# UNIVERSITIES UK RESPONSE TO ‘BUILDING OUR INDUSTRIAL STRATEGY: GREEN PAPER, JANUARY 2017’

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EXECUTIVE SUMMARY

The UK’s universities generate and translate world-class research, drive innovation, and educate the future workforce – factors which are all essential to the UK’s productivity performance and long-term economic growth. At the local and regional level, universities support growth by providing and creating jobs, and leading on local economic and social issues. Their engagement reaches across the globe and into local communities, spanning multinational companies, the world’s best researchers, local businesses of all sizes, and employers. The UK’s universities have a central role to play in the development of the government’s modern industrial strategy, and across all the proposed pillars: their health, and strength, is essential to the success of the industrial strategy.

In response to the green paper Universities UK recommends:

- Building on existing local networks and collaborations of universities which provide an overall framework in England, at the local level, for leadership on local and regional issues. Working with Local Enterprise Partnerships (LEPs) and other local actors, there is an opportunity for local university networks to go further in terms of:
  - Supporting and incubating local businesses, particularly fast growing firms through the sharing of advice and supporting them to build local collaborations and upskilling their workforce, providing access to local infrastructure – particularly for small and medium-sized enterprises (SMEs) – and enhancing their abilities to export.
  - Collaborating with employers to better match graduates with local jobs, building on existing initiatives, and to improve the employability of graduates.
  - Reaching out to learners who wish to upskill and retrain, exploring how these learners could be better supported, and understanding the scale of demand.
  - Building on existing local collaborations relating to widening participation and community engagement.

Some areas in England may not yet have an existing local network of universities, and some universities may face barriers to collaboration at the local level. Universities UK proposes:

- Universities UK to provide the underpinning framework to develop further local university collaborations, bringing together groups of universities at the local level who wish to explore collaboration or deepen their current level of collaboration. Universities UK would welcome discussions with the government on the scope of this underpinning framework, and the development of more detailed proposals to take forward.
- The government could support enhanced networks at the local level between universities, businesses, employers, and learners through business rate relief, VAT exemptions, innovation voucher schemes, and targeted funding. In light of the UK leaving the EU, it will be necessary for domestic funding to replace European sources of funding that have historically been effective in funding local initiatives. One such channel could be the Higher Education Innovation Fund (HEIF) in England. Consideration will need to be given to the most appropriate mechanisms for the devolved nations.
- The additional £4.7 billion of research and development (R&D) funding be allocated to recognise the need to continue the UK’s world-class dual support system, and the current balance of funding within it, but with a focus on increased investment in:
  o the Higher Education Innovation Fund (HEIF – England), with the fund increased to £250 million per year, the Universities Innovation Fund (Scotland) and innovation funding in Wales. Further increases (funded from outside of the £4.7 billion) should be considered if HEIF is to play a broader role in funding local initiatives in the future
  o research collaborations with overseas partners
  o the number of PhD places, including outside of STEM subjects
  o Knowledge Transfer Partnerships and collaborative research council studentships

- Upholding the principle of supporting and funding excellence wherever it is found, while considering the use of Science and Innovation Audits where relevant to inform the allocation of the Industrial Strategy Challenge Fund, and to build world-class research clusters across all parts of the UK.

- New ‘collaborative institutes’ be developed through collaborations between universities, further education and schools at the local level, focussing on technical education. This model of working could also be used beyond technical education.

- Exploring the outcome of pilots, where universities transfer 10% of their apprenticeship levy to support local learners and employers.

- Skills shortages to be addressed (for example in STEM) by ensuring that long-term emerging employer trends are reflected in careers information, advice and guidance.
INTRODUCTION

The UK’s strength in world-class research and higher level skills underpins the UK’s productivity performance and long-term economic growth, and this strength should be built on and extended to ensure the UK’s long-term prosperity. The UK’s universities play a crucial role in generating and translating world-class research, driving innovation, and educating the future workforce. They also support regional growth, provide and create jobs, and lead on local economic issues. The success of the industrial strategy will be contingent on the continued strength of the UK’s higher education sector.

The areas of focus for an industrial strategy (Question 1)

An overarching consideration for the industrial strategy is that it needs to be cross-government and long-term in nature – it should set out a long-term vision and give stakeholders certainty over the direction of government policy. It should also be relevant to, and work for, all the UK – with particular reference to the devolved administrations and bearing in mind the role London plays in underpinning the international competitiveness of the UK.

The green paper proposes establishing ‘Ministerial Forums on Industrial Strategy’ with each of the devolved administrations, and invites joint development of plans and strategies with the UK government. Further work on the industrial strategy needs to consider and build on existing activity by the devolved administrations relevant to the industrial strategy, including Scotland’s Enterprise and Skills Review and the Welsh Government’s Review of Government-funded Research and Innovation.

The green paper is right to highlight the UK’s productivity gap relative to our competitors, and the importance of addressing regional disparities. However, as the green paper points out, the picture is complex: building on London’s strengths is key to the international competitiveness of the UK, but disparities exist between the capital and other parts of the UK. The industrial strategy will need to recognise the success of London’s support for economic development initiatives nationwide, and that London provides an important international gateway to other areas in the UK (please see the case study on London under our response to pillar 9.)

The proposed ten pillars (Question 2)

The ten pillars of the green paper cover the priority areas that should be considered in a strategy focussing on raising productivity and growth. However, we would flag several further considerations that should be taken into account:

- While there is a skills pillar, it may be beneficial for the government to develop a broader ‘people’ strategy, which would not only consider the requisite skills to enhance the UK’s long-term economic growth, but also factors important for attracting skilled employees to the UK and to different parts of the UK. This strategy would need to be linked to the government’s policy on immigration. As the House of Commons Business, Energy and Industrial Strategy Committee points out in its recent report, in the context of the UK leaving the EU, the government must ensure
that businesses continue to be able to access the skills they need. The Committee recommends the government exclude university students from immigration totals and promotes high skilled migration to the UK, which Universities UK strongly supports.

- While there is a trade and inward investment pillar, the industrial strategy needs to make a much more explicit link to the UK’s international position, in light of the UK exiting the EU. A similar point has also been made by House of Commons Science and Technology Committee, who ask that the next iteration of the industrial strategy presents a closer and more explicit alignment with the government’s Brexit strategic aims. Universities UK has published policy priorities to support universities to thrive post-exit.

- Recognition needs to be given to the links between the pillars. For example, local institutions (pillar 10) and the availability of infrastructure (pillar 3) in a particular area will have significant influence over whether businesses choose to locate or invest in R&D there (pillar 4), and whether skilled employees choose to live there (pillar 2). This will in turn impact growth in that area (pillar 9).

*Delivering an effective industrial strategy (Question 3)*

While it is a very positive development that local areas will have greater autonomy to address local issues, the governance structure at the local level is becoming increasingly complex. Local Enterprise Partnerships (LEPs) in England have become a stable part of the growth infrastructure, and have built strong relationships with local actors, businesses and the community, including universities. LEPs should continue to play a prominent role in delivering local economic growth as part of the industrial strategy. We propose building on existing local networks of universities to provide leadership on local and regional issues (see our response to pillar 10).

*CASE STUDY: UNIVERSITIES UK’S SHAPING THE INDUSTRIAL STRATEGY EVENT, HOSTED BY BOURNEMOUTH UNIVERSITY, FRIDAY 3 MARCH*

The event brought together Conor Burns, MP for Bournemouth West, with representatives from eight universities (Bournemouth University, the University of Bath, the University of Bristol, the University of Exeter, Plymouth University, the University of the West of England, the University of Gloucestershire and Arts University Bournemouth), the Dorset Growth Hub, Dorset LEP, Bournemouth Borough Council, and businesses (including NatWest Bank and Pidela Consulting).

The group considered how a new industrial strategy presents challenges as well as opportunities – particularly how to ensure that existing important work fits into the new framework and is retained. The work of LEPs and progress made on Science and Innovation

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3 Universities UK, 2017, *Policy priorities to support universities to thrive post-exit* [http://www.universitiesuk.ac.uk/policy-and-analysis/brexit/Pages/policies-post-exit.aspx](http://www.universitiesuk.ac.uk/policy-and-analysis/brexit/Pages/policies-post-exit.aspx)
Audits was highlighted as being integral to an industrial strategy. The group discussed how universities could maximise their impact by engaging with local communities, businesses and employers. There was agreement that there was an opportunity to build on the strengths and connections of universities at the local, national and global level – between universities as well as with businesses of all sizes. Universities with global connections can be a ‘bridgehead’ for multinationals to engage with communities (specifically, SMEs within communities), and the government may wish to consider how to make efficient use of the excellent contacts universities have worldwide.

Lessons from other countries (Question 4)

Many of the pillars described in the green paper reflect the key elements of other countries’ industrial policies. Several countries have established industrial policies that more clearly emphasise the role of international engagement, not just in terms of trade and foreign direct investment, but also in terms of global research collaboration and the mobility of students and researchers. Germany’s internationalisation strategy, for example, is closely linked to its industrial policy and vice versa. As mentioned in our answer to question two, the UK’s industrial strategy will need to make a more explicit link to the UK’s international position, particularly in light of the UK exiting the EU.
PILLAR 1: INVESTING IN SCIENCE, RESEARCH AND INNOVATION

Priority areas for science, research and innovation investment (Question 5)

Fundamental and applied research are cornerstones of an innovative and productive economy, with long-term, speculative research often providing many of the most significant and impactful breakthroughs. Universities play a central role in carrying out both fundamental and applied research, and there is a very broad spectrum in between.\(^4\) The difficulties in predicting the benefits of research can lead to market failures in sufficient private investment in research, particularly fundamental research. Therefore, the role of government investment is particularly important in supporting and funding fundamental research.

The UK-wide dual support system that funds research is crucial to the success of the UK’s world-leading research base. Block grant funding in particular supports excellence wherever it is found, and the conditions needed for effective, long-term decision making by universities. The additional £4.7 billion of R&D funding should therefore be allocated to recognise the need to continue the UK’s world-class dual support system, and to reflect the current balance in the UK-wide dual support system, between block grant funding and research council spending. This in turn provides the conditions needed to generate the highest quality research with the greatest impact over the longer term.

The need to continue the UK’s dual support system, and to maintain the current balance of funding within the system, should be the overriding principles framing the investment of the £4.7 billion. However, we believe part of the £4.7 billion should be focussed on:

- Increased collaborative research between universities and business through the Higher Education Innovation Fund (HEIF) in England, which has a proven track record of success,\(^5\) the equivalent Universities Innovation Fund in Scotland and innovation funding in Wales. Universities UK supports HEIF being increased to £250 million per year, in line with the recommendations of the 2013 Witty review. If HEIF is to play a broader and more significant role in funding local initiatives in the future (see our response to pillar 9), then an increase beyond £250 million should be considered and funded outside of the £4.7 billion.

- Driving forward research collaboration with international partners, to maintain and enhance the UK’s influence on the international stage. The £50 million announced in the 2017 Budget for fellowship programmes to attract global talent is an important start, and its allocation should build on measures already used by universities to attract leading academics from across the globe.

It should not be forgotten that even with the additional £4.7 billion in R&D funding, the UK is far behind the rest of the world in terms of investment in R&D.\(^6\) Measures to stimulate and

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\(^4\) Data from the Organisation for Economic Co-operation and Development (OECD) shows that universities carried out 77% of all publicly-funded research in 2014. Source: OECD, 2014, Science Technology and Industry Outlook.


