



HATCH
REGENERIS

Planning for a step change: Informing
where the North West should focus
innovation to drive up productivity

A Report by Hatch Regeneris

September 2018

We work with
Innovate UK



Innovate UK and North West Business Leadership Team

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Foreword

Innovate UK and the North West Business Leadership Team jointly commissioned this study to investigate opportunities for initiatives on innovation and productivity to better benefit the North West of England in a more targeted fashion.

Several observations informed the scope:

1. that there is an increasing importance on initiatives to improve regional productivity, as a means to improve UK productivity;
2. that innovation is a key driver of productivity improvements;
3. that the UK Industrial Strategy is making a significant increase in funding and support available for innovative organisations;
4. that North West organisations have, historically, accessed a lower than proportionate level of funding from Innovate UK, the UK's innovation agency.

The intent of this study is to inform the plan for forward-looking activities, by investigating the background to these observations.

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Executive Summary

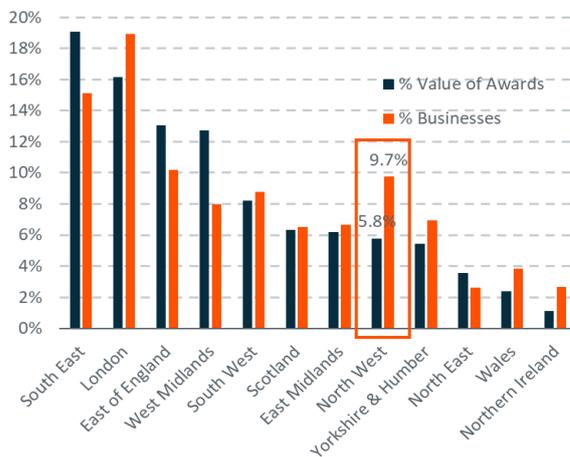
Why focus on innovation and productivity?

- i. Innovation and business productivity are two of the most important economic considerations of our time. They are each desirable in their own right, and provide a very powerful impact to any region that can harness them both across the business base.
- ii. Increasing the North West's innovation intensity will bring considerable gains on regional productivity. While the Cheshire and Warrington LEP region has the highest Research and Development (R&D) intensity of the North West LEPs, and is among the most productive LEP regions in England, the four other North West LEP regions are significantly further behind the England averages on both R&D intensity and productivity.
- iii. Stimulating businesses across the North West to invest further into R&D is of the utmost importance and will, in the medium term, help bring the productivity of the region up to par with the UK average.
- iv. In the longer run, the ambition in the North West should be establishing a level of productivity that is greater than the UK average, and a level of business R&D that is comparable with other sub-regions across the world of similar size and business make-up.
- v. In this context, the UK Industrial Strategy offers a stimulus to regional productivity. In support of the government's ambition of 2.4% of GDP to be invested into R&D, the Industrial Strategy provides the largest uplift of public funding for R&D in any parliament since 1979. The new organisation known as UK Research and Innovation (UKRI) will distribute much of this through major programmes such as the Industrial Strategy Challenge Fund (ISCF) and the Strength in Places Fund. UKRI will manage competitions that will be open to applications from businesses and researchers from across the UK, and will award the funding to the strongest proposals.
- vi. Furthermore, local areas should ensure that they draw on the rich evidence base available on previous R&D and innovation funding investments, given the critical importance of innovation to achieving local aims on productivity. This is particularly timely as some local areas within the North West are beginning to develop their Local Industrial Strategy.

Why have we studied Innovate UK funding?

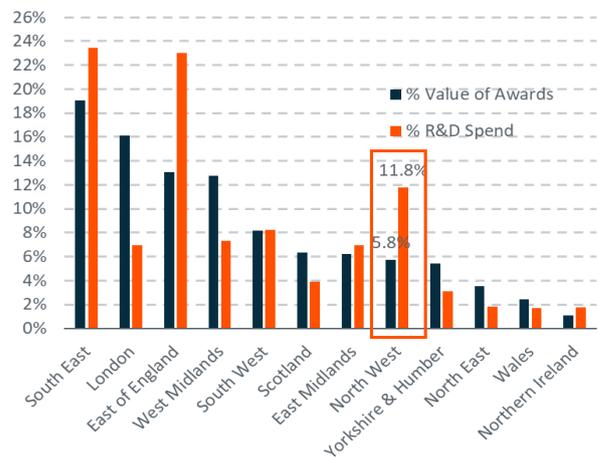
- vii. Given the major new funding opportunities becoming available from the UK Industrial Strategy, the timing is right to consider what we can learn from the North West’s performance in the various competitions that Innovate UK has managed since 2007.
- viii. The analysis presented in this report reinforces that the past performance raises important questions. In particular, regional leaders need to consider the notable shortfall in the funding secured by North West businesses in the past. Otherwise, it is likely the region will secure a proportionately low share of funding from the Industrial Strategy programmes.
- ix. The chart below illustrates the potential for a step change. It shows the proportion of funding secured by North West organisations over the past decade from the most relevant Innovate UK funding streams.¹ When compared to the region’s share of businesses and R&D expenditure, North West organisations secured a significantly lower share of the funding. North West organisations were awarded 5.8% of the funding, compared to the region’s 9.7% share of UK businesses and 11.8% share of UK expenditure on R&D by businesses.

Percentage share of award value by region, compared to business base



Source: ONS Business Counts; Innovate UK

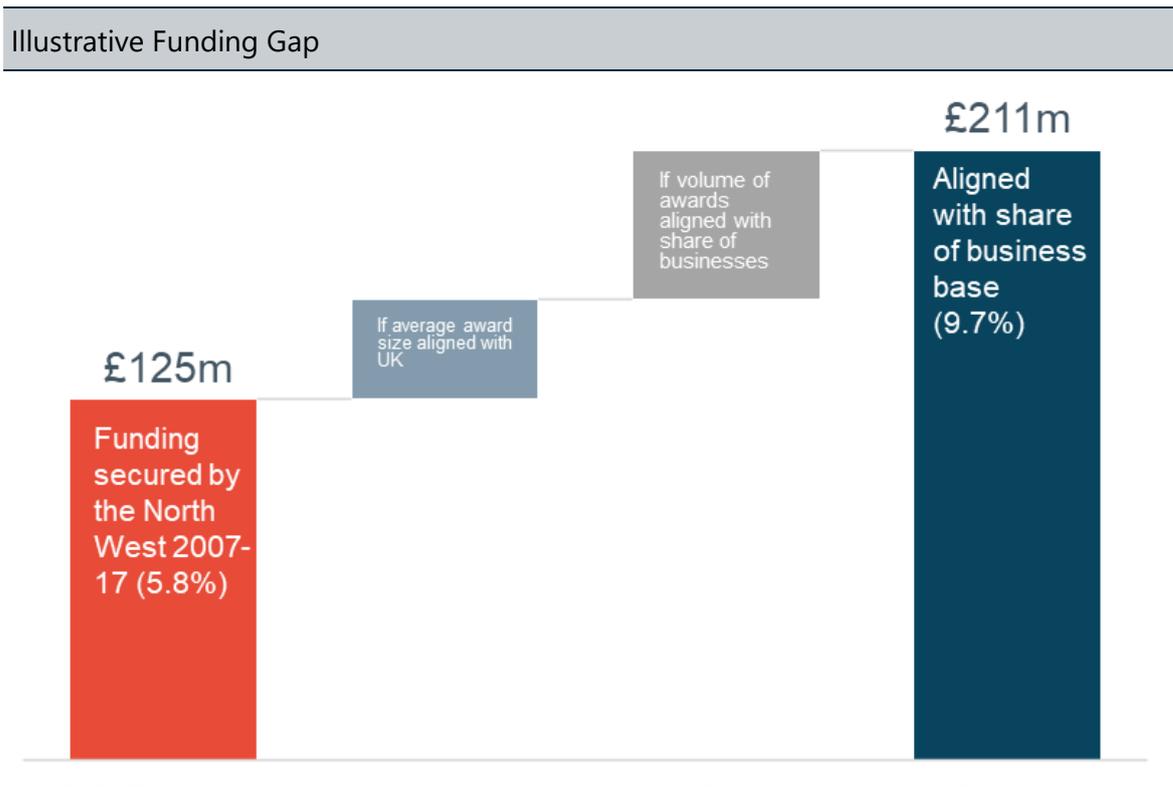
Percentage share of award value by region, compared to business R&D spend



Source: ONS, R&D Spend by Businesses; Innovate UK

¹ This data is in some instances subject to the “HQ effect”, where the R&D activity is assigned to the postcode that the business provided Innovate UK for processing the R&D project finances. For some large firms this may be misleading, e.g. if their finance office is located in the South East but the R&D activity takes place elsewhere. This study does not suggest that the North West is affected by this data issue any more than any other UK region, or that it is particularly significant to the overall conclusions.

- x. To put this into context, if more projects involving North West organisations had secured funding, and if the average size of North West awards had matched the UK average size, then the region could have secured 9.7% of the funding, in line with the region’s 9.7% share of businesses. This would have provided an additional £86m of public sector support over the decade for innovation projects, which would have been amplified by the private sector match investment alongside the public sector investment. Further work is recommended to assess whether these changes could occur in the future.



Source: Innovate UK

Planning for a step change

- xi. North West leaders need to put a plan into place if the region is to achieve the step change conceptually illustrated by the previous charts.
- xii. Our recommendation is that the plan should address the following challenges and opportunities:
 1. Increasing the awareness of North West organisations to the opportunities to develop ambitious and large-scale innovation projects, with the support of the new emerging funding programmes.

2. Ensuring that the North West's universities are aware of, and geared up for, the new emerging opportunities for collaborating with businesses on innovation, and that they continue their success in accessing national innovation funding.
3. Developing the potential of North West organisations of all sizes to act as project leads on Industrial Strategy Challenge Fund bids. This will include their skills and capacity for collaboration with organisations based in other regions, when the necessary complementary expertise is located elsewhere.
4. Working with the North West's larger firms to increase their investment into larger scale innovation projects within the region, as well as engaging their supply chains and other SMEs to maximise their participation in innovation.
5. Working with the large sectors prioritised for growth by North West policymakers, to bring forward more innovative projects, and to drive up the size of those projects where appropriate. The evidence shows that the North West's priority sectors, such as automotive, chemicals and pharmaceuticals, have secured less funding than could have been expected given their relative presence. Changing this would have a significant impact on the region's overall share of future public funding. It will be very important to work with the major firms within the region and the relevant industry bodies.
6. Further work by regional leaders to map and plan the region's existing and potential future capabilities with respect to the further opportunities emerging from the Industrial Strategy.

Informing the plan with facts

- xiii. Our extensive analysis so far of Innovate UK's most relevant funding streams between 2007/08 and 2017/18 has revealed the following key findings and facts:
 - a) The region has secured a lower than proportionate volume of awards (7.2% of awards over the period).
 - b) Importantly, the average award value of projects funded in the North West is significantly lower than nationwide: 20% lower on average over the period.
 - c) The gap in average award value has widened considerably since 2014 (since this time it has been 42% below the UK average). Notably, this coincided with a period in which Innovate UK's total investment ramped up significantly.

- d) SMEs in the North West have received a proportionally higher volume of awards than SMEs nationally, and the average value of awards to SMEs is larger than for large businesses. These are positive findings, given the need for SMEs and supply chain companies to engage in innovation.
- e) The average value of awards to large firms in the North West is around half as large as that of the UK as a whole. This very significant gap may warrant further analysis.
- f) Universities are important enablers of innovation, and North West universities have received proportionally more funding than universities as a group have nationally.
- g) The average value of awards made to University in the North West is 3% larger than across the whole of the UK. There may also be potential for North West universities to secure further funding from Innovate UK: as the region accounts for 8% of all funding awarded to UK universities, compared to 10% of all academic staff. Strategic collaborations with industry, and indeed with other universities, will be important.
- h) On average, project leads receive significantly larger awards than other project partners. The North West has a roughly equivalent share of project leads to the UK average, which is encouraging. However, the average award size for North West project leads has been 24% lower than for the UK.
- i) Across the UK, 70% of awards are made to organisations that have had an award previously. In the North West, this is 64%. Funding in the North West is therefore not overly concentrated in a small number of repeat winners.
- j) Funding has been concentrated within certain sectors, with 95% of the Innovate UK awards allocated to sectors that account for 23% of North West employment. This is only marginally more concentrated than the national picture.
- k) All of the region's main priority sectors received a lower than proportionate share of the volume of awards compared to businesses in the same sectors in other regions, and most also received a lower average award value. The gap was largest for the North West automotive sector, which received 2% of the awards to the sector despite having 10% of all automotive businesses. Other sectors also contributed to the gap (e.g. North West chemical firms received 8% of awards despite having 16% share of businesses by volume).

- l) In each sector, the funding gap is driven by a combination of lower volume and/or smaller size of awards. For instance, in pharmaceuticals, the average North West award value has significantly exceeded the UK average in the sector, but the volume of awards is proportionately lower.
 - m) In addition to the main funded sectors, the sectors in which the region has a relative specialisation received a disproportionately low share of awards. Some (e.g. legal and accounting activities) could present opportunities for securing future funding (e.g. in fintech).
- xiv. Additional specific research will illuminate some aspects of this plan further; for instance, primary research with North West organisations in specific sectors identified in this report, or drawing on forthcoming Innovate UK analysis on regional application and success rates.

1. Purpose of the study

- 1.1 Hatch Regeneris was appointed by Innovate UK and the North West Business Leadership Team (NWBLT) to undertake a study into the North West's performance on innovation and productivity.

Study background

- 1.2 The UK has a well-documented productivity gap on other advanced economies. There are also considerable and widening regional inequalities. Increasing prosperity and productivity in all cities, towns and rural areas in the UK is at the heart of the HM Government's Industrial Strategy. Innovation is a key driver of productivity.
- 1.3 As the UK's innovation agency, Innovate UK drives economic growth by working with companies to de-risk, enable and support innovation. It has committed over £1.8 billion to over 8,000 organisations since 2007. Innovate UK plays a very significant role in delivering the UK Industrial Strategy, for instance on the Industrial Strategy Challenge Fund.
- 1.4 The NWBLT also sees innovation as a crucial enabler of productivity growth, which in turn will improve businesses competitiveness and the number of high skilled, high paid jobs in the region. The NWBLT works closely with businesses leaders in the North West looking at innovation and productivity. Both are interlinked and will enable the region to become a dynamic and prosperous place to do business, live and work.

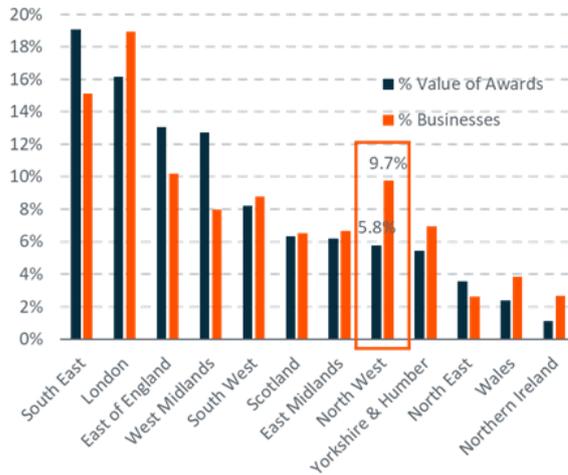
Purpose of this study

- 1.5 The productivity of the North West region as a whole is some 8% below the UK average, and the region lags on a number of indicators of innovation activity.
- 1.6 Critically for this study, headline analysis of the regional performance in Innovate UK funding competitions reveals that the North West has secured relatively low amounts of this funding compared to other regions. The North West has secured proportionately less funding from Innovate UK when compared to the size of its business base (Figure 1.1) and its private sector Research & Development investment (Figure 1.2).² The North West is an

² Although in the case of the comparison to R&D expenditure performed by businesses, this could be a positive finding as the North West business base is investing considerably into R&D despite the lower levels of funding from Innovate UK. The East of England (includes Cambridge) has a similar desirable effect; due to a dense concentration of R&D spend occurring in the private sector without public support.

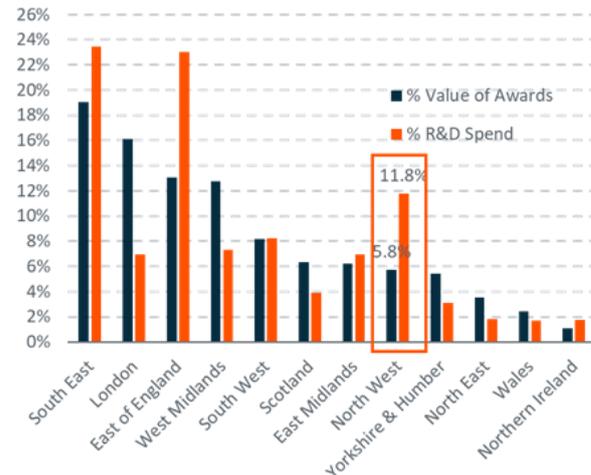
outlier in this respect: the only other regions to show a similar effect to the North West are the Devolved Nations of Wales and Northern Ireland where businesses can gain additional innovation support through devolved budgets.

Figure 1.1 Percentage share of award value by region, compared to business base



Source: ONS Business Counts and Innovate UK

Figure 1.2 Percentage share of award value by region, compared to business R&D spend



Source: ONS, R&D Expenditure performed by Businesses and Innovate UK

1.7 Innovate UK has an objective to support innovation across the UK in support of the UK Industrial Strategy. In light of the apparent underperformance revealed above, Innovate UK commissioned this study jointly with the NWBLT to examine the North West’s performance in their funding competitions in detail. The key aims are to identify:

- new evidence-based insights, to inform regional strategy.
- sectors and sub-regions to target in order to raise awareness of, and participation in, the funding opportunities on offer.

1.8 The study has drawn upon comprehensive data from Innovate UK on its investments as well as converging this with other available open datasets on productivity and R&D activity. The study has led to new insights on the correlations between R&D, innovation and productivity within the region.

