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SCIENCE AND INNOVATION



**Cheshire and
Warrington**
Local Enterprise
Partnership

STRATEGY AND DELIVERY PLAN

September 2019



...creating a place
where innovation
and new thinking is
encouraged and
supported





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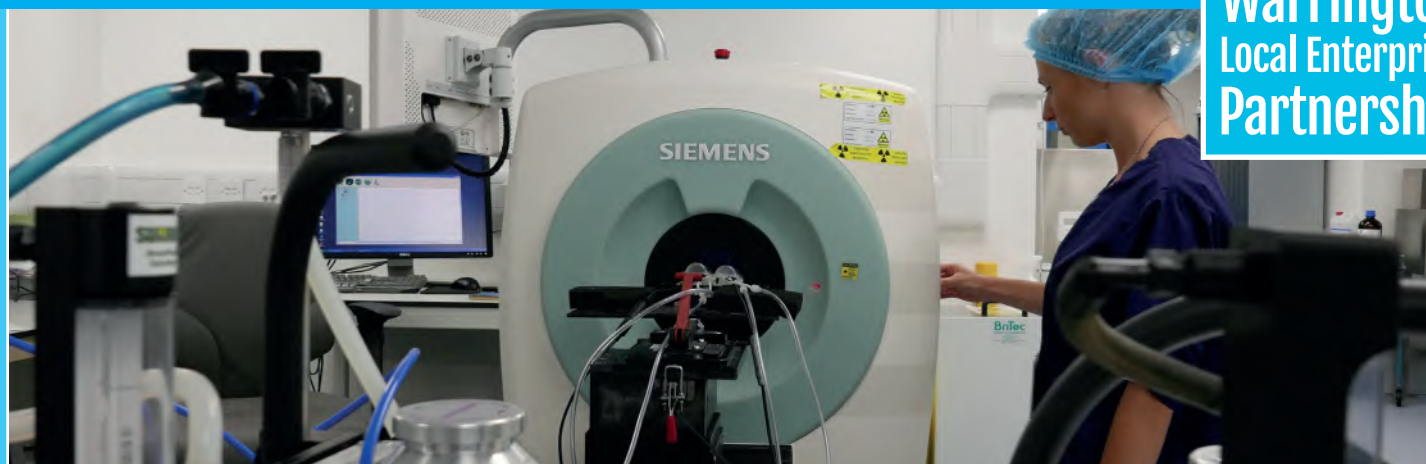


Image courtesy of Medicines Discovery Catapult

EXECUTIVE SUMMARY

The LEP sees a strong and vibrant science and innovation ecosystem as a key element in achieving its long-term economic success. Our Science and Innovation Strategy, informed by the Government's Industrial Strategy, sets out the strengths and opportunities for the Cheshire and Warrington economy from Science and Innovation activity, focussed principally on our key sector strengths of: -

- **Manufacturing**
- **Chemicals**
- **Energy & environment**
- **Logistics**
- **Life sciences**
- **Financial and business services.**

In the language of Industrial Strategy, "Ideas" is one of the five foundations of productivity and this Strategy considers what actions the LEP and its partners need to take to address weaknesses in the Science and Innovation system, and ensure that Cheshire and Warrington is a location where ideas can flourish, innovation is part of everyday business culture and cutting edge science and research can be translated into commercial success.

The work to develop this Strategy, one of seven thematic strategies which underpin our main Strategic Economic Plan (SEP), will also inform the development of our Local Industrial Strategy during 2019.



**INDUSTRIAL
STRATEGY**

CHESHIRE & WARRINGTON

Introduction

This Strategy sets out the LEP's high level vision and aspirations in respect of the Science and Innovation agenda in Cheshire and Warrington. It considers the current position in terms of public and private sector investment in research and development, the assets and strengths that we have to build on and some of the weaknesses that need to be addressed in our innovation ecosystem. It draws on a variety of evidence gathered during the development of the LEP's Strategic Economic Plan (SEP), the development of the investment proposition for the Cheshire Science Corridor, and the LEP's involvement in a number of Science and Innovation Audits. The Strategy also draws upon recent reports by North West Business Leadership Team (NWBLT) and Innovate UK (with the NP11 LEPs).

The Strategy sets out a series of activities and interventions that the LEP believes, through discussion with partners and key stakeholders, will help address the identified weaknesses and also capitalise on opportunities created by the particular strengths and specialisms of our academic and business base.