\(^6\) UUK estimates that by 2020–21 this £4.7 billion boost could allow R&D investment in the UK as a proportion of GDP to rise from 1.67% to 1.9–2.0%, assuming R&D investment from industry and the economy will continue
incentivise private investment in R&D will therefore be particularly important (see our response to pillar 4). The House of Commons Business, Energy and Industrial Strategy Committee has reiterated its previous recommendation that the government should set a target to increase R&D investment to 3% of GDP, which is also supported by the House of Commons Science and Technology Committee. The Confederation of British Industry (CBI) has proposed the government adopt an ambitious target for joint public and private expenditure on R&D to reach 3% by 2025, a target which is also supported by the Campaign for Science and Engineering. The Royal Society, British Academy, Royal Academy of Engineering and Academy of Medical Sciences have jointly called on the government to signal the UK’s ambition to compete internationally by setting a target of 3% of GDP for combined public and private R&D spending.

Creating an environment that supports commercialisation (Question 7)

The UK’s innovation performance is complex – while we fall behind on some measures of innovation, we perform strongly in others. Evidence given by the Royal Society, the Science Policy Research Unit (SPRU) and Universities UK to the House of Commons Science and Technology Committee on the industrial strategy emphasised the difficulty and dangers of comparing the UK's commercialisation performance in an overly simplistic way to that of international competitors. The UK’s weaker performance in some areas could also be attributed to the industrial mix of the UK economy, and cross-country differences in the pricing of university intellectual property. There is scope to build on our successes while addressing our weaker areas, including business demand.

The green paper indicates that the government will use the findings of commissioned research to identify and spread best practice among universities’ technology transfer offices. In doing so, the government should take into account that intellectual property policies are highly relevant in some industries, but less relevant in others. Different universities will interact with different types of firms, across a wide range of industries (please see Annexe 1.A for examples.) Therefore, the government’s proposed review should identify priority areas in a context-based review, while maintaining flexibility in its approach. The government’s review should also build on the work done by the Higher Education Funding Council for England (HEFCE) on a knowledge exchange framework, which is aimed at furthering a culture of continuous improvement in university knowledge exchange across the range of different activities.

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9 CBI, 2017, March Budget submission.

10 UK’s national academies, 2016, Open for business: a nation of global researchers and innovators

11 For example, the UK is generally regarded as having a weak investment base for innovation and technology, which contributes to the UK’s lower capacity for research translation relative to the United States. UK universities compare well to their US counterparts on collaboration with industry, spinouts per pound of research income and effectiveness of IP processes, and less well on licensing to existing industries. Source: McMillan group, 2016, University Knowledge Exchange (KE) Framework: good practice in technology transfer, report for the higher education sector and HEFCE.

12 Evidence given on 22 February 2017 by Professor Alex Halliday (Vice-President, The Royal Society), Professor Quintin McKellar CBE, (Vice-Chancellor, University of Hertfordshire, and Chair, Innovation and Growth Policy Network, Universities UK; and Professor Paul Nightingale (Deputy Director, Science Policy Research Unit (SPRU), University of Sussex).
We would also emphasise that UK Research and Innovation (UKRI) should be created in a manner that fully reflects a UK-wide picture, including the interests of the devolved administrations. It may be worth exploring the need for memorandums of understanding between UKRI and the devolved administrations.

Supporting the next generation of research leaders and entrepreneurs (Question 8)

The current system of funding PhD places has a proven track record in supporting the next generation of research leaders in the UK, and Universities UK supports the scaling-up of the funded system. In evidence given to the House of Lords Science and Technology Committee on the industrial strategy, it was highlighted that PhD provision has become increasingly collaborative through networks of universities and sector-specific networks, and the example of PhD provision in Sheffield was given. While we consider the introduction of doctoral loans in England an excellent opportunity to broaden the support for undertaking doctoral study, a loan system should not replace the current funded system over the longer term. We also note that in some cases, there may be a lack of suitable UK-based PhD candidates, and this should be addressed much earlier in the education pipeline.

The increase in PhD places across the UK announced in the 2017 Budget is very welcome. Consideration should be given to increases in places outside of STEM subjects, for example to support study in creative and digital subjects. PhD training policies, more generally, should support new and emerging inter-disciplinary approaches.

The importance of PhD students having experience of working in industry was highlighted in evidence given to the House of Lords Science and Technology Committee on the industrial strategy. Additional investment in Knowledge Transfer Partnerships (KTPs) and collaborative research council studentships would help to ensure doctorate holders have the skills required to succeed in academic and industrial research, and to convert their ideas into viable businesses. There is evidence that KTPs work and generate results in supporting entrepreneurship (please see Annexe 1.B for examples). We also note that industry will have varying requirements and in some cases may prefer Masters-level qualifications, so the importance of Masters-level study should be kept in mind.

Graduates are associated with higher levels of early-stage entrepreneurial activity. There is scope for universities, working with others locally, to expand on their activities to foster innovative businesses and support the next generation of entrepreneurs (please see our

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13 Demand for full-time doctoral training has grown every year since 2008, and views gathered by UUK show that universities attract high-quality applicants for funded PhD opportunities. (Sources: UUK analysis based on HESA, 2017, Student record 2015–16; evidence gathered by UUK to inform its response to the BIS consultation on postgraduate funding, undertaken in May 2015.) Furthermore, a study of Research Councils UK-funded doctorate holders shows positive employment outcomes for these graduates and high employer satisfaction with their skills. Only 3% of participants in this study were unemployed and 80% had a salary between £30,000 and £65,000 in the 7–9 years following graduation. Employer interviews highlight the significant contribution of these graduates to business performance and innovation. (Source: CFE research, 2015, the Impact of Doctoral Careers)

14 Evidence given on 14 March 2017 to the Science and Technology and the Industrial Strategy inquiry by Professor Richard Jones FRS, University of Sheffield

15 Evidence given on 14 March 2017 to the Science and Technology and the Industrial Strategy inquiry by Professor Robert Allison, Vice-Chancellor and President, Loughborough University.

16 In 2014, the Total Early-Stage Entrepreneurship Activity rate for graduates in the UK was 10.8%, compared to a UK average of 8.6% and 7.4% for non-graduates. (Source: Global Entrepreneurship monitor, 2014, UK Adult Population Survey 2008–14)
response to pillar 4). This activity should not be limited to students, but also include university staff.

**Government proposals on the Industrial Strategy Challenge Fund (ISCF) and supporting research and innovation strengths in local areas (Questions 6 and 9)**

Universities UK supports allocating the ISCF to areas outside the eight areas specified in the green paper, including the creative industries – which the green paper already flags as an additional area of opportunity. Funding and supporting excellence, wherever it is found, is a key principle that should be borne in mind when allocating the ISCF. While keeping to this principle, we would also highlight that much work has already been undertaken in relation to the Science and Innovation Audits, in which universities have played a key part (please see Annexes 1C for examples). It would be worthwhile for the government to consider how the Science and Innovation Audits could be used to allocate ISCF funds, while funding excellence wherever it is found.

Such an approach could help guide funding to local institutions, which could reduce disparities across different areas of the UK. However, we note that not all areas have yet had the opportunity to participate in a Science and Innovation Audit, so they should only be used as guidance where relevant and appropriate. Successful existing mechanisms used by the government to support and join up excellence should also be replicated. One such example is the Engineering and Physical Sciences Research Council (EPSRC) funding of a national network of Quantum Technology Hubs, with four hubs involving 17 universities and 132 companies. This would be a more efficient and sustainable way of addressing local disparities, rather than the creation of new institutes to foster world-class research clusters: new institutes could potentially dilute the funding of world-class research and create sustainability issues over time.

The role of public policy in developing and supporting clusters has elicited considerable debate. Around the world, a range of approaches and policies to support clusters have been developed. However, many of the most innovative clusters – such as Silicon Valley – have emerged without specific policies aimed at creating clusters or promoting networking. The OECD and European Commission recommend that in most cases policies should be designed to support and enhance the qualities that give a location a unique and lasting advantage and create the conditions for clusters to emerge and thrive, rather than directly targeting clusters. In this case the influence of public policy is important but indirect, often taking the form of policies related to infrastructure, research, education and training, and identifying and building on pre-existing strengths and assets. Therefore, the industrial strategy’s focus on pillars and building on the UK’s strengths may be more effective than an explicit focus on generating clusters.

**Universities UK proposes:**

- The additional £4.7 billion of R&D funding be allocated recognising the need to continue the UK’s dual support system, and to maintain the current balance of funding within the system, but with a focus on increased investment in:

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17 Several countries, such as Austria and the Netherlands, include research clusters as an integral part of their economic strategy and to promote SME competitiveness. In other countries, specific cluster policies have been established, such as the Pôles de compétitivité initiative in France, the Centres of expertise in Finland or Japan’s Industrial Clusters and Knowledge Clusters programmes.
- the Higher Education Innovation Fund (England), with the fund increased to £250 million per year, the Universities Innovation Fund (Scotland) and innovation funding in Wales. Further increases (funded from outside of the £4.7 billion) should be considered if HEIF is to play a broader role in funding local initiatives in the future.
- research collaboration with overseas partners
- the number of PhD places, including outside of STEM subjects
- Knowledge Transfer Partnerships and collaborative Research Council studentships

Upholding the principle of supporting and funding excellence wherever it is found, while considering using the Science and Innovation Audits where relevant to inform the allocation of the Industrial Strategy Challenge Fund, and to build world-class research clusters across all parts of the UK.
The role of universities in delivering skills, including technical skills (Question 11)

The skills pillar as outlined in the green paper acknowledges the strengths of the higher education system with a focus on addressing weaknesses in skills, including a strong focus on technical education, lifelong learning, STEM shortages and basic skills. We believe that the importance of graduate skills deserves broader recognition in the industrial strategy, as does the role of the higher education sector in addressing the weaknesses identified in the green paper. Our view is that the following three points should be emphasised in the industrial strategy:

- Universities are essential to the meeting of the current and future demand for higher level skills. Economic and technological change has led to a large increase in the proportion of graduate jobs, an increase which is projected to continue, and also upskilling within specific occupations where higher-level qualifications have become increasingly necessary. Graduate talent spurs upskilling, and demand for more graduate talent. Analysis of the supply and demand for higher level skills undertaken by Universities UK indicates a shortage of graduate talent, and that there will be a continued undersupply of graduates up to 2020–22.

- Graduates gain a wide range of subject-specific, core and employability skills throughout their years of study, including but not limited to communication, teamwork, commercial awareness, analytical, and entrepreneurial skills. These skills are crucial to employers and their productivity. While for the most part graduates fare very well, there remain employers who struggle to find the skills they require, and further work needs to be done to explore how students best attain transferable skills.

- While graduate skills are part of the answer for meeting employers’ skills needs, so are pre-degree qualifications at level 4 and 5. There is a broad area of crossover between academic and vocational education, with universities delivering vocational qualifications and education, and further education colleges delivering degrees, and often working in partnership. There needs to be a better understanding of this broad area of crossover so that both higher and further education can help address employers’ skills needs, especially in relation to apprenticeships.

One such area of crossover is collaboration between universities and further education colleges in the delivery of higher-level apprenticeships. Universities have enthusiastically

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18 By 2024, 46% of all UK employment will exist within highly skilled occupations, defined as those that fall within the Standard Occupational Classification (SOC) categories 1–3. High-skilled occupations will comprise more than half (7.6 million) of the 14 million additional openings and account for over 70% of all newly created jobs in the UK economy. Source: UK Commission for Employment and Skills, 2016, UK labour market projections: 2014–2024.