1.9 It is recognised that further research may be needed to further illuminate certain aspects.

1.10 This report is structured as follows:

- Section 2 provides a contextual review of the North West’s productivity and innovation performance

- Section 3 explains the various products that have been offered by Innovate UK and sets out the coverage of the funding data to be analysed
- Section 4 provides a detailed analysis of the Innovate UK funding in the North West, benchmarked to other regions and placed in the context of wider economic indicators
- Section 5 introduces the Wave 2 ISCF challenges and provides a headline mapping of the North West business base against these.

1.11 The appendices provide further data, including short LEP level profiles.

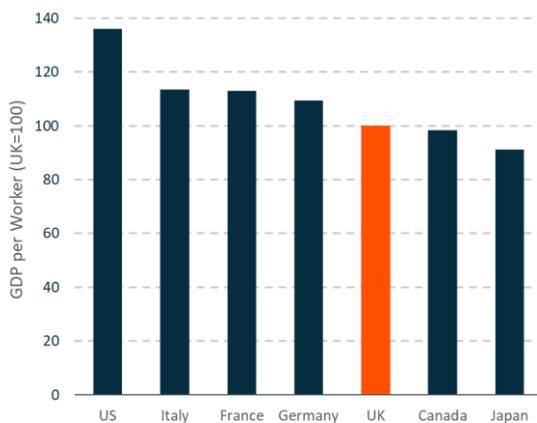
2. Productivity and innovation in the North West: review of key data

2.1 This section provides an overview of the North West’s performance on Innovation and Productivity. It sets the scene for later analysis of the region’s performance on securing Innovate UK funding.³

Productivity performance

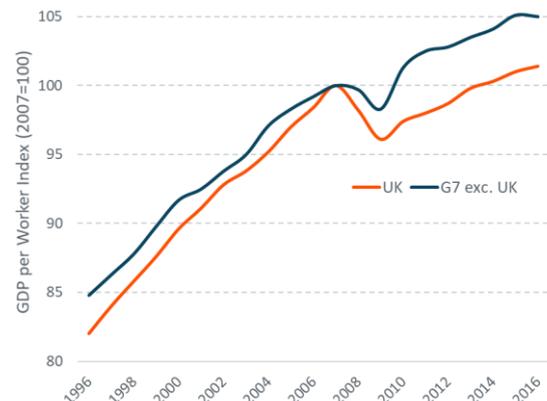
2.2 The productivity gap is both a national and regional issue. The charts below show the UK significantly trailing many of its G7 counterparts in terms of productivity, as well as the widening in the gap since the financial crisis.

Figure 2.1 Productivity in G7 Nations, 2016



Source: ONS, Productivity, 2017

Figure 2.2 Productivity over time, 96-16



Source: ONS, Productivity, 2017; note: 2007=100

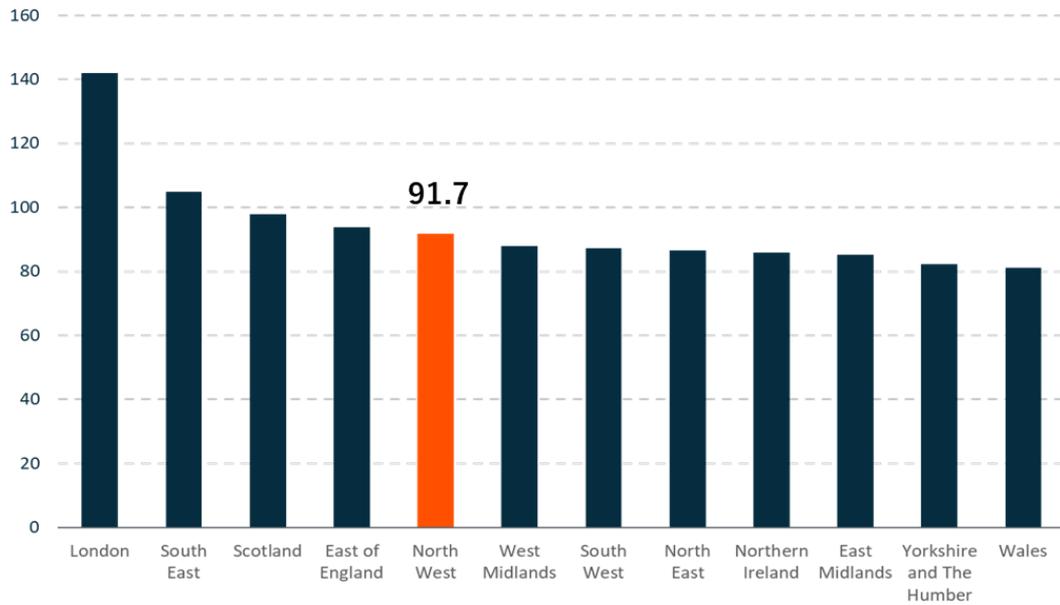
2.3 Within this national picture, the North West trails the UK average by more than 8%.⁴ Whilst this puts it ahead of several other regions, our analysis implies that if the North West is able to close the gap on the current UK average, it would add £15 billion to the UK economy.⁵

³ To measure regional variations in productivity, the balanced measure of GVA was used as this more accurately attributes the employment costs element of GVA to the workplace (workplace based) rather than the employees’ residences.

⁴ Note: this is based on *GVA per worker*. On the *GVA per hour* measure, the region performs slightly better at 92.6% of the UK average. For simplicity we use *GVA per worker* throughout.

⁵ This is the additional GVA that the North West would have if NW GVA per worker were the same as the UK’s.

Figure 2.3 Indexed GVA per worker by region (UK = 100), 2016

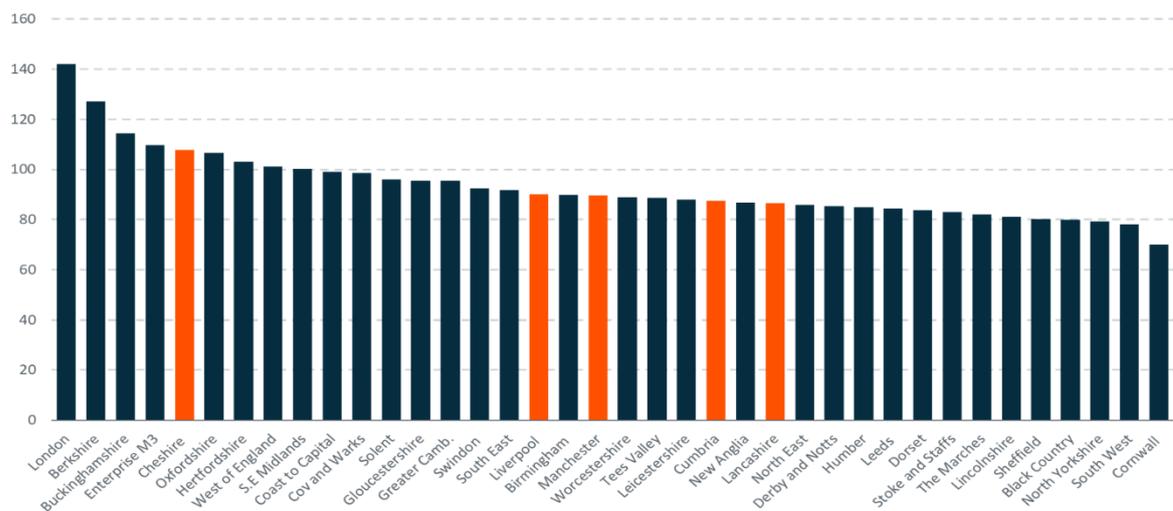


Source: ONS, Regional Productivity – Balanced Measure, 2017

The spatial pattern

2.4 Looking below the regional level reveals the varied picture within the region, with Cheshire & Warrington sitting above the UK average, as an outlier at 5th amongst all LEP areas. The four other North West LEP areas are below the national average, sitting in the second and third quartiles of the distribution by LEP area.

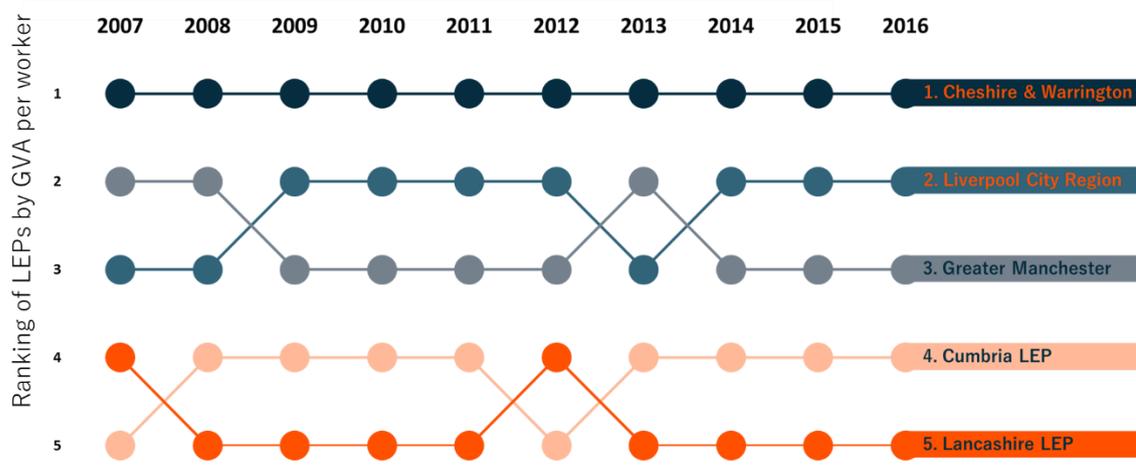
Figure 2.4 GVA per worker by LEP, 2016 (UK=100)



Source: ONS, Sub-Regional Productivity – Balanced Measure, 2018

- 2.5 Over time, the performance of individual LEPs has remained relatively constant in relative terms, as shown in Figure 2.5

Figure 2.5 Ranking of North West LEPs by GVA per worker, 2007-2016



Source: ONS, Sub-Regional Productivity – Balanced Measure, 2018

Sectoral patterns

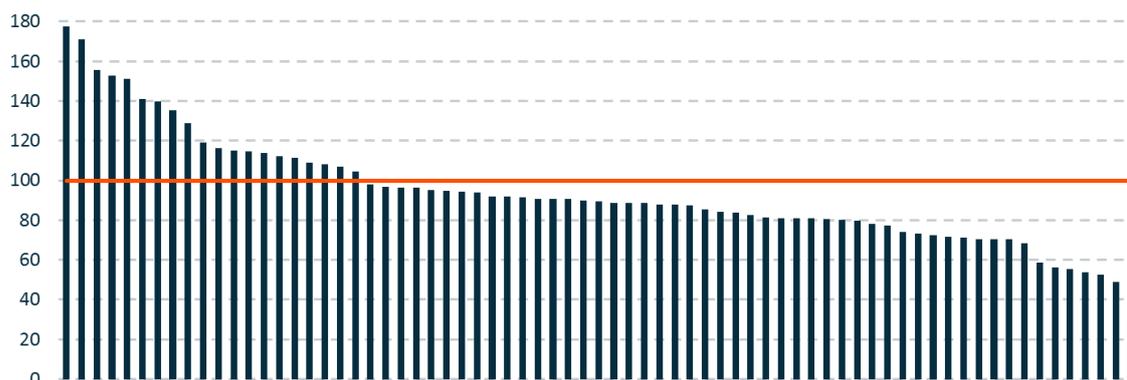
- 2.6 The North West's productivity gap is a function of: 1) the productivity of its sectors compared to the UK average for those sectors, and 2) its fundamental industrial structure.
- 2.7 Analysis at a 2 digit SIC level suggests that the majority of the gap is explained by intra-sectoral performance. That is, even if the North West's sectoral mix shifted to match that of the UK average, there would remain a significant productivity gap, because of shortfalls within sectors.
- 2.8 Figure 2.6 shows an anonymised distribution of productivity by sector, illustrating the variation in productivity across sectors in the region as well as the fact that most sectors lag behind the national average.⁶
- 2.9 Table 2.1 then shows the top ten sectors in the North West at a 2 digit level, the extent to which the region is specialised in these sectors⁷ and the productivity of these sectors compared to the national⁸ average. It indicates that there is a high concentration of employment in sectors with relatively low productivity.

⁶ Note: this is not filtered for the size of the sectors.

⁷ Using Location Quotient (LQ) analysis. An LQ of more than 1 indicates relative specialisation compared to the UK average; an LQ below 1 indicates that concentration of employment in that sector is below the national average .

⁸ This uses the GB average, given the way that the sectoral data is held.

Figure 2.6 North West productivity by sector (2 digit level), 2016 (UK = 100)



Source: ONS, Sub-Regional Productivity – Balanced Measure, 2018; ONS, Business Register and Employment Survey, 2017

Table 2.1 Productivity of top ten 2-digit sectors in North West by employment, 2016

Industry	Employment in NW	% of NW Employment	Location Quotient (GB=1)	GVA per worker (sector in GB=100)
47: Retail trade (excl automotive)	336,500	10.4%	1.1	94
85: Education	291,000	9.0%	1.0	87
86: Human health activities	290,000	9.0%	1.2	91
56: Food & beverage services	195,000	6.0%	1.0	92
84: Public admin & defence	143,000	4.4%	1.0	89
46: Wholesale trade (excl automotive)	113,000	3.5%	0.9	108
88: Social work	97,500	3.0%	1.0	115
69: Legal & accounting	95,000	2.9%	1.4	59
78: Employment activities	94,000	2.9%	0.9	107
87: Residential care activities	77,000	2.4%	1.0	140

Source: ONS, GVA Balanced Measure, 2018; ONS, Business Register and Employment Survey, 2017

Innovation performance

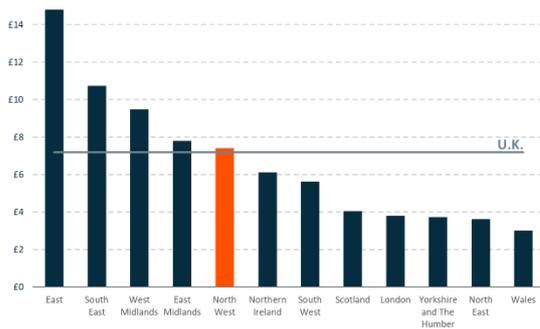
2.10 Innovation is a key driver of productivity.⁹

⁹ Studies by the OECD and NESTA have concluded that innovation accounts for 25%-50% of labour productivity growth.

Business R&D Expenditure and Patenting

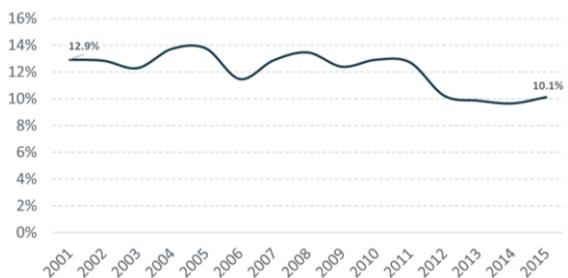
2.11 Business enterprise research and development (BERD) expenditure is a useful indicator of innovation activity. The latest data shows that the region marginally exceeds the UK average for business R&D expenditure when compared to the business base, although with some falls in the North West's share of the UK business R&D spend over the past 5-10 years.

Figure 2.7 BERD spend per business (thousands), 2015



Source: ONS, Business Enterprise R&D, 2016

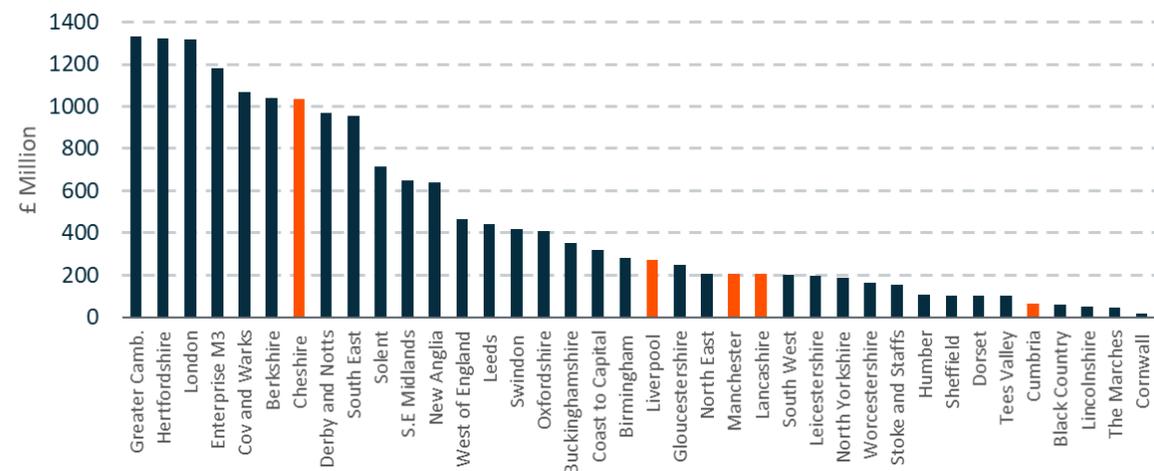
Figure 2.8 North West share of UK BERD spend, 2001-15



Source: ONS, Business Enterprise R&D, 2016

2.12 Looking at the performance at LEP level¹⁰ reveals the very significant variation between the North West LEPs.

Figure 2.9 Expenditure on Research and Development by Businesses, 2013



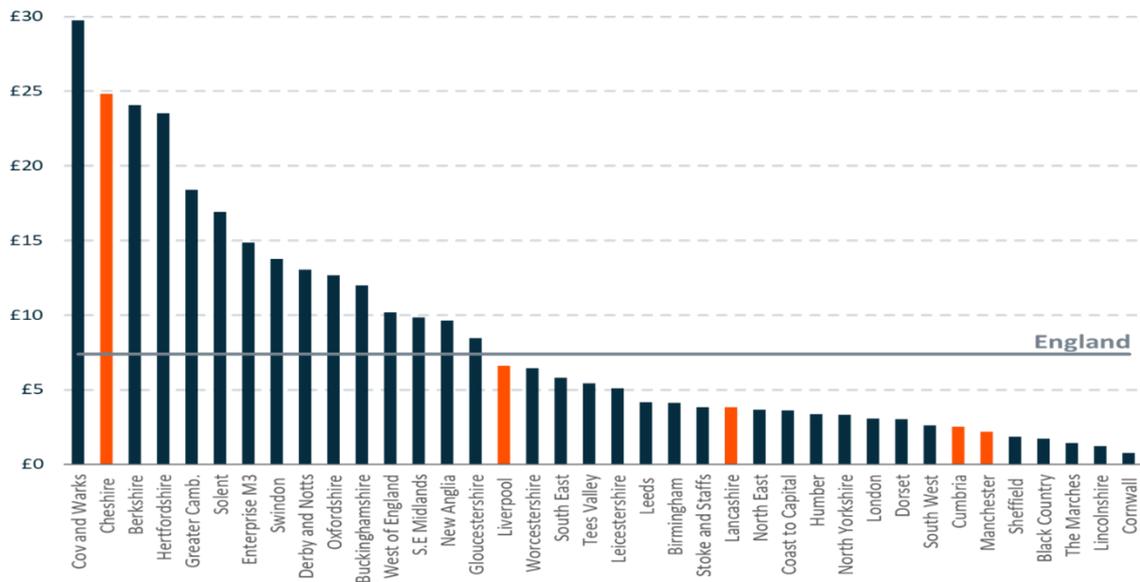
Source: ONS, Expenditure on R&D by businesses by LEP Area, 2015

2.13 Relating these results to the size of each LEP area's business base provides further insight. Cheshire and Warrington's ranking amongst LEPs increases at over three times the England

¹⁰ Note that this uses 2013 data, the latest available.

average and ranking second in England. The other four North West LEPs are below the England average, with Manchester showing the lowest level of expenditure on R&D by businesses when related to the very large number of businesses within its population.