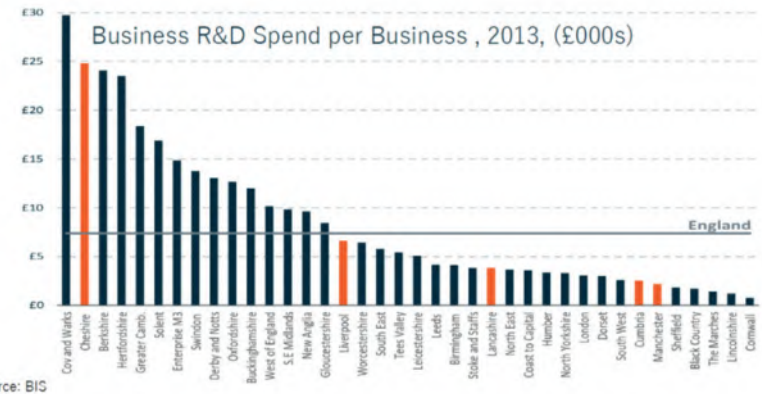
From the outset, the LEP would like to acknowledge the input from the many businesses, public-sector agencies and stakeholders who attended a series of workshops held to support the development and test the thinking around the emerging Strategy.

The current picture

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'.

Cheshire and Warrington is historically an innovative sub-region, having at various times 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 identity, 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.

Available data suggests that business investment in innovation, research and development in Cheshire and Warrington is high, although there are challenges in securing accurate, up to date data sources to confirm this. Conversely, public sector investment in research and development in the sub-region 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. There may, however, be issues around our businesses views on risk and on scale of ambition.

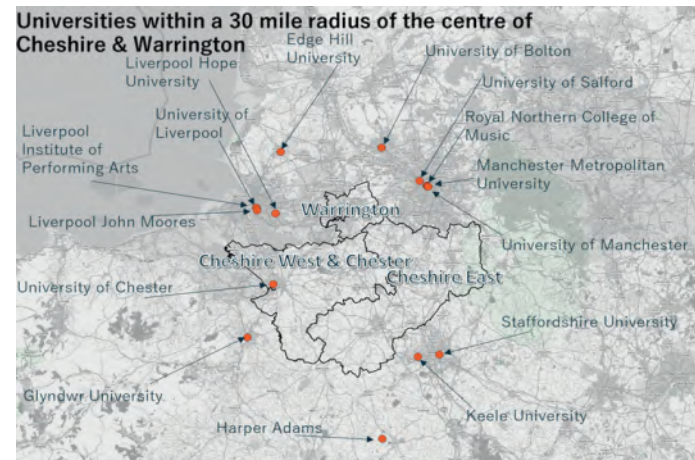


Source: BIS

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.

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.

It also owns and operates the Thornton Science Park.



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



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

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, namely: -

- *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*



Image courtesy of ESR Technology European Space Tribology Laboratories

Our Strengths

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 LEPs, Innovate UK and the North West Business Leadership Team (NWBLT) and the Northern Independent Economic Review (for Transport for the North).

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						
Northern Independent Economic Review						
GM + East Cheshire SIA*						
LCR+ SIA						
North West Nuclear Arc SIA						
Northern Powerhouse in Health Research SIA						
North West Coast Arc Eco-Innovation SIA						

¹ Sdg Economic Development (June 2018), 'Innovation North – progressing innovation in the Northern Powerhouse'

² Regeneris (July 2018), 'Planning for a step change: Informing where the North West should focus innovation to drive up productivity'