19 Universities UK, 2015, Supply and demand for higher-level skills http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Pages/supply-and-demand-for-higher-level-skills.aspx


engaged with the delivery of degree apprenticeships, and a recent Universities UK survey\textsuperscript{22} identified:

- At least sixty universities delivering or planning to deliver degree apprenticeships in 2017–18 leading to a six-fold increase in numbers. The key benefits of degree apprenticeships have been identified by these universities as enhancing employer engagement, supporting social mobility and meeting employers’ skills needs.
- Degree apprentices are mostly based locally, and institutions envisage that over the next three years there will be significant growth locally and regionally, and some growth nationally.
- Universities are engaging with employers and local organisations, such as Local Enterprise Partnerships (LEPs) and local authorities, to help them implement degree apprenticeships. Institutions work closely with SMEs and national employers, employer groups and other delivery providers, especially further education colleges.

A significant challenge for many countries is to effectively take a system-wide approach to further and higher education, which supports high quality and participation in both technical and academic education. The government should consider whether any policies abroad have effectively positioned technical education within the education system as a whole. The industrial strategy green paper refers to several particularly successful technical education systems in other countries, including Germany and Norway. However, in Germany, participation rates in higher education are a concern, falling below OECD averages and EU benchmarks.

Universities provide a diverse range of skills, including but not limited to technical, professional and vocational education.\textsuperscript{23} Universities wish to play a stronger role in the provision of technical education below degree level than the industrial strategy green paper currently suggests. Universities could develop deeper and formal collaborations with further education and schools in local areas, branded as ‘collaborative institutes’, which would focus on the provision of technical education. These institutes would provide a ‘one-stop shop’ for learners and employers. These ‘collaborative institutes’ would have the following benefits:

- They would help strengthen the pathways into higher levels of technical education, and foster the movement between technical and academic education.
- They would provide a focus for the proposed investment into institutes of technology, and make it go further than investing in stand-alone institutes, where capital funding may not go far enough to sustain these institutes over the longer term. Moreover, standalone institutes may not have sufficiently strong pathways into higher levels of technical education and bridge the movement between technical and academic education.
- They would assist in streamlining the student finance system, which will need to be consistent and joined up in its support of technical education to higher levels.

An existing example is London South Bank University’s (LSBU) collaboration with like-minded but distinct institutions to provide pathways through secondary, further and higher education, and lifelong learning, with the group containing a university technical college, an

\textsuperscript{22} Universities UK, March 2017, Degree apprenticeships: realising opportunities

\textsuperscript{23} Please see Annexe 2.A for a chart that illustrates the range of subjects provided by universities in England, by vocational status.
engineering academy, and is in the process of bringing in a further education college and a new institute for professional and technical education. In September 2017, the institute will provide a level 3 gateway to the level 4–6 higher and degree apprenticeships and other technical qualifications being delivered by the university. The institute is collaborative in nature, drawing on resources of the entire group, and provides a ‘one-stop shop’ for both learners interested in professional and technical education, and employers seeking involvement in sponsored study.

More generally, the ‘collaborative institute’ model of working need not be restricted to technical education, but could also encompass other areas of education. Universities UK would value discussions with the government about how these ‘collaborative institutes’ might be best supported.

**Addressing skills shortages (Question 13)**

The UK needs to be prepared for the challenges that are imminent and emerging from increased global competition and technological change. The needs of employers change as their circumstances change, which can be subject to developments in local, national and international markets. Predicting employer needs over the short-term, let alone the longer term, is extremely challenging as they are predicated on economic (as well as political) forecasts. As Alan Mak, MP for Havant, points out in his report on Britain’s industrial strategy,24 there may be a need for a review of how well the education system is preparing Britain for the future – a long-term, consistent approach to skills needs to be taken.

As mentioned earlier in our response, the evidence suggests that shortages of graduate talent exist, and that there will be a continued undersupply of graduates up to 2020–22.25 Changes in the supply of graduates cannot move as quickly as changes in employers’ circumstances due to the time taken for students to study, and the time needed for student choice to respond to employer demand. A broad base of higher education is therefore a flexible and responsive way to deliver the future changes needed in provision, and to provide the lifelong learning skills graduates require throughout their careers. Higher education provision should be driven by student choice and changes demonstrated by long-term emerging trends, as short-term forecasts are subject to change.

Also, raised earlier in our response is the fact that some employers struggle to find the skills they require, and further work needs to be done to explore how students best attain transferable skills. There is scope for universities and employers to work more closely to ensure the matching of graduate skills and employer needs, particularly at the local level, and to improve graduate employability (see our response to pillar 9). This could include expanding or developing existing initiatives (please see Annexe 2.B for examples), and coordinating opportunities for work experience and placements at the local level. Research by the National Centre for Universities and Business (NCUB) shows that businesses benefit from taking on students for work experience through staying ahead of competitors in the race for talent, and to capture talent as early on as possible.26 Research by UUK International

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24 Alan Mak, 2016, *Masters of the Revolution: Why the Fourth Industrial Revolution should be at the heart of Britain’s new Industrial Strategy*, and his comments made at Policy Exchange’s ‘Developing a modern industrial strategy’ event on Monday 20 March.

25 Universities UK, 2015, *Supply and demand for higher-level skills* [http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Pages/supply-and-demand-for-higher-level-skills.aspx](http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Pages/supply-and-demand-for-higher-level-skills.aspx)

26 National Centre for Universities and Business, 2016, *Work experience as a gateway to talent in the UK: assessing business views*
also emphasises the link between placements abroad and enhanced graduate employability, so ensuring graduates from all backgrounds can access opportunities for international placements is key.

Given that higher education provision should be driven by student choice and changes demonstrated by long-term emerging trends, there is a need for these long-term trends to be built into careers information, advice and guidance for prospective students. This should be factored into the government’s comprehensive strategy on careers information, advice and guidance that will be published later this year.

This strategy should also consider the important links between research, teaching and skills development. Research-led learning offers significant benefits to the student experience, with students developing practical and transferable skills in pursuing lines of enquiry and critical thinking. It will be important for the new UK Research and Innovation (UKRI) and Office for Students (OfS) to work together, along with the Department for Education and the Department for Business, Energy and Industrial Strategy, to ensure the synergies between research, teaching and skills development are capitalised on.

The green paper focuses on STEM shortages. Any increases in STEM provision need to be funded sustainably (through maintaining the amount of funding universities receive per student), and any increase in supply needs to be matched accordingly. We wish to emphasise that STEM skills gaps are not only a matter for the supply pipeline, but also a matter of effectively matching supply with demand. Many STEM graduates choose to not work in STEM professions. Some graduates (both STEM and non-STEM) may lack employability skills. There may be scope for building on the work that universities do with employers (please see Annexe 2.B for examples) as well as improving career information, advice and guidance, to address blockages in the STEM pipeline.

The importance and value of skills outside of STEM should not be forgotten. The contributions of the humanities and social sciences, for example, play a key role in understanding local economic development, the drivers of stronger local growth, and the design of effective policy measures. A specific example particularly relevant in this context is the Industrial Strategy Commission, chaired by Dame Kate Barker, which is a joint initiative by Policy@Manchester at the University of Manchester and the Sheffield Political Economy Research Institute (SPERI) at the University of Sheffield. Skills in the humanities and social sciences should be prioritised alongside STEM as the government develops and implements its industrial strategy.

The government should also build on the UK’s great strengths in the cultural and creative sectors through investment in the related skills: art, design, media, film and languages. Languages are of crucial strategic importance to the UK, through communication skills required to enable UK businesses to participate in the global market, to the ‘soft power’ in diplomacy and trade, and to enhancing cultural capital and educational attainment for students at all education levels. Access to international mobility opportunities as part of students’ higher education programmes helps to build these important language and

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28 Research from the Social Market foundation (SMF) estimated that around 18,000 of the 82,000 UK-domiciled STEM graduates in 2011–12 (or 22%) would go into non-STEM occupations. Source: SMF, 2013, In the balance: the STEM human capital crunch.
intercultural skills, as well as more generally enhance graduate employability. The 2015 Report by the Warwick Commission on the Future of Cultural Value highlighted that not enough is being done to stimulate or realise the creative potential of individuals, and this poses challenges to meeting the workforce demands of the future. Improvement requires a greater degree of investment, participation, education and digital access, and the industrial strategy provides an opportunity to address this. The government should also recognise the need for creative skills in STEM sectors, and that the combination of scientific and technical skills with creative skills is crucial – a point that was emphasised by evidence given to the House of Commons Science and Technology Committee on the industrial strategy by Nesta and the BioIndustry Association.

Management and leadership skills are also crucial. The 2016 Scaleup Review on Economic Growth highlighted the lack of business and leadership skills as a significant factor holding back business growth, and how government supports development of these skills, both prior to graduation and throughout an individual’s career, needs careful consideration.

Finally, the industrial strategy should recognise the important role played by social action and volunteering in skills development. A Chartered Institute of Professional Development (CIPD) survey reported that 67% of employers say candidates with social action experience demonstrate better employability skills. When people of all ages, but particularly young people, engage in social action they develop skills to prepare them for work and life, while also making a positive impact in their communities. Evidence from the #iwill campaign partners demonstrates how embedding social action in all areas of society is more likely to enable it to be the norm for all young people.

Encouraging retraining and upskilling (Question 14)

Many factors are driving the need for increased emphasis on lifelong learning – individuals living longer and retiring later, the increasing pace of technological change, the mobility of individuals between careers and across geographies. The diverse range of university provision on offer enables individuals to engage with learning across their lifetimes, and the government’s recent announcements on two-year degrees may increase choices for learners. However, barriers exist which prevent learners in older age groups from engaging in learning that would benefit their careers and increase the productivity of the economy in relation to:

- enhancing existing careers: employers may not allow time off or pay for an employee to undertake study that would enhance an employee’s productivity in the longer term (as employees may switch employers)
- career change: learners face an opportunity cost of foregone earnings in their current career

The government has a role to play in addressing these barriers, and creating the right conditions to incentivise lifelong learning. Initiatives could include:

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29 University of Warwick, 2015, Enriching Britain: Culture, Creativity and Growth - The 2015 Report by the Warwick Commission on the Future of Cultural Value
30 Evidence given on 22 February 2017 by Steve Bates OBE, (Chief Executive, BioIndustry Association) and Jen Rae (Head of Policy, Nesta).
31 CIPD, 2015, A guide for employers: how to unlock social action in recruitment
https://www.cipd.co.uk/binaries/talent-social-action-recruitment.pdf
32 http://www.iwill.org.uk/
• incentivising employers to finance enhanced learning for their employees
• ensuring the student support system enables students from diverse backgrounds to study flexibly (for example part-time or through distance learning), and incentivises upskilling or retraining where it will benefit their long-term career opportunities

These considerations should be factored into the government’s lifelong learning pilots announced in the 2017 Budget.

Studying flexibly involves tailoring provision to meet a range of student needs. Universities are ideally placed to monitor and respond to changes in demand for more flexible provision at the local level. Therefore, there is the potential for local universities, employers and learners to collaborate to provide a more accessible interface or ‘one-stop shop’ for employers and potential learners at the local level (please also see our response to pillar 9). Other stakeholders have also recognised the need for greater collaboration at the local level to enhance skill levels. The House of Commons Business, Energy and Industrial Strategy Committee has recommended that the government consider the potential for greater devolution of responsibility and funding for skills to the local level, in order to better identify regional needs and design appropriate solutions. The CBI’s recent report found the primary factor in boosting regional productivity is educational attainment and skill levels, and recommended in their submission to the 2017 Budget that the government give support to adult re-skilling that includes improved support for Equivalent or Lower Qualifications, part-time learning, fast-track, condensed courses and the structural reform needed to deliver these options.

Greater collaboration between local universities, employers and learners could involve exploring the extent to which local learners can be better supported, and assessing the scale and nature of demand – this could include looking at the appetite for personal learning accounts and how they might be potentially used.

