



**Cheshire and Warrington LEP
Science and Innovation
Strategy and Delivery Plan
September 2018**

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v.4

Executive Summary

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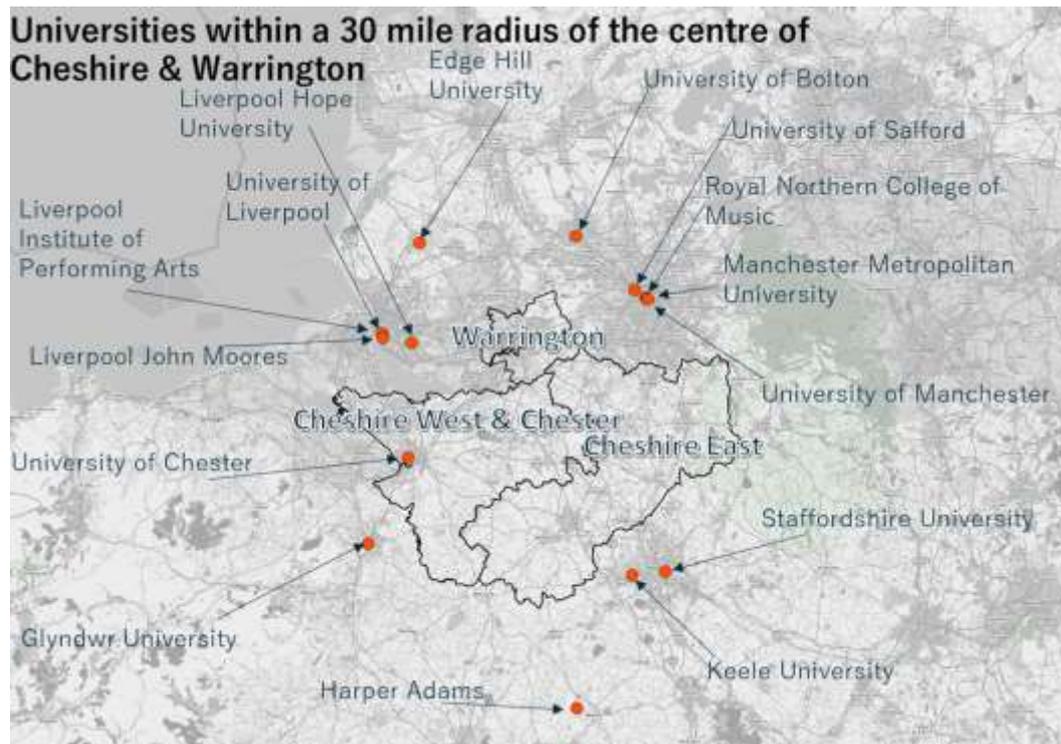
Introduction

Science and Innovation are critical to maintaining and improving productivity. Government recognises this through its Industrial Strategy, aiming to 'drive partnerships between the best minds in science and business in Britain'. Industry itself recognises the importance of innovation, for instance the Federation of Small Businesses' report 'Spotlight on Innovation', published in July 2017¹, raises a number of points of relevance to the LEP in developing this strategy: -

- 24% of small firms have not made any significant changes to products or ways of working in the last three years – with many held back by pressures on time or resources
- Small businesses that do innovate are far more likely to introduce a change within their business (95%) like a new software or change to organisational structure or marketing process, rather than invent a new, market changing product (25%)
- The term "innovation" can be interpreted wrongly by smaller businesses, and that conversations framed around 'significant business improvements' can be much more fruitful
- The proportion of small businesses that innovated in the past three years was highest in manufacturing and information and communications sectors (both 84%)
- Around two thirds (67%) of innovators invested up to £10,000 to innovate in the past three years; only 10% of innovators accessed Government support to make changes, with half (46%) of the remaining 90% saying they did not know of any support.

In terms of academic science, Cheshire and Warrington is at the centre of one of the largest concentrations of Higher education Institutions in Europe with 15 HEIs within a 30-mile radius providing access to some 200,000 students. More specifically, the sub-region is home to the University of Chester which has 13 'Centres of Research Excellence' including Allied Health Professions, Psychology, Psychiatry and Neuroscience and Dentistry, Nursing and pharmacy.