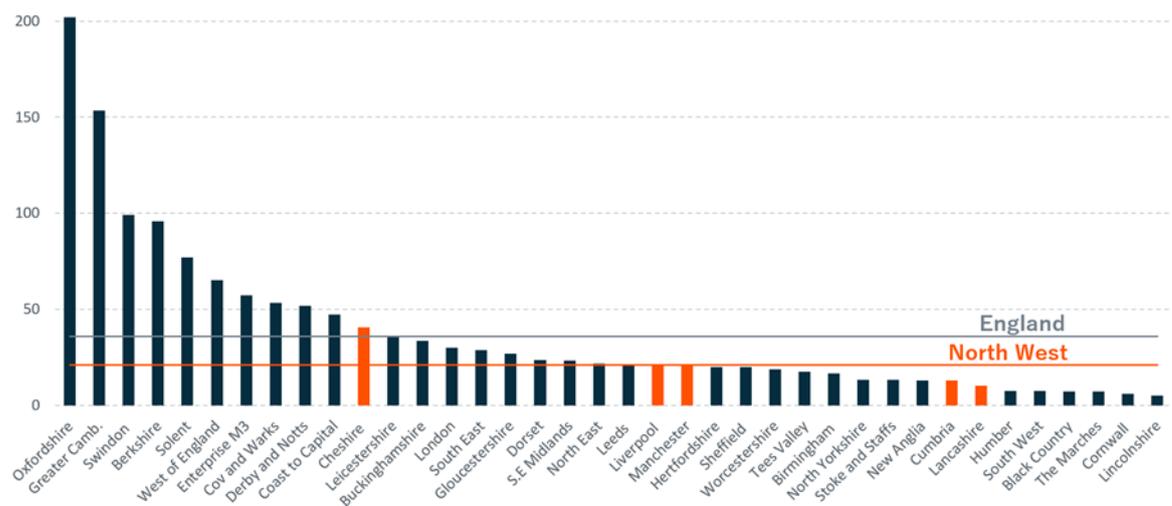
Figure 2.10 BERD spend per business within the LEP area (thousands), 2013



Source: BIS, Mapping Local Comparative Advantages, 2015

2.14 Data on patent applications clearly shows a spatial skew towards the South East, and the divergence in the location of patent applications within the North West.

Figure 2.11 Patent applications per 1,000 businesses, 2015



Source: BIS, Mapping Local Comparative Advantages, 2015

Science and Innovation Audits

- 2.15 The Science and Innovation Audits (SIAs) bring together businesses, universities, LEPs and other collaborators to produce an evidence base to identify areas of opportunity where areas of the UK can build on existing strengths to develop a comparative advantage that will support future strengths. The SIAs examine an area's strength in science and innovation and relate these to a national and international context.
- 2.16 Although this study does not specifically review or comment on the SIAs, they provide important context and are used to inform later sections on sectoral analysis. An overview of relevant SIAs from waves 1 and 2 are provided in Appendix B.

3. Innovate UK Awards

- 3.1 As the UK's innovation agency, Innovate UK provides support and awards funding to organisations nationwide so that high-risk innovation becomes viable.
- 3.2 In the past, firms in the North West have secured a lower than proportionate share of Innovate UK's funding when compared to other UK regions. This section of the report examines what lies beneath this headline.

Innovate UK funding products

- 3.3 Over the last ten years, Innovate UK has offered many funding products. An overview of these is provided below:
- Collaborative Research & Development (CR&D), which provides funding for businesses, universities and research and technology organisations to work collaboratively on innovative projects in strategically important areas to tackle specific technical or societal challenges. Two or more organisations will collaborate and at least one will be a business, typically an SME. This is the most significant funding product, accounting for 37% of Innovate UK funding distributed since 2007.
 - Smart Awards, were grants for individual pre-startups, start-ups, micro businesses and SMEs to enable them to assess potential markets and invest in R&D and innovation. Three types of funding support were available: proof of market, proof of concept and demonstration of prototype. Smart was designed to address the funding gap experienced by many small and early stage businesses. Innovate UK offered Smart Awards until 2016 and they account for 4.0% of Innovate UK funding distributed since 2007.
 - Feasibility Studies are for businesses who need to test an innovative idea and explore its commercial potential. Funding can be awarded to both individual companies and consortia. Successful projects are then better prepared to enter larger programmes (e.g. CR&D) to develop the idea. Feasibility Studies account for 3.9% of Innovate UK funding distributed since 2007.
 - The Small Business Research Initiative (SBRI) programme helps businesses to develop an innovative product or service through a contract from a public sector organisation needing a solution to a specific challenge. The business gets funding to develop its ideas and the guidance of a lead customer and the public sector gets

more innovative ways of meeting its needs. SBRI contracts account for 3.0% of Innovate UK's funding since 2007.

- The Knowledge Transfer Partnership (KTP) scheme helps businesses to innovate and grow by linking them with an academic or research organisation and a graduate. A KTP enables a business to bring in new skills and the latest academic thinking to deliver a specific, strategic innovation project through a knowledge-based partnership. KTPs account for 3.0% of Innovate UK's funding since 2007.
- Innovation Vouchers offered SMEs up to £5k in funding to enable them to work with experts they have not worked with before and gain knowledge that could help their business to grow. The experts could be from academia and research and technology organisations (RTOs) and from the fields of design and intellectual property. Innovate UK offered Innovation Vouchers until 2016 and they account for 0.3% of Innovate UK funding distributed since 2007.

3.4 The below table presents the funding allocated since 2007 against each product.¹¹

Product type	Allocation since 2007	% of total allocation ¹²	Average award size	% of awards made to NW firms
Collaborative Research & Development	£2,006m	36.9%	£181k	7.1%
Smart awards (up to 2016)	£223m	4.1%	£100k	12.0%
Feasibility Studies	£215m	4.0%	£46k	9.5%
Small Business Research Initiative	£167m	3.1%	£209k	8.5%
Knowledge Transfer Partnerships (KTPs)	£115m	2.1%	£107k	11.9%
Innovation Vouchers (up to 2016)	£16m	0.3%	£5k	12.8%

Source: Innovate UK, Funding Data, 2017

3.5 North West organisations have secured more than a proportionate number of Innovation Vouchers (12.8%), KTPs (11.9%) and Smart awards (12%), and a roughly proportionate number of Feasibility Studies (9.5%). However, these products have smaller average award sizes. Furthermore, Innovate UK no longer offers Innovation Vouchers.

¹¹ The raw database contains funding data from prior to 2007, however, that relates to awards made by the Department for Trade and Industry (DTI), which set up the Technology Strategy Board (now known as Innovate UK) in 2007. The data for prior to 2007 has been excluded from this study, as it was not funding awarded by Innovate UK.

¹² The column does not sum to 100% as the data for large projects and managed external programmes is not included.

- 3.6 North West organisations have secured less than a proportionate number of CR&D (7.1%) and SBRI (8.5%), which are the products with larger average award sizes.
- 3.7 This report now focuses on CR&D and SBRI. As these are the products with the largest award sizes, they are most relevant to the headline finding that North West firms have secured less than a proportionate share through the competitions.

Funding Data

- 3.8 For the remainder of this section, when referring to Innovate UK Funding, it means awards made from 2007 onwards under the Collaborative Research & Development (CR&D) and Small Business Research Initiative (SBRI) schemes.
- 3.9 Innovate UK releases data on awards on a regular basis going back to 2007/08 as well as some legacy funding from before then. The data used in this study covers the period from 2007/08 to the end of 2017. Unless otherwise stated, funding data presented within the analysis covers the whole period. The data provided by Innovate UK includes but is not limited to the following indicators:
- Project Details
 - project name; description
 - Competition Details
 - reference number; name; competition year
 - Award Recipient Details:
 - name; whether they are a project lead; postcode and region; type of organisation; Company Reference Number; funding amount awarded

Geocoding the data

- 3.10 The postcode and region information enables geolocation of the awards. This allows analysis of the spatial distribution of Innovate UK funding against other spatial indicators such as the productivity and innovation analysis in the previous section.
- 3.11 This data is in some instances subject to the “HQ effect”, where the R&D activity is assigned to the postcode that the business provided Innovate UK for processing the R&D project finances. For some large firms this may be misleading, e.g. if their finance office is located in the South East but the R&D activity takes place elsewhere. This study does not suggest

that the North West is affected by this data issue any more than any other UK region, or that it is particularly significant to the overall conclusions.

Linking to Companies House Data

3.12 To analyse the distribution of funding to different sectors of the economy, we have linked the Innovate UK funding data to Companies House data on registered businesses using a Python software package. This gives up to date 5-digit Standard Industrial Classification (SIC) codes for all businesses registered in the UK, allowing us to see which detailed industry each of the companies funded by Innovate UK is registered under. Whilst this provides valuable insight, it is important to note the limitations of SIC codes for these purposes:

- although there are a wide variety of SIC codes, they do not always accurately explain a business's main activity (for example, web design does not have its own SIC code, and often falls into a broader code such as computer consultancy activities)
- the latest set of SIC codes were defined in 2007 and may not be wholly appropriate to some more innovative business activities (robotics or AI are key examples of this)
- businesses are only recorded under their main SIC code, despite potentially being relevant to more than one (for example, aerospace manufacturers may also develop other transport equipment but could only register under one SIC code)
- SIC codes are self-reported and may not be accurately defined by the businesses themselves.

3.13 While these limitations are known to exist, it is also thought likely that they affect all parts of the UK roughly equally and so SIC codes are suitable for making regional comparisons when used with care.

4. North West performance on Innovate UK Competitions

4.1 This section provides a detailed analysis on the North West's performance in Innovate UK funding competitions. We consider:

- Headline performance
- Size of awards
- Characteristics of award recipients
- Sectoral insights.

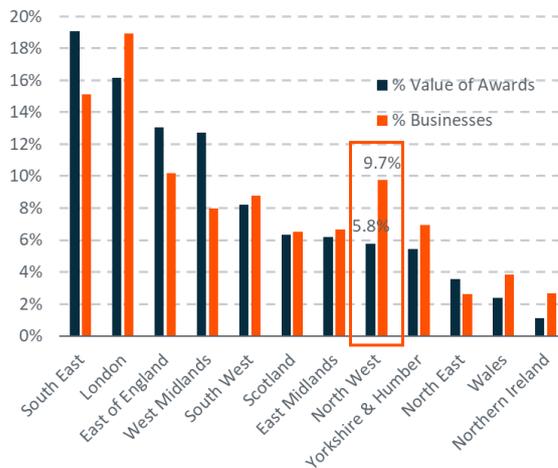
Innovate UK funding awarded to NW organisations

4.2 As revealed in Section 1, the North West has received 5.8% of Innovate UK funding by value over the period considered. This puts it 8th of the 12 regions of the UK in terms of funding received. The levels of funding received are significantly disproportionate to the size of the North West's economy and its propensity for Research and Development, as shown in the charts below.

4.3 The charts show that the North West has the 4th highest number of businesses and 3rd highest expenditure on research and development by businesses across all UK regions. In both cases, the proportion of funding is almost half that of the contextual indicator.¹³

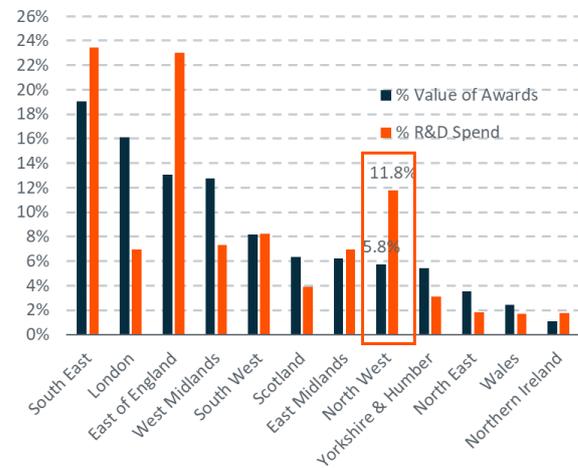
¹³ Please refer to the comments on the HQ Effect in Paragraph 3.11 when interpreting the data in this section.

Figure 4.1 Percentage share of award value by region, compared to business base



Source: ONS Business Counts and Innovate UK

Figure 4.2 Percentage share of award value by region, compared to business R&D spend



Source: ONS, R&D Expenditure performed by Businesses and Innovate UK

4.4 There are some possible reasons for the North West having a lower proportion of value of Innovate UK awards to what may be expected from the business base:

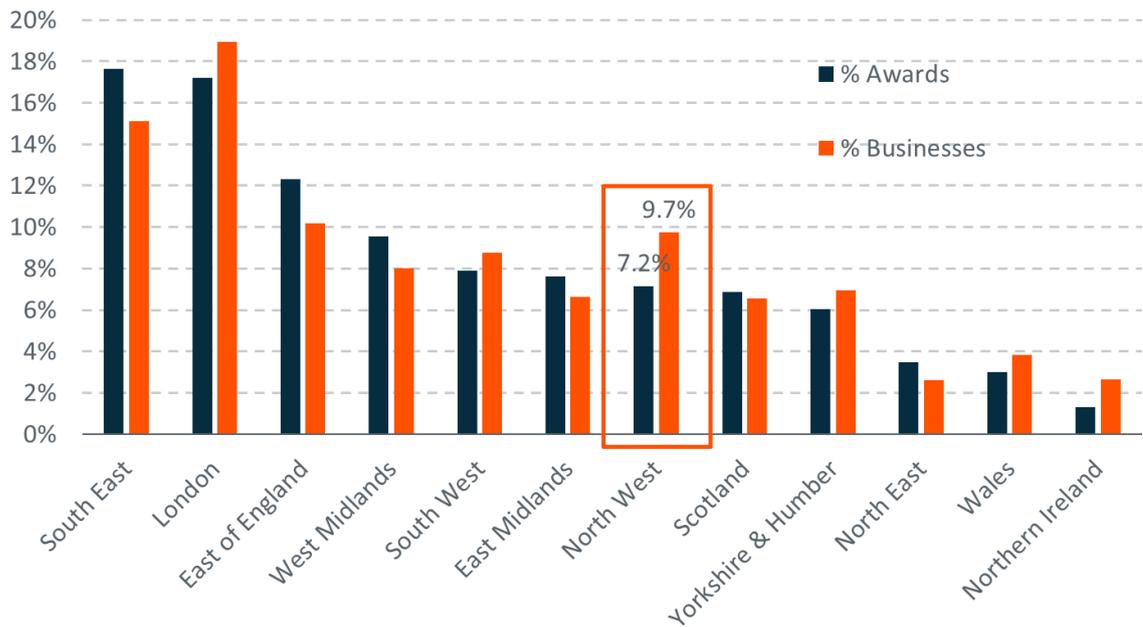
- 1) **Fewer applications** from NW organisations compared to other regions;
- 2) NW applications having a **lower success rate** in the national competitions; or
- 3) NW firms receiving **smaller awards, on average**, compared to awards made to organisations in other regions.

Number of awards to North West participants

4.5 At the time of writing, work is underway by Innovate UK to investigate 1) application volumes and 2) success rates, but this has not yet been completed. However, we are able to analyse the total number of awards given to North West organisations, which is the product of these elements.

4.6 North West organisations have received 7.2% of all awards over the period. Whilst this is greater than its share of the value of awards, it remains well below the contextual indicators. Hence the North West's lower than proportionate share of total award value is partly explained by a lower volume of awards secured. This means NW organisations are either not bidding to the same degree or are losing out to organisations from other regions (this is being currently investigated by Innovate UK).

