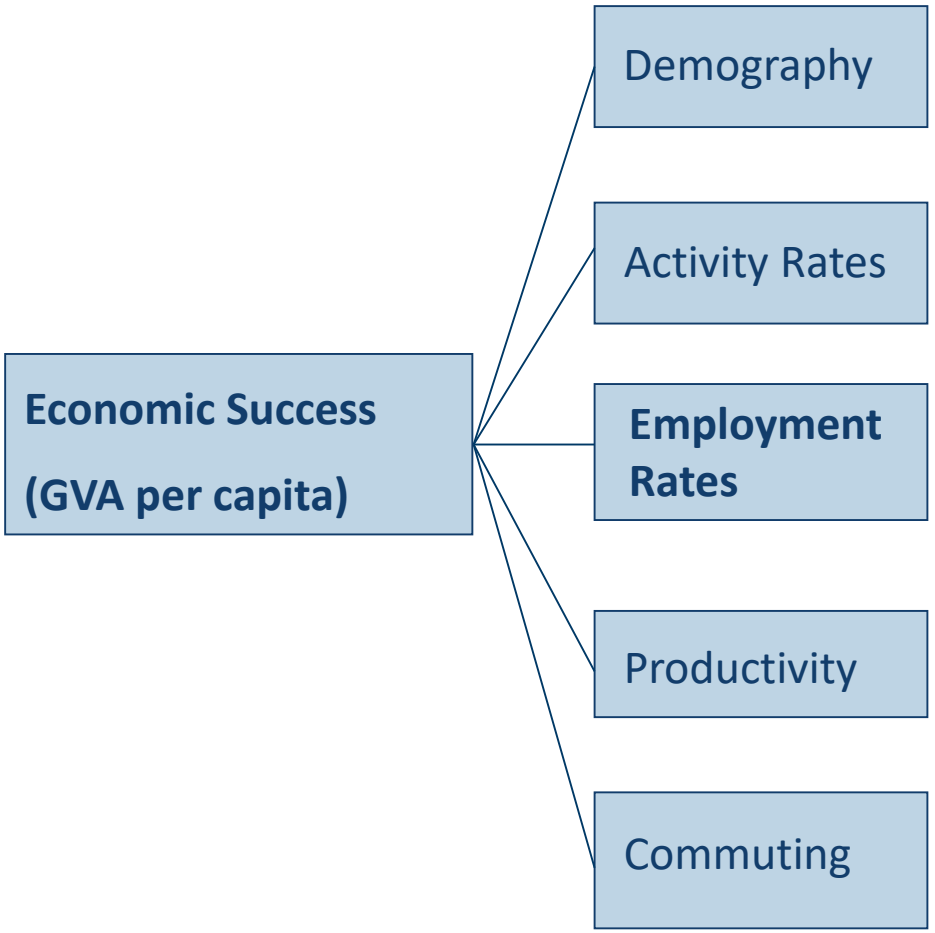
- Population base
- Migration
  - Employment prospects
  - Character of the area
  - Housing offer

The Core Determinants of Economic Success



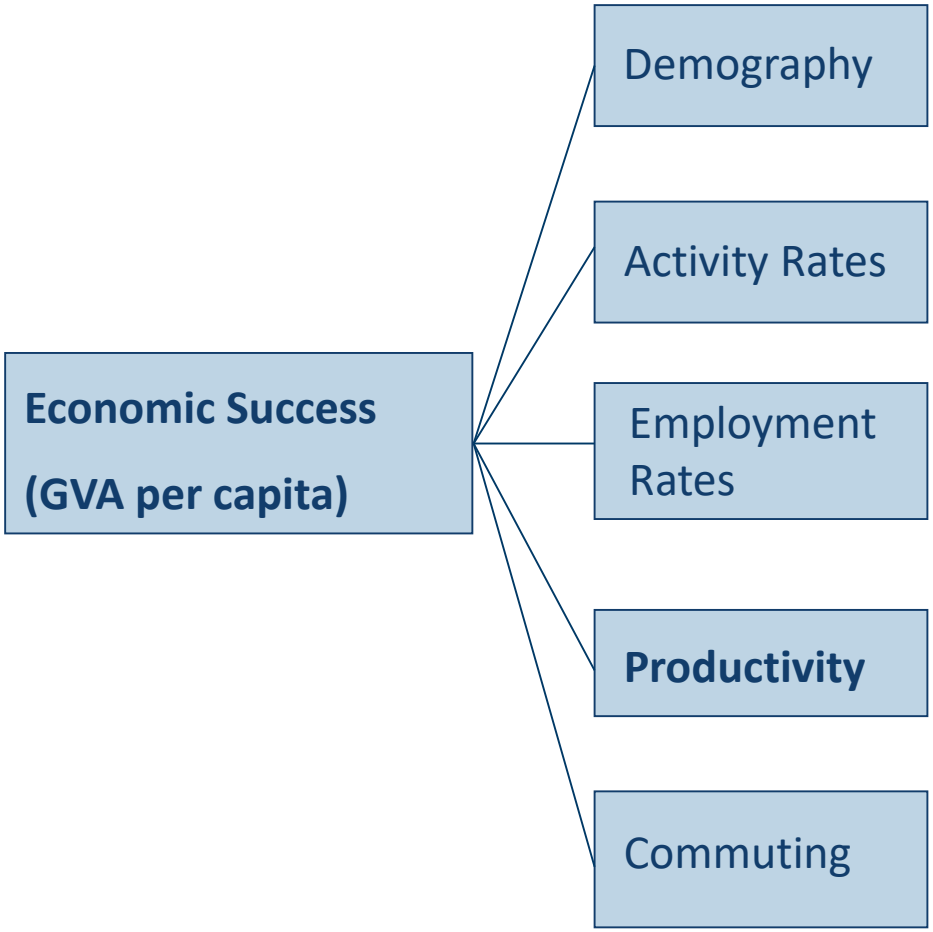
- Age profile
- Skills/education attainment
- Employment offers

The Core Determinants of Economic Success



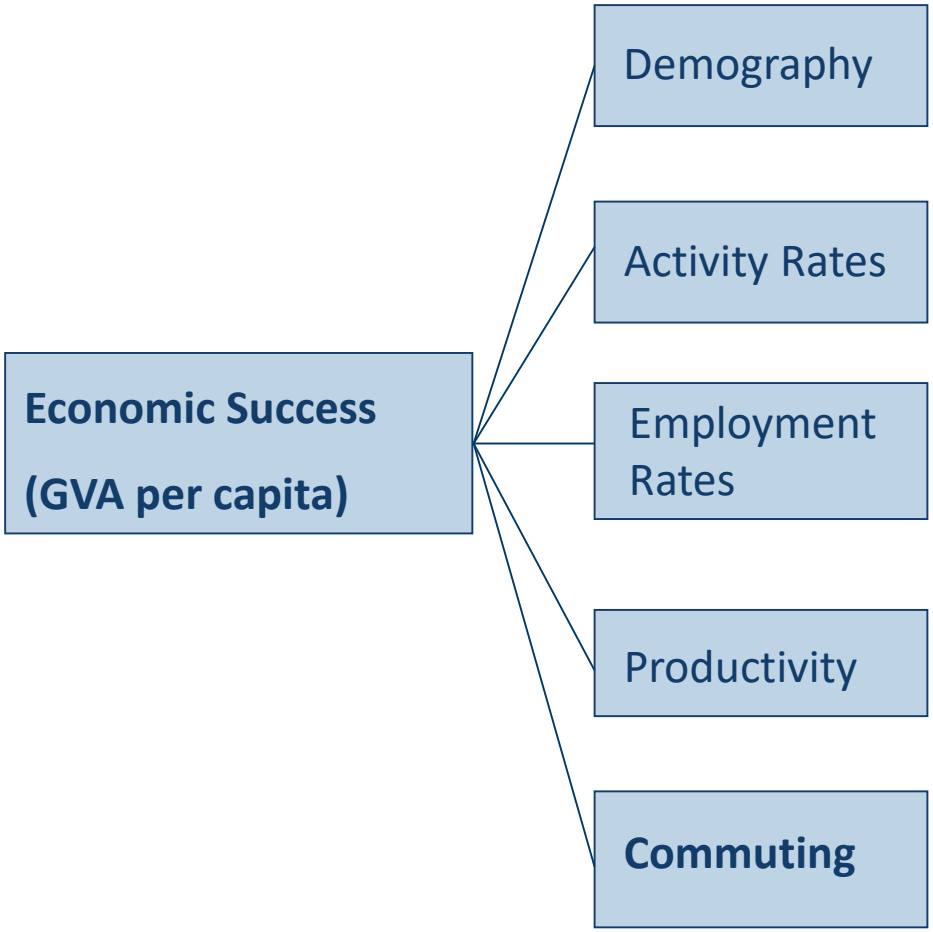
- Job creation rates/volume
- Skills match

The Core Determinants of Economic Success



- Treasury 'drivers'
  - Skills
  - Enterprise
  - Investment
  - **Innovation**
- Nature of employment
  - sectors, markets, occupations

The Core Determinants of Economic Success



- Relative Employment prospects
- Role within wider economy

*'Did you ever think that making a speech on economics is a lot like p****** down your leg? It seems hot to you . . . but it never does to anyone else'*

LBJ

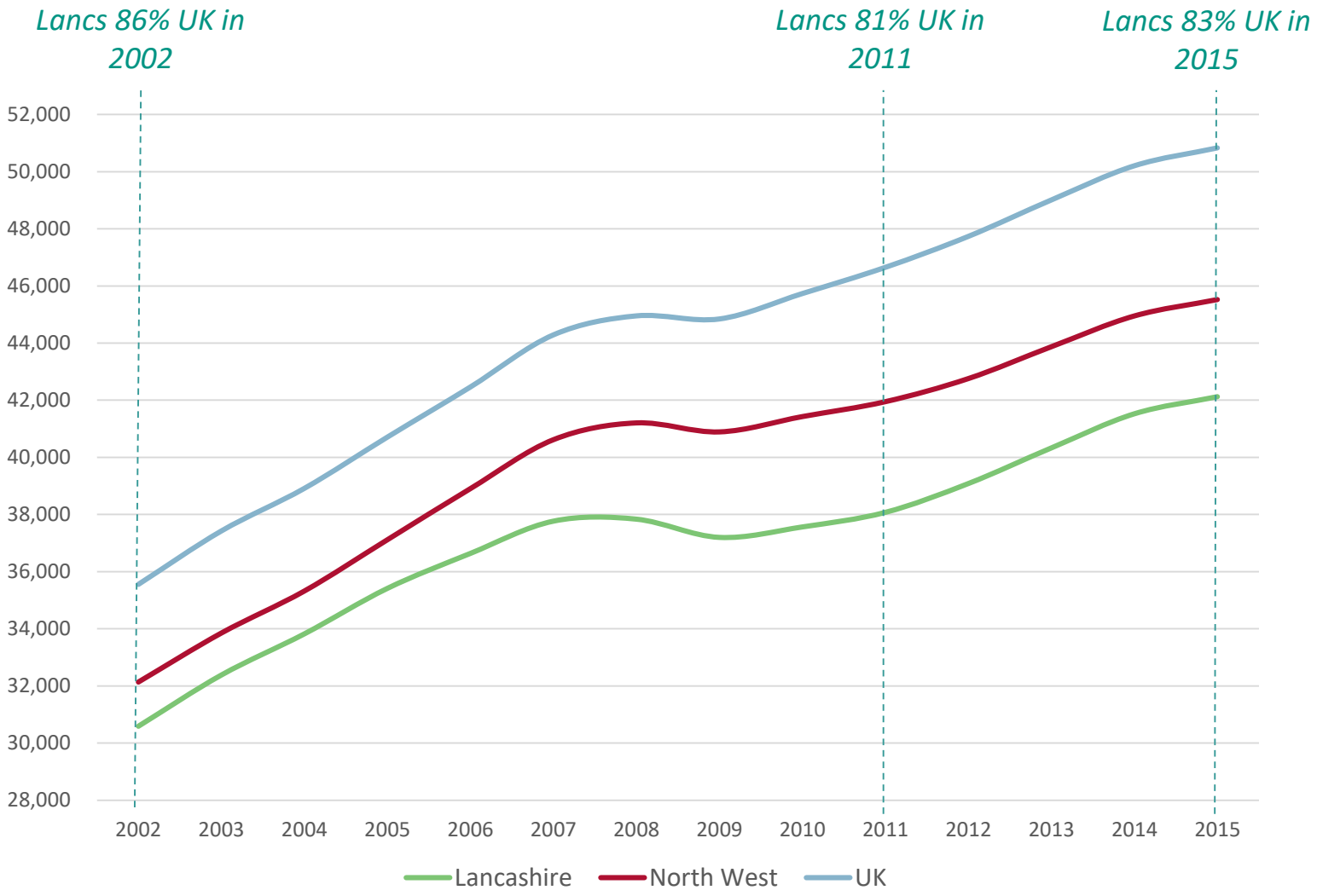
2. Setting the scene – the headline data messages