¹ Federation of Small Businesses (July 2017) 'Spotlight on Innovation: How Government Can Unlock Small Business Productivity'



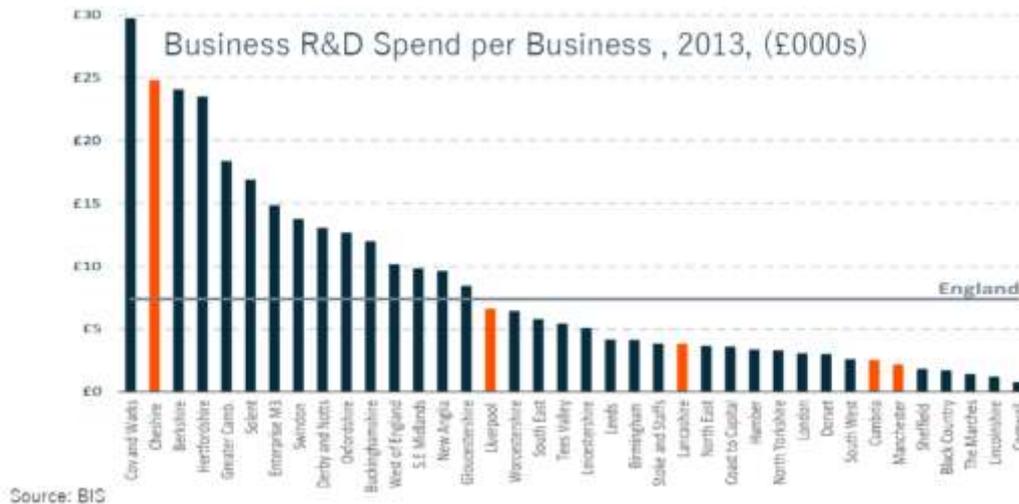
Source: Regeneris 2018 (Using data from HEFCE, 2013; HESA, 2017)

We are historically an innovative sub-region, having been home to the Electricity Council Research Centre Innovation in Capenhurst, Shell's research centre at Thornton and the Atomic Energy Authority laboratories at Risley. Whilst many of these facilities have changed their form and function over time, that legacy of business-led innovation remains. Innovation and has many definitions but we are taking a broad view covering not only creating new things but doing things in a different way or using different technologies.

One of the biggest factors facing our economy is the increase in the use of digital technologies and platforms. This links to the emerging digital strategy, but also very much to the innovation agenda – digital is often a means to an end, rather than an end in itself [NB, the LEP is commissioning a separate, dedicated Digital Strategy].

We are home to many innovative businesses and key science assets – some of them of global significance. We also have a portion of our business base that is less productive than national and international benchmarks, and innovation may be key to tackling this issue.

Business investment in innovation, research and development in Cheshire and Warrington is high; public sector investment lags behind many other areas. The views of stakeholders at a number of the sessions the LEP held to develop this strategy was that this in itself was not necessarily a bad thing – business tends to invest in R&D where it sees a defined need and opportunity.



The Cheshire Science Corridor is the key spatial priority for Science and Innovation in the SEP. One of the key areas of feedback has been the need to raise the profile of the science and innovation assets within the Cheshire and Warrington sub-region (and the North as a whole) and the Science Corridor is seen as a good vehicle for doing this.

The LEP would like to acknowledge the input from the many businesses and public-sector agencies and stakeholders who attended a series of workshops held to support the development and test the thinking around the emerging Strategy.

Whilst not home to an N8 University, Cheshire and Warrington can draw on the research expertise and resources of some 15 Universities within an hour's drive of the sub-region. Our own University – the University of Chester – is developing its offer in key sectors such as engineering, information technology and nursing.