Figure 4.3 Proportion of number of awards by region in context of business base

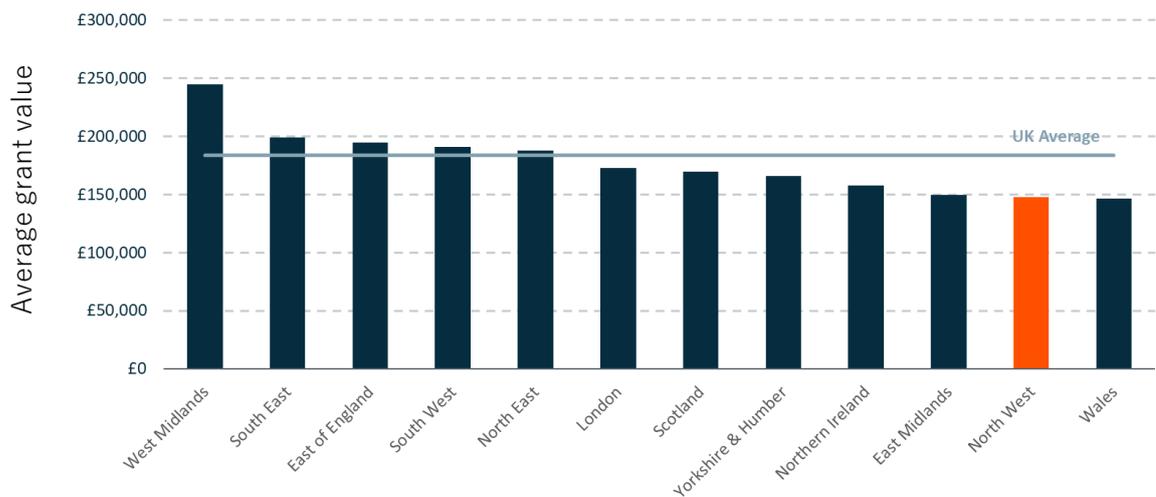


Source: Innovate UK, Funding Data, 2017

Size of Awards

- 4.7 Given that the proportion of awards given to North West organisations (7.2%) is higher than that of the total value awards (5.8%), this implies that the average size of awards is also a major contributing factor to the North West’s lower overall funding.
- 4.8 The average size of award made to the North West over the period is £148,000. This is 20% below the UK average of £184,000, with the West Midlands the highest at £244,000 and Wales the lowest at £146,000. In the ranking of UK regions, the North West has the second lowest average award size.

Figure 4.4 Average award size by region

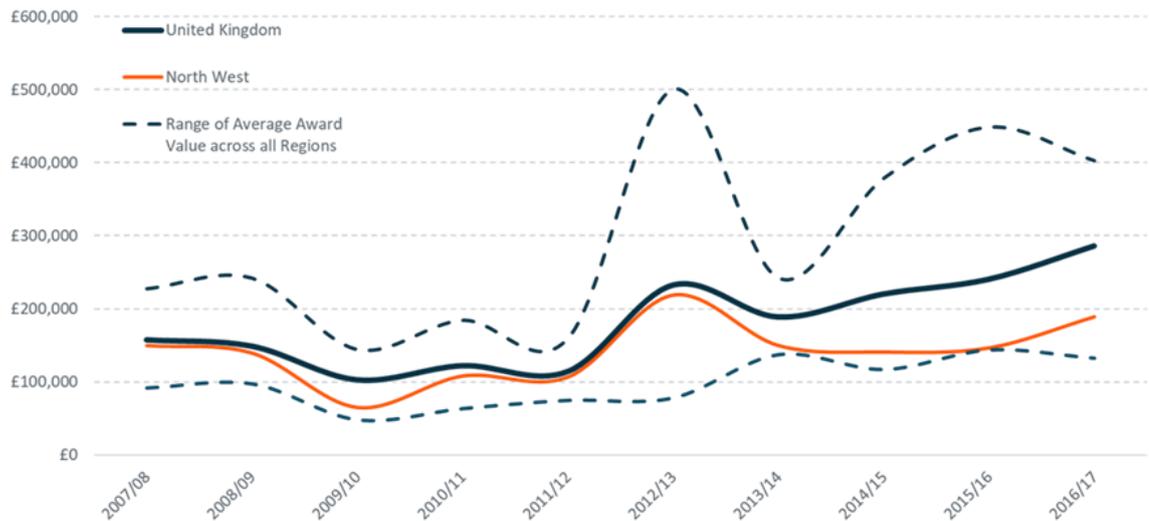


Source: Innovate UK, Funding Data, 2017

- 4.9 This trend has been consistent over time but has become more pronounced in recent years. The chart below reveals that although the North West has consistently been somewhat below the UK average, the position worsened significantly in the period between 2013/14 and 2016/17.
- 4.10 Up to and including 2013/14 the North West’s average award size was 11% below the UK average; **since 2014/15 it has been 42% below the UK average.** In both 2013/14 and 2015/16, the average award size in the North West was the lowest amongst all regions.¹⁴

¹⁴ 2017/18 has been excluded from the time series charts as the data is incomplete for this year and there is a time lag in the input of data on awards offered. This does not affect the overall analysis.

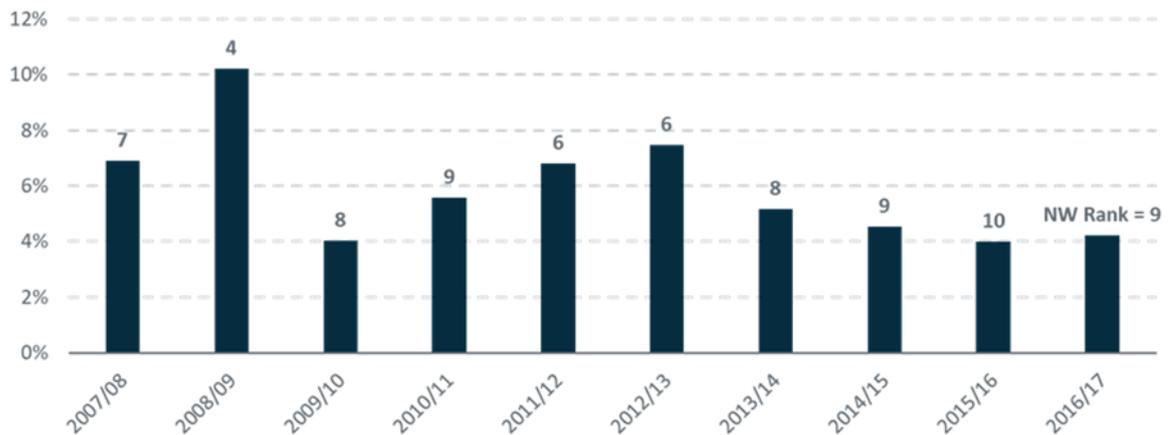
Figure 4.5 Average award size 2007/08 to 2016/17



Source: Innovate UK, Funding Data, 2017

This is borne out in the figures on the North West’s proportion of the UK’s total award value awarded each year, where although the proportions are similar, the dip in the share of award value from 2012/13 to 2016/17 mirrors that of the chart above:

Figure 4.6 North West’s proportion of UK total award value awarded each year



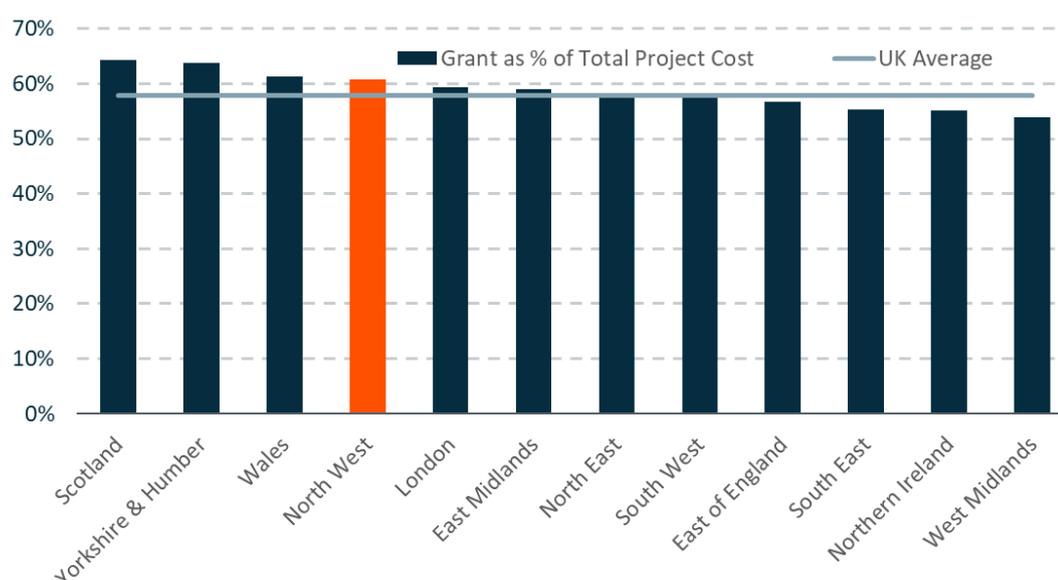
Source: Innovate UK, Funding Data, 2017

- 4.11 The NW has consistently secured less funding relative to its business base. The region gained some ground in the latest year’s data, however, this is largely due to a drop in total funding across the UK as North West funding has remained around the same level as the previous year.

The Innovate UK intervention rate

- 4.12 In examining the North West’s performance, it is worth noting that North West award recipients may simply be requesting a lower size of award from Innovate UK as they for some reason require less public funding for their R&D projects (in proportional terms).
- 4.13 The data available for this study does not allow us to investigate this in detail, but we have analysed the overall Innovate UK *intervention rate* for each region. The intervention rate is the proportion of the total costs of a project that Innovate UK funding represents.
- 4.14 The chart below shows that the intervention rate for the North West is slightly higher at 61% than the UK average of 58% and there is very little variability between regions. The average award size is generally proportionate to the total project costs, suggesting that the projects as a whole for North West organisations are smaller than in other regions.

Figure 4.7 Innovate UK intervention rate by region



Source: Innovate UK, Funding Data, 2017

Does leading a project affect the award size?

- 4.15 Given the collaborative nature of the projects, within each funded project there are multiple award recipients. Each project has a ‘lead’, and one or more ‘partners’. Data across the UK shows a very large spread between the awards to project leads and project partners: the average award for all organisations is £184,000, with a spread between £310,000 on average for project leads and £120,000 on average for project partners.

- 4.16 With this in mind, we have investigated the propensity of North West awardees to be project leads as opposed to partners. Of North West organisations awarded funding, 31.5% are the leads on projects. This is only marginally below the UK as a whole at 32.2%. However, the average award size for NW project leads is 24% lower than for the UK as a whole, and the average award size for NW project partners is 13% lower than the UK as a whole. Both are significant findings and highlight that project leads are an important cohort to engage.

	UK	North West	% difference
Project lead	£310k	£237k	-24%
Project partner	£123k	£107k	-13%
Percentage difference	152%	122%	

Source: Innovate UK, Funding Data, 2017

Characteristics of Award Recipients

Type of organisation

- 4.17 Innovate UK funds private sector businesses, universities and charitable sector organisations. Of the total value of awards to the North West, 65% was awarded to businesses, 25% to academic institutions, and 8% to public sector/charity organisations.
- 4.18 Compared to the UK, universities in the North West have received a higher proportion of the value of awards. The breakdown compares to the UK as a whole as follows:

	Businesses	Academics	Public Sector/ Charity	Unknown/ Unclassified
North West	65%	25%	8%	1%
UK	72%	18%	5%	4%

Source: Innovate UK, Funding Data, 2017; note: figures may not sum due to rounding

- 4.19 As shown in the table below, the average size of awards to businesses has been 29% smaller in the North West than in the UK as a whole. In contrast, the average size of awards to academics in the North West is somewhat higher (3%) than the UK average.

Table 4.3 Average size of Innovate UK awards by type of institution

	Businesses	Academics	Public Sector/ Charity	Unknown/ Unclassified
UK	£187,700	£162,900	£194,100	£209,800
North West	£133,700	£167,500	£580,300	£52,000
% difference	-29%	+3%		

Source: Innovate UK, Funding Data, 2017

- 4.20 The very large North West average award size to the public sector/charities is primarily the result of a £7.7m award in 2012/13 to the Liverpool Clinical Commissioning Group for an exceptional assisted living services project (DALLAS).
- 4.21 There are only a small number of unknown/unclassified award recipients and this category is a minor consideration for this study.

Size of firms

- 4.22 The current spread in firm size of the business base in the North West and the UK is broadly similar, as shown in Table 4.4. Over 99% of firms in the UK and NW economy are SMEs.

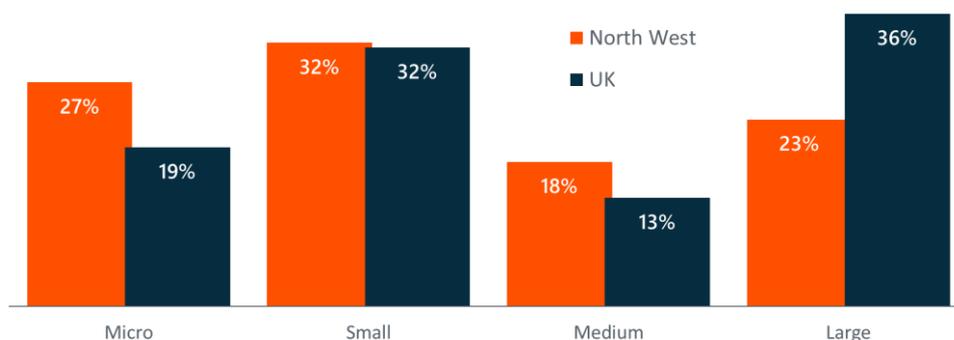
Table 4.4 Business base by size of business, 2017

	North West	UK
Micro	88.7%	89.4%
Small	9.3%	8.7%
Medium	1.6%	1.5%
Large	0.4%	0.4%

Source: ONS, UK Business Counts, 2018

- 4.23 Looking at the number of awards that Innovate UK made to businesses, in the North West 68% were to SMEs (micro, small or medium sized enterprises), whereas across the UK as a whole this was 63%.
- 4.24 Of the North West funding (by value) that went to businesses, 77% went to SMEs, with the largest proportion (32%) going to Small businesses. This compares to the UK as a whole with 64% of funding going to SMEs and the largest proportion (36%) going to Large businesses. This indicates a higher gearing of funding in the North West towards smaller firms. See Figure 4.8.

Figure 4.8 Split of Innovate UK funding by value, by size of business



Source: Innovate UK, Funding Data, 2017

- 4.25 The higher SME support to the North West helps to explain the previous analysis on intervention rates, as SMEs can request higher intervention rates than large firms.
- 4.26 Across the UK and within the North West, the average award size for SMEs is larger than for large businesses (which could result from lower funding gaps experienced by larger firms, and less need for Innovate UK funding). There is, however, a significant disparity between the size of awards to North West firms and firms of the same size nationwide. This is particularly evident in larger sized firms where the average size of NW awards is close to half that of the UK as a whole.

Table 4.5 Average award sizes

	Average Award Size Total Value of Awards			Total Value of Awards		
	UK	North West	% difference	UK	North West	NW % of UK
Micro	£163k	£143k	-12%	£305m	£22.3m	7.3%
Small	£215k	£176k	-18%	£497m	£26.2m	5.3%
Medium	£191k	£128k	-33%	£208m	£14.4m	6.9%
SMEs	£192k	£151k	-21%	£1bn	£62.9m	6.2%
Large	£181k	£96k	-47%	£561m	£18.6m	3.3%
All Businesses	£187k	£134k	-28%	£1.6bn	£81.5m	5.2%

Source: Innovate UK, Funding Data, 2017

Universities

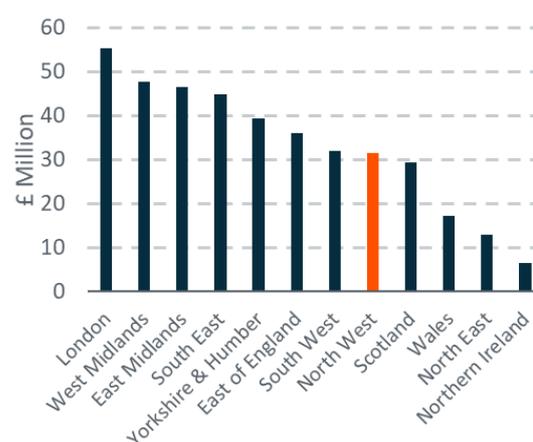
4.27 Universities are very important in enabling business-led innovation and boosting productivity, and as we saw earlier, have received a significant share of Innovate UK's awards.

4.28 The most prominent universities in the North West are among the region's largest award recipients, with the University of Manchester, University of Liverpool, Lancaster University, Manchester Metropolitan University, University of Salford and Liverpool John Moore's University all appearing in the top twenty North West organisations funded.

4.29 To put this into context, the North West makes up over 9% of Higher Education Institutions (HEIs) and has 10% of academic staff across the regions of the UK (it ranks 4th highest in both).¹⁵

4.30 Although universities have been prominent award recipients in the North West, they account for 7.9% of Innovate UK's funding to all UK academic institutions and have received the 4th lowest funding of all the regions when compared to the number of academics across all universities in each region, as shown below. This partly reflects the large and diverse nature of the North West HE sector, with a range of research intensities across institutions. However, it suggests that there may be even more potential for North West universities to secure funding in future. Strategic collaborations with businesses, and other research organisations, will be important in maximising this potential.