Simon Pringle

Our Place – in a Nutshell

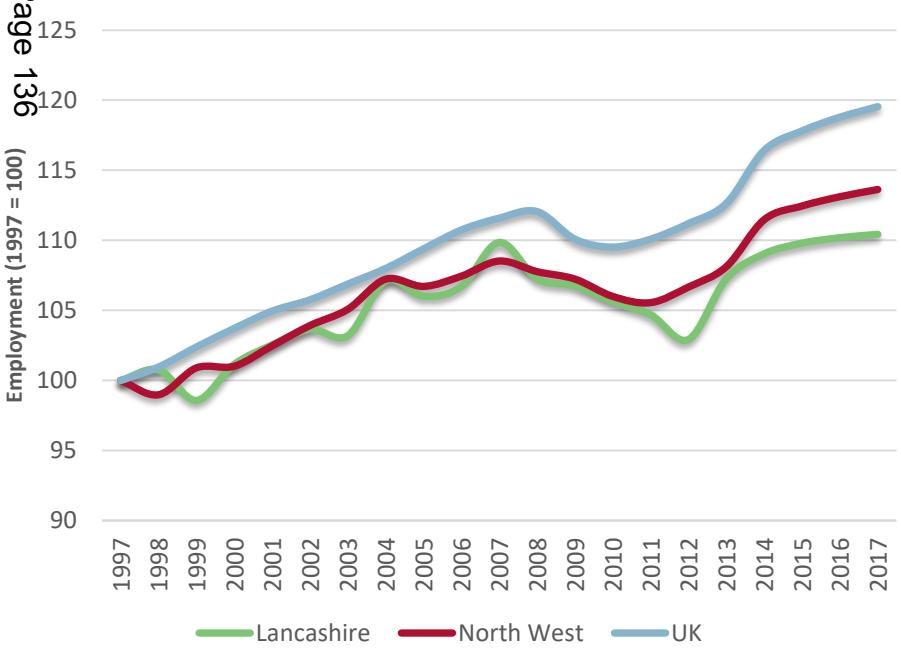
	Indicator		Lancs LEP	North West	UK	Source/Date
	Working- age Population (WAP)	N/A	914.5k	4.5m	41.4m	APS/2016
Population & Employment	Working-age Population (WAP) (%)		62%	63%	63%	APS/2016
	Economic Activity Rate (WAP)		78%	76%	78%	APS/2017
	Employment Rate (WAP)		74%	72%	74%	APS/2017
	Employment Growth (WAP) (+/- since 2007)		+3%	+6%	+8%	BRES/2015
	Total number of jobs		633k			
Productivity & Wealth	GVA per head		£19.6k	£21.8k	£29.0k	ONS/2015
	GVA per employee		£42.1k	£45.5k	£50.8k	ONS/2015
	GVA (+/- since 1997)		+39%	+45%	+49%	ONS/2015
	Average Weekly Earnings		£480pw	£502pw	£541pw	ASHE/2014
	Average House Prices		£135.6k	£152.0k	£219.5k	UKHPI/2015
Enterprise	Total Active Enterprises	N/A	43.3k	259.7k	2.6m	BD/2015
	Business Birth Rate		12%	14%	14%	BD/2015
	Business Death Rate		9%	10%	9%	BD/2015
	Employment in Manufacturing (% of all jobs)		13%	9%	8%	BRES/2015
Skills	NVQ levels (% with L4+)		33%	34%	38%	APS/2016
	NVQ levels (% with no qualifications)		8%	10%	8%	APS/2016
	Employers with Skills Gaps		1%	1%	1%	UKCES/2015
	Employers with Hard-to-Fill Vacancies		4%	5%	5%	UKCES/2015

The Lancs economy – the long view: GVA per employee

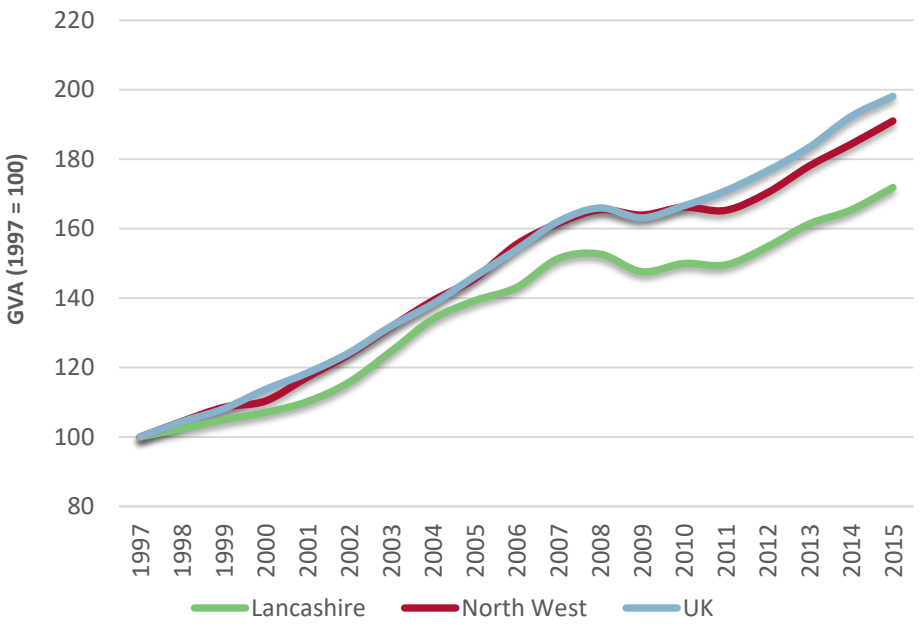


The Lancs economy – the long view: jobs & GVA

- **Employment** in Lancs grew by 49k between 2012-17
- Recovery from 2013-17, following fall from 2007-12
- But, slower growth than NW & UK



- **Aggregate GVA** in Lancs was £29bn in 2015 = 18.5% of NW
- Consistent, but in relative terms, slow growth compared to NW & UK
- Gap with UK widened since 2011

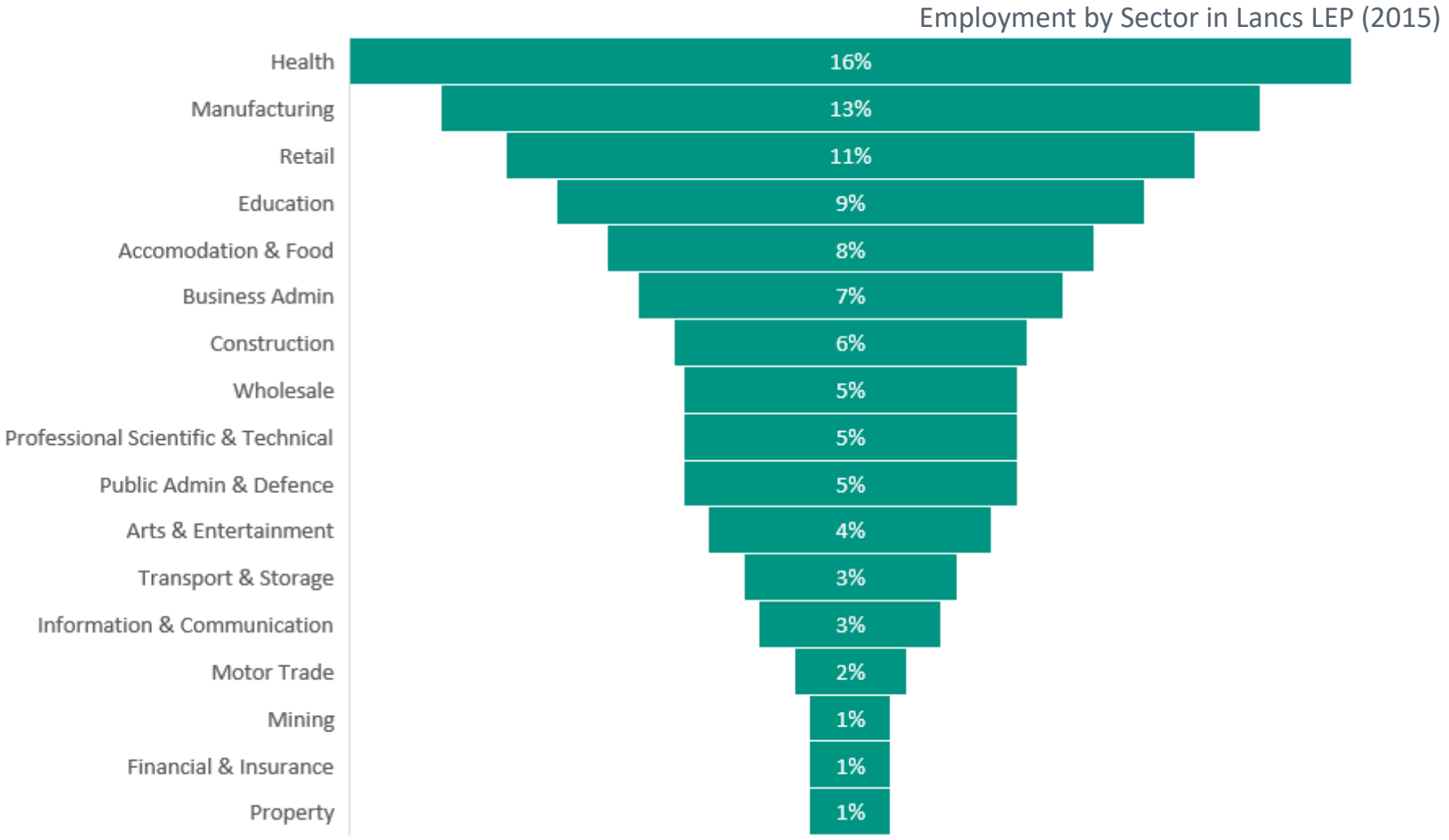


Business/sectors – overview

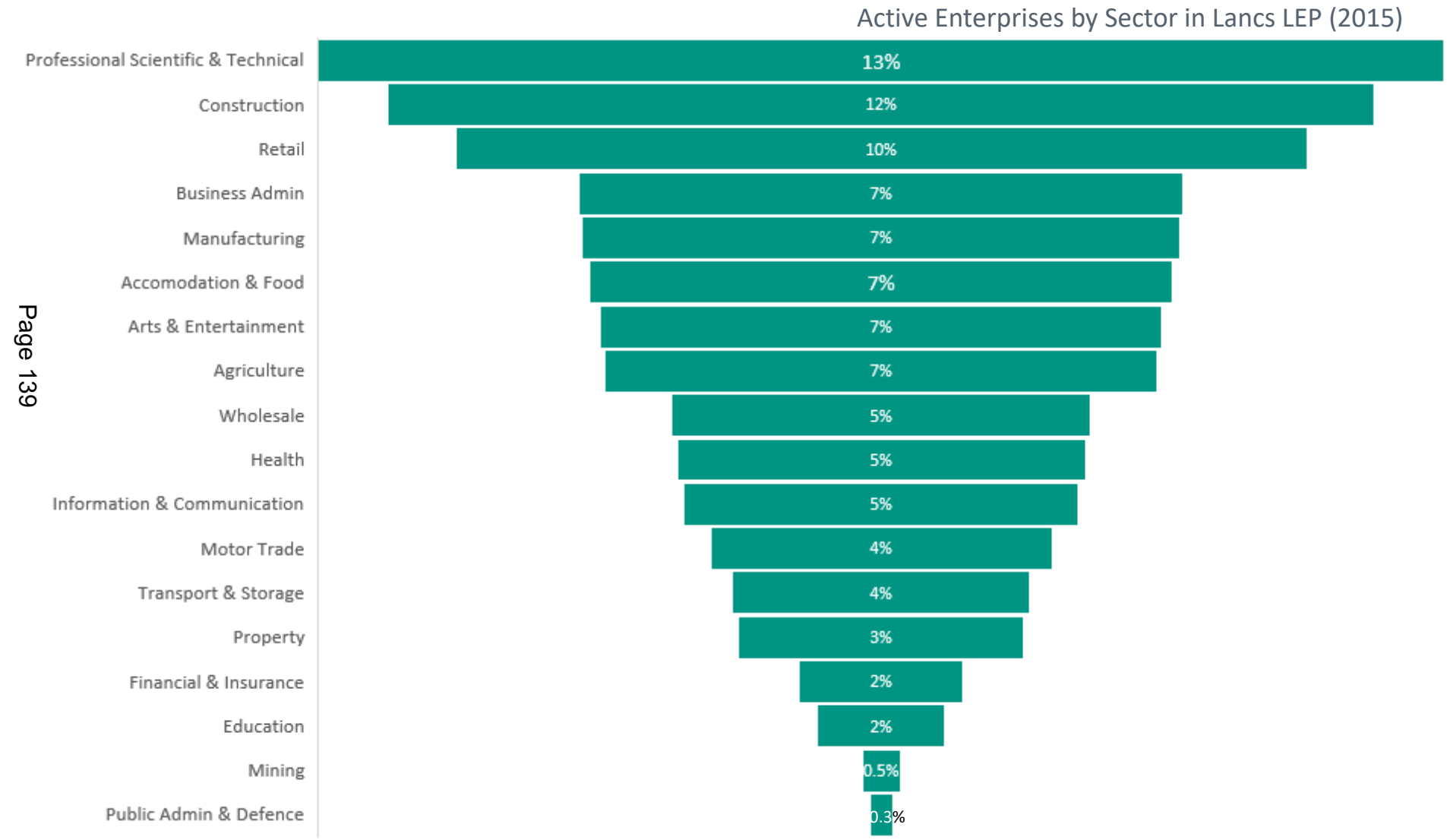
	Indicator		Lancs LEP	North West	UK	Source/Date
Enterprise	Total Active Enterprises	N/A	43.3k	259.7k	2.6m	BD/2015
	Business Birth Rate		7%	7%	9%	BD/2015
	Business Death Rate		11%	10%	11%	BD/2015
	Employment in Manufacturing (% of all jobs)		12%	9%	8%	BRES/2015

- 630k jobs in Lancs LEP in 2015 (~20% of NW total)
- 43k active enterprises in 2015 (20% of NW total)
- High concentration of manufacturing jobs as share of all jobs (industrial legacy)
- High density of jobs in Industrial Strategy & NPIER sectors…
- . . . but a low birth rate of new enterprises