Our Vision for Science and Innovation / Science and Innovation in the SEP

The refreshed SEP, initially published in 2017 set out a series of high level **ambitions** in the area of Science and Innovation: -

- Creating a place where innovation and new thinking is encouraged and supported
- Offering a fertile location for academic and industrial research and development, working to support a strong ecosystem that can develop and deliver practical commercial solutions
- Use the Cheshire Science Corridor as a foundation to develop and maintain innovation and knowledge networks and linkages with Centres of Excellence (including Catapult Centres) elsewhere in the UK and internationally.
- Identify and support those areas where we can demonstrate a track record of innovation excellence and which could be developed, through working with Government, into nationally and internationally-leading resources.
- Build stronger links to those research-intensive Universities in neighbouring sub-regions and beyond which are undertaking academic research of relevance to our business base
- Build on the strengths identified in Science and Innovation Audits undertaken with Greater Manchester LEP and Liverpool City Region LEP and others

- Work with education and skills providers to ensure business has access to a workforce with the qualifications and skills they need

In short, we want Cheshire and Warrington to an outstanding location for science and innovation.

This vision is based on a strong track record in a number of areas including

- Excellence in research in space (Jodrell Bank / SKA)
- Excellence in research and development in life sciences and pharma (Astra Zeneca / Alderley Park legacy)
- Excellence in materials chemistry (Wood, Waters Corporation, National Nuclear Laboratory)
- Excellence in innovation in energy and environment (CEGB / Atomic Energy Authority / NNL / UU / Wood)
- Excellence in digitally enabled process and product innovation (Siemens / ??)

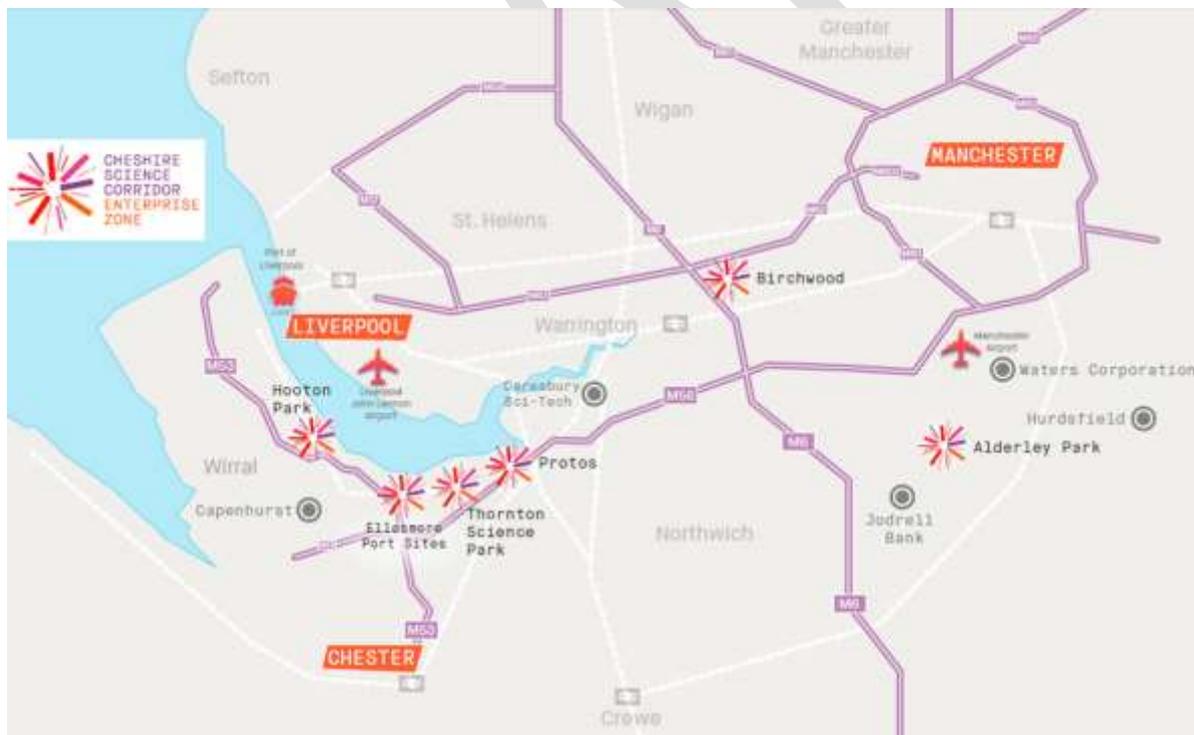
CASE STUDY – Square Kilometre Array

CASE STUDY – Alderley Park (BioHub?)