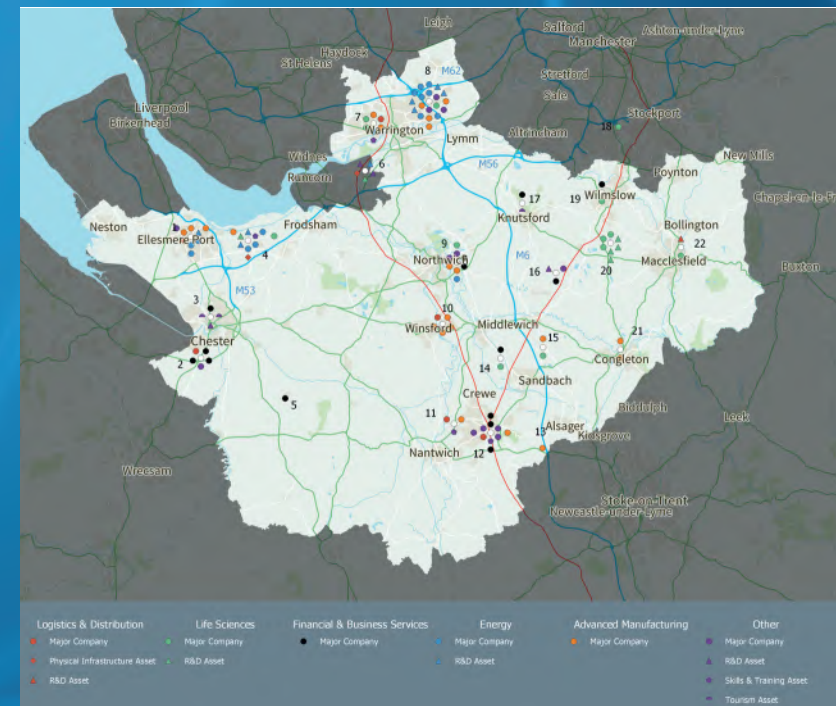
³ SQW, (June 2016), 'The Northern Powerhouse Independent Economic Review'

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 Plan, Cheshire Science Corridor overarching value proposition and the supporting evidence base to the LEP Energy Strategy.

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 which to drive future economic growth. Some of this will emerge as we develop our Local Industrial Strategy during 2019, but there are already some useful indicators from the reports referenced above and resources such as the Smart Specialisation Hub.

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



⁴ <http://www.871candwep.co.uk/strategic-economic-plan/>

⁵ Regeneris and Breeze Consulting (May 2018), 'Cheshire and Warrington Value Proposition: Overarching Evidence Base'

⁶ Mickledore (March 2018), 'Development of an Energy Strategy and Implementation Plan for Cheshire & Warrington'

⁷ <http://smartspecialisationhub.org/lep-profile/cheshire-warrington-lep-cw-lep/>

CASE STUDIES



Square Kilometre Array (SKA)

The Square Kilometre Array (SKA) is regarded by many as the 'largest science experiment in the world'. The project, involving over 20 countries and with a phase 1 construction budget of €650 million, is creating the world's biggest radio telescope, and its headquarters is in the heart of Cheshire at the Jodrell Bank Observatory. The SKA will eventually use thousands of dishes and up to a million low-frequency antennas that will enable astronomers to monitor the sky in unprecedented detail and survey the entire sky much faster than any system currently in existence.

Its unique configuration will give the SKA unrivalled scope in observations, largely exceeding the image resolution quality of the Hubble Space Telescope. It will also have the ability to image huge areas of sky in parallel, a feat which no survey telescope has ever achieved on this scale with this level of sensitivity.

Credit Alderley Park



Alderley Park

Alderley Park is the UK's largest BioScience Campus, dedicated to helping shape the future of the world's health. Its Mereside campus is part of Manchester Science Partnerships, one of the leading science and technology park operators in Europe.

Offering 1 million sq ft state-of-the-art chemistry, biology and pathology labs, dedicated incubator facilities and a range of shared scientific services the park is now home to over 150 companies. It is also home to the Medicines Discovery Catapult, a national centre of applied R&D expertise promoting and supporting the discovery of new medicines in the UK. Working with industry, academic teams, technology experts, charities, regulators and others, the MDC helps accelerate the discovery of innovative, fast-to-patient drugs.

Alderley Park is also home to the Centre for Antimicrobial Resistance (AMR). As a joint private-public venture the AMR aims to get all new antimicrobial drugs and diagnostics to market in the shortest possible time through a fully integrated development capability, offering translational R&D from pre-clinical hits through to clinical proof of concept.

Credit Wood



Wood

Cheshire and Warrington is home to a significant cluster of nuclear design, engineering and technical support services. Amongst the many world-renowned names located here, many centred at Birchwood Park in Warrington, is Wood.

Operating the UK's largest private nuclear labs, Wood is a key player in the supply chains of Sellafield Ltd and EDF Energy, with expertise in new build design, as well as maintenance and decommissioning of the existing reactor fleet. Its facilities include world-class gas, corrosion and materials laboratories influencing the future of Advanced Gas Reactors and Pressurised Water Reactors.