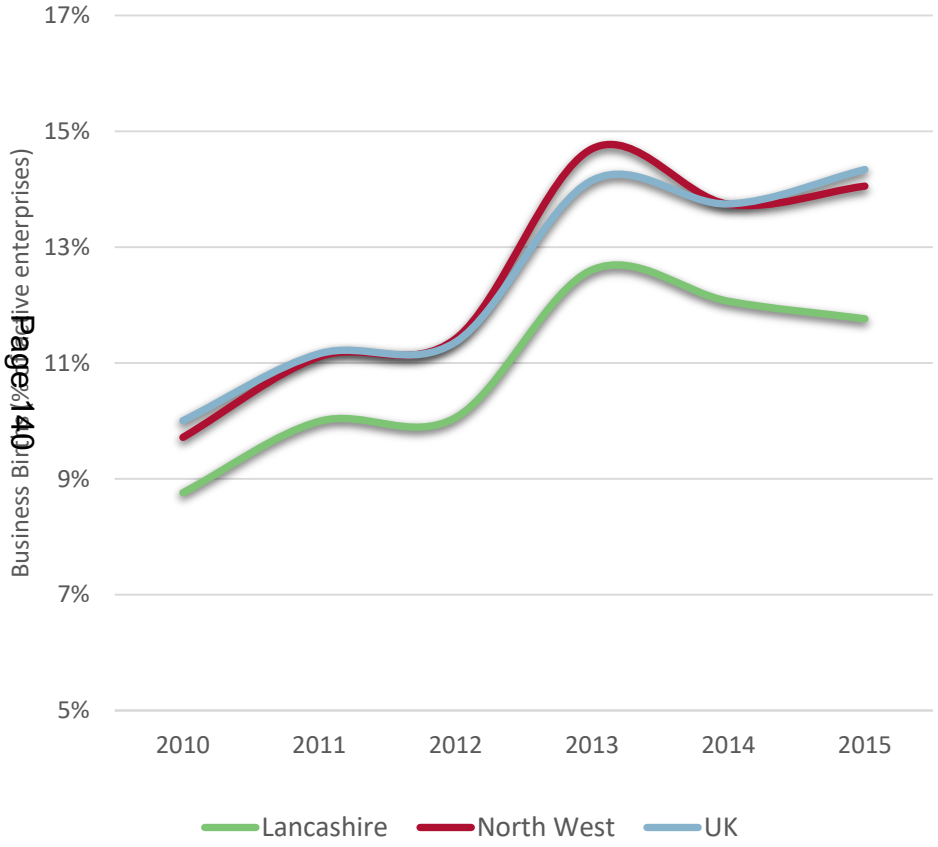
Business/sectors – employment distribution

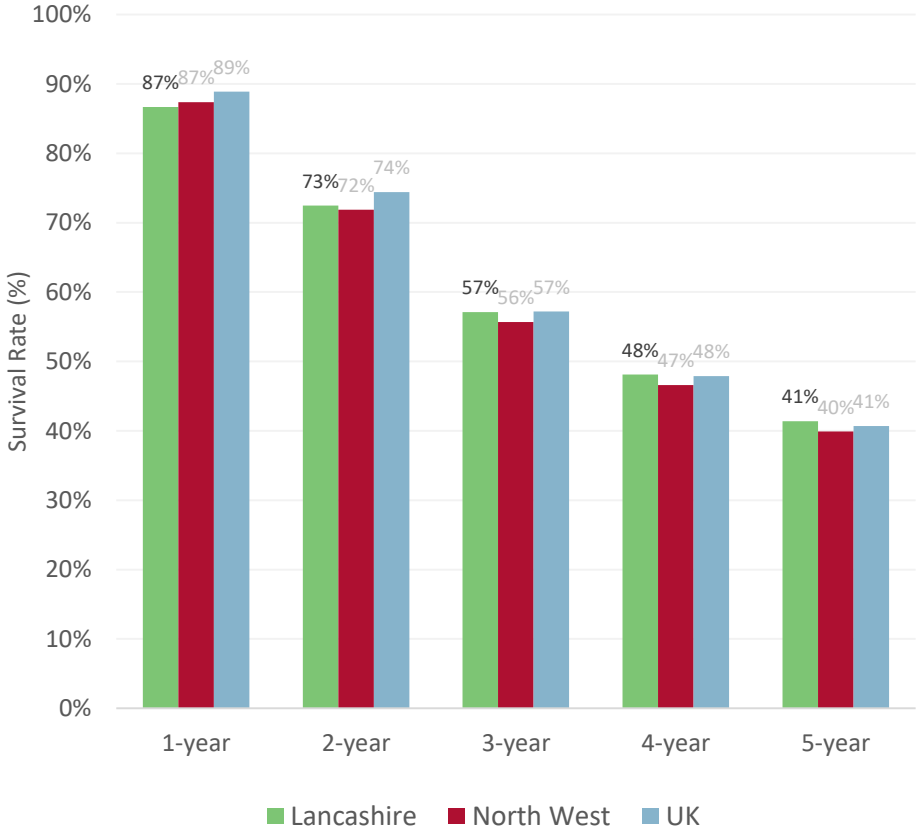


Business/sectors – numbers of businesses by sector



Business/sectors – business births & deaths



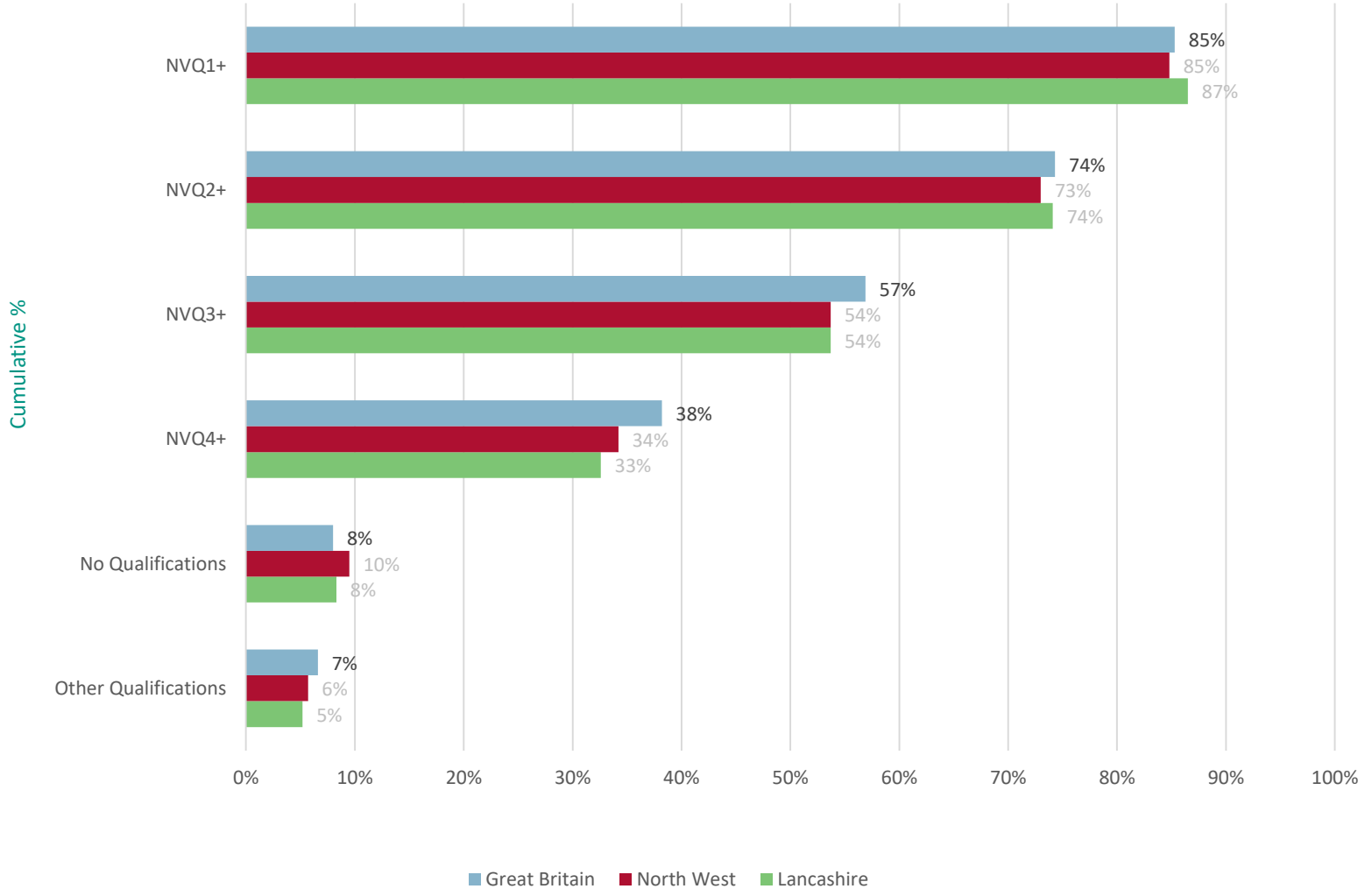


People/Human Capital – overview

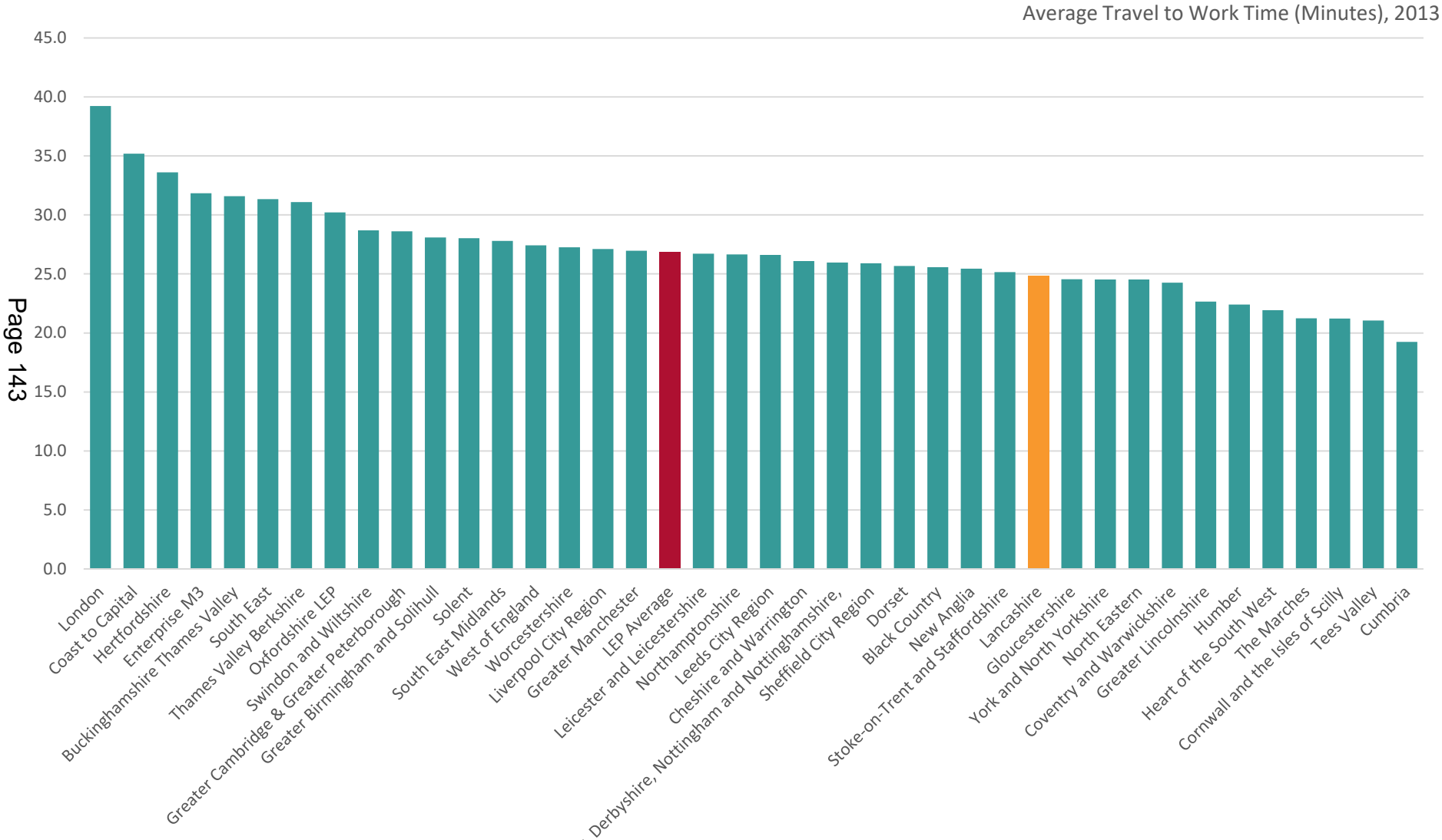
	Indicator		Lancs LEP	North West	UK	Source/Date
Skills	NVQ levels (% with L4+)		33%	34%	38% (GB)	APS/2016
	NVQ levels (% with no qualifications)		8%	10%	8% (GB)	APS/2016
	Employers with Skills Gaps		1%	1%	1%	UKCES/2015
	Employers with Hard-to-Fill Vacancies		4%	5%	5%	UKCES/2015

- Share of Lancs workforce skilled to NVQ L4+ is 5p.p. lower than GB average
- Still too few people with no qualifications compared to the North West as a whole