CASE STUDY – Wood Group

CASE STUDY - Cheshire Science Corridor

The Cheshire Science Corridor is home to the largest concentration of science and technology assets in the North of England, ideally located between two of the UK's most dynamic cities, Manchester and Liverpool.



This cluster of scientific talent is home to world-class innovators who are forging new discoveries and technologies that are revolutionising industry, energy, health and space.

This unique corridor of scientific know-how is home to the highest skilled workforce in the North of England working for world-leading companies that recognise the benefits of locating in such a talent-rich region.

From incubators, co-working laboratories and grow-on space for scale-ups through to bespoke campus headquarters, science and technology companies investing in the Cheshire Science Corridor will be joining a cluster of more than 200 science and research organisations with access to four of the UK's top 10 STEM universities.

The Cheshire Science Corridor is home to:

- **Alderley Park** – the UK's largest and best invested bioscience campus renowned for the discovery and development of innovative new medicines, including Beta Blockers, home to over 150 life sciences businesses, the national Anti-Microbial Resistance Centre (AMR) and Innovate UK's Medicines Discovery Catapult.
- **Birchwood Park** – established and diverse science and engineering business location and the centre for Nuclear Services in the UK including the National Nuclear Laboratory, the Nuclear Decommissioning Authority, Sellafield Ltd's Design Engineering Centre, Rolls-Royce Nuclear, Atkins, Amec Foster Wheeler, AECOM and Nuvia.
- **Capenhurst Technology Park** - a cluster of leading companies at the site of the former Electricity Council Research and Development Centre and URENCO's uranium enrichment and nuclear waste treatment plant.
- **Hurdsfield** - home to chemical specialist BASF Performance Products and Astra Zeneca's second largest global manufacturing operation employing 2,500 staff producing products for 130 global markets, which are estimated to account for 1% of the UK's exports.
- **Jodrell Bank** – home to the University of Manchester's Centre for Astrophysics and the global HQ for the Square Kilometre Array, the World's biggest science experiment.
- **Protos** – where Peel Environmental is creating a nationally strategic energy hub including the Frodsham Wind Farm, energy from waste facility, biomass facility and environmental technologies including resource recovery.
- **Sci-Tech, Daresbury EZ** - the Science and Technology Funding Council facility at Daresbury just over the border in the Liverpool City Region and home to the UK's fastest industrial supercomputer and the University of Liverpool's Virtual Engineering Centre.
- **Thornton Science Park** - formerly Shell's European Research HQ and home to the University of Chester's Faculty of Science and Engineering and the Energy Security and Innovation Observing System for the Subsurface (ESIOS) funded.

The Cheshire Science Corridor benefits from Enterprise Zone status, which provides attractive business incentives for companies moving into a number of designated science parks and development sites. The Enterprise Zone has been up and running now for two years and continues to achieve excellent results:

- 623 new jobs created
- 40 new businesses
- Over £30m in private sector investment
- 247,000 sq ft of new and refurbished commercial floorspace

The LEP has been working closely with landowners and developers to create an investment strategy, which will see the LEP invest £20m in infrastructure and new commercial floorspace to further unlock and accelerate development in the Enterprise Zone and attract new investors and occupiers into the sub-region.

Current Policy Position

National

There are some challenges around articulating national Science and Innovation Policy. No current, single policy exists (one was developed during the early days of the Coalition Government in 2010), however a number of policy documents do cover this agenda.

Industrial Strategy

Principal amongst these is the UK Industrial Strategy, published in November 2017, which aims to set a 'long term plan to boost the productivity and earning power of people throughout the UK'.

Comprising a mixture of 'foundations' and 'Grand Challenges' the Strategy looks to build on existing industrial and academic strengths. The ideas foundation and the emphasis on innovation through the four Grand Challenges (Ageing Society, Artificial Intelligence & Data Economy, Clean Growth and the Future of Mobility) place science and business-led research at the heart of the Industrial Strategy.