Employing over 1800 nuclear specialists the company also hosts a national, open access High Temperature Test facility which allows companies and research organisations to test materials at up to 1,000°C for applications such as Generation IV nuclear fission, nuclear fusion and advanced gas turbines.

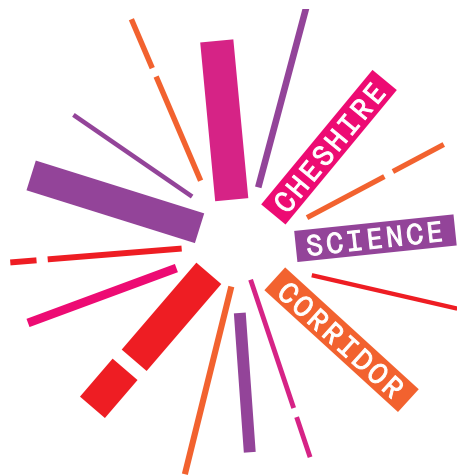
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Some of the LEP's
Science and
Innovation Assets
are of Global
Significance

*Bullsequana Scafell Pike Supercomputer;
Image courtesy of STFC / Hartree Centre*



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 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.

Industry itself recognises the importance of innovation, for instance the Federation of Small Businesses' report 'Spotlight on Innovation', published in July 2017, 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.

⁸ Federation of Small Businesses (July 2017) 'Spotlight on Innovation: How Government Can Unlock Small Business Productivity'

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.

Our five foundations align to our vision for a transformed economy



We will set Grand Challenges to put the United Kingdom at the forefront of the industries of the future:



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

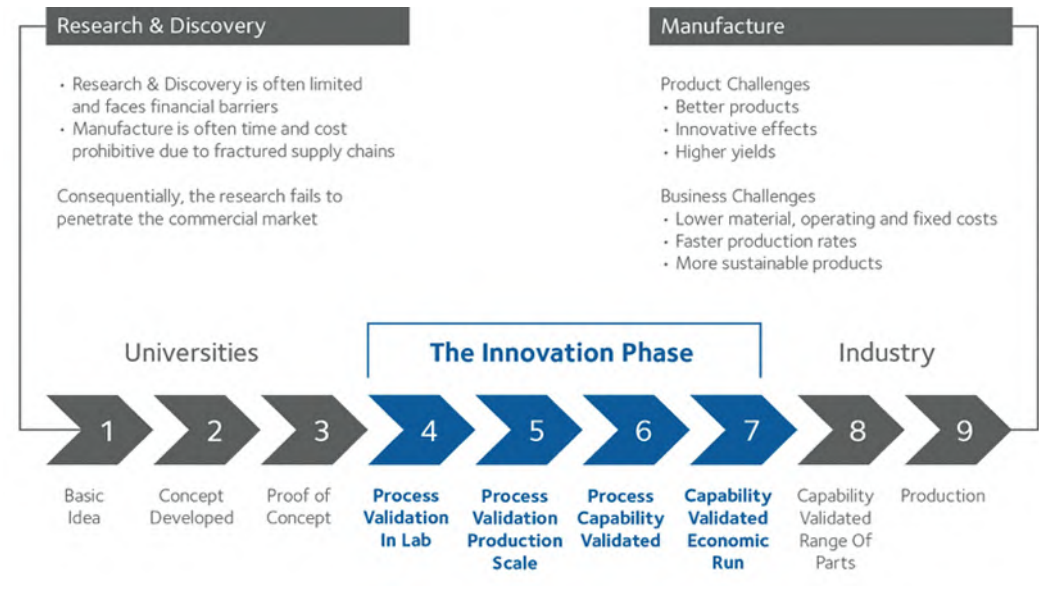
Innovate UK supports business to innovate through the 'innovation phase' of product development (technology Readiness Level 4 – 7).

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**

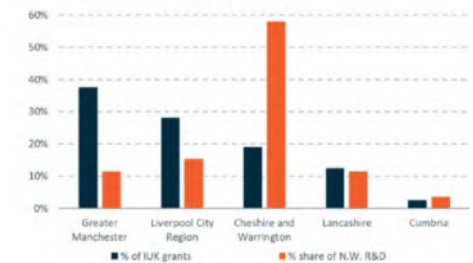
- LCR and C&W: more than proportionate share
- Remainder: lower than proportionate share