Universities wish to play a proactive role in supporting local learners, who may come from a diverse range of backgrounds, and to boost engagement with local employers. Therefore, several Universities UK members have committed to participating in pilots to transfer 10% of their apprenticeship levy to other employers– with a view to enhancing social mobility and wider engagement with employers, particularly SMEs.

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CASE STUDY: UNIVERSITIES LEVERAGING THE APPRENTICESHIP LEVY TO SUPPORT LOCAL OPPORTUNITIES

Universities UK is leading an initiative encouraging universities to use the opportunity to transfer 10% of their apprenticeship levy to other employers to boost the number of apprentices, increase employer engagement and provide opportunities for local people.

Universities in England are enthusiastically developing degree apprenticeships to meet employer demand. As well as delivering degree apprenticeships, almost all universities will

34 CBI, 2016, Unlocking regional growth, and CBI, 2017, March Budget submission.
be paying the apprenticeship levy and looking to recruit their own apprentices. Universities UK welcomes the fact that the government has recognised that employers do not operate in isolation and work in a range of partnerships with other employers often through supply chains. The option to transfer 10% of the levy to other employers – not just in the supply chain – to help develop their workforce is a concrete way of supporting employer partnership especially at the local level.

Universities UK is working with universities who are interested in using their levy to support these partnerships and to boost apprenticeship recruitment. The funds could be used to support companies such as SMEs and could support the development of apprenticeship opportunities for young people from disadvantaged backgrounds.

So far eleven universities have agreed to join a Universities UK pilot group – the University of Leeds, Liverpool John Moores University, London South Bank University, Queen Mary University of London, Southampton Solent University, Aston University, Anglia Ruskin University, Buckinghamshire New University, University of Warwick, Sheffield Hallam University and Coventry University, and we expect more to join. The pilot group will develop practical proposals to support the project and identify what national policies and process will be needed to enable the success of the project. We aim to work with the Department for Education, the Skills Funding Agency, the Institute for Apprenticeships, the CBI, the Greater London Authority and employers to ensure the success of this project.

**UNIVERSITIES UK PROPOSES:**

- New ‘collaborative institutes’ be developed through collaborations between universities, further education and schools at the local level, focussing on technical education. This model of working could also be used beyond technical education.
- Skills shortages to be addressed (for example in STEM) through ensuring that long-term emerging employer trends are reflected in careers information, advice and guidance.
- Collaboration between local universities and employers to better match graduates with local jobs, and to improve employability. This could include expanding or developing existing initiatives. Part of this collaboration could also include reaching out to learners who wish to upskill and retrain, and exploring how these learners could be better supported, and the scale of demand.
- Exploring the outcome of pilots, where universities transfer 10% of their apprenticeship levy to support local learners and employers.
PILLAR 3: UPGRADING INFRASTRUCTURE

Supporting private investment in infrastructure, local infrastructure needs and further actions (Questions 15, 16 and 17)

The UK’s universities invest in infrastructure to support the education of students, including teaching facilities and student accommodation, and to underpin their research activities, including research laboratories and facilities. This investment in infrastructure is crucial to a high-quality student experience and to generate world-leading research and innovation. It also has significant benefits to local suppliers and the community.

The vast majority of investment in new facilities and refurbishment is funded by universities themselves: by 2018–19, around 70% of capital expenditure by universities in England will be funded through their own cash. Borrowing will be the second most important source.35

Uncertainty arising from the UK voting to leave the EU may have an impact on the ability of universities to finance their capital expenditure. Within two weeks of the referendum vote, eight universities had their credit status modified, with S&P Global Ratings modifying the ratings of two universities, and Moody’s changing the outlook for six. This is an indication that universities’ access to financing, and the cost of financing, may change. Surpluses generated are the only way many universities can invest in infrastructure, as there is limited government funding and not all universities are able to borrow more. Surpluses may dissipate if unanticipated shocks to revenue occur around student recruitment and research income.

In addition, universities may be more reluctant or unable to pursue European sources of financing, such as loans through the European Investment Bank. European Structural and Investment Funds (ESIF) have historically been a source of funding for capital investment by universities, and while the government has confirmed it will guarantee ESIF-funded projects (subject to projects being good value for money and being in line with domestic strategic priorities) up until the UK has left the EU, uncertainties remain which may impact on the ability of universities to invest.

The Research Partnership Investment Fund (RPIF) has been highly successful in leveraging external investment in research infrastructure. Since 2012, over £500 million has been allocated, attracting £1.4 billion of external investment. Additional investment in RPIF has the potential to leverage even more external investment for new projects. However, the amount of direct government funding for teaching infrastructure has fallen significantly since 2008, which means universities are much more reliant on their own sources of funding to finance teaching infrastructure.

There are local networks of universities, such as the N8 Research partnership, which have promoted collaboration through equipment sharing, equipment databases, collaborative processes and shared facilities. Linking these networks of universities to key local development actors will be important for a coherent picture of local infrastructure. Elsewhere in our response, we have noted that the availability and access to local infrastructure has clear implications for other pillars in the industrial strategy, including the decisions of businesses on where to locate and invest, and the decisions of individuals on

35 HEFCE, 2016, *Financial health of the higher education sector: 2015-16 to 2018-19 forecasts*
where to live and work. It will be important for local networks of universities and local actors to feed into an overarching and coherent national plan as it relates to UK infrastructure.

The green paper flags that as well as physical and digital infrastructure, an effective data infrastructure is also essential. Universities will have an important role to play in addressing challenges as well as exploiting opportunities in sharing data. The UK is a world-leader in open science, and has made significant progress in embedding open access to research publications across the higher education sector. Following advice to the Minister for Universities and Science in 2016 (provided by Professor Adam Tickell) an independent taskforce has been appointed to make detailed recommendations on how the national infrastructure and policy landscape may need to evolve to better support ambitions to make a step-change in open access to research data.

This Open Research Data Taskforce, chaired by Professor Pam Thomas (University of Warwick), is working closely with a wide range of stakeholders, such as funders of research, representatives of the academic community and ICT and infrastructure specialists, and will report its findings to the Department for Business, Energy and Industrial Strategy in January 2018. We urge the government to continue supporting the work of the taskforce, and to consider how funders of research can best support and implement the recommendations as they emerge.
PILLAR 4: SUPPORTING BUSINESSES TO START AND GROW

Factors constraining companies from making longer term investment decisions (Question 19)

Investment decisions by businesses can include investing in upskilling the existing workforce, in R&D and in innovation. Key factors constraining investment include uncertainty in the economic environment and risk aversion arising from uncertainty in the ability to capture the returns on investment. Employers may be reluctant to invest heavily in training staff when staff can move on to other employers, investment in R&D may or may not generate tangible results, and it can be uncertain whether markets exist for new innovations.36

Addressing these factors by the government needs to offset risk aversion by firms, and to create an environment where fear of failure is reduced, with readily available access to advice and guidance where needed. As Alan Mak MP points out in his report, ‘government shouldn’t be involved in ‘picking winners’, but instead, focus on creating positive conditions for innovation to flourish, science and technology to develop, and for commercialisation to take place.’37 Measures could include:

- Creating an environment where long-term finance is available to businesses who wish to upscale. Universities UK has held local events on the industrial strategy across England, bringing together universities, businesses and local stakeholders, and a strong theme emerging is that a greater emphasis should be given by government to upscaling businesses, rather than spinouts alone. This is supported by comments made by the London Stock Exchange and Octopus Investments, made at a Policy Exchange event on the industrial strategy38 and in evidence given by BenevolentBio and Woodford Patient Capital to the House of Lords Science and Technology Committee on the industrial strategy.39 The recommendations of the Patient Capital Review will be very important in this respect.
- Ensuring investment in R&D is supported. The announcements made in the 2017 Budget to increase the simplicity of R&D tax credit claims and to raise awareness amongst SMEs are welcome. However, the government should consider whether additional measures are necessary to support business investment in R&D, such as easing regulatory burden.40
- Incentivising businesses to upskill their workforce. This should be a key consideration in the lifelong learning pilots announced in the 2017 Budget.

As noted in our response under pillar 3, another factor that can constrain business growth and investment could include the cost of access to infrastructure (for example in London, particularly for SMEs).

37 Alan Mak, 2016, Masters of the Revolution: Why the Fourth Industrial Revolution should be at the heart of Britain’s new Industrial Strategy, and his comments made at Policy Exchange’s ‘Developing a modern industrial strategy’ event on Monday 20 March.
38 ‘Developing a modern industrial strategy’ event held by Policy Exchange on Monday 20 March, comments were made by Liz Stevenson, London Stock Exchange and Chris Hulatt, Octopus Investments.
39 Evidence given on 21 March 2017 by Professor Jackie Hunter CBE, (Chief Executive Officer, BenevolentBio) and Neil Woodford CBE, (Founding Partner, Woodford Patient Capital).
40 Evidence given on 21 March 2017 by Professor Jackie Hunter CBE, Chief Executive Officer, BenevolentBio.
**Addressing barriers to growth by businesses, and effective networks (Question 22)**

Universities play a key role in generating, collaborating with, and fostering innovative businesses *(please see Annexe 4.A for examples)*. Universities also collaborate with other universities in local areas to support businesses *(please see Annexe 4.B for examples)*. There could be scope to build on these local networks/collaborations, to play a key role in fostering innovative businesses at the local level to ensure fast-growing firms can scale-up and make the long-term investment decisions needed to ensure their success. These local collaborations could also support businesses (particularly SMEs) to access university infrastructure.

Local university and business collaborations could be supported through business rate relief and VAT exemptions, and could reach SMEs through targeted innovation voucher schemes. VAT exemptions, in particular, could help SMEs access university infrastructure. Current VAT rules on shared research facilities create disincentives to university and business co-location, whereby if commercial activity on research institute premises exceeds 5%, the entire facility is subject to full VAT. This threshold should be reformed in order to stimulate universities to collaborate with businesses through co-location, and to ensure research infrastructure can be accessed at the local level.

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**CASE STUDY: SUPPORTING LOCAL SMALL BUSINESSES**

At Universities UK’s ‘Shaping the industrial strategy’ event, hosted by Aston University on Friday 24 March, Professor Mark Hart from the Aston Centre for Growth and Enterprise Research Centre gave an overview of factors underpinning the growth performance of small businesses. The main points he raised included:

- Leadership and management skills are crucial to small businesses, with three quarters of SMEs in England reporting a deficit of such skills.
- The Goldman Sachs 10,000 small businesses programme is designed to provide high-quality, practical education and business support to leaders of high-growth small businesses and social enterprises across the country. The programme is run in partnership with the Aston Centre for Growth at Aston University, the Said Business School at the University of Oxford, Leeds University Business School at University of Leeds, and the Manchester Metropolitan University Business School at Manchester Metropolitan University.
  - Graduates of the programme are three times more likely to be creating jobs and twice as likely to be growing revenue than other UK small businesses.
- The Small Business Charter (SBC) is an award which recognises the work of business schools who provide active and effective help to and engagement with small businesses – there are 33 charter schools and more in the pipeline.
  - Aston University has benefited from being a charter school through becoming more embedded in the local business support ecosystem, and forming closer relationships with other business schools and policy makers.
- Forthcoming research will explore in more detail how access to publicly funded research boosts the performance of SMEs.
- There is scope for building local consortia of universities to support the local small business sector to survive and grow.