Cheshire and Warrington is one of six LEPs selected to develop a 'Local Industrial Strategy' (LIS) as part of a recently announced second wave. In doing so we will need to look at how, as a sub-region, we respond to those Grand Challenges in terms of their impact on our future economy and also as a potential source of ideas responses to address them.

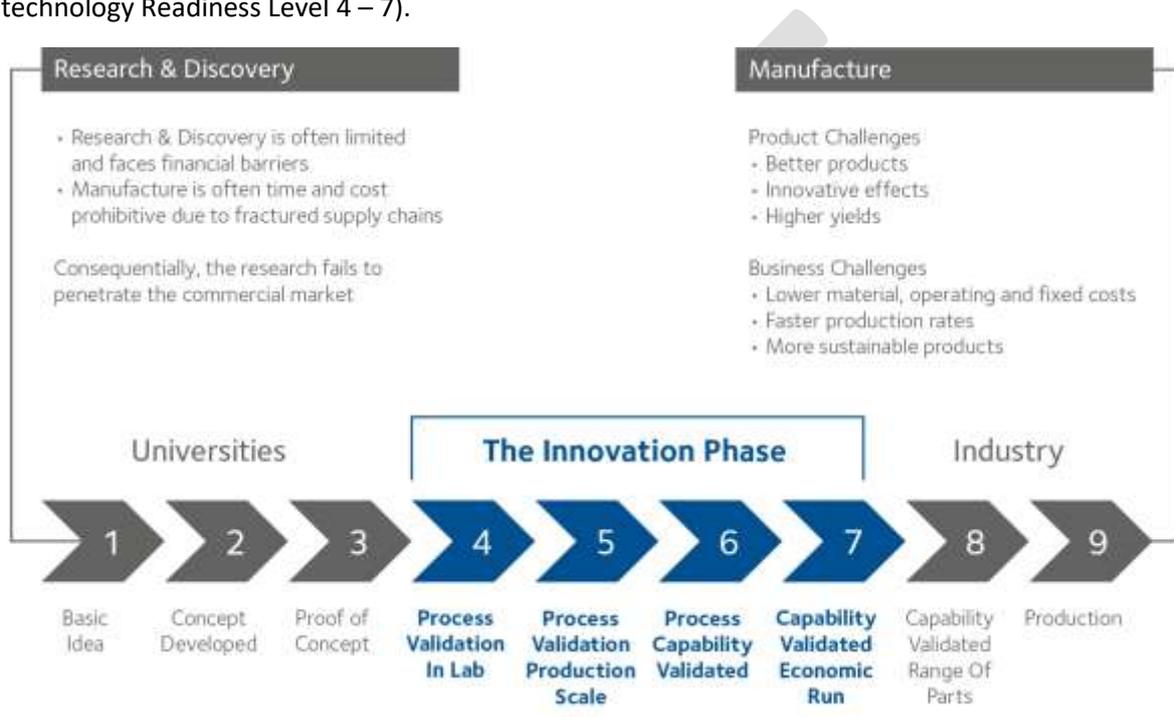
This Strategy will need to be flexible enough to ensure that it stays relevant once the LIS has been developed, setting a clear long-term vision and pathway for science and innovation in Cheshire and Warrington, and some short term actions pending development of the LIS.

UKRI

Government is supporting the Science and Innovation agenda through the National Productivity Investment Fund (NPIF), which includes an allocation of some £4.7 billion over four years for the Industrial Strategy Challenge Fund, and the Strength in Places Fund. Its ambition is to raise the level of UK investment into Research and Development to 2.4% of GDP by 2027, and in the future to 3%. UK Research and Innovation (UKRI), launched in 2018, brings together Innovate UK, Research England (formerly HEFCE) and seven Research Councils and its Strategic Prospectus aims to ‘strengthen the UK’s world-leading knowledge economy and deliver impact across society’.

Innovate UK

Innovate UK supports business to innovate through the ‘innovation phase’ of product development (technology Readiness Level 4 – 7).