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



Cheshire and Warrington Local Enterprise Partnership

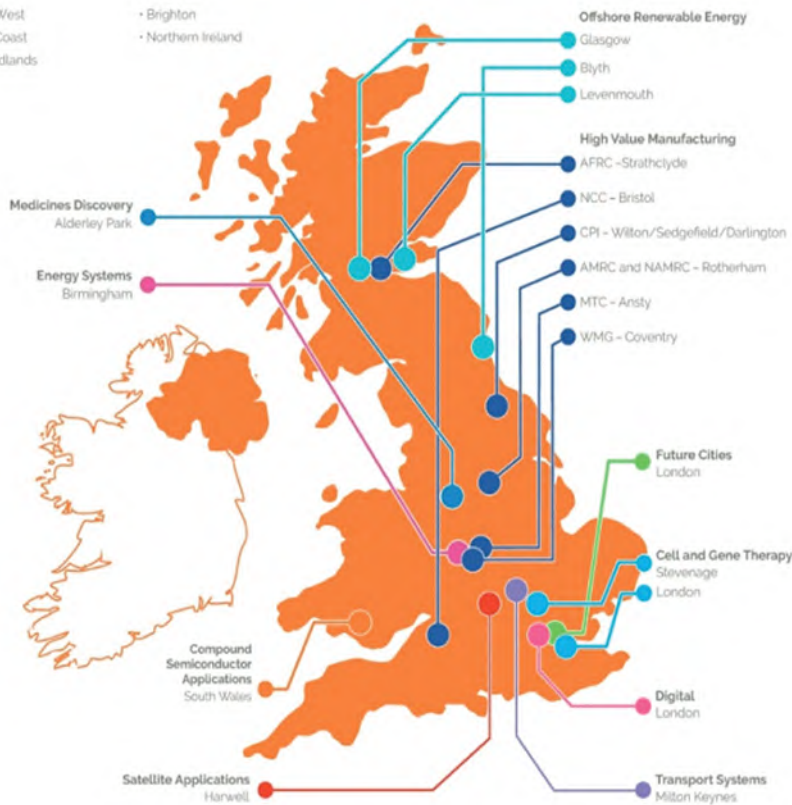
Regional Centres

Satellite Applications

- North East
- Scotland
- South West
- South Coast
- East Midlands

Digital

- North East and Tees Valley
- Yorkshire
- Brighton
- Northern Ireland



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 impact on SME innovation be if large companies withdraw?

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).

Lots of recognised assets in the sub-region, but not always well 'marketed' or connected together - not much evidence of cross-sector collaborations

Gaps / Issues / Opportunities

Our workshop sessions asked stakeholders to consider what the current gaps, issues and opportunities in relation to Science and Innovation in Cheshire and Warrington where. Some of the things they said are shown here:

Daresbury could play a pivotal role as the digital hub for the sub-region working across sectors/sites

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.

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.

Need to understand where Cheshire and Warrington 'fits' in terms of the wider north west and national picture.

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?

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.

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.

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 a greater share of public R&D funding**

As part of the wider Strategic Economic Plan, the Science and Innovation Strategy has strong linkages to a number of other policy areas. In particular, the focus of the Skills and Employment Strategy on increasing uptake of science, technology, engineering and maths courses, and informing young people of the opportunities for careers in science, innovation and research.

There are links also to the LEP digital agenda, both in terms of making sure the right digital infrastructure is in place to support science and innovation activity, and that employees, students and businesses have the skills to 'think' and 'do' digital.

DELIVERY PLAN TO 2021

Provide clear and visible leadership to the Science and Innovation agenda in Cheshire and Warrington

- *The LEP strategy committee will oversee implementation of this strategy and ensure it remains current and responsive to changes in policy for science and innovation.*

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 by April 2020.*
- *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'.*
- *The LEP will build better relationships with relevant regional and national assets (such as the Catapult Network) and innovation agencies to help better connect businesses to the resources and expertise available through those assets. [ongoing]*

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. [December 2019]*
- *Understand the opportunities for collaboration and cooperation with other parts of the UK and internationally linked to our specific areas of strength [December 2019].*

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 including securing appropriate sector-level engagement in the mentoring process for SMEs [January 2019]*
- *Review how support for innovation activity is provided through the Cheshire and Warrington Growth Hub and consider options for either enhancing provision or making the current offer more effective [December 2019]*
- *Consider how to replace current ESIF for innovation post-2020 including influencing the shape and priorities for the UK Shared Prosperity Fund [July 2020]*

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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