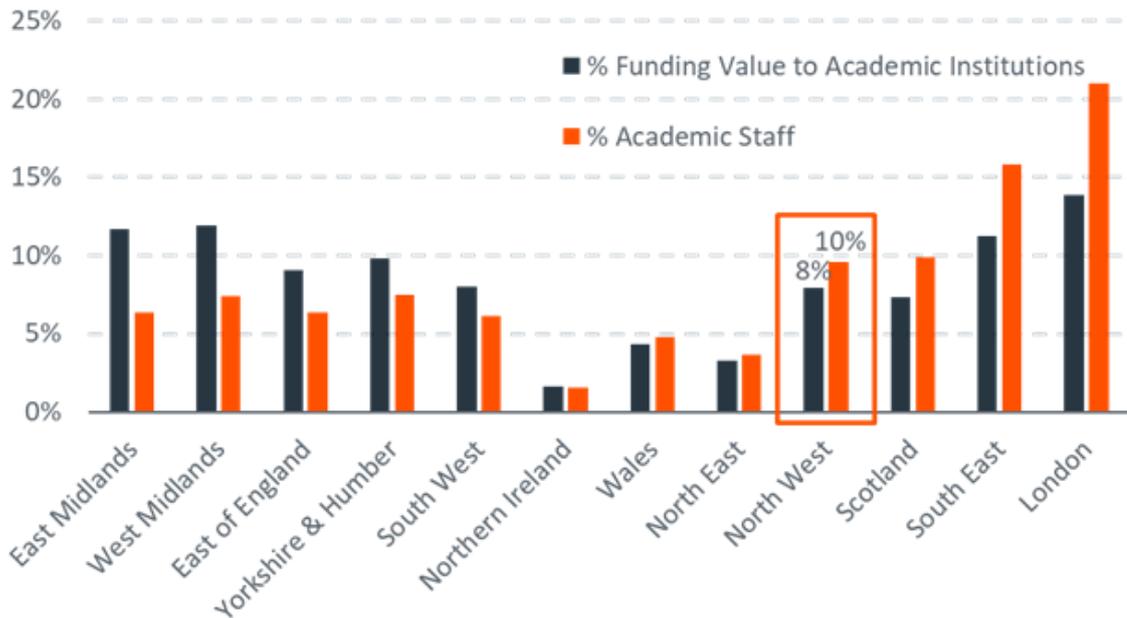
Figure 4.9 Funding to academics



Source: Innovate UK

¹⁵ HESA, Staff by HE Provider 2015/16, 2017

Figure 4.10 Innovate UK Funding to academic institutions per academic staff by region

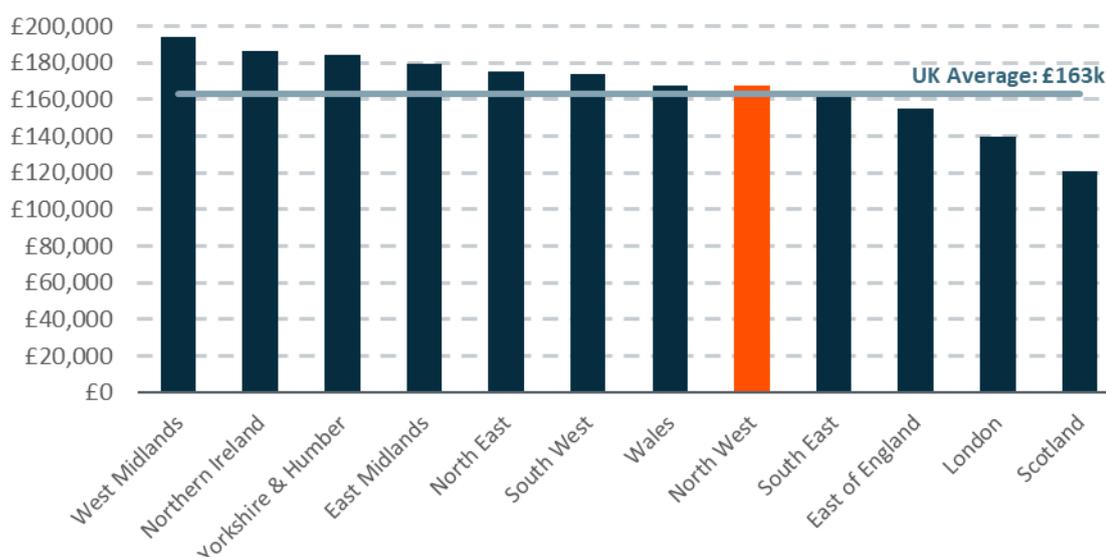


Source: Innovate UK, Funding Data, 2017; HESA, Staff by HE Provider 2015/16, 2017

4.31 As noted earlier, universities in the North West secure slightly larger awards on average, at £167k, than the rest of the UK at £163k. This suggests that the shortfall when compared to the region’s share of all UK academics is explained by the number of awards being secured, rather than the size of awards.¹⁶

¹⁶ According to the latest data from HESA, North West Universities have an average of 1,291 academic staff per university, whereas across the UK this is 1,235

Figure 4.11 Average size of awards to academic institutions



Source: Innovate UK, Funding Data, 2017

Spread of funding across organisations

- 4.32 Some firms may be hesitant in applying for funding due to a lack of capacity, experience or misconceptions about the burden of applying and chances of success. This means that those who are successful in one competition may be more likely to apply again.
- 4.33 Across the UK, 70% of awards have been made to applicants with more than one award. In the North West this is smaller at 64% of awards. At the higher end, for organisations that have received 10 or more awards, in the UK this represents 29% of all awardees and in the North West this is 22% of all awardees.
- 4.34 This suggests that although there is some concentration of awards in certain organisations, this is less of a trend in the North West than nationally.
- 4.35 The table below shows the ten North West organisations that have received the most awards from Innovate UK since 2007. 31% of the total award value has gone to these organisations. There is a clear pattern of academic institutions, accounting for 4 of the top 10, with the businesses focused around engineering and scientific activities.

Table 4.6 Organisations with highest number of awards in the North West

	Awards	% Awards	Total Funding	% Total Funding	Average Award	Sector
Manchester Uni	67	7.9%	£11.1m	8.9%	£166k	Academic
Liverpool Uni	48	5.7%	12.1m	9.7%	£253k	Academic
C-Tech Innovation	33	3.9%	£4.8m	3.8%	£145k	72190 - Other R&D on natural sciences and engineering
Lancaster Uni	22	2.6%	£2.1m	1.7%	£95k	Academic
HW Comms	12	1.4%	£2.0m	1.6%	£168k	74909 - Other professional, scientific & technical activities
LJM University	9	1.1%	£1.2m	1.0%	£135k	Academic
Roland Hill Ltd	8	0.9%	£0.1m	0.1%	£15k	82990 - Other business support service activities
Natnl Nuclear Laboratory	8	0.9%	£1.0m	0.8%	£129k	71122 - Engineering related scientific & technical consulting
ABB Ltd	8	0.9%	£0.5m	0.4%	£68k	27120 - Manufacture of electricity distribution & control apparatus
Bentley Motors	8	0.9%	£3.9m	3.1%	£486k	29100 - Manufacture of motor vehicles

Source: Innovate UK, Funding Data, 2017

Sectoral insights

4.36 SIC Codes describe the main activity within the sectors of the UK. By joining the Innovate UK data with Companies House information we have analysed funding using 2-digit SIC codes, which split the economy into 88 discrete sectors. This has also enabled us to consider any correlations with the size, concentration and productivity of these sectors in the North West. We have focussed on the following aspects:

- Establishing which sectors have been most active in accessing awards, in absolute terms
- Comparing these most active sectors to other data on the presence of these sectors in the region (e.g. the number of businesses and employees in the sectors)

- Examining how active the strongest sectors in the region (including those prioritised for growth by policymakers) have been in accessing funds
- Investigating any correlations between the sectors that have been funded and the productivity of these sectors.

4.37 We assigned all funding to academic institutions as a separate, distinct “academic” sector to ensure that this is not lost in the analysis.

4.38 It should be noted that this data excludes organisations that are neither academic institutions nor businesses as well as businesses that were not matched with a SIC code from Companies House through their Company Reference Number.¹⁷

Which sectors have been accessing awards?

4.39 Innovate UK funding is open to applicants from all sectors, with the limiting factor being their ability to meet the competition’s objectives.

4.40 Those have received the most funding in the North West are shown in Table 4.7.

¹⁷ As a percentage of total award value awarded to business, those that were not matched to SIC codes account for only 4% in the North West and 5% in the UK. In terms of the number of awards this is 7% for the North West and 8% for the UK. They are a minor consideration for this study.

Table 4.7 Sectors in the North West receiving the most Innovate UK funding

Sector (2 Digit SIC)	% of Total Value of Awards in NW
Academic	28.1%
72: Scientific research and development	18.6%
74: Other professional, scientific and technical activities	7.4%
71: Architectural & engineering activities; technical testing & analysis	4.9%
29: Manufacture of motor vehicles, trailers and semi-trailers	4.1%
28: Manufacture of machinery and equipment n.e.c.	4.0%
61: Telecommunications	3.9%
62: Computer programming, consultancy and related activities	3.1%
20: Manufacture of chemicals and chemical products	2.4%
70: Activities of head offices; management consultancy activities	2.1%

Source: Innovate UK, Funding Data, 2017 note: proportions here exclude awards allocated to public sector, charities and unknown/unclassified organisation. Hence the proportion received by academics is higher than that quoted in Table 4.2 earlier.

What innovations are the top funded sectors working on?

- 4.41 The more detailed SIC codes from Companies House (to 5-digit level) helps to illuminate more precisely the types of activities that have been funded.
- 4.42 The **Scientific Research & Development sector (SIC 72)** receives the highest proportion of Innovate UK funding in the North West, at 19%. Large projects funded under this sector include innovative medical treatments, such as disease resistance, and environmental technologies, such as low cost solar cells. The companies are involved in natural sciences and engineering, breaking down as follows:
- Other research and experimental development on natural sciences and engineering – **11% of total funding in the region.**
 - Research and experimental development on biotechnology – **5%**
 - Research and experimental development on social sciences and humanities – **3%**
- 4.43 The next highest sector by value of funding is **Other Professional, Scientific and Technical activities** (7% of NW Innovate UK Funding) which mainly covers specialist services and consultancy activities, such as environmental consulting and activities that cannot be readily classified. Projects vary widely, from AI to horticulture.
- Environmental consulting activities – **6%**

- Unclassified Professional, Scientific and Technical activities – 1%

4.44 The third highest funded sector is **Architectural and engineering activities, and technical testing and analysis** (5% of NW Innovate UK Funding). Large projects here are mainly focussed on low carbon energy and automotive solutions, including robotics for nuclear decommissioning and hydrogen fuelled vehicles.

- Engineering related scientific and technical consulting activities – 3%
- Other engineering activities (not including engineering design for industrial process and production or engineering related scientific and technical consulting activities) – 1%
- Engineering design activities for industrial process and production, Technical testing and analysis, Architectural activities, Urban planning and landscape architectural activities -1%

4.45 Looking more specifically at the organisational level, the ten North West organisations in receipt of the most funding from Innovate UK in terms of total value of awards are as follows:¹⁸

- University of Liverpool – 8.5%
- University of Manchester – 7.8%
- Liverpool Clinical Commissioning Group – 5.3% (for one large programme)
- C-Tech Innovation Limited – 3.3%
- Bentley Motors Limited – 2.6%
- Lancaster University – 2.0%
- Cellular Therapeutics Limited – 1.6%
- HW Communications Limited – 1.4%
- F2G Limited – 1.4%
- In Touch Limited – 1.2%

¹⁸ The percentages show the proportion of total North West CR&D and SBRI Funding that has gone to each organisation; Note: These figures include more recent funding data up to April 2018

How does the sectoral split in awards compare to the size of the sectors?

4.46 The chart below shows the distribution of funding across (anonymised) sectors in the region, compared to the proportion of North West employment in that sector. It demonstrates that, including academic institutions, only four sectors at this 2-digit level account for over 5% of the funding individually, but together they make up over half of all funding (54%). Further:

- 23 sectors make up 95% of all funding. This is 26% of the 89 2-digit sectors we have analysed. Although this is a disproportionate share of SIC codes, there are a number of industries that are not relevant or make up an insignificant proportion of employment in both the North West and the UK as a whole.
- Notably, 35 sectors have accessed no Innovate UK funding in the North West, despite making up 34% of employees.

Figure 4.12 Distribution of proportion of awards and employment by sector



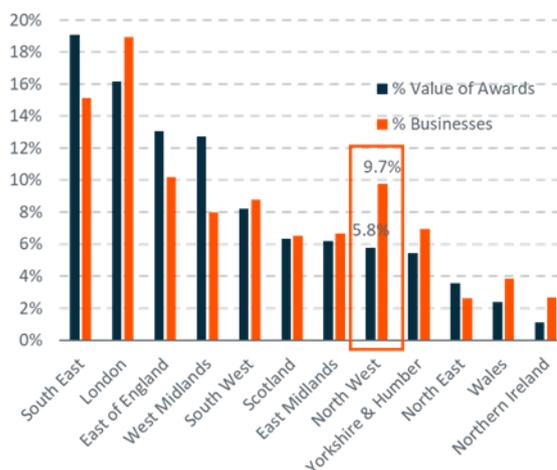
Source: Innovate UK, Funding Data, 2017

How active have the strongest sectors been?

4.47 Another way of looking at the sectoral dimension is to examine how active the stronger sectors in the region have been in accessing funding. At face value, we might expect these sectors to be more likely to access funding. If they are not doing so, then this might represent an untapped opportunity.

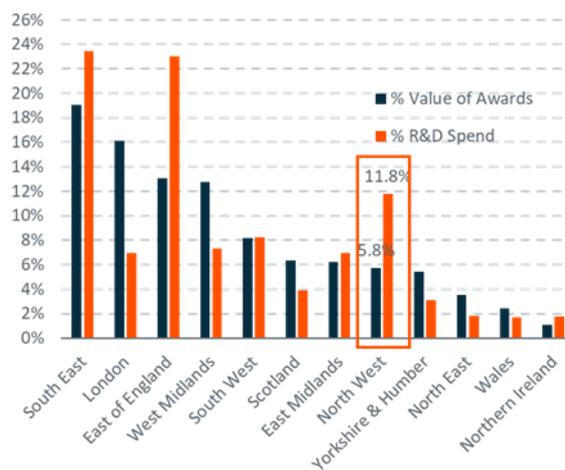
4.48 In framing this analysis, it is worth recalling the headline analysis presented earlier. It sets a benchmark against which to measure the sectors in terms of contributing to or mitigating the North West's poor overall performance.

Figure 4.13 Percentage share of award value by region, compared to business base



Source: ONS, Business Counts, 2018 and Innovate UK

Figure 4.14 Percentage share of award value by region, compared to business R&D spend



Source: ONS, R&D Expenditure performed by Businesses and Innovate UK

4.49 There are various ways of filtering sectors by “strength”. Our analysis focusses on two distinct (and, in some cases, overlapping) sets of sectors:

- Sectors **prioritised by policymakers** for growth
- Sectors in which the North West has a **relative specialisation** compared to other regions.

4.50 We consider each in turn below:

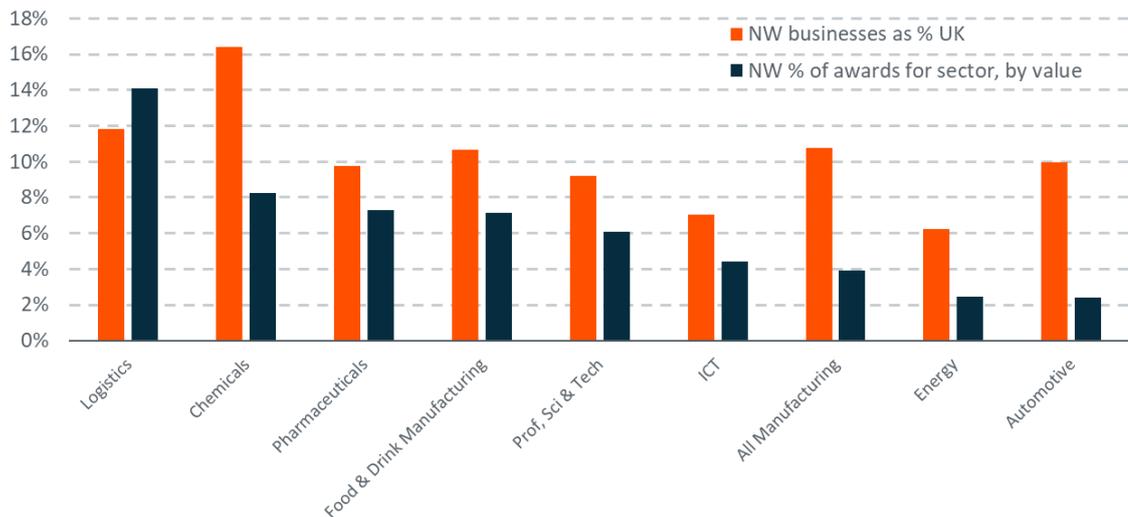
Policy Priority Sectors

4.51 A selection of sectors are seen by policymakers as priorities for the region, owing to a range of factors including their relative size, growth prospects and value added. These are articulated in several places, including LEP Strategic Economic Plans, Northern Powerhouse Policy documents and the Science & Innovation Audits, amongst others. We have isolated these sectors in the funding data to look at their performance.¹⁹

¹⁹ Note that our analysis does not cover all priority sectors as some are difficult to define within the constraints of the available data. This includes as aerospace which is not easily described by a discrete set of SIC codes. SIC Codes used:

4.52 The chart below shows the amount of funding awarded to North West businesses over the period as a proportion of the UK total for each sector compared to the proportion of UK businesses that the North West makes up for each sector. This demonstrates that all but one sector (logistics) receives a less than proportionate share in funding. On this measure, the disparity is highest for automotive and chemicals.

Figure 4.15 Percentage of funding for NW sectors in the context of the business base



Source: Innovate UK, Funding Data, 2017; ONS, UK Business Counts, 2017

4.53 The table below provides more detail on what lies beneath this performance, dissecting it into these sectors’ regional share of total awards and the average value of the awards compared to the UK.

4.54 This reveals a number of messages:

- All of the sectors received a lower than proportionate share of awards by volume
- Only two of the sectors exceeded the UK average for award value (pharmaceuticals and logistics). In the case of logistics, the average award value is sufficient to pull the North West sector’s share of total award value above parity with its share of the business base.
- This implies that nearly all of the sectors shown below receive both a lower proportion of awards by volume and a lower than average award.