It channels support through four sectors: -

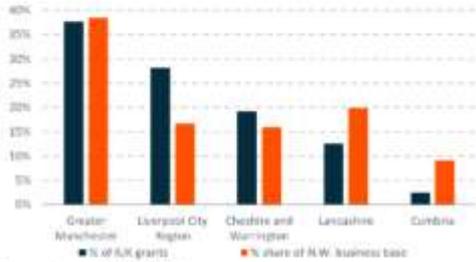
- Emerging and enabling technologies
- Health and Life Sciences
- Infrastructure Systems
- Manufacturing materials.

In addition, the organisation offers an ‘open programme’ to provide grants to any innovative UK company working on any high value innovative technology, business model or process in any area of the economy. Funding is offered on a competitive application process.

Analysis by Regeneris, on behalf of the NWBLT and Innovate UK, suggests that the North as a whole secures lower than average levels of public research and innovation funding per project, and that Cheshire and Warrington receives a lower level on average than the North. In part this may reflect a lack of scale or ‘ambition’ compared to projects elsewhere in the UK, so the strategy should consider ways of raising that level of ambition where possible.

(A) Value of Innovate UK Grants in context of **business base**

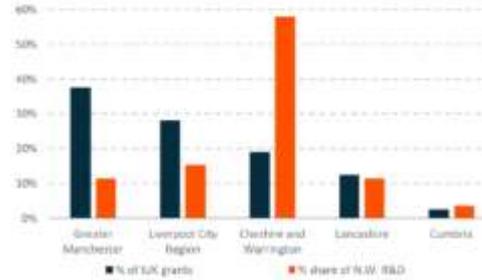
- LCR and C&W: more than proportionate share
- Remainder: lower than proportionate share



Source: Innovate UK, ONS.

(B) Value of Innovate UK Grants in context of **business R&D spend**

- GM, LCR and Lancs: more than proportionate share
- C&W well below proportionate share
- Cumbria slightly below



Catapult Network

Another source of national innovation support for business is the Catapult Network. Catapults are ‘not-for-profit, independent physical centres which connect businesses with the UK’s research and academic communities’. They each focus on an area in which the UK has genuine potential to generate growth in strategically important global markets (Fig.x).

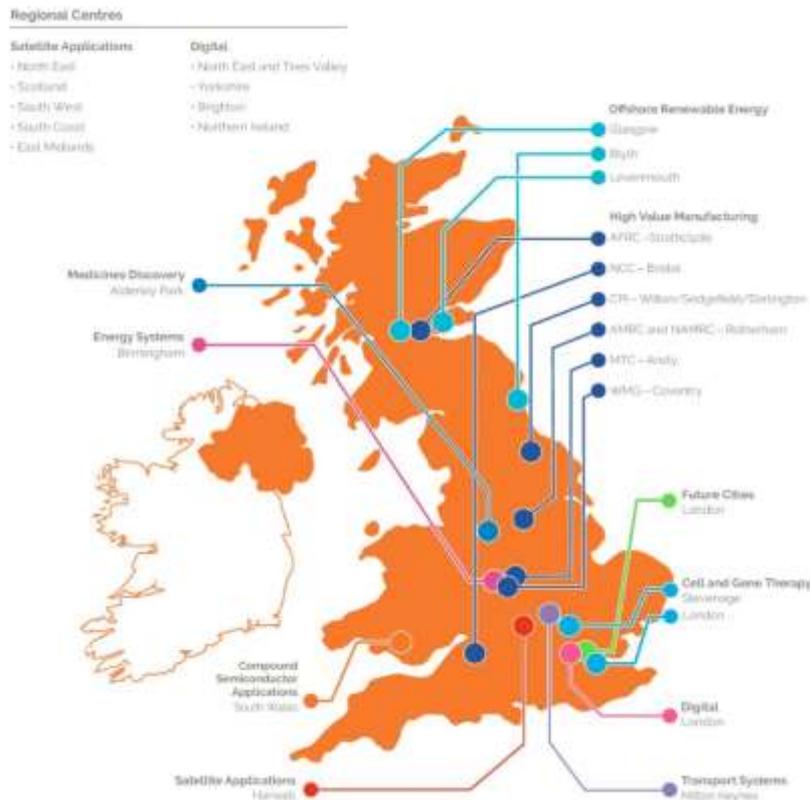


Fig. x

Local

There are a range of studies and reports available which highlight the science and innovation assets and strengths of the Cheshire and Warrington sub-region. At the regional level this includes recent studies on behalf of the NP11 LEPs², Innovate UK and the North West Business Leadership Team (NWBLT)³ and the Northern Independent Economic Review (for Transport for the North)⁴.