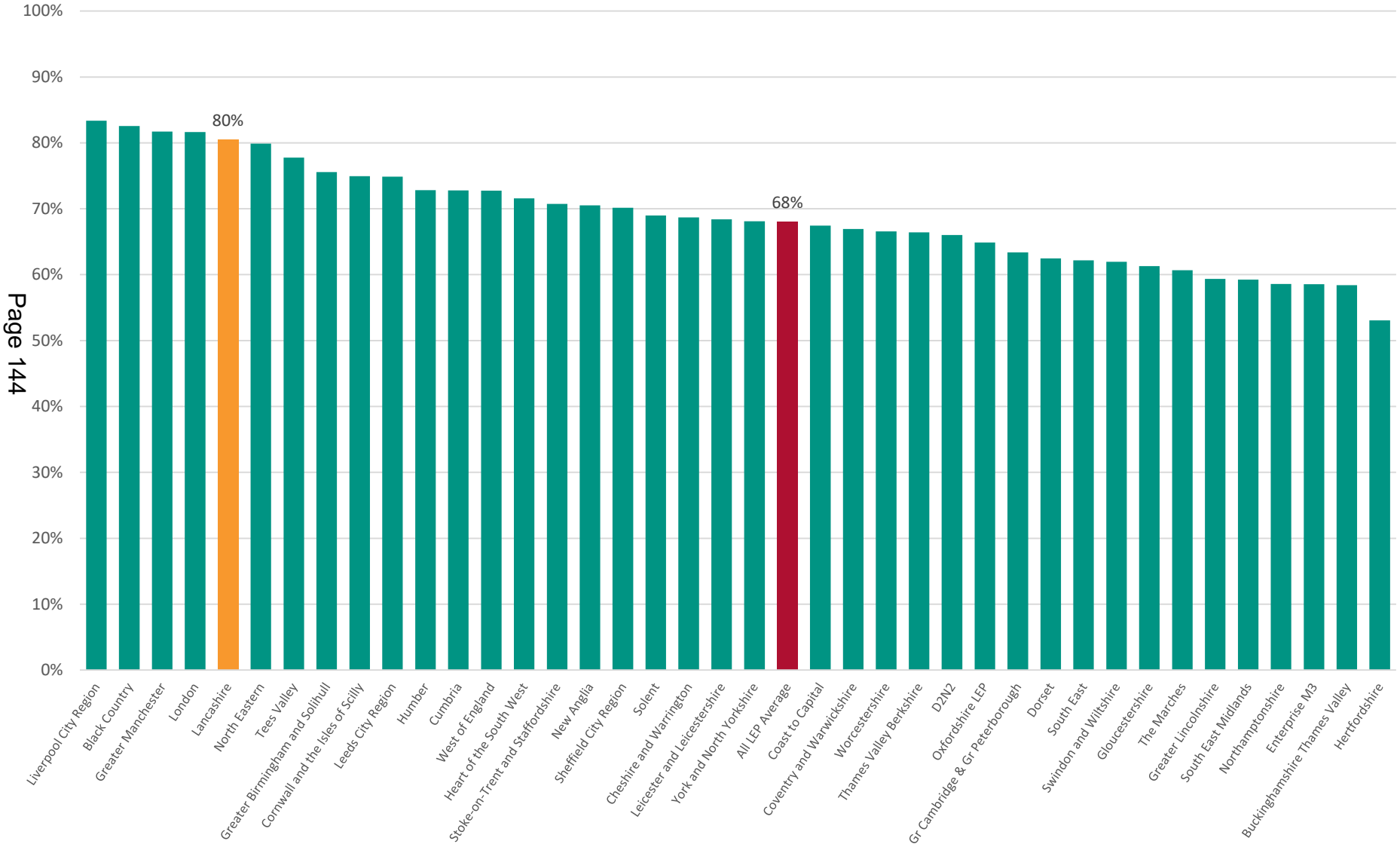
People/Human Capital – skills in workforce



People/Human Capital – Travel to Work (LEP)



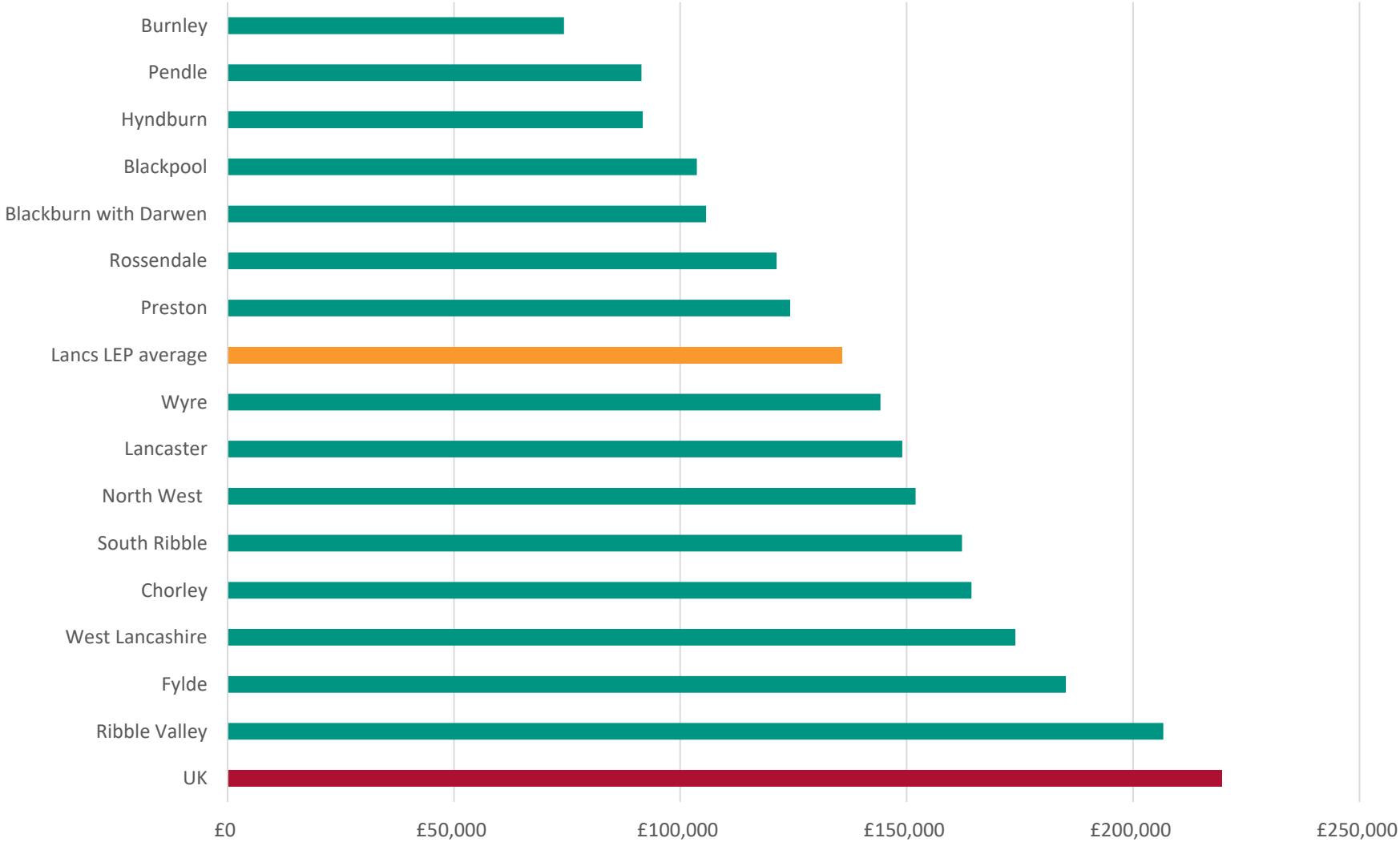
People/Human Capital – graduate retention at 6 months (2012/13)



Infrastructure/Assets – Strategic Sites

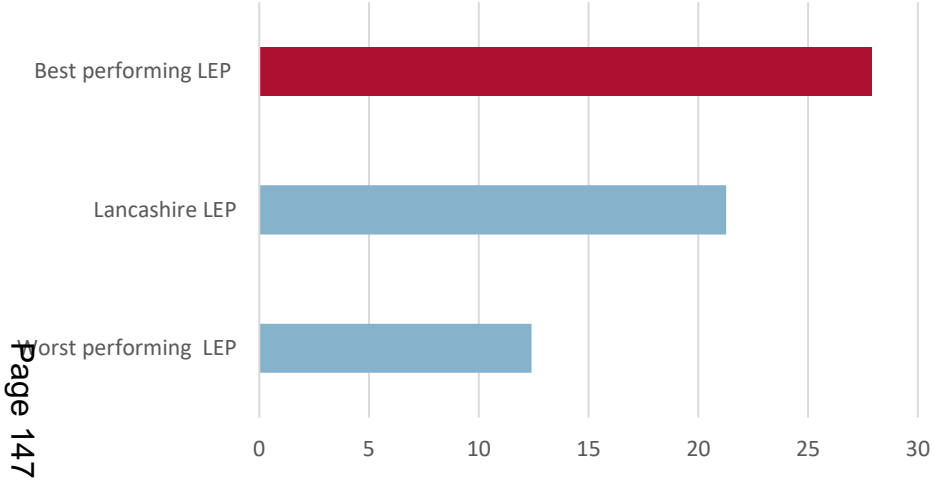
- Cutting edge R&D facilities in key sectors including Aerospace, Nuclear, & AdvMan
- EZs with specific sector foci :
  - Samlesbury Aerospace EZ (AdvMan & Engineering)
  - Hillhouse Technology EZ (Energy, Chemicals & Polymers)
  - Blackpool Airport EZ (Energy, Wind, Nuclear & Waste-to-Energy)
  - Wharton Aviation EZ (AdvMan & Engineering).
- 4 HEIs located/part-located in the area
  - Health Innovation Campus – Lancaster
  - Engineering Innovation Centre – UCLan
- Translational research centres & connectivity between HEIs/industry
- Strategic assets (e.g. Port of Heysham)
- However, a lack of quality employment space an ongoing problem…

Infrastructure/Assets – Average House Prices

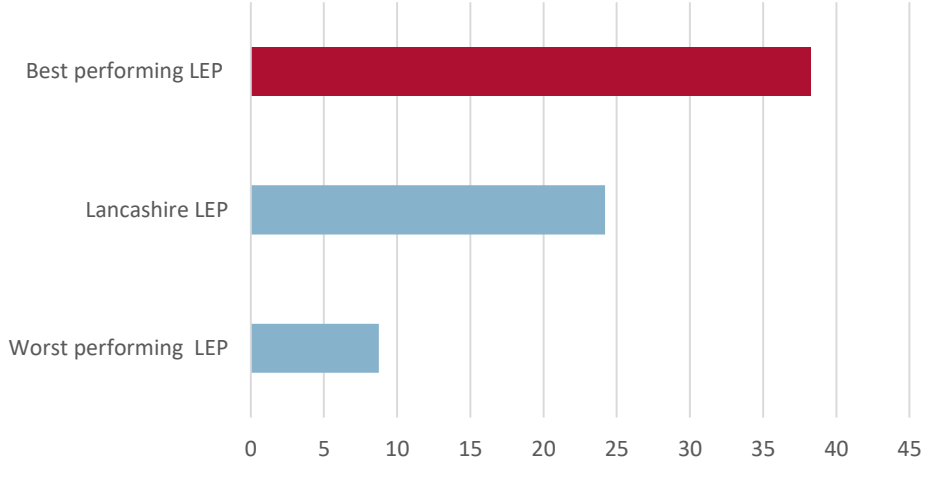


Infrastructure/Assets – Broadband

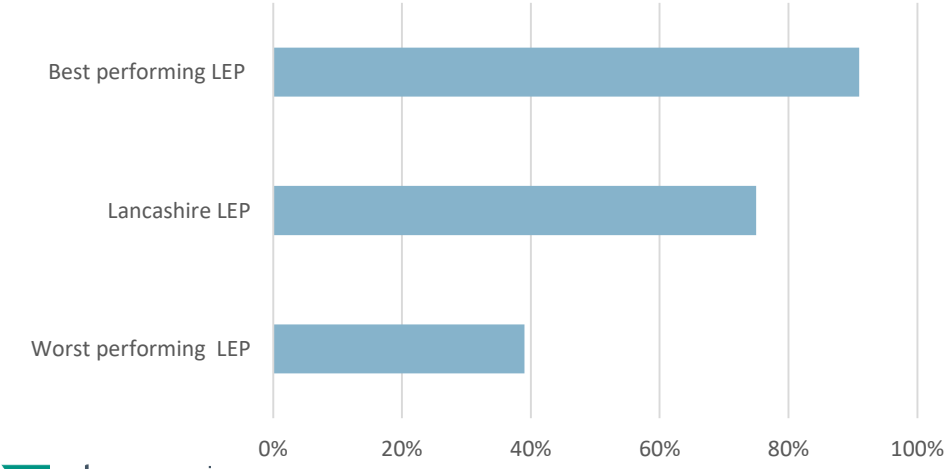
Average download speed (Mbit/s)



Take-up of lines > 30 Mbit/s (number of lines)



Super-Fast Broadband Availability (% premises)



Note - Black Country LEP is the highest performing LEP against each indicator.