UNIVERSITIES UK PROPOSES:

- Building on existing local networks of universities to incubate and support the growth of fast growing firms: to share advice and provide a peer network, to support their investment in upskilling their workforce and the next generation of entrepreneurs, build local collaborations, and access local infrastructure.
- The government could support these local networks through business rate relief and VAT exemptions.
- A particular focus could be given to supporting “first generation” SME graduate employers to boost SME innovation and growth. This could be further supported by a government-supported innovation voucher scheme to introduce SMEs to university expertise and new technologies in line with industrial strategy priority areas.
PILLAR 5: IMPROVING PROCUREMENT

Further steps government could take to support innovation through public procurement (Question 23)

Universities are significant economic actors in their own right, with some £11 billion of non-pay expenditure in 2013–14. The higher education sector has taken huge steps in improving the effectiveness of procurement in higher education, including through the establishment of the Higher Education Procurement Association and Procurement England Ltd, a roll-out of Procurement Maturity Assessments across English higher education institutions, and with UK-wide, high-level coordination being delivered through Procurement UK. Around 26% of non-pay spend in 2014–15 (totalling some £1.86 billion) now goes through collaborative agreements, and university procurement teams are working through regional and national procurement consortia to ensure that SMEs can benefit from servicing the needs of UK universities.

There are also significant opportunities that might be realised through smarter procurement and via links to the Social Value Act in England and Wales and the Procurement Reform Act in Scotland. Universities might be able to leverage their spending to complement the requirements of such acts and to address industrial strategy priorities - for example, by ensuring that suppliers focus on supporting skills development, and that industry is being cultivated and supported in the areas where it is most needed. There may also be opportunities to link higher education procurement and the apprenticeship levy with suppliers, to create new opportunities with regards to providing skills development in local areas, in support of industrial strategy priorities.

The Research Councils could also take a more strategic approach to investment in infrastructure, which, in the wake of the UK leaving the EU, would be assisted by government support of opportunities to develop UK supply chains with regards to bespoke and high-value scientific and research equipment.
PILLAR 6: ENCOURAGING TRADE AND INVESTMENT

Supporting firms to start or increase their exports (Question 25)

UK universities are very experienced in running schemes which help local businesses, including SMEs, break into new export markets and to strengthen local industrial clusters (please see Annexe 6.A for examples). Universities also utilise their international connections and expertise to benefit their local areas. Any new measures to support exports as part of the industrial strategy should capitalise on universities’ experience in helping businesses break into new markets, their international reach, and extensive partnerships.

In addition, universities contribute significantly to UK exports in their own right, through their international activities. This includes the provision of teaching services and materials to international students in and outside of the UK. There are numerous barriers to trade in educational services, including, for example, difficulties in obtaining authorisation to establish facilities abroad, a lack of opportunity to qualify as a degree-granting institution, and restrictions on electronic transmission of course materials. To help universities enhance their exports, education exports should be considered as the UK develops future trade relationships and free trade agreements.

Supporting inward investment and measuring success (Question 26)

Many countries have focussed policies on investment promotion to support foreign direct investment (FDI), providing investors with information on a country’s strengths and investment services. Universities play an important role in attracting FDI by representing and promoting several of the UK’s strengths around the world, including its reputation for cutting-edge, world-class research and higher education. In the UK, an exceptionally high proportion of Gross Domestic Expenditure on R&D (GERD) is funded from abroad. The OECD estimate that in 2015 17.6% of UK GERD was funded from abroad, compared to 5.0% in Germany and 4.7% in the United States. Universities are a globally recognised source of research and innovation, play an important part in the creation of the industry clusters and innovation hotspots sought by investors, and ensure that a strong talent pool is available for local companies.

For universities to promote the UK abroad and for investors to identify the strengths of the UK, government policies that support international research collaboration as well as student and researcher mobility are very valuable. Maintaining and enhancing the conditions that make UK universities world-leading is critical to their success in attracting FDI.

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41 Jane Knight, 2002, Trade in Higher Education Services: The Implications of GATS
42 OECD, 2017, Main Science and Technology Indicators, released: 2 February 2017
PILLAR 7: DELIVERING AFFORDABLE ENERGY AND CLEAN GROWTH

Universities, business and government working together to develop competitive opportunities from innovation in energy (Question 29)

The research undertaken and skills provided by universities will have a key role to play in delivering affordable and sustainable energy and clean growth over the long term for the UK. Universities carry out research funded by the Natural Environment Research Council (NERC) and other research councils, and through block grant funding: it will be important for these funding sources to be sustained for universities to continue to make breakthroughs relating to renewable energy sources, and making current energy options more effective and efficient. In addition, graduates and postgraduates educated by universities will be essential to provide the necessary skills across business and the government to ensure the sustainable use of natural resources and for climate change mitigation and adaptation. Universities are also committed to act as role models, and many have strategies to maximise their positive impact and minimise their negative impact on the communities in which they are based. This encompasses their building and construction work and how they carry out their day to day operations.43

Collaborations between universities, business, and the government already exist in relation to energy, and the industrial strategy provides an opportunity to extend and deepen these collaborations. The recently announced collaboration between NERC, the National Centre for Atmospheric Science (NCAS) and Cranfield University is an excellent example of cross-agency collaboration. Other collaborations are also occurring, for example, DONG Energy and Siemens are working closely with the University of Hull and other leading research and business partners to develop plans aimed at ensuring an international industry focus on offshore energy in the UK (called Project Aura). The Offshore Renewable Energy Catapult, the Advanced Manufacturing Research Centre (AMRC) at Sheffield and the Energy Institute at Durham University are also actively involved. The construction industry is another example where effective partnerships have been built between universities, government and business to promote sustainable construction. It may be worthwhile considering how investment can be maintained to develop skills for sustainable construction over the longer term, bearing in mind the construction industry is particularly vulnerable to cyclical fluctuations.44

While we are supportive of the government’s plans for a new research institution to act as a focal point for work on battery technology, as we noted in our response to pillar 1, it would be worthwhile for the government to consider how the Science and Innovation Audits could be used to build and extend collaborations, rather than creating new institutes as a matter of course (please see Annexe 8.B for a summary of emerging findings). This would enable these collaborations to be financially sustainable in the longer term. It should be recognised, however, that not all areas have yet had the opportunity to participate in a Science and Innovation Audit. Successful existing mechanisms used by the government to support and join up excellence should also be replicated, for example the Engineering and Physical Sciences Research Council (EPSRC) funding of a national network of Quantum Technology Hubs, with four hubs involving 17 universities and 132 companies.

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44 As noted by the Construction Industry Training Board in written evidence submitted to the House of Commons Business, Energy and Industrial Strategy Committee for their industrial strategy inquiry.
PILLAR 8: CULTIVATING WORLD-LEADING SECTORS

Enabling growth in new sectors of the future that emerge around new technologies and new business models (Question 33)

Universities make multi-faceted contributions to support new sectors of the future, including supporting new ways of working and bringing new ideas to market (please see Annexe 8.A for examples.) The diversity of the higher education sector brings with it a great breadth and depth of collaborations with industry. Universities will be strengthening their key alliances and partnerships to participate fully in sector deals. Universities themselves are part of the knowledge sector, which has important links with other sectors, and which faces its own unique opportunities and challenges.

Much work has already been undertaken in carrying out the Science and Innovation Audits, in which universities have played a key part. The Science and Innovation Audits could provide important information and potential areas for sector deals across the UK (please see Annexe 8.B for examples.) The outcomes of the Science and Innovation Audits should be pooled and sector linkages identified across the UK. This point is supported by evidence given by Dame Ann Dowling and Professor Iain Gray to the House of Lords Science and Technology Committee on the industrial strategy. The role of the Science and Innovation Audits in identifying areas of excellence and their geographical distribution was emphasised, but also the importance of identifying how geographical areas work together for the good of the whole of the UK – different parts of the UK need to work together and not compete unnecessarily with each other.

PILLAR 9: DRIVING GROWTH ACROSS THE WHOLE COUNTRY

Key principles (Question 34)

Universities contribute to broader economic growth which benefits the entirety of the UK. Future growth and the rebalancing of the economy will rely on knowledge based industries that are dependent on the research, innovation and higher-level skills that universities provide. Universities also make significant contributions at the local and regional level. Universities UK has published a series of regional briefings for England which highlight the wide range of interactions that universities undertake to support local and regional economies. Contributions highlighted include: job creation, investment in regeneration, attracting funding from central government, supporting local communities, businesses and services, and attracting skilled people to the area.

As mentioned in our answer to question 1, particular consideration should be given to building on existing work of the devolved administrations in developing plans for the industrial strategy. The government should consider how further devolution can allow decisions to be taken closer to the point of delivery and therefore be tailored to the needs of the area. Consideration should also be given to increasing local decision making in areas without a larger city.

45 Evidence given on 14 March 2017 to the Science and Technology and the Industrial Strategy inquiry by Professor Dame Ann Dowling OM DBE FRS FREng, (President, Royal Academy of Engineering) and Professor Iain Gray CBE FREng FRSE (Vice-President, Royal Society of Edinburgh).
Raising skill levels and encouraging growth across the country (Question 35)

The factors identified in the industrial strategy green paper, reflecting differences in incomes between different parts of the UK, all interact. For example, the willingness of employees to live in a certain area and for businesses to locate in a certain area will crucially depend on that area’s infrastructure, connectivity, and other quality of life considerations. Therefore, measures to address different skills levels and R&D investment cannot be looked at in isolation of key factors that make an area a desirable place to live and locate a business.

CASE STUDY: UNIVERSITIES UK’S SHAPING THE INDUSTRIAL STRATEGY EVENT, HOSTED BY KING’S COLLEGE LONDON, TUESDAY 7 MARCH

The event brought together representatives from ten universities (King’s College London, Queen Mary University of London, Brunel University London, Middlesex University, St George’s University of London, Imperial College London, Royal College of Art, University of the Arts London, University of Westminster and Royal Holloway University of London), the Greater London Authority, London First, Centre for London and the Future Cities Catapult.

The discussion focussed on the industrial strategy green paper’s concept of place, and the implications for London. The main points of discussion included:

- The industrial strategy may represent an opportunity to consider whether there is a new way of delivering local economic development across the UK, using the assets of London. There is an opportunity for universities to engage with London initiatives such as the London Economic Action Partnership (LEAP), the Mayor’s business advisory board, and Skills for Londoners taskforce. It will be necessary to consider how these and other local initiatives could be more joined up with initiatives operating across other parts of the UK.

- London has an important role in incubating businesses, but international competition is fierce. London needs to increase its competitiveness in relation to the financial environment to support high-tech companies and start-ups and their growth (including the availability of long-term finance) and other factors which impact the long-term growth of companies and SMEs (such as the costs of locating in London, including the cost of access to infrastructure like high-speed internet access).

- London is a magnet for talent from across the UK and across the world, and therefore for multinational companies. There should be a focus on creating the right conditions in local economies, bridging the divide between London and other parts of the UK – this includes looking at conditions which attract businesses to locating in certain areas, and the living conditions which attract residents. This would create additional jobs more evenly across the UK, and stronger skills bases would follow.
The industrial strategy green paper proposes new schemes to support the retention and attraction of graduates. There are many good examples of effective graduate retention schemes operating across England (please see Annexe 9.A for examples, and the case study below).

CASE STUDY: UNIVERSITIES UK’S SHAPING THE INDUSTRIAL STRATEGY EVENT, HOSTED BY ASTON UNIVERSITY, FRIDAY 24 MARCH

The event brought together representatives from seven universities (Aston University, the University of Birmingham, Keele University, the University of Worcester, Birmingham City University, Coventry University, and Staffordshire University), the West Midlands Combined Authority, CBI West Midlands, the Greater Birmingham Chamber of Commerce, the Greater Birmingham and Solihull Local Enterprise Partnership, and the University Hospitals Birmingham NHS Foundation Trust.