In addition, whilst not leading on a Science and Innovation Audit (SIA) of its own, Cheshire and Warrington has supported and been referenced in all three waves of SIAs: -

Wave	Lead	Focus
1	GM: East Cheshire	Health Innovation, Advanced Materials, Digital, Energy, Industrial Bio-technology
2	Liverpool City Region	Infections, Materials Chemistry, High Performance and Cognitive Computing
3	University of Lancaster	North West Coastal Arc: Low Carbon and Eco-Innovation
3	Bangor University	North West Nuclear Arc
3	Northern Health Sciences Alliance	Northern Powerhouse in Health Research: Data for Better Health, Precision Medicine

The high-level strengths identified by these studies is set out in the Table, below.

	Life Science / Pharma	Energy	Chemicals	Advanced Engineering	Fin Tech	Agri-Tech / Food
Strategic Economic Plan	Green	Green	Green	Green	Green	Orange
Northern Independent Economic Review	Green	Green	Green	Green	Green	Green
GM + East Cheshire SIA*	Green	Green	Green	Light Blue	Light Blue	Light Blue
LCR+ SIA	Green	Light Blue	Green	Light Blue	Light Blue	Light Blue
North West Nuclear Arc SIA	Light Blue	Green	Light Blue	Light Blue	Light Blue	Light Blue
Northern Powerhouse in Health Research SIA	Green	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue
North West Coast Arc Eco-Innovation SIA	Light Blue	Green	Light Blue	Light Blue	Light Blue	Light Blue

The LEP has also commissioned a number of studies in its own right which further emphasise our areas of broad scientific and industrial innovation strength. These include the evidence base for the original and refreshed Strategic Economic Plan⁵, Cheshire Science Corridor Overarching Value Proposition⁶ and the supporting evidence base to the LEP Energy Strategy⁷.

The other key learning point from these studies is the extent to which our priorities and agendas are shared by neighbouring LEPs and with North Wales. **Developing these areas of common interest will be a key priority for this strategy.**

To genuinely advance the Science and Innovation Agenda in Cheshire and Warrington, we need to understand these strengths in much finer detail so that we can identify true areas of difference on

² Sdg Economic Development (June 2018), 'Innovation North – progressing innovation in the Northern Powerhouse'

³ Regeneris (July 2018), 'Planning for a step change: Informing where the North West should focus innovation to drive up productivity'

⁴ SQW, (June 2016), 'The Northern Powerhouse Independent Economic Review'

⁵ <http://www.871candwep.co.uk/strategic-economic-plan/>

⁶ Regeneris and Breeze Consulting (May 2018), 'Cheshire and Warrington Value Proposition: Overarching Evidence Base'

⁷ Mickledore (March 2018), 'Development of an Energy Strategy and Implementation Plan for Cheshire & Warrington'

which to drive future economic growth. Some of this will emerge as we develop our Local Industrial Strategy during 2018/19, but there are already some useful indicators from the reports referenced above and resources such as the Smart Specialisation Hub⁸.

Identifying our Science and Innovation Clusters / Strengths / Smart Specialisation opportunities

- [Mapping utilising information from the Regeneris Sector Propositions – is it possible to get a single, overlaid and colour-coded map?]
- Life sciences / bio-tech / pharma / complex medicines – Alderley Park / Macclesfield (plus agri-focussed life sciences = Cheshire Breeding companies)
- Energy – Nuclear Engineering and fuels (Birchwood + Capenhurst)/ energy systems (Ellesmere Port + Capenhurst) / clean energy (Knutsford + Ellesmere Port)
- Finance and business services tech – Knutsford / Warrington / Chester

As mentioned at the start of the Strategy, the LEP held a series of facilitated stakeholder workshops over a three-month period to test thinking on the development of policy priorities and key areas of focus for the Strategy and Delivery Plan. Some of the principle gaps, issues and opportunities identified by attendees to the three sessions is set out below.