Knowledge – overview

	Indicator		Lancs LEP	North West	UK	Source/ Date
Educational Excellence	Graduate retention rates		80%	77% (NW average)	68% (All-LEP average)	HESA 2012/13
	Undergrads in STEM/non-STEM		34%/66%	35%/65%	35%/65% (England)	HESA 2013/14
	FT Post-grads in STEM/non-STEM		49%/51%	68%/32%	65%/35% (England)	HESA 2013/14
	University spin-outs/start ups since 2000		27 (1% of UK total)	156 (7% of UK total)	2,293	Spinouts UK/2017
Enterprise & Infrastructure	Total R&D Expenditure (£ per person employed)		£525	£1,093	£1,070	Eurostat + BRES/2011
	of which Business R&D expenditure (BERD)		£388 (74%)	£851 (78%)	£765 (71%)	Eurostat + BRES/2011
	Employment in Professional, Scientific & Technical (% of all jobs)		5%	7%	8% (GB)	BRES/2015
	Residents employed in STEM subjects (Prof & Associate Prof)		6.2%	6.9%	7.2%	APS/2014

Knowledge – REF 2014 Overall 3* & 4*, Lancaster

Knowledge – HE Business & Community Interaction Survey

Research related activities - contract research 2015-16	Lancaster	UCLAN	Edge Hill	University of Cumbria	Combined Total
Number with SMEs	47	19	0	0	66
Total value with SMEs (£000's)	1,235	86	0	0	1,321
Number with other (non-SME) commercial businesses	100	15	2	1	118
Total value with other (non-SME) commercial businesses (£000's)	1,254	244	3	3	1,504
Number with non-commercial organisations	243	82	17	26	368
Total value with non-commercial organisations (£000's)	5,818	1,566	129	140	7,653
Total number of contracts	390	116	19	27	552
Total value of contracts (£000's)	8,307	1,896	132	143	10,478

Knowledge – HE Business & Community Interaction Survey

Research related activities – Cons Services 2015-16	Lancaster	UCLAN	Edge Hill	University of Cumbria	Combined Total
Number with SMEs	212	62	6	9	289
Total value with SMEs (£000's)	4,206	492	29	0	4,727
Number with other (non-SME) commercial businesses	104	7	1	2	114
Total value with other (non-SME) commercial businesses (£000's)	483	55	2	8	548
Number with non-commercial organisations	40	34	24	10	108
Total value with non-commercial organisations (£000's)	854	8,103	1,699	69	10,725
Total number of contracts	356	103	31	21	511
Total value of contracts (£000's)	5,543	8,650	1,730	77	16,000

Knowledge – Research commercialisation

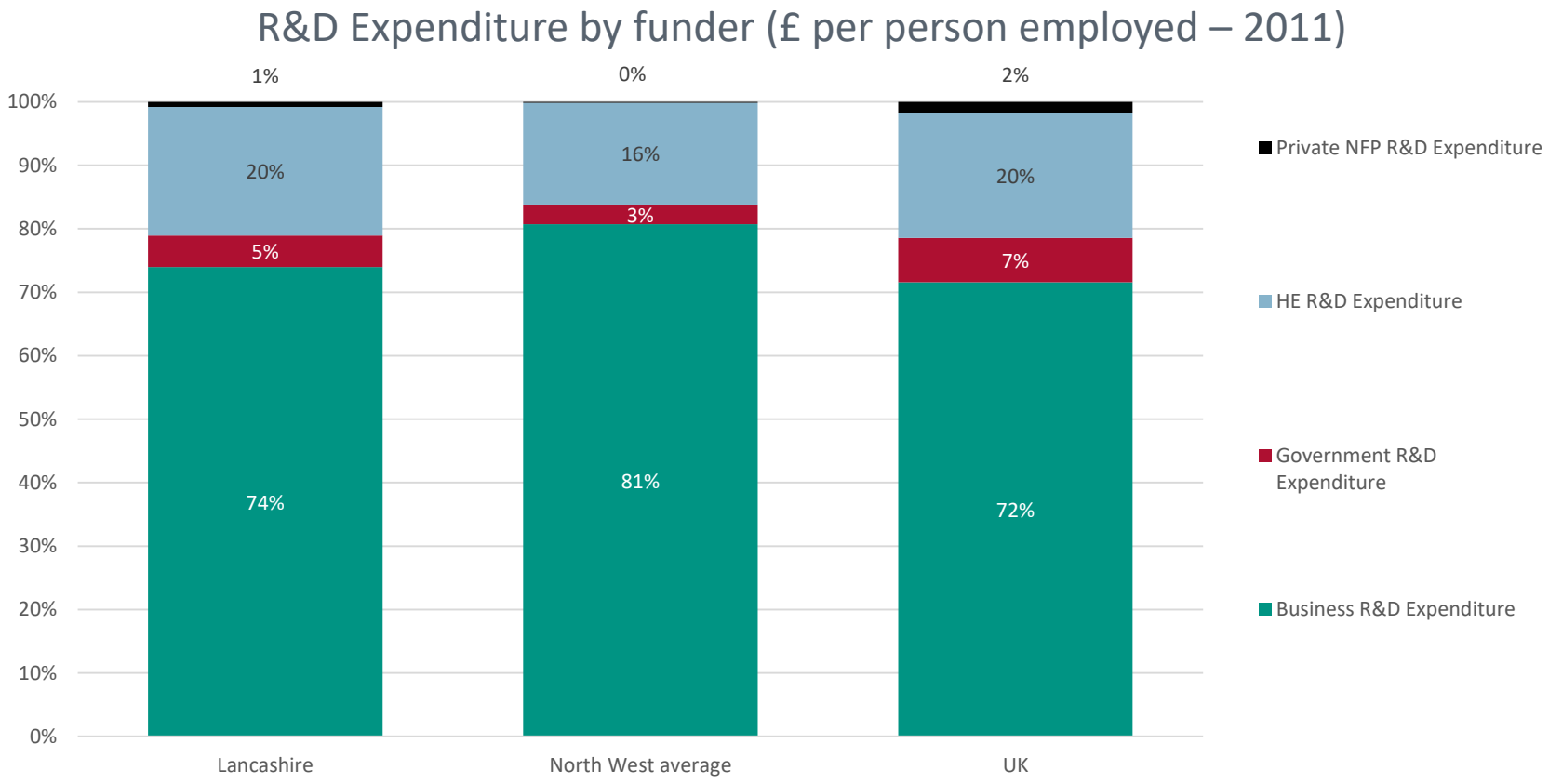
Region	Total Spin-outs/ Start-ups since 2000	Share of UK (%)
Scotland	631	28%
London	301	13%
South East	259	11%
East	252	11%
North West	156	7%
of which Lancs HEIs	*27*	*1%*
Yorkshire & Humber	151	7%
South West	132	6%
West Midlands	117	5%
Northern Ireland	91	4%
East Midlands	76	3%
North East	67	3%
Wales	44	2%
UK	2293	-

Lancs' HEI have historically produced few start-ups & spin-outs compared to other parts of the country

Spin-outs/start-ups since 2000:

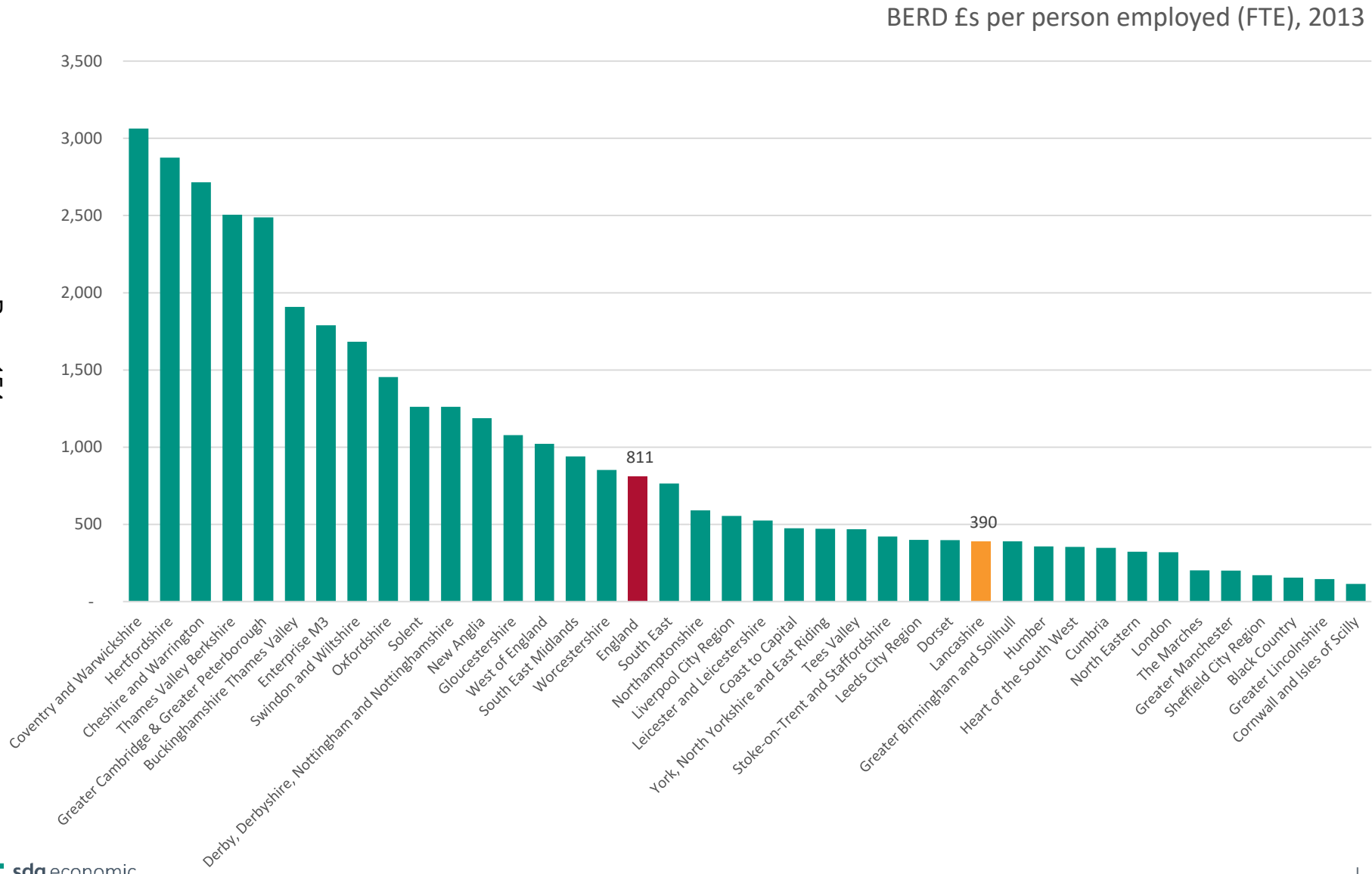
- University of Lancaster – 26 spin-outs & 1 start-up
- UCLAN – 1 spin-out

Knowledge – who's funding R&D in Lancs?

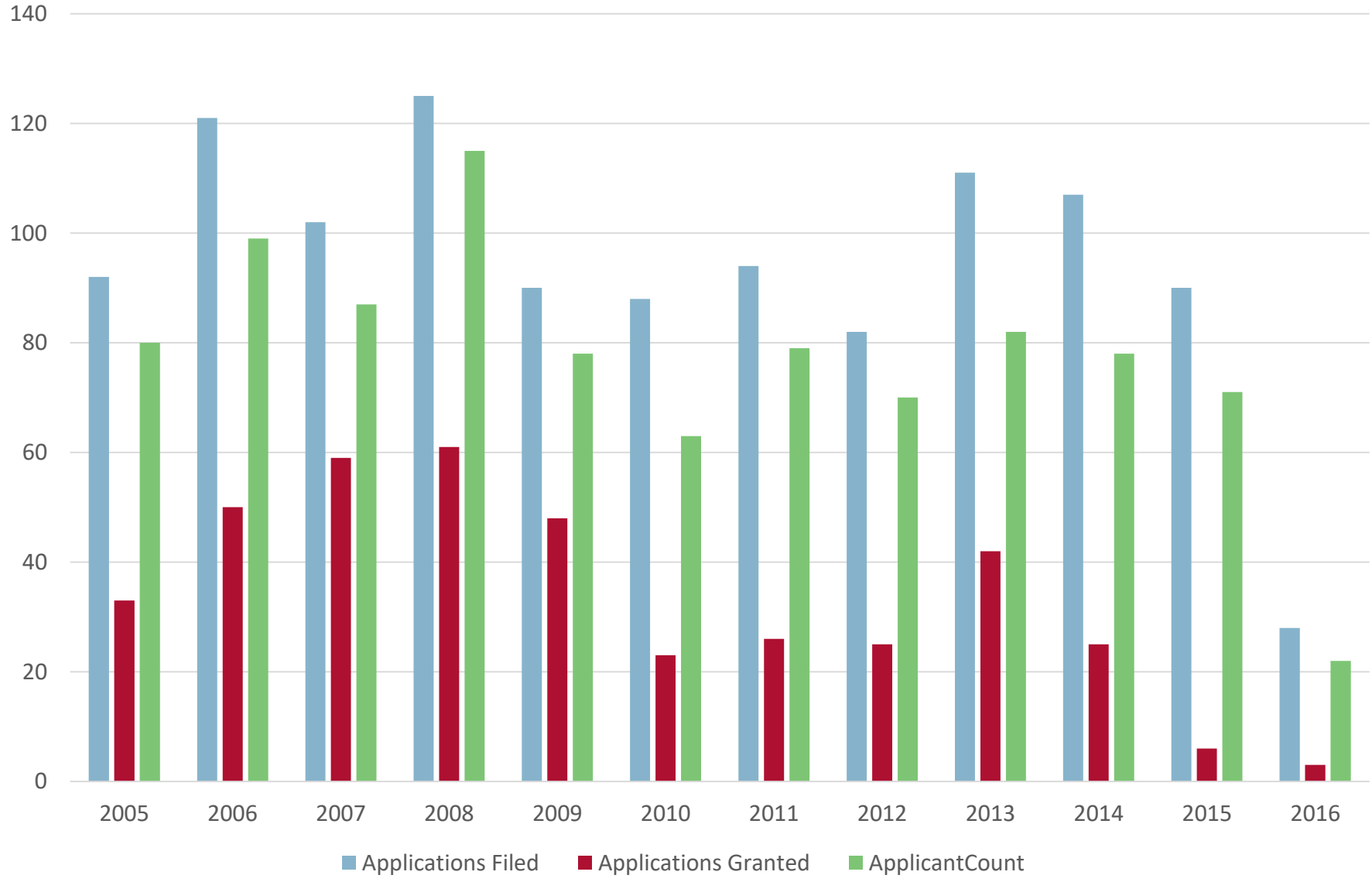


- Total R&D Expenditure (£ per person employed) in Lancs is £525 compared to UK average of £1,070 – nearly double that of Lancs
- Lancs has a greater share of BERD expenditure than UK average, but smaller slice of GovERD compared to UK