Manufacturing: C; Automotive: 29; Chemicals: 20; Energy: 5, 6, 8, 9, 35; Food & Drink Manufacturing: 10, 11; ICT: J; Logistics: 49-52; Pharmaceuticals: 21; Professional, Scientific & Technical: L, M

Table 4.8 Performance of Selected NW sectors prioritised for growth by LEPs

	NW Businesses as % UK in sector	NW award value as % UK in sector	NW awards as % UK in sector	Avg NW award size (UK in sector = 100)
Automotive	10%	2%	4%	54
All manufacturing	11%	4%	7%	53
Energy	6%	2%	4%	68
Chemicals	16%	8%	11%	75
ICT	7%	4%	5%	81
Professional, scientific & technical	9%	6%	8%	79
Food and drink manufacturing	11%	7%	8%	87
Pharmaceuticals	10%	7%	6%	119
Logistics	12%	14%	8%	172
All sectors in North West	10%	6%	7%	80

Source: Innovate UK, Funding Data, 2017; ONS, UK Business Counts, 2017

4.55 We have taken this further to explore what impact raising these sectors' award shares towards the UK average would have had in closing the overall North West gap. This helps to provide an indication for the future on what might make the biggest difference.

- Manufacturing as a whole is the biggest driver behind the overall gap, unsurprisingly given the sector's size, the main driver is the volume of awards rather than the size of awards.
- For individual sectors, Automotive Manufacturing and Professional, Scientific & Technical Services are the biggest drivers behind the overall gap
- Volume of awards is the driver behind the gap for automotive, with average grant size being the main driver for Professional, Scientific & Technical.

Sectors with relative specialisation in North West

4.56 The other analytical filter we have applied is to focus on those sectors that show a relative specialisation in the North West (those with a Location Quotient/LQ above 1²⁰). Table 4.9 shows the top 20 2-digit sectors in this category, ranked by total employment in the sector.

²⁰ Defined as the proportion of employment in the sector in the North West, divided by the proportion of employment in the sector in Great Britain. An LQ of more than 1 indicates relative specialisation compared to the UK average; an LQ below 1 indicates that concentration of employment in that sector is below the national average

Some of these 2-digit sectors also appeared in the preceding analysis of priority sectors, with explicitly (e.g. SIC 29: automotive manufacturing) or implicitly (e.g. SIC 61 telecoms is part of the broader ICT sector). A few observations can be made:

- A number of these sectors in the region did not access any awards in the period. Some of these may not be surprising as they are unlikely to be relevant to the funding on offer (e.g. accommodation). Others may represent areas of opportunity for the future. For example, there may be opportunities for fintech innovation in legal and accounting businesses.
- Most of the sectors received a lower share (by value and number) of awards than their share of the business base. Again, some of these (e.g. retail) are perhaps not a surprise. Others (e.g. transport equipment) might have been expected to secure more.
- One sector (waste collection, treatment and disposal) secured a very large value and volume of awards. Closer inspection shows that this covered a range of recycling and circular economy projects.
- Real estate activities also accessed a disproportionately large value of awards, and exceeded the UK average for average award value. The project-level data shows that this includes the CityVerve project, a large Greater Manchester project aimed at creating new services and operating models in transport, healthcare and energy.

Table 4.9 Performance of NW's strongest sectors, defined by scale and specialisation

	NW Employees (000s)	NW LQ (GB=1)	NW Businesses as % UK in sector	NW award value as % UK in sector	NW awards as % UK in sector	NW Average Size of Awards (UK=100)
47: Retail trade, excl automotive	336	1.1	12.2%	0.4%	1.1%	34
85: Education	291	1.0	9.2%	10.3%	7.0%	148
86: Human health activities	290	1.2	11.9%	3.9%	5.7%	70
56: Food & beverage services	195	1.0	10.7%	0.0%	0.0%	-
84: Public admin & defence	143	1.0	7.5%	0.0%	0.0%	-
69: Legal & accounting	95	1.4	9.6%	0.0%	0.0%	-
49: Land transport & transport via pipelines	74	1.2	10.7%	20.8%	8.3%	250
52: Warehousing & support for transportation	69	1.2	16.4%	3.6%	4.3%	82
55: Accommodation	59	1.2	9.5%	0.0%	0.0%	-
10: Food manufacturing	54	1.3	11.0%	8.3%	8.9%	94
68: Real estate activities	53	1.0	9.7%	10.4%	9.7%	108
25: Manufacture of fabricated metal products	35	1.1	10.9%	6.8%	13.2%	51
42: Civil engineering	33	1.3	9.4%	1.9%	8.7%	21
53: Postal & courier activities	26	1.0	11.7%	0.0%	0.0%	-
30: Manufacture of other transport equipment	25	1.7	9.5%	0.6%	2.6%	24
29: Automotive manufacturing	24	1.3	10.0%	2.4%	4.5%	54
80: Security & investigation	23	1.1	10.5%	-	0.0%	-
61: Telecommunications	23	1.0	8.8%	20.3%	11.7%	174
38: Waste collection, treatment and disposal activities; materials recovery	22	1.5	12.3%	54.5%	30.3%	180
22: rubber & plastic manufacturing	20	1.3	12.3%	9.0%	9.5%	95

Source: Innovate UK, Funding Data, 2017; ONS, Business Register & Employment Survey, 2017

Links to productivity

4.57 As we saw in section 2, productivity has strong links to innovation, with innovation often the driving force behind improvements in productivity. Below, we have shown the top 20 funded sectors in the North West by total award value, the size of these sectors and their productivity. This shows that, with a few exceptions (e.g. chemicals), the sectoral distribution

of awards in the North West does not show any particular correlation with areas of comparative advantage, in terms of productivity.

Table 4.10 Top twenty funded sectors in North West mapped against relative productivity

	NW award value as % UK in sector	NW awards as % UK in sector	NW Businesses as % UK in sector	NW Average Size of Awards (UK=100)	GVA per Worker (GB=100 in sector)
Academic	8%	8%	-	103	N/A
72: Scientific R&D	6%	8%	8%	81	151
74: Other prof, scientific and technical activities	7%	8%	9%	83	91
71: Architectural, engineering and testing	6%	10%	11%	59	80
29: Automotive Manufacture	2%	4%	10%	54	81
28: Manufacture of other machinery and equipment	7%	9%	10%	74	90
61: Telecommunications	20%	12%	9%	174	84
62: Computer programming, consultancy	3%	5%	7%	51	111
20: Chemical Manufacturing	8%	11%	16%	75	153
70: Head Offices & Mgmt Consultancy	4%	5%	8%	74	83
32: Other manufacturing	4%	8%	10%	45	84
49: Land transport and transport via pipelines	21%	8%	11%	250	81
25: Manufacture of fabricated metal products	7%	13%	11%	51	97
82: Business Admin & Support	4%	8%	10%	54	96
27: Manufacture of electrical equipment	4%	6%	10%	63	70
38: Waste collection, treatment and disposal	54%	30%	12%	180	85
26: Manufacture of computer, electronic and optical products	2%	3%	9%	59	98
22: Manufacture of rubber and plastic products	9%	9%	12%	95	114
10: Food Manufacturing	8%	9%	11%	94	89
13: Manufacture of textiles	15%	22%	13%	70	88

Source: Innovate UK, Funding Data, 2017; ONS, GVA (Balanced), 2017; ONS, BRES, 2017

4.58 The table below cuts the data in a different way, showing the performance of the North West's top 20 most productive sectors (relative to their Great Britain counterparts)²¹ in Innovate UK competitions. Although some account for significant proportions of Innovate

²¹ Note that this excludes very small sectors (those with less than 0.1% of the North West employment).

UK funding to the North West, relative to the number of businesses in the sector, they all underperform their UK counterparts.

Table 4.11 Performance of NW's strongest sectors by productivity					
	GVA per Worker (GB=100 in sector)	NW award value as % UK in sector	NW awards as % UK in sector	NW Businesses as % UK in sector	NW Average Size of Awards (UK=100)
95: Repair of computers & household goods	171	-	-	10%	-
20: Chemical Manufacturing	153	8%	11%	16%	75
21: Pharma Manufacturing	153	7%	6%	10%	119
72: Scientific R&D	151	6%	8%	8%	81
93: Sports & Recreation	141	0%	0%	10%	-
87: Residential care activities	140	0%	0%	10%	-
23: Manufacture of other non-metallic mineral products	136	2%	4%	10%	56
31: Manufacture of furniture	129	0%	0%	11%	-
96: Other personal services	119	1%	5%	11%	27
91: Libraries, museums and cultural activities	116	-	0%	8%	-
81: Services to buildings and landscape activities	115	0%	0%	9%	-
88: Social work activities	115	0%	0%	10%	-
22: Manufacture of rubber and plastic products	114	9%	9%	12%	95
30: Manufacture of other transport equipment	112	1%	3%	10%	24
62: Computer programming, consultancy and related	111	3%	5%	7%	51
41: Construction of buildings	109	3%	7%	8%	42
46: Wholesale trade, excl automotive	108	6%	6%	11%	92
78: Employment activities	107	0%	0%	9%	-
43: Specialised construction activities	105	2%	3%	9%	74
26: Manufacture of computer, electronic and optical products	98	2%	3%	9%	59

Source: Innovate UK, Funding Data, 2017; ONS, GVA (Balanced), 2017; ONS, BRES, 2017

5. The Industrial Strategy Challenge Fund

The ISCF Challenges

- 5.1 The Industrial Strategy Challenge Fund (ISCF) provides funding and support to UK businesses and researchers. The fund is part of the Government's £4.7 billion increase in R&D over 4 years and is delivered by UK Research & Innovation.
- 5.2 The ISCF aims to bring together the UK's world-leading research with business to meet major industrial and societal challenges where:
- the UK has a world-leading research base and businesses ready to innovate
 - there is a large or fast-growing and sustainable global market
 - Challenges are each aligned with the Industrial Strategy's 4 Grand Challenges: AI and the data economy, clean growth, the future of mobility and meeting the needs of an ageing society
- 5.3 The Challenges span a broad variety of societal areas from healthy ageing to transforming construction to robots for a safer world. The Challenges are announced in Waves as competitive calls to the research and innovation community encouraging cross-sector multidisciplinary collaboration between academic researchers and industry partners; a total of £1.73bn has been allocated across the first two Waves which cover:²²
- Transforming construction
 - Data to early diagnosis & precision medicine
 - Transforming food production
 - Next generation services
 - Energy revolution
 - Healthy ageing
 - Audience of the future
 - Quantum technology

²² More information on current challenges is available here: <https://www.gov.uk/government/collections/industrial-strategy-challenge-fund-joint-research-and-innovation>

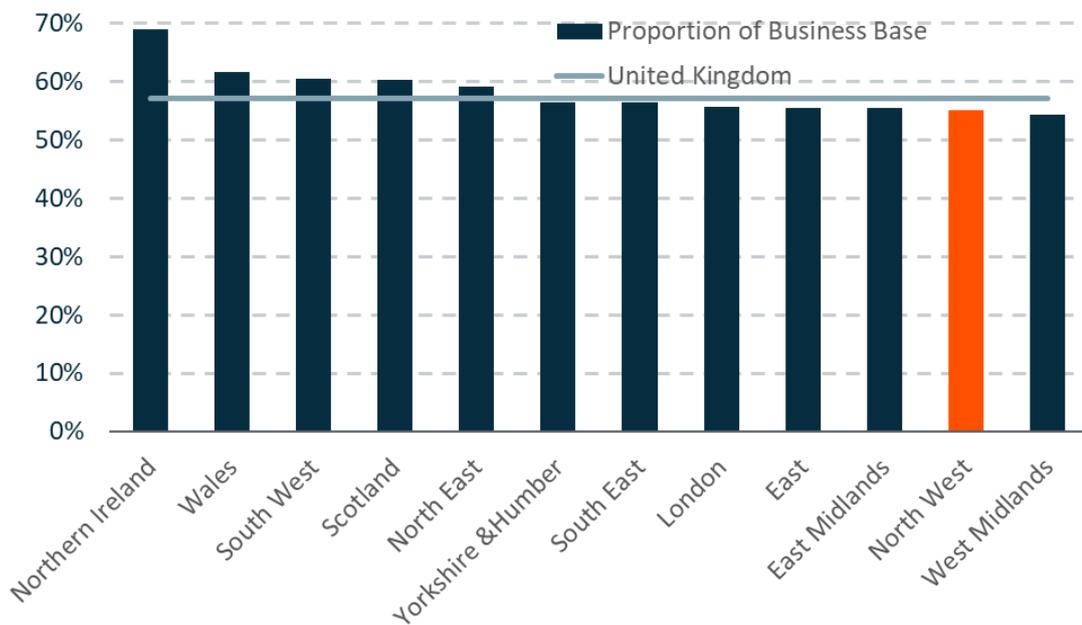
5.4 Furthermore, the Wave 3 competition has recently taken place, inviting expressions of interest from industry to identify the next wave of challenges to be supported.

How is the North West currently positioned?

5.5 Although the Challenges are specific in terms of their aims, they are relevant to a wide variety of business sectors. Innovate UK has indicatively mapped each of the Wave 1 and 2 Challenges to sectors that may be relevant to them. Using this mapping, we have identified the proportion of the business base in each region of the UK that has a Challenge relevant to them based on their 2 digit SIC code. This comes with the caveat that sectors are only indicatively mapped to Challenges and although a business is registered under one particular SIC code, it may have the potential to perform activities relevant to a variety of sectors.

5.6 Across the United Kingdom, around 57% of businesses are registered under a sector that has an ISCF Challenge relevant to them. For the North West, this is 55% which is not a large difference but puts the North West second from bottom amongst other regions.

Figure 5.1 Percentage of businesses in sectors relevant to ISCF waves



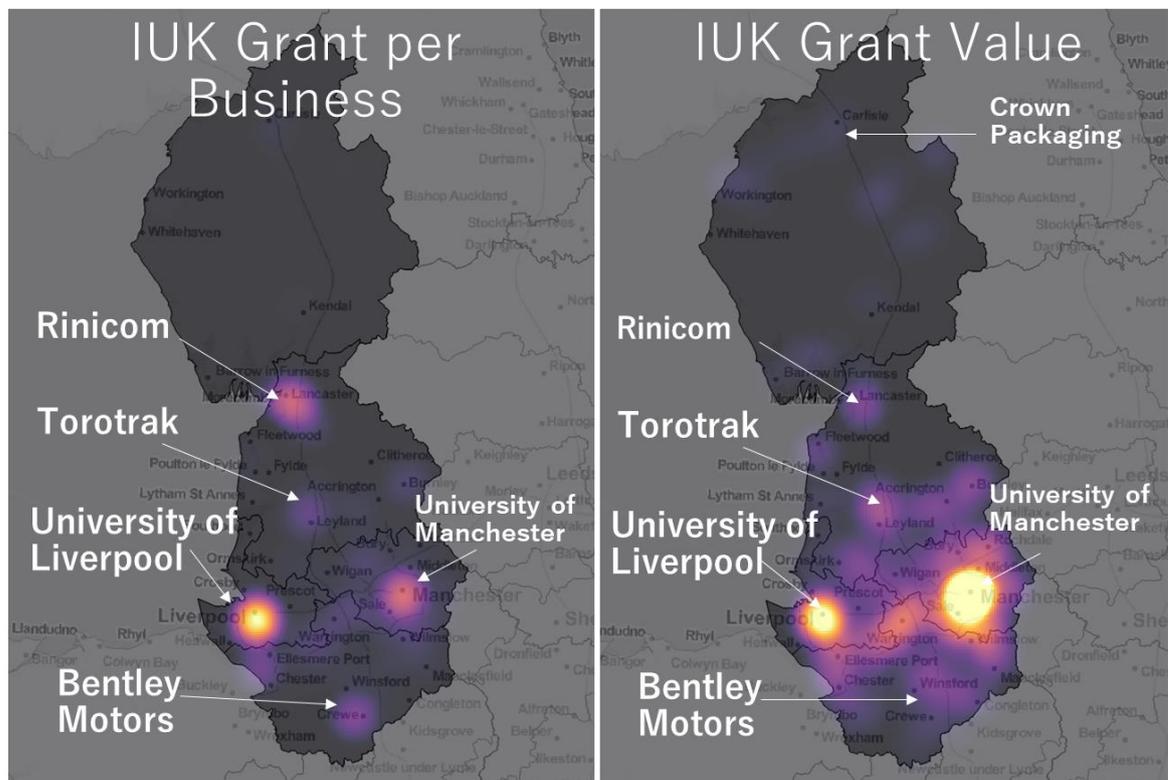
Source: Innovate UK, 2018; ONS, UK Business Counts, 2017

Appendix A - Spatial Picture

North West Spatial Picture

A.1 The maps below show hotspots within the North West for both absolute levels of funding and funding relative to the business base in the area, as well as some of the organisations that received large awards in the hotspots. The funding hotspots are largely unsurprising given they cover areas with large concentrations of business activity and employment.

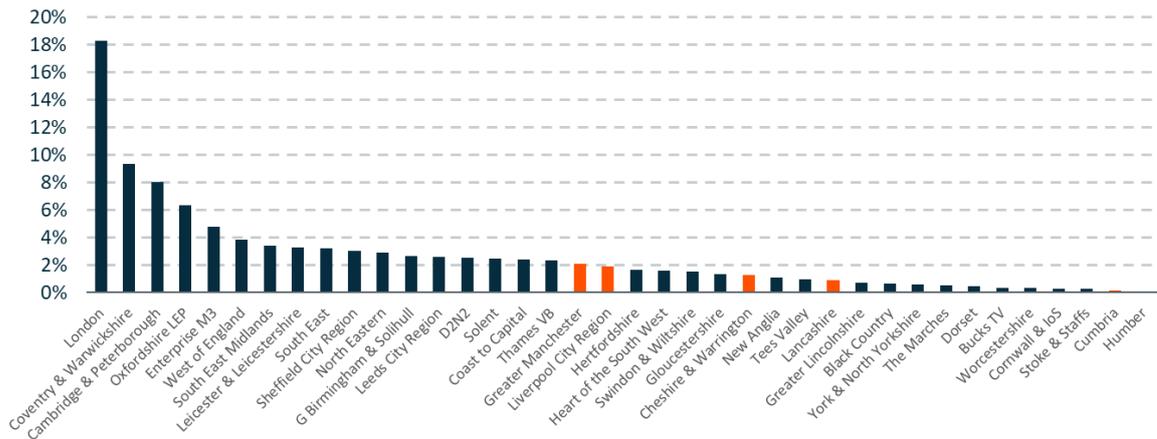
Figure A.1 Innovate UK funding hotspots in the North West



Source: Innovate UK, Funding Data, 2017; ONS, UK Business Counts, 2017

A.2 The Chart below shows the distribution of funding at Local Enterprise Partnership (LEP) level. This shows that North West LEPs are generally spread around the middle and lower end of the scale, with Cumbria second from bottom.