Gaps / Issues / Opportunities

- Considering the role of place in supporting innovation. Will be of increasing importance as working practices change (e.g. greater home working) and opportunities for face-to-face interactions / networking as part of the 'traditional' office routine reduce.
- Can't underestimate the importance of personal connections and networks. These can be a challenge / barrier to SME's whose networks may not be well developed.
- Some 'big businesses' are doing things to support smaller companies and start ups (e.g. Nuclear Mentoring scheme). How do we get visibility of this and encourage more of it?
- Need to understand where Cheshire and Warrington 'fits' in terms of the wider north west and national picture.
- Business does not recognise or conform to notional administrative boundaries!
- Need to better understand where our current R&D is happening. If it is (as suspected) resting with a small number of large companies, this is a risk (e.g. AZ impact). Large companies feed the supply chain – what would impacts on SME innovation be if large companies withdraw?
- Lots of recognised assets in the sub-region, but not always well 'marketed' or connected together – not much evidence of cross-sector collaborations
- Daresbury could play a pivotal role as the digital hub for the sub-region working across sectors/sites
- Need to highlight our track record (generally agreed as good, but potentially based on legacy activity) as this can be an important factor in attracting new innovators and investment.

⁸ <http://smartspecialisationhub.org/lep-profile/cheshire-warrington-lep-cw-lep/>

- Some existing cross-boundary collaboration happening but need to understand opportunities for wider collaboration around key sub-regional strengths (e.g. energy)
- Business is looking for easy engagement and access to support. Can be as complicated as required in the 'back office' but the 'front door' has to be easy to find and easy to go through
- Strategy needs to reflect awareness of our current strengths and weaknesses and the needs of our economy – but also has to align with national and regional priorities to secure maximum impact.

Key 'take aways' from these sessions were: -

[check slides, workshop 2 and 3]

Stakeholders also considered from their perspective what "good" might look like in terms of Cheshire and Warrington being a strong location for Science and Innovation businesses.

What "good" looks like: -

- Strong and visible innovation eco-system
- Accessible physical assets – i.e. kit and equipment that SMEs cannot afford to purchase
- Strong networks of experts and mentors
- Larger companies actively engaging supply chains for their innovation
- Skills agenda aligned to the R&D agenda
- Strong partnerships with a network of HEIs
- Accessing our fair share of public R&D funding

Delivery Plan to 2020

Making Cheshire and Warrington an outstanding place for Science and Innovation

- Supporting ongoing development of the Cheshire Science Corridor including marketing and investment propositions and an investment plan for the Science Corridor EZ
- Supporting the development of strong clusters focussed initially on energy and life sciences, including identification of options for resourcing development of the sub-region's science and innovation 'ecosystem'
- Building better relationships with relevant regional and national assets and innovation agencies to help better connect businesses to the resources and expertise available through those assets.

Building on Our Strengths

- Linked to the development of a Local Industrial Strategy, develop a finer-grain understanding of our business base, sectoral strengths within science and innovation and the opportunities for smart specialisation.
- Understand the opportunities for collaboration and cooperation with other parts of the UK and internationally linked to our specific areas of strength

Supporting Business on the Innovation Journey

- Engaging and shaping the Made Smarter NW Pilot to support SMEs to innovate through adoption of digital practices and processes
- Consider how to replace current ESIF for innovation post-2020 including influencing the shape and priorities for the UK Shared Prosperity Fund

Inspiring the next generation

- Continuing to support activities to engage and inspire young people to pursue careers in science, research and development
- Encouraging business to work with the LEP's Education and Skills Board to ensure skills needs are properly identified and that the education and skills system responds accordingly
- Identify and encourage stronger links with FE / HE institutions to link research, innovation and skills needs for business

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