Knowledge - BERD in more detail



Knowledge – Patenting



3. Where are we heading?

…the GMFM forecasts

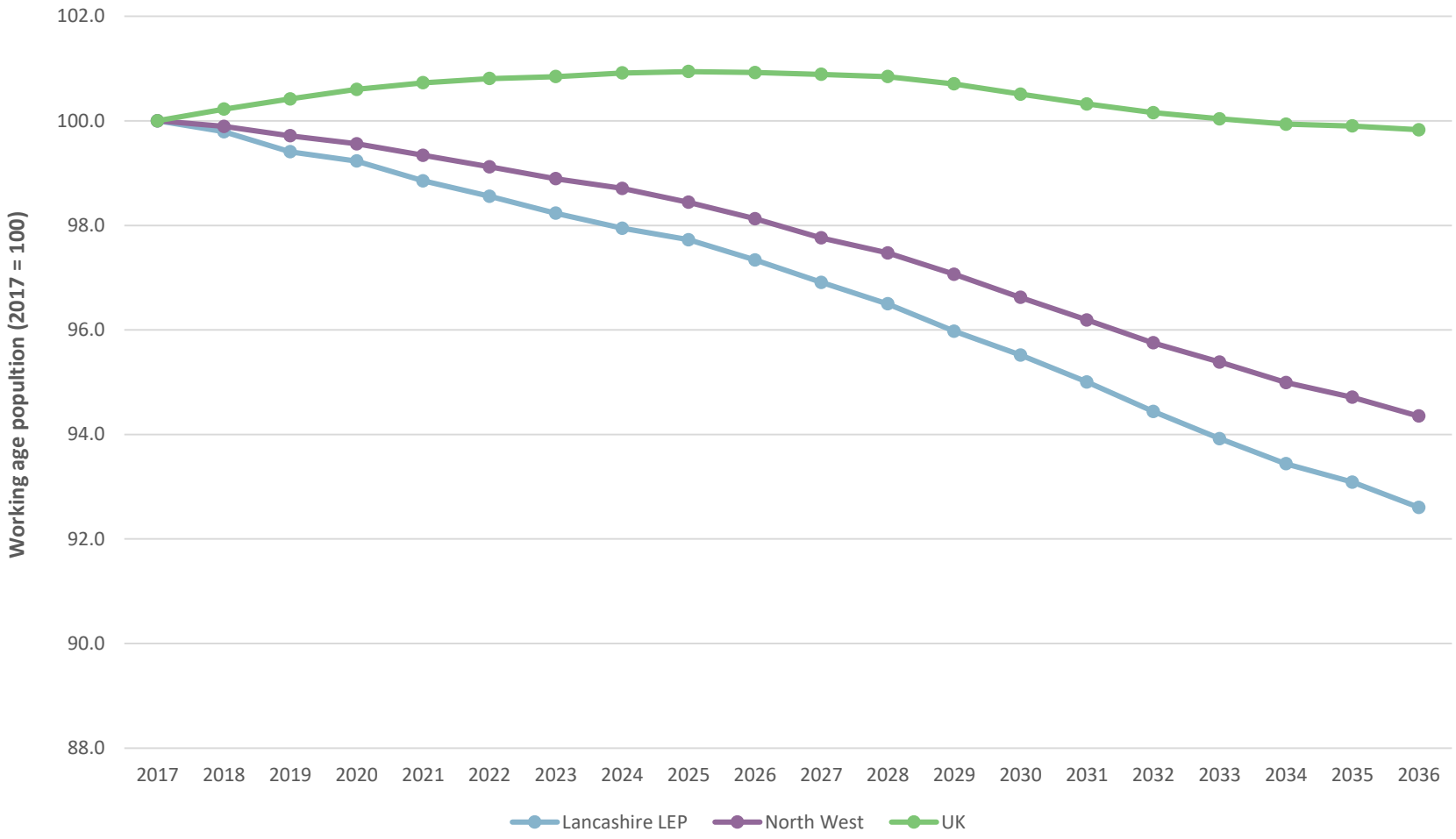
Forecast Summary

	Indicator	Lancs LEP	North West	UK
Now	Working-age Population	914k	4.5m	41.6m
	Employment (workplace-based jobs)	727k	3.6m	34.8m
	GVA (£2013 prices)	29.3bn	157.4bn	1,674bn

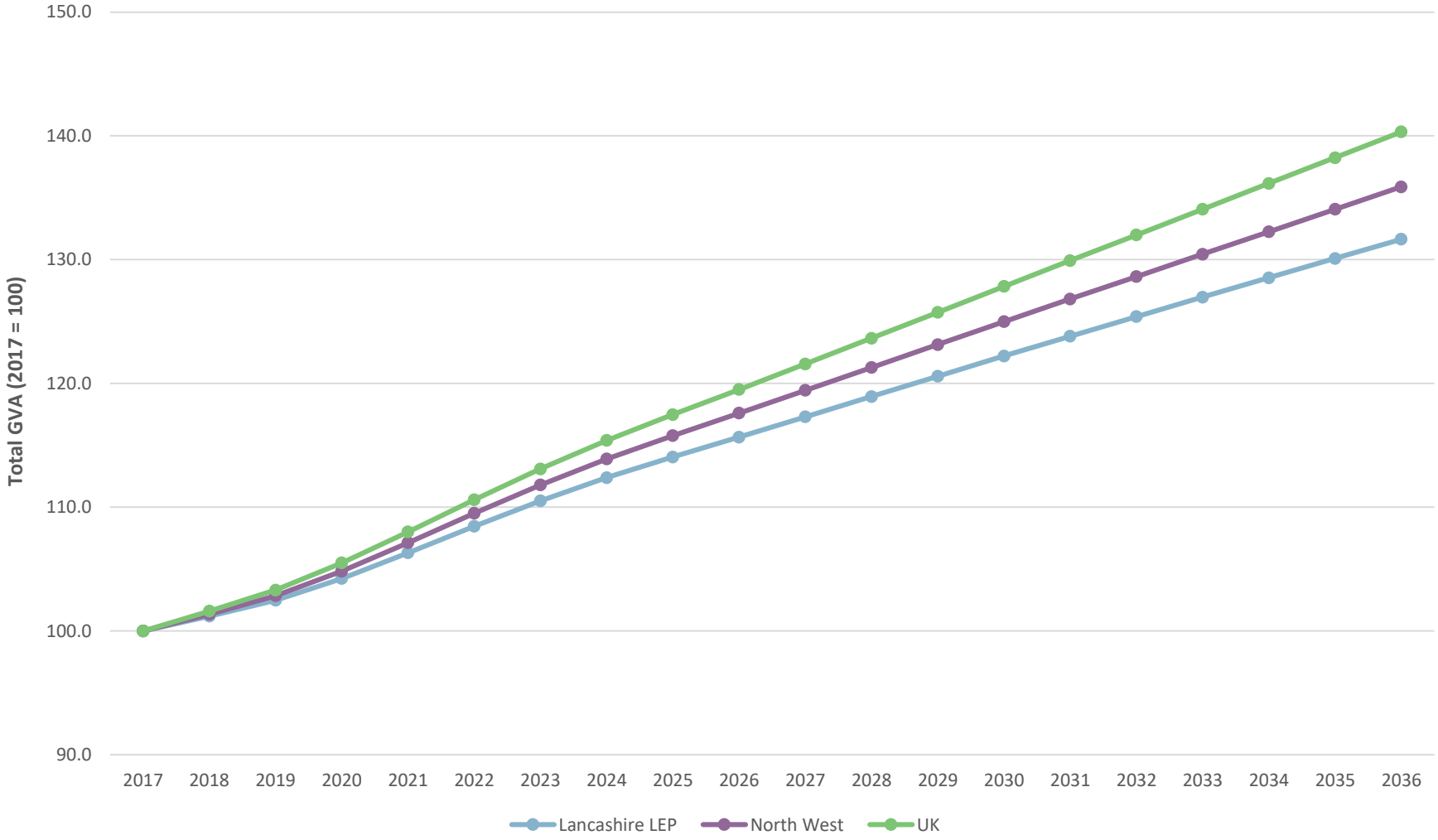
	Indicator	Lancs LEP	North West	UK
2036	Working-age Population	858k (-6.0%)	4.4m (-3.7%)	42.3m (+1.6%)
	Employment (workplace-based jobs)	746k (+2.7%)	3.8m (+5.6%)	37.3m (+7.3%)
	GVA	38.5bn (+31.7%)	213.9bn (+35.9%)	2,349bn (+40.3%)

Source: Oxford Economics forecasting models

Forecast Working Age Population



Forecast Productivity



Forecast Employment by Sector

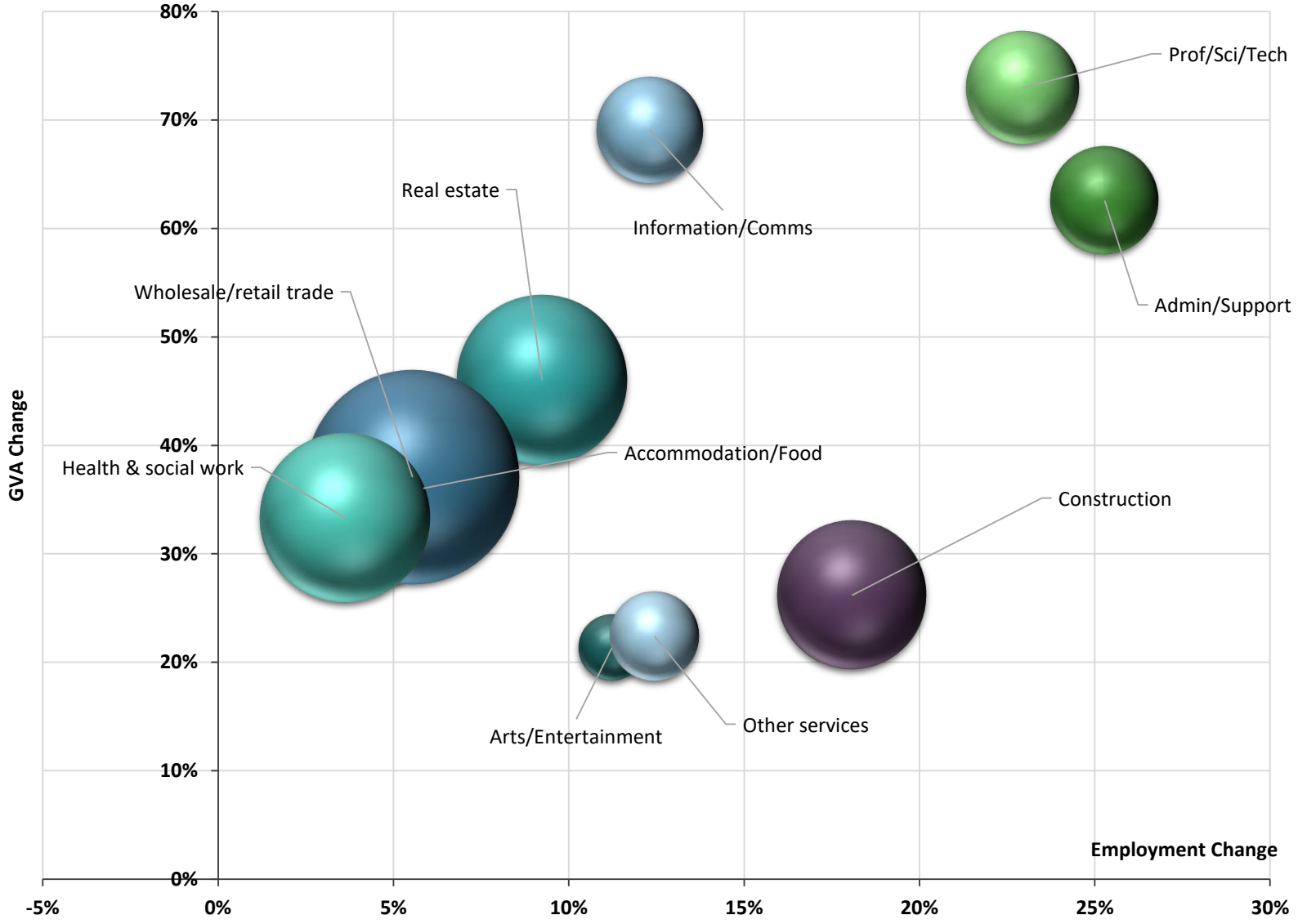
Sector	2017 (Employment 000s)	2036 (Employment 000s)	Change
Administrative and support service activities	50.8	63.7	25%
Professional, scientific and technical activities	39.0	48.0	23%
Construction	51.4	60.7	18%
Other service activities	23.3	26.2	12%
Information and communication	22.2	24.9	12%
Arts, entertainment and recreation	20.5	22.9	11%
Real estate activities	8.9	9.8	9%
Accommodation and food service activities	51.2	54.2	6%
Wholesale and retail trade; repair of motor vehicles and motorcycles	123.3	130.2	6%
Human health and social work activities	105.1	108.9	4%
Transportation and storage	25.8	25.0	-3%
Education	61.9	59.2	-4%
Financial and insurance activities	9.0	8.2	-9%
Public administration and defence; compulsory social security	32.6	27.2	-17%
Water supply; sewerage, waste management and remediation activities	5.9	4.8	-19%
Agriculture, forestry and fishing	9.7	7.7	-20%
Manufacturing	82.6	62.7	-24%
Electricity, gas, steam and air conditioning supply	2.6	1.9	-29%
Mining and quarrying	0.6	0.3	-52%

Forecast GVA by Sector

Sector	2017 (GVA £m)	2036 (GVA £m)	Change
Professional, scientific and technical activities	1,261	2,181	73%
Information and communication	1,123	1,899	69%
Administrative and support service activities	1,155	1,878	63%
Real estate activities	2,860	4,176	46%
Financial and insurance activities	712	989.1	39%
Wholesale and retail trade; repair of motor vehicles and motorcycles	4,527	6,205	37%
Accommodation and food service activities	1,133	1,541	36%
Electricity, gas, steam and air conditioning supply	273	368	35%
Human health and social work activities	2,853	3,804	33%
Water supply; sewerage, waste management and remediation activities	460	609.6	32%
Construction	2,196	2,771	26%
Transportation and storage	1,023	1,255	23%
Other service activities	791	968	22%
Arts, entertainment and recreation	438	532	21%
Manufacturing	4,965	5,950	20%
Education	2,001	2,045	2%
Agriculture, forestry and fishing	230	234	2%
Mining and quarrying	63	58	-8%
Public administration and defence; compulsory social security	1,217	1,088	-11%