The discussion covered the value of universities collaborating at the local level, to support businesses to recruit and retain graduates in the local area. An example of such an initiative is Graduate Advantage, based at Aston University, and funded by a consortium of universities and university colleges with support from the European Regional Development Fund (ERDF) up to 2015. It aims to assist, and where needed change the attitude of employers when hiring graduates, and SMEs are a particular focus. The programme keeps abreast of what skills and vacancies employers have, and shares feedback from firms that have taken on a new graduate with firms interested in doing so (please see Annexe 9.A for further details of the programme).

While the initiative has been very successful, the question of future funding from the ERDF arose. It was agreed that European Structural and Investment Funds (ESIF) more generally have been important for funding local initiatives, and that in light of the UK leaving the EU, this funding should be replaced by alternative domestic funds. One such channel might be increased investment through the Higher Education Innovation Fund (HEIF) in England.

While there are already examples of effective schemes operating, there are other parts of England which could benefit from a scheme being introduced. For example, at Universities UK’s industrial strategy event hosted by Newcastle University, there was agreement that the five universities in the North East area could collaborate to encourage graduates to stay and work in the area. Ross Smith, Director of Policy at the North East Chamber of Commerce highlighted three areas where universities could help:

- “The first is to sell the region as more than just a place to study.
- The second relates to the type of job opportunities that exist locally. With relatively few corporate headquarters in North East England, traditional graduate training schemes are less common. But the opportunity to work within a SME or smaller office can often be a much better launchpad for a career, as it means getting a more rounded experience and responsibility quicker. Universities could help prepare SMEs
who have the potential for graduate vacancies, and ensure this is matched with the expectations they encourage among their students.

- The final point relates to the scale of opportunity in the region. Universities can work with Local Enterprise Partnerships to identify the industry clusters that have significant scale in this region, and focus on helping students better recognise and understand these.’

Therefore, the opportunity exists for local networks of universities to work together to provide a ‘one-stop shop’ for employers and graduates, to help better match graduate skills with the needs of local businesses, and to cultivate employability opportunities like the initiatives outlined in our response to pillar 2.

Local collaborations of universities could also be used to bring together the economic growth and social inclusion agendas, building on local collaborations relating to widening participation and community engagement. The opportunity areas announced by the government will see local partnerships formed with early years providers, schools, colleges, universities, businesses, charities and local authorities to ensure all children can reach their full potential. Local collaborations of universities have a key role to play, and universities already collaborate locally in relation to widening participation in higher education. One example is the University of South Wales’ award winning programme, UHOVI (Universities Heads of the Valleys Institute), which won a Guardian Award for Commitment to Widening Participation 2013. This programme focused on higher education in further education, work-based learning with employers, community and schools outreach in non-traditional hard to reach areas, and promoting progression to higher-level learning. In the final year of the UHOVI funded project there were over 2,000 learners at over 47 venues, with 585 employees from over 100 employers (please see Annexe 9.B for further examples).

As part of Universities UK’s work to promote and enhance the role universities play in social mobility, we are currently working with employers to scope a pilot project that would undertake an audit, at the regional level, of current activity that supports and enhances graduate outcomes from lower socio economic groups. Such an audit would identify gaps, the different actors, and where improvements could be made. Subject to the outcomes of the pilot, this approach could be extended to other regions. Universities UK proposes working with the government, employers and regional actors to take forward this pilot.

The green paper makes proposals on creating world-class clusters under this pillar - please see our response under pillar 1 in relation to these proposals.

UNIVERSITIES UK PROPOSES:

Collaboration between local universities and employers to better match graduates with local jobs, and to improve employability. This could include expanding or developing existing initiatives. Part of this collaboration could also include reaching out to learners, and exploring how these learners could be better supported with a view to addressing widening participation considerations. The government could support these collaborations through targeted funding. In light of the UK leaving the EU, it will be necessary for domestic funding to replace the European sources of funding that have historically been effective in funding local initiatives. One such channel in England could be through increased investment in the Higher Education Innovation Fund. Consideration will need to be given to the most appropriate mechanisms for the devolved nations.
PILLAR 10: CREATING THE RIGHT INSTITUTIONS TO BRING TOGETHER SECTORS AND PLACES

Creating and strengthening local institutions to support local growth (Questions 36, 37 and 38)

Universities UK’s response to the industrial strategy green paper has made key proposals on building on existing local networks and collaborations of universities (please see Annexe 10.A for examples.) Across all of Universities UK’s industrial strategy local events, held in the North East, South West, West Midlands, and London, there was a consensus that local collaborations of universities had much to offer in terms of their convening role. There was also demand from local businesses and local actors (such as Local Enterprise Partnerships, Combined Authorities, and Chambers of Commerce) for universities to be more involved in local issues, building on existing initiatives and partnerships. We believe local networks of universities provide an overall framework, at the local level, for leadership on local and regional issues. There is an opportunity for these networks to go further in terms of:

- Supporting and incubating local businesses, particularly fast-growing firms through the sharing of advice and supporting them to build local collaborations and upskilling their workforce, providing access to local infrastructure (particularly SMEs), and enhancing their abilities to export.
- Collaborating with employers to better match graduates with local jobs, building on existing initiatives, and to improve employability of graduates.
- Reaching out to learners who wish to upskill and retrain, exploring how these learners could be better supported, and the scale of demand.
- Building on existing local collaborations relating to widening participation and community engagement.

The government could support these enhanced networks with universities, businesses, employers and learners through business rate relief, VAT exemptions, innovation voucher schemes, and targeted funding. In light of the UK leaving the EU, it will be necessary for domestic funding to replace the European sources of funding that have historically been effective in funding local initiatives. In England, this could be through the Higher Education Innovation Fund (HEIF). Consideration will need to be given to the most appropriate mechanisms for the devolved nations. As Birmingham Science City mention in their response to the industrial strategy response, government backing of local institutions and collaborations will be crucial to the success of a more local approach: ‘... local institutions will only be effective if they are granted sufficient authority or resource to operate. We would also like to see this pillar extended to include support for networks and alliances that work across and between institutions to enable and catalyse collaborative approaches, and cross-sector and cross-organisational learning and innovation.’
CASE STUDY: UNIVERSITIES UK’S SHAPING THE INDUSTRIAL STRATEGY EVENT, HOSTED BY NEWCASTLE UNIVERSITY, FRIDAY 17 MARCH

The event brought together representatives from five universities (Newcastle University, Northumbria University, the University of Sunderland, Durham University and Teesside University), the North East Local Enterprise Partnership, Tees Valley Local Enterprise Partnership, RTC North, the North East Chamber of Commerce, the Newcastle upon Tyne Hospitals NHS Foundation Trust, Sunderland Software City, Opus Building Services, Engie, Offshore Renewable Energy, North East Process Industry Cluster, the Office of Chi Onwurah MP, and the Academic Health Science Network for the North East and North Cumbria.

A theme emerging from the discussion was the opportunity for universities to collaborate at the local level to provide a more readily accessible interface for local employers and businesses, particularly SMEs, who may find it more difficult to source appropriate contacts at multiple universities due to time and expertise constraints. This single point of contact could advise how to find expertise, employ graduates, access specialist equipment and infrastructure.

Andrew Buckley, Chief Executive at RTC North proposed: ‘why don’t the five universities in the North East club together to hire a single SME engagement team who are able to signpost businesses to the most appropriate source of support?... Could universities do more to understand how SMEs work and to mould their training and consultancy offerings around the time and budget constraints of a small and growing businesses? ...I also believe passionately that our universities have a central role to play in helping to address some of the critical skills challenges facing the North East economy. The North East is seen as a great place to be a student but it isn’t yet seen as a great place to build the early years of a career. This has to change.’

In addition, universities should explore collaborating with local further education and school partners, to deliver ‘collaborative institutes’ which focus on technical education, to provide a ‘one-stop shop’ to learners and employers at the local level. The ‘collaborative institute’ model of working need not be restricted to technical education but also cover other areas to create stronger pathways of learning.

The existing local networks of universities are ideal platforms to harness the strengths of universities engaging at the local level, and to deepen these interactions. Many universities are already involved in leadership initiatives relating to local growth and development.

Richard Kenny, Director of Partnerships at the West Midlands Combined Authority said:

‘The higher education sector makes a significant contribution to the quality of life in the communities of the West Midlands, and universities in the West Midlands Combined Authority area, are among the best in the world. They have an impact on all aspects of life in the West Midlands and are vital for the future. Six of the major universities – the University of Warwick, the University of Birmingham, Aston

47 http://www.universitiesuk.ac.uk/blog/Pages/How-can-universities-better-support-local-and-regional-businesses.aspx
University, Birmingham City University, Coventry University and the University of Wolverhampton - are engaged in the delivery and development of the West Midlands Strategic Economic Plan, and are partners in the West Midlands Growth Company jointly marketing the area across the world and helping to deliver on trade, investment and business development. These six universities are also seeking to establish a major ‘think tank’ for the West Midlands to provide intelligence-led insight, innovation and advice to the Combined Authority, and are seeking to do this initially by aligning and joining up their existing place-based strengths, assets and opportunities, to secure significantly more from the sum of the parts.’

The ‘Leading Places’ project, funded by the Higher Education Funding Council for England, has piloted projects in six areas aimed at encouraging local councils, universities and other anchor institutions to work together to help drive growth, re-design public services and strengthen the involvement of local communities. Evidence given by the Royal Academy of Engineering to the House of Commons Science and Technology Committee on the industrial strategy\(^{48}\) emphasised that across several areas in England and Scotland, there is a ‘tremendous amount of interface and co-operation with the universities from an industrial point of view.’ (Please see Annexe 10.B for further examples of university engagement in local growth and development initiatives).

Local Enterprise Partnerships (LEPs) have become a stable part of the growth infrastructure in England – they will be critical for delivering future policy, including Science and Innovation Audits and devolution deals. Many universities have led on the development of Growth Hubs throughout England, and most LEPs have a university represented on their board. Universities second staff to LEPs and often provide pro bono support for strategy development. A more significant role for local networks of universities would reinforce the work of LEPs in England. We note that the governance structure at the local level is increasingly complex in England – with LEPs, combined authorities, devolution deals, city deals, enterprise zones, university enterprise zones, and pan-LEP geographies of the Midlands Engine and Northern Powerhouse. Local networks of universities can help to bridge and connect these structures.

Universities UK recognises that some areas in England may not yet have an existing local network of universities, or that some universities may face barriers in collaborating at the local level. Universities UK could provide an underpinning framework for local university collaborations to develop, and bring together groups of universities at the local level who wish to explore collaboration or deepen their current level of collaboration. Universities UK would welcome discussions with the government on the scope of this underpinning framework, and the development of more detailed proposals to take forward. We also acknowledge that some areas across England do not have universities, and that there is scope for addressing how these areas can be better connected to the expertise and resources universities offer.

\(^{48}\) Evidence given on 22 February 2017 by Allan E Cook CBE FREng, Vice-President, Royal Academy of Engineering.
Annexe 1.A: Examples of the range of approaches by universities to intellectual property

Universities interact with many different sectors, each with their own approach to commercialising discoveries. Some inventions (such as software packages) can be licensed to existing businesses rapidly and at relatively modest cost, while others (such as drug discoveries) will often require an institution to invest huge sums in a spin-out company over several years to come to fruition. In the creative industries, universities may drive innovation through encouraging student and staff entrepreneurship rather than through traditional intellectual property exploitation. Some university intellectual property is offered to companies and individuals for free to maximise the impact.

Where intellectual property licensing is a key pathway for impact in some industries, lack of proof-of-concept funding can be a barrier. For example, three universities have partnered with GSK, AstraZeneca and Johnson & Johnson to create the Apollo Therapeutics fund, a £40 million pot supporting the translation of academic science into innovative new medicines.