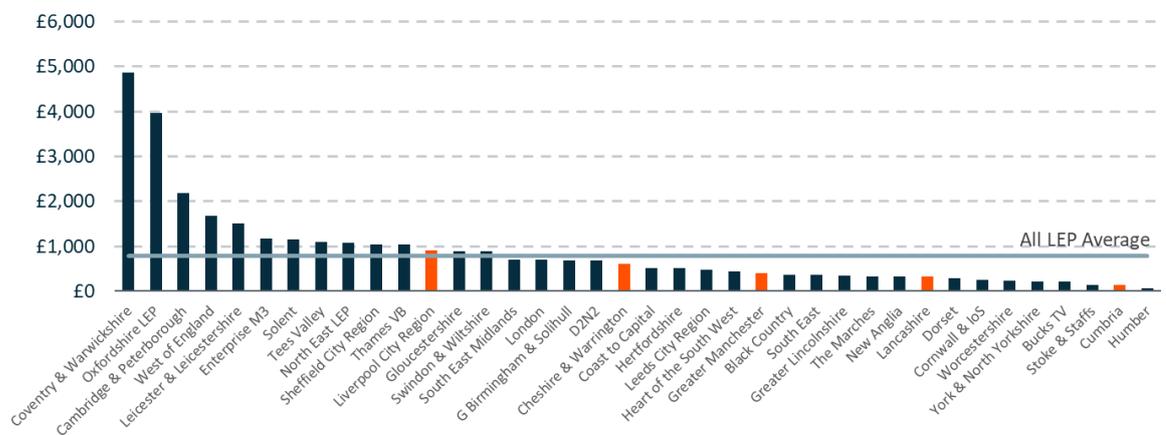
Figure A.2 Distribution of proportion of funding by LEP



Source: Innovate UK, Funding Data, 2017

A.3 Normalising these against the business base in each LEP shows that most of the LEPs in the North West are receiving below average funding, relative to the size of their economy with Liverpool City Region receiving only marginally more than average across LEPs.

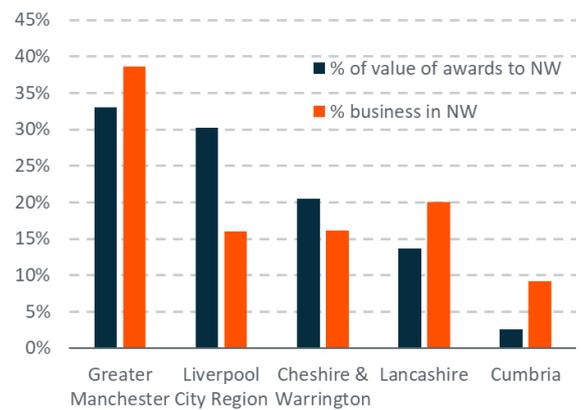
Figure A.3 Distribution of total award value per business population of LEP



Source: Innovate UK, Funding Data, 2017; ONS, UK Business Counts, 2017

A.4 Isolating just the LEPs within the North West, the chart to the right shows that Liverpool City Region and Cheshire & Warrington receive a greater share of North West funding, relative to their business bases, whilst Greater Manchester, Lancashire and particularly Cumbria receive less funding relative to their business bases.

Figure A.4 Funding and business base



Source: Innovate UK, Funding Data; ONS, UK Business Counts, 2017

A.5 Although it is unsurprising that the larger cities of Liverpool and Manchester have received a large proportion of funding, given their concentration of both businesses and universities, the disparity between the LEP areas is not fully explained by this and does not reflect the relative sizes of each LEP's economy.

LEP Profiles

A.6 We have also provided a set of LEP profiles which provide key figures for each of the LEPs in the North West.

Cheshire & Warrington

- Total GVA: £29 billion (18% of North West)
- Total Employment: 488,500 (15% of North West) & number of businesses 42,000 (16% of NW)
- GVA per worker (Indexed to England = 100): £56,800 (106)
- Business R&D spend per business (Indexed to England = 100): £29,800 (326)
- Number of Universities (academic staff count): 1 (670)
- Total Innovate UK Funding per business (England = 100): 72
- Total Innovate UK Funding per £ R&D spend (England = 100): 21
- Average Size of Award (England=100): 79
- Academic Funding per Academic Staff Member (Indexed to England = 100): £400 (18)
- Proportion awardees that are lead partners (Indexed to England = 100): 36% (111)
- Top 5 funded organisations:
 - *C-Tech Innovation Limited*
 - *National Nuclear Laboratory Limited*
 - *Bentley Motors Limited*
 - *Novelis UK Limited*
 - *Sellafield Limited*
- Top 5 funded sectors:
 - *72: Scientific research and development*
 - *71: Architectural and engineering activities; technical testing and analysis*
 - *74: Other professional, scientific and technical activities*
 - *20: Manufacture of chemicals and chemical products*
 - *29: Manufacture of motor vehicles, trailers and semi-trailers*

Cumbria

- Total GVA: £12 billion (7% of North West)
- Total Employment: 231,000 (7% of North West) & number of businesses 23,800 (9% of NW)
- GVA per worker (Indexed to England = 100): £46,000 (86)
- Business R&D spend per business (Indexed to England = 100): £3,000 (33)
- Number of Universities (academic staff count): (405)
- Total Innovate UK Funding per business (England = 100): 16
- Total Innovate UK Funding per £ R&D spend (England = 100): 43
- Average Size of Award (England=100): 34
- Academic Funding per Academic Staff: N/A – no funding to academic organisations
- Proportion awardees that are lead partners (Indexed to England = 100): 43% (134)
- Top 5 funded organisations:
 - Roland Hill Limited*
 - Technical Fibre Products Limited*
 - Innovia Films Limited*
 - Crown Packaging UK Plc*
 - Create Technologies Limited*
- Top 5 funded sectors:
 - 32: *Other manufacturing*
 - 25: *Manufacture of fabricated metal products, except machinery and equipment*
 - 82: *Office administrative, office support and other business support activities*
 - 26: *Manufacture of computer, electronic and optical products*
 - 72: *Scientific research and development*

Greater Manchester

- Total GVA: £64 billion (38% of North West)
- Total Employment: 1,266,500 (39% of North West) & number of businesses 100,500 (39% of NW)
- GVA per worker (Indexed to England = 100): £47,100 (88)
- Business R&D spend per business (Indexed to England = 100): £2,800 (31)
- Number of Universities (academic staff count): 4 (8,780)
- Total Innovate UK Funding per business (England = 100): 49
- Total Innovate UK Funding per £ R&D spend (England = 100): 174
- Average Size of Award (England=100): 74
- Academic Funding per Academic Staff Member (Indexed to England = 100): £1,600 (78)
- Proportion awardees that are lead partners (Indexed to England = 100): 26% (82)
- Top 5 funded organisations:
 - University of Manchester*
 - Warburtons Limited*
 - Manchester Metropolitan University*
 - Axion Recycling Limited*
 - University of Salford*
- Top 5 funded sectors:
 - Academic*
 - 72: Scientific research and development*
 - 25: Manufacture of fabricated metal products, except machinery and equipment*
 - 62: Computer programming, consultancy and related activities*
 - 74: Other professional, scientific and technical activities*

Lancashire

- Total GVA: £31 billion (19% of North West)
- Total Employment: 629,500 (19% of North West) & number of businesses 52,100 (20% of NW)
- GVA per worker (Indexed to England = 100): £45,500 (85)
- Business R&D spend per business (Indexed to England = 100): £4,600 (50)
- Number of Universities (academic staff count): 2 (3,320)
- Total Innovate UK Funding per business (England = 100): 39
- Total Innovate UK Funding per £ R&D spend (England = 100): 73
- Average Size of Award (England=100): 84
- Academic Funding per Academic Staff Member (Indexed to England = 100): £700 (35)
- Proportion awardees that are lead partners (Indexed to England = 100): 28% (88)
- Top 5 funded organisations:
 - *Lancaster University*
 - *HW Communications Limited*
 - *MI Technology Group Limited*
 - *University of Central Lancashire*
 - *Victrex Manufacturing Limited*
- Top 5 funded sectors:
 - *Academic*
 - *74: Other professional, scientific and technical activities*
 - *20: Manufacture of chemicals and chemical products*
 - *28: Manufacture of machinery and equipment n.e.c.*
 - *71: Architectural and engineering activities; technical testing and analysis*

Liverpool City Region

- Total GVA: £31 billion (19% of North West)
- Total Employment: 613,500 (19% of North West) & number of businesses 41,700 (16% of NW)
- GVA per worker (Indexed to England = 100): £47,500 (89)
- Business R&D spend per business (Indexed to England = 100): £8,700 (95)
- Number of Universities (academic staff count): 6 (5,855)
- Total Innovate UK Funding per business (England = 100): 107
- Total Innovate UK Funding per £ R&D spend (England = 100): 120
- Average Size of Award (England=100): 100
- Academic Funding per Academic Staff Member (Indexed to England = 100): £2,500 (124)
- Proportion awardees that are lead partners (Indexed to England = 100): 34% (106)
- Top 5 funded organisations:
 - University of Liverpool*
 - Liverpool John Moores University*
 - ABB Limited*
 - Unilever PLC*
 - Aimes Grid Services Community Interest Company*
- Top 5 funded sectors:
 - Academic*
 - 71: Architectural and engineering activities; technical testing and analysis*
 - 72: Scientific research and development*
 - 27: Manufacture of electrical equipment*
 - 61: Telecommunications*

Appendix B - Science & Innovation Audits

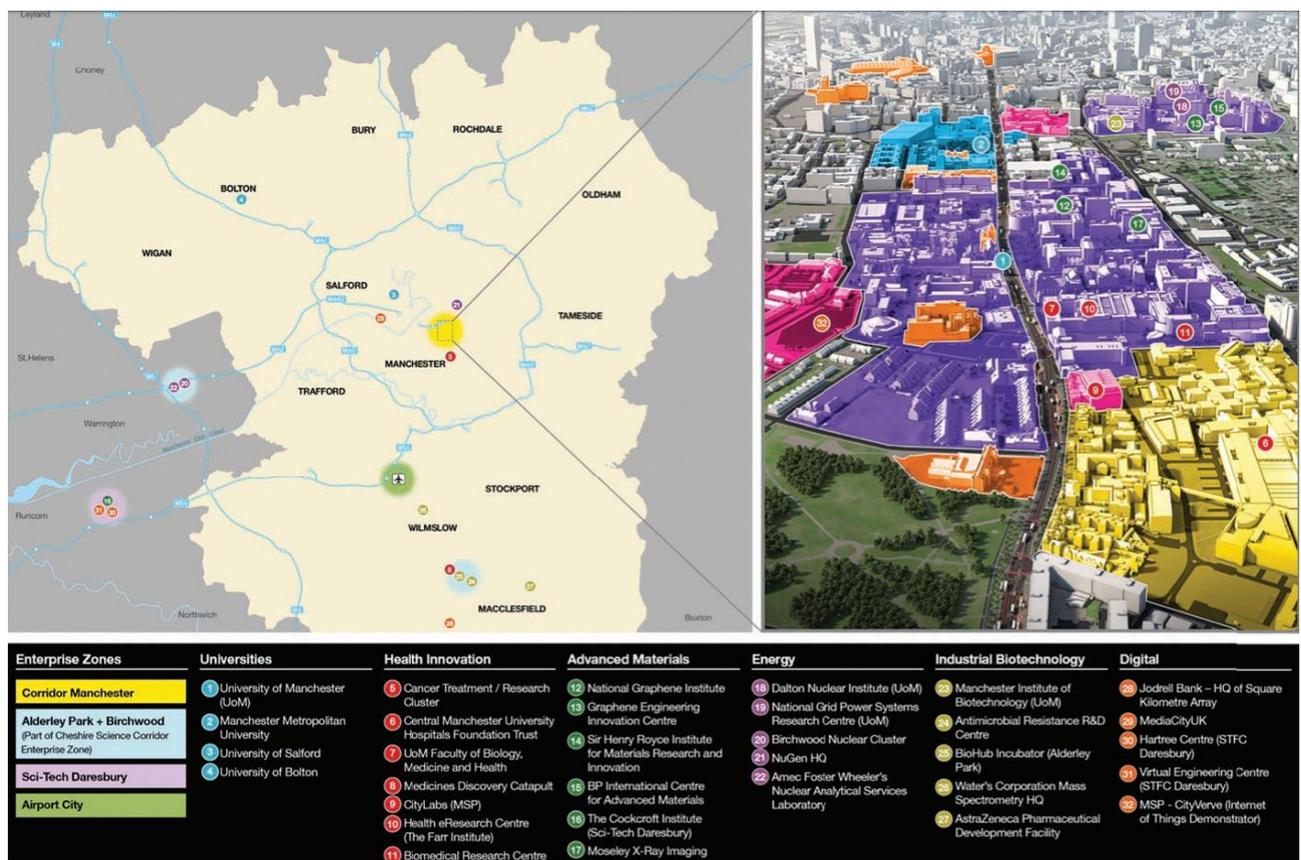
Greater Manchester and Cheshire East

B.1 The Greater Manchester and Cheshire East SIA identifies three areas of opportunity:

- **Health** – a globally leading centre for clinical trials
- **Materials** – rapid accelerator to application
- GM as a full-scale **test-bed** and lead market to develop and demonstrate innovative technology

B.2 The figure below shows the key assets identified in the SIA:

Figure B.1 Greater Manchester & Cheshire East SIA map



Source: Greater Manchester & Cheshire East Science & Innovation Audit

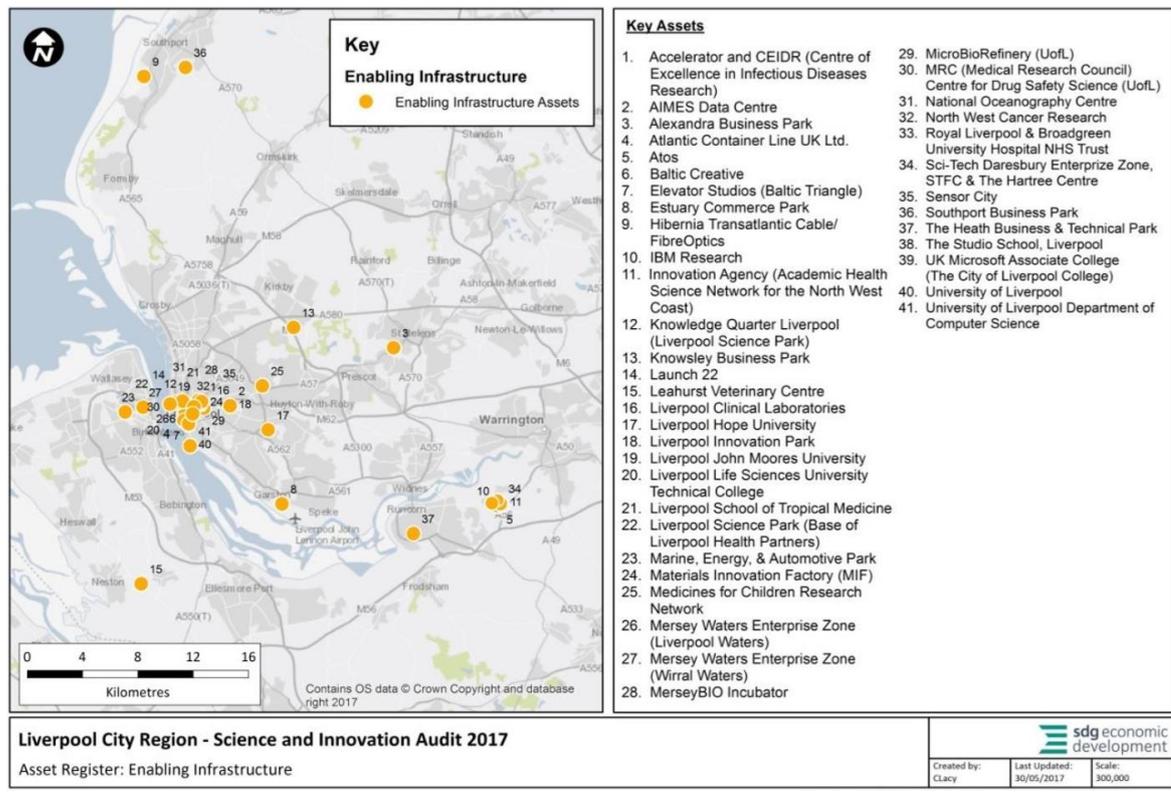
Liverpool City Region

B.3 The Liverpool City Region SIA's Science & Innovation Ambitions are:

- **Infection:** to consolidate the LCR's position as an international centre of excellence in tackling infectious diseases, and create a cluster of anchor and high growth companies to take advantage of global market opportunities in infection
- **Materials Chemistry:** to apply the LCR's world class materials chemistry capabilities and commercialisation model to provide transformational opportunities for mature UK sectors, create new high-growth industries, and become a recognised global leader.
- **High Performance & Cognitive Computing:** to harness the LCR's world-leading High Performance and Cognitive Computing capabilities to accelerate cross-sector growth and productivity, public sector transformation, and develop a world-class data-centric and disruptive digital technologies cluster.
- **Innovation Excellence:** for the LCR to be a national exemplar of place-based and innovation-driven economic growth that supports the UK Industrial Strategy.