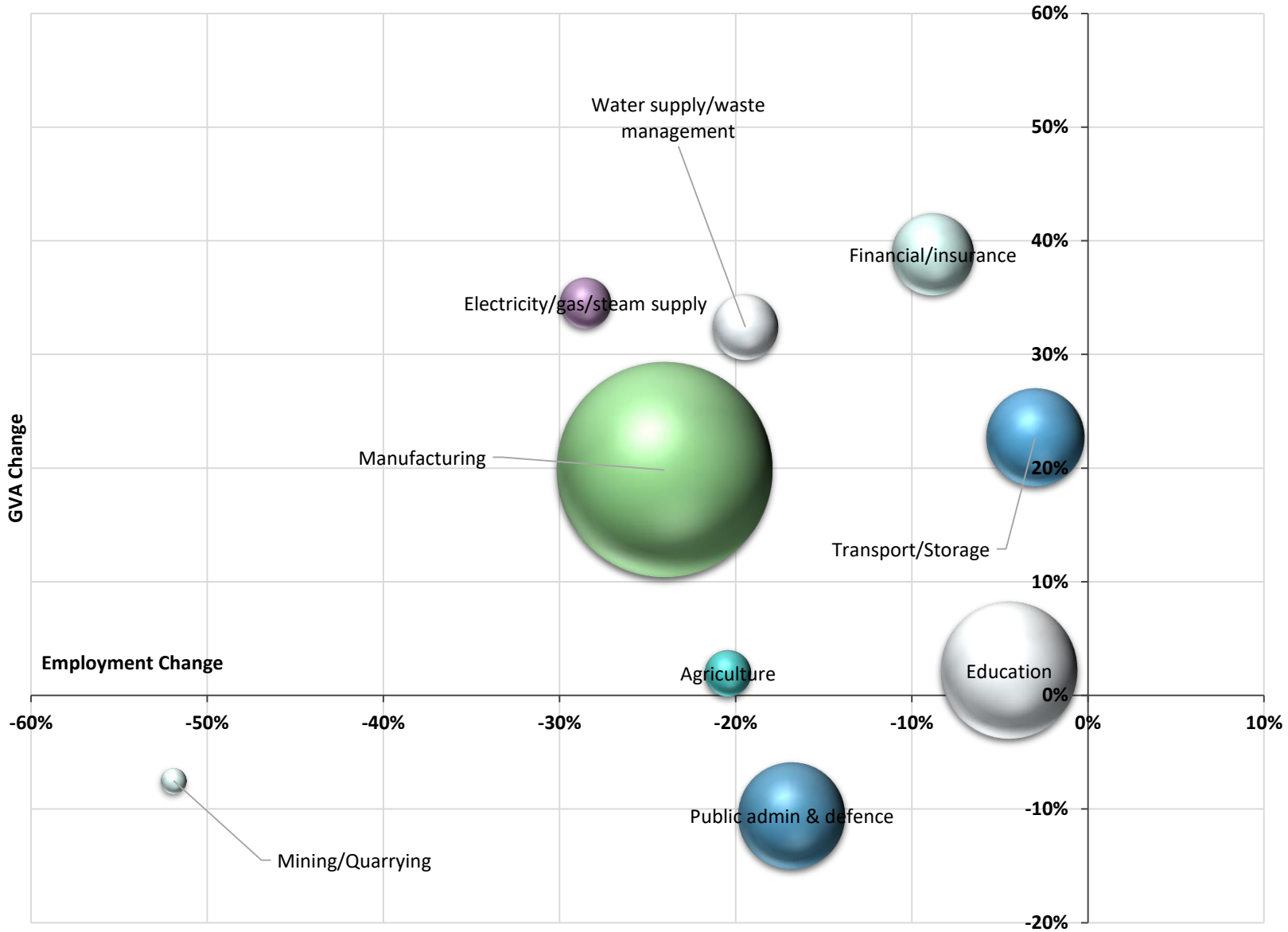
Projected Sector Shapes – Expanders

- Sectors projected to grow in both employment & GVA.



Projected Sector Shapes – Adjusters

- Adjusters are sectors projected to decrease in employment but grow in GVA.



Drawing in Call for Evidence & Scoping Call Evidence to create the SWOT Assessment

Scoping Calls

- 12 semi-structured interviews with key stakeholders from a cross-section of industry, public sector, & academia
- Topics covered included:
  - Opportunities
  - Realistic ambitions
  - Risks & Mitigations
  - Strengths
  - Weaknesses
  - Collaboration

Scoping Calls – High-Level Headlines

- Opportunities:
  - Synergies both within and between sectors (e.g. civil/military aviation, advanced manufacturing/digital)
  - Create new clusters particularly in digital/health tech
- Ambitions:
  - Supporting “disruptive” innovation/technologies across different sectors
  - Combining technologies amongst sectors (e.g. ultra-reliable nuclear tech to automation/aerospace)
- Risks:
  - Lack of ownership and unity to deliver on the strategy
  - Apathy/lack of ambition

Scoping Calls – High-Level Headlines

- Strengths:
  - Significant and established technical strengths across a number of sectors
  - Strong supply chain capabilities
- Weaknesses:
  - Lancashire not currently ambitious enough with it's innovation agenda
  - Strengths not currently well publicised
- Collaboration:
  - Some strong examples of collaboration however tends to be within sectors rather than between
  - Opportunities for a more co-ordinated, pro-active, and responsive innovation collaboration

Call for Evidence

- Review of c.40 documents received from cross section of public/private and academia
- Reviewed through via SWOT analysis across 4 themes:
  - Businesses, sectors & agglomeration
  - People/Human Capital
  - Infrastructures/assets
  - Knowledge
- The SWOT findings from the call for evidence literature review is presented on the following slides

Call for Evidence – Businesses/Sectors - Strengths

- The county has the single largest concentration of aerospace production in the UK, employing over 20,000 people.
- The automotive sector has an important base in Lancashire with a workforce of over 3,500 and, along with nuclear and aerospace, is a key part of the advanced manufacturing sector.
- Energy supply chains, particularly nuclear, offshore, and wind are significant in the area.
- It is a strength that these sectors above are well-established and well-regarded.
- Lancashire businesses are generally good at exploiting export opportunities. Around 20% of all businesses in Lancashire export, and this equates to £5bn worth of goods and services.
- Larger businesses in the area are well linked to HEIs and research centres, and SMEs have many, not necessarily well-publicised, technical strengths in high value sectors.
- Lancaster University Management School (LUMS) is triple accredited and world ranked. It is one of only 4 UK management schools to have gained the Small Business Charter Gold Award in recognition of the role it has played supporting British enterprises.

Call for Evidence – Businesses/Sectors - Weaknesses

- Over recent years Lancashire has failed to capitalise on its key competitive strengths and assets to establish a successful track record in securing new inward investment opportunities.
- The county is currently ranked by UKTI as one of the poorest performing areas in the UK in terms of attracting new foreign-owned companies.
- Lancashire's poor performance relative to its economic size, industrial strengths and neighbouring competitor areas is in part due to the absence of a strategic marketing and investor development capacity.
- There could be a broader sector focus outside of high value manufacturing and the other obvious strengths. There is less of a focus on potentially important sectors such as food and drink, digital, tourism, professional services, and chemicals.
- Although large companies are well connected both regionally and internationally, more could be done to engage and connect SMEs. In particular, connecting SMEs more closely to the graduate talent pipeline and to international markets and export opportunities.
- While large companies are nationally and internationally connected, again more could be done to encourage SMEs to operate internationally.

Call for Evidence – Businesses/Sectors - Opportunities

- Opportunities to take advantage of Industry 4.0, not just in the advanced manufacturing sector but in enablers such as digital and specialised logistics.
- In nuclear, the development of Small Model Reactors (SMRs) presents an opportunity for the area to develop a nuclear advanced manufacturing hub.
- Developing and improving access to strategic employment sites.
- Improving the internationalisation of SMEs via existing networks HEIs and larger companies have, ensuring the supply chain can benefit from global markets.
- Lancaster is home to a burgeoning group of digital businesses and there is an opportunity for it to become the perfect place to operate as a test bed location.

Call for Evidence – Businesses/Sectors - Threats

- Overseas competitors are fast learners, particularly in aerospace.
- Pressure to reduce production costs has resulted in upper tier companies seeking to rationalise and simplify their supply chains.
- A sector profile report for Lancashire shows that unless additional land becomes available/ developed there will be a "shortage of employment land in Lancashire to 2019 and to 2024.
- A focus on existing strengths means the area could be too focussed on sustaining a presence rather than being more innovative in other growing sectors.
- One concrete consequence of the UK leaving the European Union will be the loss of EU structural funds. These have been of great importance in providing both capital and revenue funding for business and innovation support in the region, particularly to SMEs.

Call for Evidence – People/Human Capital - Strengths

- Higher level skills (Level 4+) have increased in recent years. There has been a 5-percentage point increase in the proportion qualified to this level between 2004 and 2014 (from 24 to 29%). This is equivalent to an increase of 56,500 of the workforce with higher level skills.
- Universities are good at attracting graduate talent in high value STEM subjects and are increasingly focussing on retention and connecting graduates to local employers.

Call for Evidence – People/Human Capital - Weaknesses

- Widespread consensus that skills remain a problem. This includes intermediate technical skills and graduate attraction and retention.
- Mismatch between the chosen career and skills development pathways of local people and the sectors of the economy which have the greatest growth potential.
- Raising awareness of career prospects in regional SMEs through internships and placements to highly-skilled graduates could be improved.
- Concern about gaps in leadership and management, to enable businesses to compete in international marketplaces.
- Other skills issues include difficulties in finding individuals with language and engineering skills, and engineers with marketing skills.

Call for Evidence – People/Human Capital - Opportunities

- The Energy HQ at Blackpool & Fylde College – the development of a National Energy HQ to meet the training needs of the energy and oil and gas sectors.
- Lancaster Campus Teaching Hub (Health and Social Care) – to provide staff and students with fully flexible space to support growth in qualified professionals and deliver CPD to upskill the existing workforce.
- The Advanced Manufacturing Centre for Skills Development and Employer Engagement - a £1.3m partnership between Lancaster University and BAE Systems to facilitate skills development.
- Opportunity to use higher level and degree-level apprenticeships to help meet the demand for high level skills although there may be a need for incentives to increase employer participation.

Call for Evidence – People/Human Capital - Threats

- Employers are likely to find it difficult to recruit higher skilled and experienced personnel.
- Increasing demand for construction is likely to lead to more severe skills shortages in skilled trades.
- Growth in business and professional services and ICT related business may be affected by a limited pool of labour of well qualified younger people.
- Economic forecasts suggest that manufacturing employment will decline by some 10,000 jobs over the next ten years.
- At every level, a better educated and qualified workforce is required, with both soft and professional & technical skills, to improve the overall competitiveness and sustainability of the Lancashire economy.
- There is a need to ensure that the engineers of the future are fully equipped with the right skills to work in an Industry 4.0 setting.
- Replacement of an ageing workforce will become increasingly pressing.
- The potential decline in EU nationals working in the private sector and academia will need to be managed.

Call for Evidence – Infrastructure/Assets - Strengths

- The National Nuclear Laboratory (based at Sellafield) is the most relevant publicly-funded non-university R&D facility.
- Enterprise Zones with sector focuses including:
  - Samlesbury Aerospace EZ (Advanced Manufacturing & Engineering)
  - Hillhouse Technology EZ (Energy, Chemicals & Polymers)
  - Blackpool Airport EZ (Energy, Wind, Nuclear & Waste to Energy)
  - Wharton Aviation EZ (Advanced Manufacturing & Engineering)
- Four HEIs located or part-located in the LEP area
- Port of Heysham, provides logistics support to one of the largest offshore gas fields in UK waters. Well placed to exploit market opportunities presented by existing and new offshore wind operations and maintenance facilities.

Call for Evidence – Infrastructure/Assets - Weaknesses

- Area has failed to attract significant new occupiers and investors in recent years.
- There has been relatively little additional, new, city centre office supply developed over the last decade in key centres such as Preston.
- There is a strong perception locally that East Lancashire is poorly connected.
- Congestion on the M65 is already evident during peak periods and exacerbated by the limited capacity, traffic flow composition and proximity of some junctions. This is negatively impacting on access and connectivity to key employment sites along the M65 corridor.
- For businesses in the digital sector, a current lack of the fundamentals of office space, networking, finance, support and telecoms infrastructure are making it difficult for businesses and start-ups to thrive.

Call for Evidence – Infrastructure/Assets - Opportunities

- A new Preston Western Distributor will improve access to the Warton site of the Lancashire EZ, the Springfields nuclear fuel facility at Salwick.
- Electrified rail services between Preston, Manchester and Liverpool.
- UCLAN Engineering Innovation Centre (EIC) - UCLAN Engineering Innovation Centre (ERDF) – due to be completed in 2019, the centre will host specialist engineering R&D facilities, and continued opportunities for local SME support.
- Burnley Vision Park - High quality 5-acre business park to accommodate advanced manufacturing and engineering sectors and to include 46,000 sq. ft. first phase incubator, workspace and grow-on space.
- Edge Hill University Innovation Technology Hub - The Edge Hill Technology Hub will create new and refurbished, high quality space for teaching, learning, student employability, enterprise and knowledge exchange activities.

Call for Evidence – Infrastructure/Assets - Threats

- Three motorways intersect with the M6 at Preston; anticipating pressures on this important part of the Strategic Road Network is of critical importance to Preston, Lancashire and the broader north of England economy.
- 90% of East Lancashire's manufacturing plants (1800) employ less than 50 people, and many of these businesses still operate from outdated mill premises, potentially constraining their ambitious growth opportunities.
- Any future changes in government policy around rail or road infrastructure investment could impact on potential network improvements and prevent these problems from being tackled.