Supporting examples of the varying approaches universities can take to intellectual property are set out below:

- The STAR (Self-sustaining Treatment for Active Remediation) technology developed by the University of Edinburgh effectively remediates hydrocarbons using smouldering combustion. In 2010, the technology was licensed to Geosyntec Inc and has now been demonstrated in two field trials resulting in 99% remediation.
- Biovex, a spin out company created by University College London in 1999, was acquired 11 years after by US Biotechnology giant Amgen Inc in a deal worth $1bn. The company has since completed Phase III studies on its anti-cancer vaccine targeting melanoma and has submitted a Biological License Application to the US Food and Drug Administration awaiting product approval.
- The Multiple-Sclerosis Patient Related Outcome (PRO) measures are used in clinical trials to determine the efficacy of drugs on improving or delaying disease onset. The £360,000 copyright licence revenue generated over the last three years is shared between the institutions that created the PRO measures. One of them, Plymouth University, gives academics the choice of either taking such licence revenue as salary or using the income for research. In this case, all the Plymouth income is used by Professor Hobart (the research leader) to support his research at the MS Unit.
- Since 2010, EasyAccessIP grants free technology licences from 10 UK universities, in return for a one-page agreement to use the technologies to create social and economic impact.
- The University of the Arts London runs the SEED fund, which offers enterprising students/graduates funding, mentoring and legal & IP guidance to test and develop their business ideas.

49 Imperial College London, University College London and the University of Cambridge
50 Claire Brady, Russ Cummings, Tony Hickson, Tom Hockaday, Linda Naylor, Tony Raven, Clive Rowland, Cengiz Tarhan, 2015, UK University Technology Transfer: behind the headlines
51 Ibid
52 https://www.plymouth.ac.uk/research/support/intellectual-property/intellectual-property-case-studies
Annexe 1.B: Examples of the impact of knowledge transfer partnerships (KTPs), and where they have effectively supported entrepreneurship

**Increased profits:** Blue Sheep approached the University of the West of England, Bristol (UWE Bristol) for help with taking their new products to market and through the KTP. UWE Bristol were able to provide some strategic marketing development assistance that helped to deliver a pre-tax profit of £482,000.53

**Winning new business:** Design and manufacturing firm Mech-tool Engineering has cut its costs by £350,000 and gained major new business thanks to a KTP with Teesside University. The firm worked with Teesside to develop an integrated production process which allowed it to reduce both total costs and delivery times for its products and to win new contracts.54

**Reduced running costs:** Virtus Consult, a small local consultancy, is tapping into Oxford Brookes University’s expertise in sustainable construction via a KTP to validate, refine and package a methodology for energy management that has been shown to cut running costs in hospitals by almost 20%.55

**Community engagement:** A KTP with the University of Cardiff enabled Welsh charity Lamau to work with researchers on evidence-based responses to the needs of vulnerable people. The KTP helped Lamau win contracts and grants worth over £4 million and become the leading charity for homeless and vulnerable people in Wales, rolling out services across the nation.56

**Enhanced competitiveness:** The University of Wolverhampton helped a local firm of chartered land surveyors establish a 3D modelling department. The firm’s strengthened capabilities in 3D modelling and building information modelling helped it become a leader in these areas, with 3D modelling services now making up 15% of sales turnover. The success of this KTP also resulted in two additional KTPs and in the recruitment of several university graduates by the firm.57

**Supporting SMEs to develop new products and to innovate:** KTP projects have great potential to benefit SMEs, as demonstrated by the two following projects:

- A KTP project between Aston University and innovative optical instruments firm, Optimec, resulted in a ground breaking new product, and has enabled Optimec to position itself at the forefront of technology based metrology in the contact lens industry.
- The KTP between Coventry based Gas Data Ltd and the Aston Institute of Photonic Technologies developed gas monitoring solutions for difficult-to-detect gases, using optical fibre technologies. As early adopters of optical fibre technologies in this field, Gas Data Ltd have gained a clear competitive advantage across Europe.

53 [http://www1.uwe.ac.uk/business/innovationandfunding/knowledgetransferpartnership/bluesheep.aspx](http://www1.uwe.ac.uk/business/innovationandfunding/knowledgetransferpartnership/bluesheep.aspx)
54 [http://www.mechtool.co.uk/teesside-university-helps-engineering-company-make-substantial-savings-n58](http://www.mechtool.co.uk/teesside-university-helps-engineering-company-make-substantial-savings-n58)
Supporting entrepreneurship: It is estimated that KTP associates have created 35 high-value businesses with an average turnover of £1 million each between 1984 and 2014.\(^\text{58}\)

The collaboration between Signal media, a London-based media-monitoring start-up and the University of Essex led to considerable growth as the company raised $3.2 million from private investors and its staff numbers grew from 3 to 30 in just over two years. Dr Miguel Martinez-Alvarez, the young graduate brought in as KTP associate, was named as a KTP Business Leader of Tomorrow in 2014 and has since become head of research at Signal and a co-founder of the company\(^\text{59}\).

Dr Wan Li Low, a Biological Science Researcher from the University of Wolverhampton, worked as a KTP associate for OSIL, an independent engineering service provider. This experience allowed OSIL to develop a new generation of non-chemical odour biofiltration systems generating over £5 million of new business, and the researcher to learn to develop and integrate scientific research ideas into strategic business plans. As a result, Dr Low was able to win a Technology Strategy Board’s Business Leader of Tomorrow 2013 award, and to start a career as a consultant microbiologist.\(^\text{60}\)

Floreon Ltd was established with the support of two KTPs with the University of Sheffield, which resulted in the creation of Florian, a highly disposable and environmentally friendly packaging material. Dr Andrew Gill, the KTP associate, is now a technical director and a shareholder in the company.\(^\text{61}\)

TBG Solutions and the University of Manchester recruited KTP Associate James Jacobs, a recently qualified PhD graduate to develop novel technology to solve the challenge of theft from oil pipelines in urbanised areas. Following this experience James has developed new skill-sets and taken on the role of Senior R&D engineer with TBG and Company supervisor to the new associate in a second KTP project with the university.\(^\text{62}\)

\(^{60}\)https://www.wlv.ac.uk/media/departments/business-solutions/OSIL-case-study.pdf
\(^{62}\)http://documents.manchester.ac.uk/display.aspx?DocID=29965
Annexe 1.C: University engagement in the Science and Innovation Audits (SIAs)

First wave

The Sheffield City region and Lancashire’s SIA saw Lancaster University, the University of Central Lancashire and the University of Sheffield work together as key partners alongside BAE Systems, the Lancashire Local Enterprise Partnership, the Sheffield City Region and others.

The University of Edinburgh led on a SIA focussing on the city and region’s digital potential with a consortium including local businesses, innovation centres and public bodies. The SIA has already increased interactions between the partners around data-driven innovation and related themes such as innovation hubs, low carbon and Internet of Things networks.

Second/Third Wave

The University of Liverpool and the Liverpool City Region Local Enterprise Partnership are leading a SIA that will focus on the area’s research and business strengths in materials chemistry, infectious diseases, high performance computing and cognitive computing.

The University of Leeds is leading a SIA highlighting the UK’s Medical Technology strengths. The SIA will investigate how the UK can reach its full potential in the sector, which in 2015 had a global market value of £370 billion.

The University of York is leading on an audit of the bio-economy of the North of England, examining the area’s assets in industrial biotechnology, and AgriFood.

Newcastle University is to lead a SIA for Offshore Renewable Energy Technologies, investigating the offshore capabilities of the major ports in Northern England and Scotland. This will assess how the area can be transformed from an implementation hub for imported offshore wind energy technology to a major export hub for manufacturing and services in this sector.
ANNEXE: PILLAR 2 – DEVELOPING SKILLS

Annexe 2.A: Percentage of first degree subjects by provider type 2014–15

Source: Universities UK, 2016, Higher Education in England: Provision, skills and graduates
Annexe 2.B University and employer engagement

As the Higher Education Business and Community Interaction Survey shows, continuing professional development (CPD) is an important engagement activity for universities. Most institutions deliver bespoke courses for businesses, on campus (93%) and/or on business premises (83%). Some CPD courses are relatively formal, (undertaken to gain membership of a professional, statutory or regulatory body) and other CPD is more task-focused (for instance selecting particular modules from an MBA course to develop a specific business resource). Income from CPD rose by 36% from 2005–06 to 2015–16, from £491 million to £668 million. 63

Twelve case studies of university and employer engagement were featured in a 2014 joint report between the UK Commission for Employment and Skills and Universities UK, ‘Forging futures: building higher level skills through university and employer collaboration’.

Specific university–employer examples include:

- **University of South Wales** and British Airways (BA): BA employs over 1,400 people across South Wales; in order to ensure a steady supply of maintenance engineers, the university has worked with BA to develop a BSc degree in aircraft maintenance engineering, which includes industry-standard EASA Part 66 training, an essential requirement for a career in aircraft maintenance as an engineer and awarded under BA’s licence.

- **Grads4Nottm**: Working with Boots and Nottingham City Council, Nottingham Trent University have developed a graduate scheme that aims to retain graduates in the city. Under the scheme, employers submit a business challenge that they are currently facing and give students and graduates from the university a two-week funded placement. Under the scheme, local companies can raise their profile with graduates, as well as gain access to Nottingham’s graduate talent pool.

- **University of Huddersfield** - Open for Business: Realising that small and medium-sized firms based in their local area may sometimes view the university as difficult to access, the University of Huddersfield has begun to host open days for as many as 30 local businesses at a time. The open days are designed to introduce local SMEs to the local graduate talent pool and, with the aid of local firms who have already hired Huddersfield graduates, explain the innovation and value-added that can come from hiring a Huddersfield graduate.

- The Management School at Lancaster University host over 50 ‘Entrepreneurs in Residence,’ local SME owners and managers who help the school to refine its programmes, enhance the student experience including contributing to the classroom, and act as ambassadors. Critically, all entrepreneurs hire a Lancaster graduate. Businesses are from a range of sectors, from engineering to cheese making to financial services.

- **Coventry University's** (CU) Scarborough campus, which opened in 2015, was constructed with the aim of providing professional, career-focused education in an

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area with few higher education providers. Working with their local council, CU Scarborough identified a difficulty in retaining health and social care workers locally. In response, CU Scarborough designed, with the local healthcare trust, a Higher National Certificate (HNC) in applied health and social care. This is a one-year bespoke programme that is equivalent to the first year of a Bachelors degree. The first cohort of approximately 15 students has been recruited by the local trust and will divide their time between the Scarborough campus and working in local care homes.
ANNEXE: PILLAR 4 – SUPPORTING BUSINESSES TO START AND GROW

Annexe 4.A: Evidence of universities collaborating with and fostering innovative businesses

University income from collaborative research, contract research, and consultancy rose from £1.8 billion in 2005–06, to £3 billion in 2015–16 – an increase of 65%. Research and consultancy income from SMEs also grew significantly, by 45% (from £95 million to £138 million over the same period).\(^{65}\)

Universities have also made their cutting-edge facilities more accessible to businesses and charities over the last decade, resulting in an increase in income from facilities and equipment from £109 million in 2005–06 to £210 million in 2015–16, an increase of 92%. Access from small companies has grown particularly fast, with the doubling of facilities and equipment income from SMEs over the last decade.\(^{66}\)

Examples of specific university initiatives supporting innovative businesses include:

The University of Reading has established the Thames Valley Science Park with the ambition to create a science park with international appeal that builds on the established cluster of high-growth-potential companies already there. The ‘Gateway’ building is expected to open in August 2017 and will provide 70,000 square feet of specialist space for innovation-led and technology-based companies. Approximately 20 companies are expected to fill the building. The new site will eventually deliver approximately 800,000 square feet of flexible laboratory and office space in a campus style setting designed to encourage collaboration. Once completed, the Science Park will have the potential to provide up to 5,000 new jobs.