B.4 The City Region's key assets are shown in the figure below:

Figure B.2 The spatial distribution of Science and Innovation assets in the Liverpool City Region (non-exhaustive list)



Source: Liverpool City Region Science & Innovation Audit

The Bioeconomy in the North of England

B.5 The Bioeconomy in the North of England Science & Innovation Audit focuses on specific assets related to agri-tech and industrial biotechnology. Although this SIA covers the whole of the North of England, assets specific to the North West include:

- University of Chester's NoWFOOD centre of excellence for food science and technology
- N8 agrifood a collaborative project between the research-intensive universities of the North of England
- Tesco Dairy Centre of Excellence in Liverpool University's Wood Park Farm in Cheshire
- University of Liverpool's Centre of Excellence for Sustainable Food Systems
- University of Manchester's Centre of Excellence in Biocatalysis, Biotransformations and Biocatalytic Manufacture (CoEBio3)

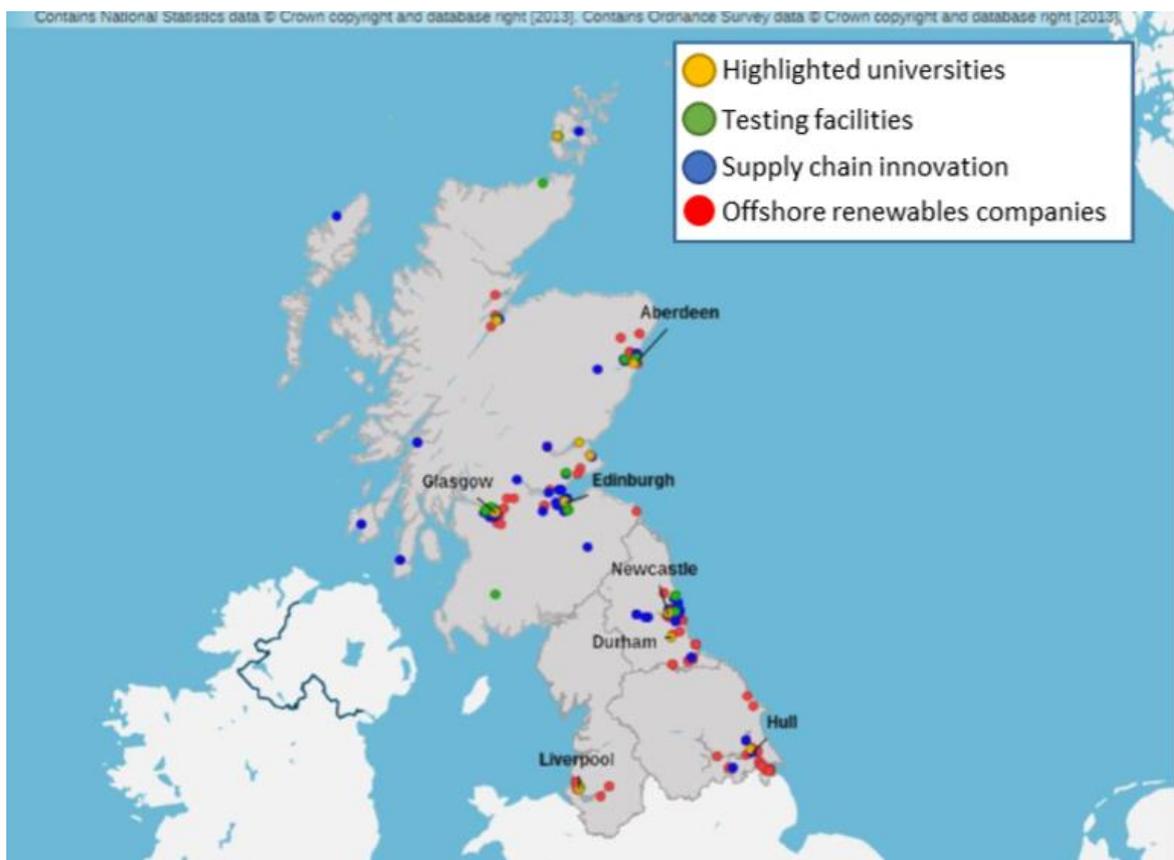
B.6 Key strengths identified for each of the LEP areas include:

- **Cheshire and Warrington LEP** has strengths in pharmaceuticals, biologics & biomedicine; food production food processing with some biofuels, fertiliser and agrochemicals production
- **Cumbria LEP** has significant strengths in farming, food, forestry, paper manufacture and because of its landscape has an important visitor economy. Additionally, pharmaceuticals manufacture takes place in Ulverston, and a large biomass to energy plant is operating in Workington.
- **Greater Manchester LEP** has many small and medium sized pharmaceutical and biomedical companies and has identified strengths in pharmaceutical manufacturing with facilities at Alderley Park, Macclesfield and nearby in the Liverpool City Region and Cheshire and Warrington LEP areas. This LEP area is also strong in food processing.
- **Lancashire LEP** has significant strengths in farming and food production as well as in forestry
- **Liverpool City Region LEP** has particular strength in pharmaceuticals and the biomedical sectors and along with food processing and biofuel production and also operates a biomass to energy plant in the region.

Offshore Renewable Energy

- B.7 The Offshore Renewable Energy SIA focuses on the North of England and Scotland's strengths in offshore renewable energy technologies, in particular offshore wind and wave and tidal energy.
- B.8 The map below shows the SIA's assessment of key activity with the North West's centred mainly around the Liverpool City Region:

Figure B.3 SIA area key offshore renewable energy activity



Source: Offshore Energy Science & Innovation Audit

Sheffield City Region and Lancashire

- B.9 The Sheffield City Region and Lancashire SIA focuses on driving productivity through innovation in high value manufacturing in the areas. The SIA has a specific focus on the following areas:
- Mechanisation, water power, steam power
 - Mass production assembly line, electricity

- Computer and automation
- Cyber physical systems

B.10 The SIA provides an audit of translational research centres within the region which provides insight into the region's existing and future innovation strengths:

Figure B.4 Planned and existing translational research centres

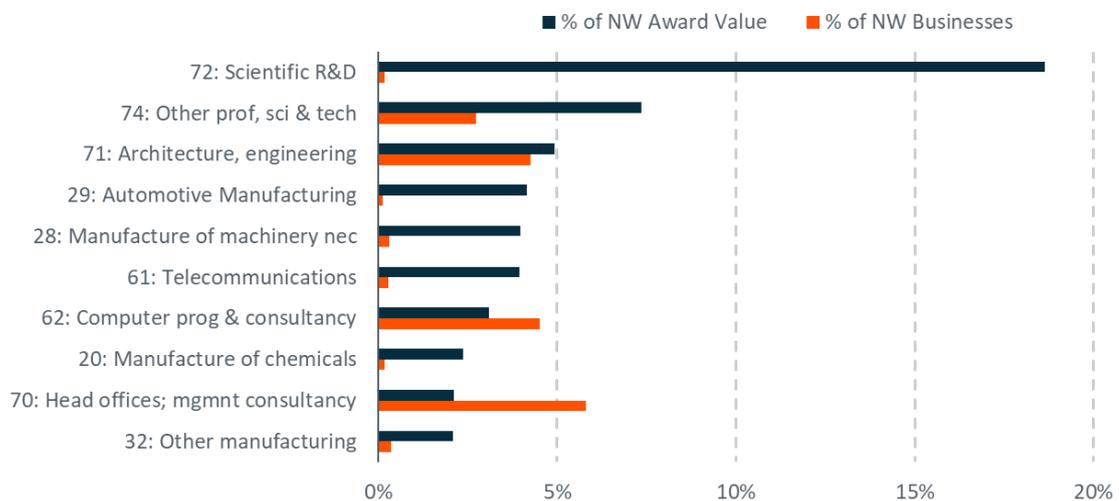
Facility name	Existing/planned	Focus areas
AMRC Group	Existing – £280m investment	High value manufacturing
UCLan Engineering Innovation Centre	In development – £40m+ investment	High value manufacturing
SHU National High Power Impulse Magnetron Sputtering Technology Centre	Existing – £6.2m investment	High value manufacturing
Lancaster Management School	Existing – see details below	Business and Management in high value manufacturing
Centre for Eco-Innovation	Existing – £9.8m investment, £20m new funding confirmed	Sustainability, circular economy, best practice SME engagement
North West AMRC	Planned – £69m proposed project	High value manufacturing
BAE Systems' Training Academy	Existing – £15.7m investment	High value manufacturing
National Centre for Food Engineering	Planned – £11.2m funding confirmed	Food Manufacturing
Advanced Wellbeing Research Centre	Planned – £20.1m funding confirmed	Health Technology and Wellbeing
Lancaster Health Innovation Campus	Planned – £40m funding confirmed	Health Technology
SCHARR	Existing – see details below	Health Economics and Health Technology
The Collaborative Technology Access Programme (cTAP)	In development – £11.4m investment	Design, manufacture of chemical products

Source: Sheffield City Region and Lancashire SIA, 2016

Appendix C - Additional Sector Analysis

- C.1 The chart below shows the North West’s top 10 sectors by the value of Innovate UK funding compared to the number of businesses in that sector, excluding the academic sector. There does not appear to be a strong correlation.
- C.2 This is important as Innovate UK does not just fund the biggest sectors, instead the funding is targeted to accelerate UK innovation; i.e. some very small sectors are the most innovative or have the most innovation potential.

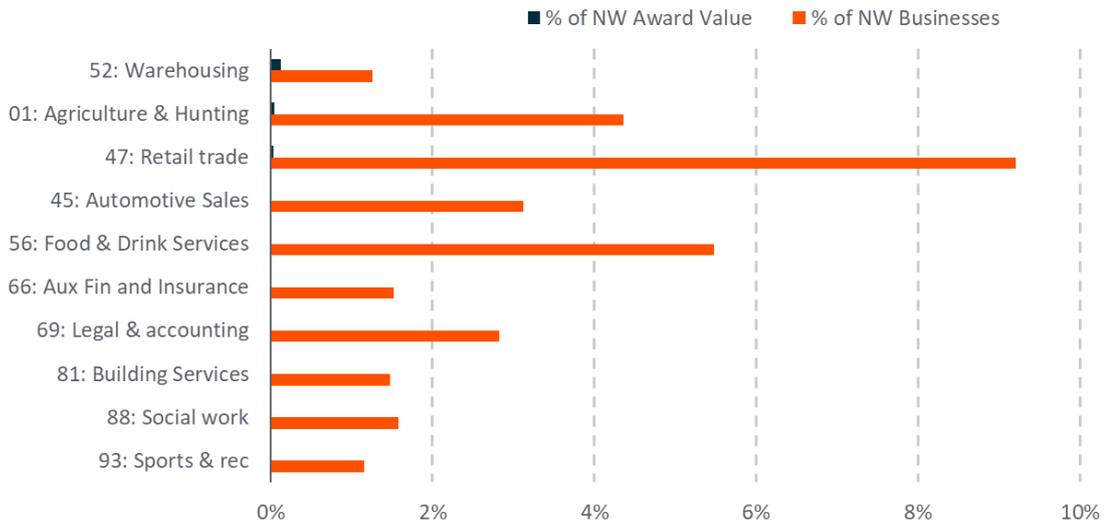
Figure C.1 Top 10 funded sectors relative to business base



Source: Innovate UK, Funding Data, 2017; Note: Excludes academic sector

- C.3 Conversely, if we look below at the lowest funded sectors relative to the number of businesses, there are seven which have a significant proportion of businesses (over 1%) but have received no funding, with the other three receiving relatively small levels of funding (less than 0.2%). Some of the sectors are unsurprising, given their lack of fit with innovation policy priorities historically such as retail trade. However, other sectors such as specialised construction activities and food and beverage services, present an opportunity area for the North West, particularly given their relevance to the Industrial Strategy Challenge Fund.

Figure C.2 Bottom 10 funded sectors relative to business base



Source: Innovate UK, Funding Data, 2017; Note: Excludes sectors with less than 1% of business base

Appendix D - English Constituency Data

	No. of Awards	Total Value of Awards	% NW Awards	% NW Award Value	% NW Businesses
Altrincham and Sale West	13	£1.22m	1.6%	1.0%	2.2%
Ashton-under-Lyne	2	£0.24m	0.2%	0.2%	1.0%
Barrow and Furness	9	£0.19m	1.1%	0.2%	1.2%
Birkenhead	6	£0.1m	0.7%	0.1%	0.9%
Blackburn	1	£0.29m	0.1%	0.2%	1.3%
Blackley and Broughton	0	£0m	0	0	1.4%
Blackpool North and Clevellys	9	£1.07m	1.1%	0.9%	0.8%
Blackpool South	1	£0m	0.1%	0.0%	1.0%
Bolton North East	9	£0.7m	1.1%	0.6%	1.3%
Bolton South East	4	£0.9m	0.5%	0.7%	1.1%
Bolton West	3	£0.19m	0.4%	0.2%	1.2%
Bootle	5	£0.51m	0.6%	0.4%	0.9%
Burnley	6	£0.74m	0.7%	0.6%	1.0%
Bury North	9	£1.2m	1.1%	1.0%	1.7%
Bury South	1	£0.15m	0.1%	0.1%	1.4%
Carlisle	9	£1.06m	1.1%	0.9%	1.2%
Cheadle	21	£2.03m	2.5%	1.6%	1.7%
Chorley	3	£0.15m	0.4%	0.1%	1.5%
City of Chester	46	£5.81m	5.5%	4.7%	1.6%
Congleton	15	£1.99m	1.8%	1.6%	2.0%
Copeland	0	£0m	0	0	1.3%
Crewe and Nantwich	17	£5.15m	2.0%	4.1%	1.4%
Denton and Reddish	2	£0.12m	0.2%	0.1%	1.0%
Eddisbury	4	£0.3m	0.5%	0.2%	1.9%
Ellesmere Port and Neston	4	£1.01m	0.5%	0.8%	0.9%
Fylde	4	£0.42m	0.5%	0.3%	1.3%
Garston and Halewood	11	£0.81m	1.3%	0.7%	1.1%
Halton	6	£1.27m	0.7%	1.0%	1.0%
Hazel Grove	0	£0m	0	0	1.1%
Heywood and Middleton	1	£0m	0.1%	0.0%	1.3%
Hyndburn	2	£0.24m	0.2%	0.2%	1.1%
Knowsley	3	£0.26m	0.4%	0.2%	0.9%
Lancaster and Fleetwood	47	£5.91m	5.6%	4.7%	1.2%
Leigh	4	£0.53m	0.5%	0.4%	1.2%
Liverpool, Riverside	94	£26.44m	11.3%	21.2%	2.2%
Liverpool, Walton	10	£1.27m	1.2%	1.0%	0.6%

	No. of Awards	Total Value of Awards	% NW Awards	% NW Award Value	% NW Businesses
Liverpool, Wavertree	13	£2.26m	1.6%	1.8%	0.9%
Liverpool, West Derby	0	£0m	0	0	0.6%
Macclesfield	10	£0.8m	1.2%	0.6%	1.9%
Makerfield	1	£0m	0.1%	0.0%	0.9%
Manchester Central	151	£27.35m	18.1%	22.0%	4.8%
Manchester, Gorton	1	£0.03m	0.1%	0.0%	1.0%
Manchester, Withington	2	£0.34m	0.2%	0.3%	1.2%
Morecambe and Lunesdale	8	£3.04m	1.0%	2.4%	1.0%
Oldham East and Saddleworth	2	£0.27m	0.2%	0.2%	1.3%
Oldham West and Royton	2	£0.04m	0.2%	0.0%	1.2%
Pendle	4	£0.29m	0.5%	0.2%	1.1%
Penrith and The Border	14	£0.62m	1.7%	0.5%	2.2%
Preston	6	£0.2m	0.7%	0.2%	1.3%
Ribble Valley	5	£0.81m	0.6%	0.7%	1.9%
Rochdale	9	£0.72m	1.1%	0.6%	1.3%
Rossendale and Darwen	3	£0.65m	0.4%	0.5%	1.3%
Salford and Eccles	22	£0.75m	2.6%	0.6%	1.8%
Sefton Central	1	£0.12m	0.1%	0.1%	0.9%
South Ribble	11	£2.87m	1.3%	2.3%	1.4%
Southport	1	£0.01m	0.1%	0.0%	1.1%
St Helens North	1	£0.13m	0.1%	0.1%	0.9%
St Helens South and Whiston	2	£0.02m	0.2%	0.0%	1.0%
Stalybridge and Hyde	6	£1m	0.7%	0.8%	1.0%
Stockport	7	£0.81m	0.8%	0.6%	1.3%
Stretford and Urmston	4	£0.44m	0.5%	0.4%	1.8%
Tatton	26	£3.96m	3.1%	3.2%	2.4%
Wallasey	0	£0m	0	0	0.8%
Warrington North	21	£2.41m	2.5%	1.9%	1.3%
Warrington South	20	£1.89m	2.4%	1.5%	1.8%
Weaver Vale	40	£5.16m	4.8%	4.1%	1.3%
West Lancashire	6	£0.31m	0.7%	0.2%	1.4%
Westmorland and Lonsdale	7	£0.93m	0.8%	0.8%	2.0%
Wigan	2	£0.52m	0.2%	0.4%	1.2%
Wirral South	16	£1.41m	1.9%	1.1%	0.9%
Wirral West	0	£0m	0	0	0.8%
Workington	14	£0.42m	1.7%	0.3%	1.3%
Worsley and Eccles South	1	£0m	0.1%	0.0%	1.1%
Wyre and Preston North	0	£0m	0	0	1.5%
Wythenshawe and Sale East	13	£1.6m	1.6%	1.3%	1.2%

Source: Innovate UK, Funding Data, 2017; ONS, UK Business Counts, 2018; Note: Funding data includes only Collaborative R&D (CR&D) and Small Business Research Initiative (SBRI) funding



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