Call for Evidence – Knowledge - Strengths

- The North West AMRC at Salmesbury, which links to the University of Central Lancashire's (UCLan) Engineering Innovation Centre, is the first substantial project which will begin to achieve an Advanced Manufacturing Innovation District.
- Research impact outperforming national averages in key underpinning areas for Industry 4.0, including Human-Computer Interaction, Computer Graphics/ Computer-Aided Design, Artificial Intelligence, Ceramics and Composites, Transportation, Business and International Management.
- Large teaching hospitals, with many leading clinicians and academics active in collaborative research with local universities and the private sector.
- In 2014, BAE Systems managed overall research and development (R&D) investment of £902m, including £63m of its own funds.
- A weighted average of companies undertaking product and process innovation shows values of 25.4% in Lancashire compared to 23.6% in England as a whole., suggesting a strong foundation and culture of innovation in the area.
- There are a number of successful knowledge transfer partnerships in the region, and an increasing focus of connecting research and innovation between HEIs and the private sector.

Call for Evidence – Knowledge - Weaknesses

- Although there are some highly innovative companies, the overall level of private sector R&D is too low.
- On 2013 data, Lancashire ranked 27 out of 39 LEPs on R&D investment, with expenditure of £204 million (£390 per FTE).
- The excellence of the region's translational research institutions is acknowledged, but they should operate at a larger scale across the whole region to meet fully the demands and needs of the regional industrial base.
- There is a high degree of connectivity between the region's innovative manufacturing firms, though there is evidence of a long tail of less innovative companies.
- The research base is well connected to national and international networks, though more could be done, for example in some aspects of digital.

Call for Evidence – Knowledge – Opportunities

- The projected increase in the development and use of autonomous systems in both defence and civil applications provides a real opportunity for Lancashire to position itself as a centre of excellence in this area.
- The global security technology and services market is predicted to grow to more than £52 billion by 2016. Lancashire has unique strengths in this sector and there is an opportunity for Lancashire to position itself as a centre of expertise in this growing sub-sector.
- The growing use of big data will open up new commercial opportunities, such as the provision of data aggregation and analytics services to a wide range of businesses from climate change to manufacturing and defence.
- Lancaster University, together with partners Lancaster City Council and Lancashire County Council, is developing a Health Innovation Campus.
- Eco-innovation Cumbria is an existing ERDF funded programme led by the University of Cumbria with partners from Lancaster University and UCLan. Eco-Innovation Cumbria aims to increase innovation in, and adoption of, low carbon technologies.

Call for Evidence – Knowledge – Threats

- The region has a well-developed business network relating to innovation, representing the focus sectors, as well as those relating to SMEs. However, given the need for enhanced diffusion (in terms of speed of diffusion, and breadth across sectors) of technology relating to the developments of Industry 4.0, there is a need to review how these networks are responding and if they can continue to operate effectively.
- In Nuclear, a study by NAMRC indicated that supplier capacity could be the limiting factor if several small modular reactors were to be ordered simultaneously, which, given the opportunities for Lancashire in this area, is a risk to manage.
- There is some skepticism as to whether investment in technology alone will stimulate a suitable return on investment. Rather investment in skills will provide the appropriate support for the comprehensive innovation needs of the breadth of Lancashire's businesses.
- Should Britain leave Euratom when it exits the EU, there is potential that this may have a negative impact on technology transfer and innovation.

Aggregated SWOT Assessment

- The scoping calls, call for evidence, and secondary data analysis were combined to create an aggregated SWOT analysis of Lancashire's innovation potential.
- The following slides present the aggregated SWOT for the four themes.

Business/Sectors

Strengths

- Established sectoral strengths, particularly in AdvMan (Aerospace, Automotive), Energy (inc. nuclear), & Health/Social Care
- Track record of exporting/trading
- Good links between large businesses & HEIs/Research Centres
- SME/supply chain technical strengths in high value sectors
- Above average employment growth rate
- BOOST

Weaknesses

- Failure to secure inward investment
- Newco formation rate below UK average
- Slow GVA growth compared to NW & UK & widening relative productivity gap
- Business birth rate lags behind comparators
- Absence of strategic marketing capacity
- Overly insular mindset amongst SMEs

Opportunities

- Industry 4.0
- Small modular reactors (SMRs) . . . & nuclear AdvMan hub
- Fracking
- Well aligned with NPh IER
- Using existing networks to improve internationalisation of SMEs
- Test-bed opportunities – Health & Engineering
- Connecting SMEs to graduate talent & export opportunities

Threats

- Focus on traditionally strong sectors potentially at expense of others
- Competition, particularly from overseas
- Pressure for Tier 1s to reduce costs/rationalise supply chain
- Shortage of employment land
- Loss of EU Structural Funds
- Autonomy & digitization of rote activities

People/Human Capital

Strengths

- Higher level skills increased in recent years (+5% between 2004-14)
- Graduate retention rates generally high
- Pipeline of new skills initiatives & facilities in key sectors
- Good network of providers – Skills Hub coordination
- Lancaster University Mngt School
- HEIs/FEs which get 'inclusion'

Weaknesses

- Higher level skills lag behind UK average
- Widespread 'consensus' on skills needs remains a problem
- Mismatch between career/skills pathways of residents & key sectors
- Need to raise awareness of career prospects with SMEs
- Concern about gaps in leadership & management

Opportunities

- New initiatives inc Energy HQ, Lancaster Campus Teaching Hub for Health & Social Care, AdvMan Centre etc.
- Use of higher/degree-level apprenticeships to meet demand
- Northern Powerhouse Productivity Academy
- General scope for realigning to Industry 4.0

Threats

- Loss of highly-trained graduates to other parts of the country
- Replacement of ageing workforce
- Manu employment forecast to decline
- Major improvements in soft/professional/technical skills required
- Below average WAP, with WAP base expected to shrink in coming years
- Potential decline in attractiveness for EU Nationals
- Skills policy fuzziness nationally – Apps vs degrees, levy etc.

Infrastructure/Assets

Strengths

- High class R&D facilities across key sectors
- Enterprise Zones with key sector focus
- Four HEIs located/part-located in the area
- Translational research centres
- Strategic assets (eg as Port of Heysham)
- Relatively low Travel to Work times of employees

Weaknesses

- Failure to attract significant new occupiers & investment
- Relatively little new office space added to key centres in recent years
- Parts of LEP area poorly connected (e.g. East Lancs)
- Lack of infrastructure for digital start-ups
- Civic capacity & capability

Opportunities

- Capacity to grow – land & utilities
- Number of initiatives including:
  - Preston Western Distributor
  - Electrified rail investment
  - Burnley Vision Park
  - UCLAN Engineering Innovation Centre
  - Edge Hill Innovation Tech Hub

Threats

- Pressures on strategic road network
- Lack of employment space for growth
- Negative impacts of changes to Government policy on road or rail infrastructure will have a negative impact
- No upside from HS2/HS3 investment
- Attractiveness of QoL offer – housing & public services

Knowledge

Strengths

- NW AMRC at Samlesbury, EIC at UCLAN
- HEIs outperforming national averages in some underpinning areas for Industry 4.0
- Large teaching hospitals collaborating with HEIs/private sector
- Product & process innovation slightly higher than UK average
- Successful knowledge transfer partnerships

Weaknesses

- Overall private sector R&D is too low
- Translational research centres need to operate at larger scale
- Long tail of less innovative companies
- Smaller proportion of UGs & FT Post-Grads studying STEM subjects than nationally
- Academic links to Big Data agenda
- Innovation 'reputation' – historic

Opportunities

- Autonomous systems in Aerospace & AdvMan
- Next gen nuclear health & eco-innovation
- Global security technology/cyber market
- Big Data & Analytics
- Low-carbon sector more generally
- Greater role in Global Innovation Networks & Global Value Chains, post Brexit

Threats

- Need for enhanced diffusion
- Ability of key sectors to capitalize & deliver on growth opportunities
- Ensuring investment in skills as well as technology
- Brexit impacts on research collaboration
- Much lower £ per employee R&D expenditure compared to UK average – specifically in BERD & GovERD
- Innovation not yet a 'pervasive' behavior
- Lancs falls behind

Overarching SWOT Analysis for Lancs

Strengths

- Sectoral strengths, tier 1 & supply chain - Smart Specialisation
- Graduate retention rates are good, & higher level skills are gradually improving
- Significant HEI, R&D, & translational research centre assets
- Track record of successful knowledge transfer partnerships & collaboration

Weaknesses

- Lack of inward investment & need to improve SME connectivity to talent & export opportunities
- Low skills/aspirations – longstanding
- Poor connectivity in parts of county, physically & digitally
- Low levels of private sector R&D, need to scale up & connect SMEs to opportunities

Enterprise
Skills
Infrastructure /Assets
Knowledge

Opportunities

- Productivity improvements as result of Industry 4.0, delivery of strategic sites & SME clusters
- Wholesale shift to value-added economy gradually improving
- Number of initiatives in key sectors covering technical & leadership & management skills
- Frictionless interface between business & knowledge base

Threats

- Competition from overseas, cost challenges, focus on key sectors potentially at expense of others
- Replacing ageing workforce, forecast employment decline in some key sectors
- Ongoing connectivity problems, county 'passed by' by key infrastructures
- Parochial & insular approach to knowledge

Simon P's 3 Innovation Channels

- 'Staying Ahead' innovation
- 'Routeways to new excellence' innovation
- Process & behaviour innovation

Next Steps

- Notes from today's session & slide-pack
- Development of Plan Framework themes & vision statement, drawing on . . .
  - Baseline
  - Econometrics (& related market/technology futures work)
  - Policy review work
  - Today's feedback
  - Further round of consultation & reflection
- . . . & starting to think about impactful actions
- Presentation of strategy framework
  - Second Workshop event October 2017
- Action planning work
- Third workshop event October/November 2017

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Lancashire County Council
Lancashire Innovation Strategy
Asset List

BasicSheet

Asset Name

Academic Centre of Excellence in Cyber Security Research - (Security Lancaster Research Centre, Lancaster University)

Advanced Manufacturing Capital for Skills Development & Employer Engagement (Project)

Advanced Manufacturing Research Centre (AMRC) North West

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Alstom Transport

Asahi Glass Chemicals

Assystem Design and Engineering Services

BAE Systems (Samlesbury Aerodrome)

BAE Systems (Warton Aerodrome)

BAE Systems' Training Academy (The Advanced Manufacturing Centre for Skills Development and Employer Engagement)

Blackpool & Fylde College - Lancashire Energy HQ

Blackpool & Fylde College

Blackpool & Fylde College - Maritime Engineering Facility

Blackpool 21st Century Conference Centre & Hotel
Blackpool Airport
Blackpool BHVA
Blackpool Bridges Maintenance
Blackpool Heritage Visitor Attraction

Blackpool Integrated Traffic Management
Blackpool Teaching Hospitals NHS Foundation Trust
Blackpool Town Centre Quality Corridors
Blackpool Tramway Extension
Burnley Vision Park
Business Insight3 (Bi3)/ Edge hill Partnership
CAP Gemini
Capita
Carphone Warehouse
Centenary Way Viaduct Maintenance
Centre for Global Eco-Innovation
Collaborative Technology Access Programme (cTAP)
Co-operative Bank
Darwen East Distributor
East Lancashire Strategic Cycle Network
EDF Group
Edge Hill Innovation Technology Hub
Edge Hill University
Energy Simulator Suite (equipment) for Lancashire
Energy HQ
Energy Skills HQ
Engineering & Innovation Centre (EIC) (UCLan)
Fleetwood Fire Training Centre Phase 2
Guardian Financial Group
Heysham Power Stations
HGS
Hurst Green Plastics Ltd
Hyndburn-Burnley-Pendle Growth Corridor
Hyndburn-BurnleyPendle Growth
Corridor
James Fisher Aerospace
James Fisher Nuclear
Lancashire Care NHS Foundation Trust
Lancashire Centre for Excellence for Digital
Technology and Innovation
Lancashire Energy HQ
Lancashire NHS Test Bed

Lancashire Teaching Hospitals NHS Foundation Trust
Lancaster Campus Teaching Hub (Health and Social Care)
Lancaster China Catalyst Programme
Lancaster Health Innovation Campus
Lancaster Management School
Lancaster University
Lomeshaye Industrial Estate Extension
M55 to St Annes Link road
Making Rooms - Lancashire's First Fab Lab
Mechanical & Electrical Replacements, South & Montreal Buildings
Myerscough College - Farm, Innovation Technology Centre
National Nuclear Laboratory
National Nuclear Laboratory
Nelson & Colne College - Advanced Engineering & Manufacturing Innovation Centre
North West Burnley Growth Corridor
NS&I
PACCAR (Leyland Trucks)
Panaz
Pennine Gateways Blackburn and Darwen
Port of Heysham
Precision Polymer Engineering
Preston City Centre Improvements
Preston Western Distributor
Rawtenstall Redevelopment Zone
Realtime: UK
Redevelopment of Brierfield Mill
Rolls Royce (Barnoldswick)
Runshaw College - Science & Engineering
Runshaw Enhancing IT Infrastructure Project
Safran-Aircelle
Sanko-Gosei
Sellafield Ltd
Shady Lane

South Lancaster Housing Growth Initiative
Springfields Fuels
The LEAD Programme (Lancaster University Management School)
Training 2000 - Additional Engineering Training Capability
UCLAN Adelphi Square
UCLan Engineering Innovation Centre
UCLan Westlakes Campus
UNITE With Business
University of Central Lancashire (UCLan)
University of Cumbria
University of Cumbria Lancaster Campus
Victrex
Vinnolit GMBH
Westinghouse Springfields Fuels Ltd

END

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