The University of Bristol joined forces with the local council and the West of England LEP to create Engine Shed, an incubator facility credited with adding £8 million to the local economy in its first year (2013).

Queen Mary University of London was the lead organisation in Creativeworks London (CWL), which built new partnerships and commercial opportunities between academia and the creative industries, museums, libraries, and other cultural institutions. CWL was a collaboration of over 30 organisations involved in the creative industries in London, with three funded schemes to promote collaboration between the arts and humanities research base in London and London's creative economy: Creative Vouchers; Creative Entrepreneurs in Residence; and Researchers in Residence. Many partnerships and links built during its tenure form an important part of ongoing research and innovation.

The University of Hull has created around 150 new businesses at its Enterprise Centre. Almost 90 of them were still in business, still growing and employing graduate-level staff after five years – better than the national average. The University was a national award winner for its successful relationship with an organisation, called For Entrepreneurs Only (FEO), which is based at their Enterprise Centre. FEO member companies have a combined annual turnover of £3 billion, employ 19,000 people and created 1,600 new jobs in the past 12 months.


\(^{66}\) ibid
Norwich University of the Arts’ Ideas Factory incubation centre supports local digital creative SMEs to start up and grow. It gives them space, business support services and access to the university’s infrastructure – including the only digital user research lab outside London.

The Digital Health Enterprise Zone (DHEZ) initiative led by the University of Bradford provides innovation space and facilities for supporting start-ups and facilitating collaboration among researchers, businesses and the NHS on digital healthcare solutions that help patients prevent and manage long-term conditions (e.g. diabetes, cancer, dementia).

The University of Huddersfield and the 3M corporation joined together in 2013 to construct a purpose-built innovation centre on the Huddersfield campus, the 3M Buckley Innovation Centre. The centre hosts over 100 businesses, including start-ups and SMEs, in a range of sectors, from healthcare to 3D printing. The firms not only have access to Huddersfield’s research expertise but also hire from Huddersfield’s graduate talent pool.

The University of Bath’s Advanced Propulsion Centre, which helps drive innovation and address skills gaps in the automotive industry, will bring £500 million worth of investment into the area from 27 international companies.

The Centre for Alternative Materials and Remanufacturing Technologies at the University of Exeter provides free advice to local SMEs about manufacturing and operational improvements, and helps them test new products and materials, adding an estimated £2 million to regional growth since its launch.

Teesside University’s Digital City innovation initiative is helping local SMEs place graduate interns in their businesses by providing recruitment support and a 50% contribution towards their salary.

With over 250 digital businesses, the University of Salford-led MediaCityUK is the largest purpose-built media location in Europe and the second most important digital skills hub in the UK, benefitting from on-site delivery of degrees and development courses from the University and a University Technical College.

Manchester Metropolitan University has partnered with the Greater Manchester (GM) Business Growth Hub to deliver the GM High Growth Network, a programme offering local SMEs peer-to-peer support for accelerating their growth.

The Leading Enterprise and Development (LEAD®) programme uses the insights gained from multidisciplinary research conducted at Lancaster University to support leadership skills development in SMEs. Since 2004, the programme has supported over 3,000 SME owners and helped create 10,000 jobs. An independent evaluation of the LEAD pilot suggests that the programme helped these companies to:

- raise profitability, employment or sales turnover (90% of participants)
- raise productivity, by £8,800 a year on average (75% of participants)
- grow 3.5% a year, increase jobs by 3.6% a year (on average) and secure an extra £11 million in net sales per year, of which about £7.5 million can be attributed to LEAD®
LEAD® also informed a successful £32 million Regional Growth Fund bid to support business growth in 20 UK cities, which is expected to leverage £2.8 billion of additional private sector investment and create or safeguard 77,000 local jobs.

**Plymouth University** has successfully collaborated with Bombardier to develop EBITtrack400, a cutting-edge coded railway signalling product which has improved railway reliability and eliminated ‘false positive’ danger alerts, thus achieving savings for train operators while improving the travelling experience. EBITtrack400 has opened up new international markets for Bombardier and helped the company become the world leader in coded track systems, with profits from worldwide sales of the product exceeding $6 million. This has also led to an investment in their Plymouth site which exports some of the products, securing the long-term survival of the site and the local retention of 60 high-skill jobs in the R&D, design and manufacturing functions.

Established in 1996, the Sussex Innovation Centre (SINC), a wholly owned subsidiary of the **University of Sussex**, now has multiple incubation hubs across the South East. It provides support for the creation and growth of technology- and knowledge-based companies in Sussex through an in-house delivery team, as well as a team of placement students and graduates to deliver projects on its members’ behalf. Since its creation, over 160 high-growth companies have been based at the centre; their combined revenue is now over £250 million and the companies currently employ many hundreds of people in the local area. SINC’s success is reflected in the performance of supported businesses. The centre reports that, whilst only 15% of new companies ever go on to be profitable 85% of SINC members become sustainable businesses with the centre’s support, and one in six of those grow to achieve turnover in the millions.

**University of South Wales’** Exchange business hub supports start-ups, SMEs, and social enterprises to strive for growth, by linking support, advice and investment partners; student projects and placements; academics; and a bespoke collaborative networking environment.

MK:Smart is a £16 million collaborative initiative, partly funded by HEFCE and led by the **Open University**. Building on the large-scale city data capability provided by the MK Data Hub, the project is developing innovative solutions in three priority areas for the city: transport, energy and water management, tackling key demand issues. This is complemented by an ambitious programme of external engagement activities, including a programme supporting businesses that wish to take advantage of the MK:Smart capabilities. This includes access to a local Innovation and Incubation Centre which provides training in data-driven business innovation and the digital economy, as well as support for business development, demonstration facilities, and incubation space.

MK:Smart was a finalist in the Smart City of the Year category at the 2015 World Smart City Congress. The initiative is expected to deliver up to 20% in water savings, 50% less traffic congestion, a 2.8% reduction in electric consumption and 2% gas reduction, enabling Milton Keynes to safeguard growth in 14,500 jobs by 2026, create 480 jobs in the SMEs supported, and secure a 0.1% share of the global smart tech market.
Annexe 4.B Evidence of universities collaborating in local areas to support businesses

**SETsquared: a collaboration between the universities of Bath, Bristol, Exeter, Southampton and Surrey.** SETsquared’s region is roughly bounded by the M5, M4, M3 and the A31 - A35. The region is home to many leading research-based technology corporates, universities, public-sector research establishments and successful entrepreneurs. It was created in the early 2000s when the region had a lower-than-expected technology start-up rate compared to other similar areas, such as Cambridge or Silicon Valley. The aims of the SETsquared Partnership are threefold; to accelerate the growth of high-tech start-up companies through five business incubation centres, to develop the entrepreneurial talents of the students at five partner universities and to help academic researchers realise the commercial impact of their work.

**Nottingham Trent University, the University of Nottingham and the University of Derby** have partnered to create Enabling Innovation, a programme that will provide over 2,500 local companies with business, research and innovation support. It will also help them recruit local talent through dedicated sector hubs and financial support with graduate interns’ salaries.

The three-year Sheffield Innovation Programme will allow more than 200 SMEs from across the region to access academic expertise, facilities and resources at the University of Sheffield and Sheffield Hallam University to stimulate innovation to deliver new products and services.

**Keele University** and **Staffordshire University** have partnered with local councils and the NHS trust to launch the Keele New Deal. This £70 million initiative aims help tackle low productivity and grow a positive culture of innovation and research within the region, create high-quality local jobs, improve local health and healthcare, and promote business competitiveness through innovation.
Annexe 6.A Universities supporting export activities of businesses

Yorkshire Universities (a group of 12 local higher education institutions) works with the Leeds City Region LEP and the Department for International Trade on a pioneering scheme connecting local businesses with international students, who can provide vital intelligence, language and cultural skills to help those firms break into their target export markets.

The University of the West of England, Bristol has opened a permanent office in Guangzhou which promotes the city of Bristol and the university to businesses in South China.

Lancaster University’s Lancaster China Catalyst Programme will support up to 400 local SMEs to become established in China, helping them cut through red tape, source suitable graduates and get advice on doing business in the Far East.

The University of Liverpool, Liverpool John Moores University and Liverpool Hope University work with local partners on the ‘It’s Liverpool in China’ initiative, which aims to encourage investment and build Liverpool’s business links with China.

Through its large campus in Ningbo, China, the University of Nottingham has managed to establish extensive partnerships with some of China’s biggest companies and enable SMEs from the East Midlands to build links with the business community.

University College London and Loughborough University London, together with private and public partners, have designed Growth Builder, a 12-month business growth programme that will help local entrepreneurs to succeed globally.

Exemplas, a company wholly owned by the University of Hertfordshire, is working with UK Trade and Investment to support local companies wanting to export for the first time or identify new markets.

Newcastle University Business School runs the Herbert Loebl Export Academy with the Department for International Trade and RTC North to offer new local businesses the chance to explore, with expert help, how to go about getting their business export ready.

Birmingham City University has a memorandum of understanding with the government’s Department for International Trade to help West Midlands businesses thrive in the global trading environment.

International students from Staffordshire University business school have supported local SMEs wanting to export with market research, translation and cultural advice.
ANNEXE: PILLAR 8 – CULTIVATING WORLD-LEADING SECTORS

Annexe 8.A Universities supporting new sectors of the future

The University of York is one of five universities in the UK offering the Engineering Doctorate in Large Scale Complex IT Systems, a unique training programme sponsored by companies like Airbus, BT and IBM which enables students to combine cutting-edge research into an emerging discipline with experience in a business context.

Anglia Ruskin University and CNET Training, working with firms like Amazon, Google and Microsoft, are developing a postgraduate degree in Data Centre Leadership and Management designed for the data centre industry – the first of its kind in the world.

Sensor City, the University Enterprise Zone created by Liverpool John Moores University and the University of Liverpool, will house, support and establish commercially viable high tech businesses working on sensor systems and applications.

The new campus for Ageing and Vitality developed by Newcastle University and the Newcastle Hospitals NHS Foundation Trust provides space for companies and researchers to work together on solutions that address the challenges of an ageing population, including how to enable more people to stay active and healthy as they get older, how to combat age-related diseases.

The University of Brighton has developed an industry-accredited MSc in Applied Computer Science in partnership with international IT services provider FDM, designed specifically for preparing graduates for a career in IT consulting.

The University of Surrey’s 5G Innovation Centre (5GIC), set up in 2014 to define and develop a global 5G network, has attracted £70 million worth of funding from Huawei, Fujitsu and the UK’s four leading mobile operators, which want to reap the benefits from the spin off companies, collaborations and skilled academic and industry leaders that will emerge from the centre.

The Institute for Environmental Analytics, a joint initiative by the University of Oxford, the University of Reading and the University of Surrey and major businesses such as Microsoft and Sainsbury’s, is developing the technologies, knowledge and skills that are urgently required to translate environmental research into commercially-relevant solutions for managing weather hazards in a range of sectors including agriculture, energy, construction, insurance and logistics.

Researchers at Ulster University have helped two leading manufacturers of clothing for outdoor activities develop a new range of functional clothing for the active ageing. The new age-appropriate outdoor garments incorporate wearable technologies that enable self-monitoring of physiological parameters (heart rate, respiration rate) and activity levels (step-counts, distance walked) with optimal placement of sensors to improve signal-to-noise ratio.
Annexe 8.B Emerging findings of the Science and Innovation Audits (SIAs)

The SIA for Edinburgh and South East Scotland City Region, led by the University of Edinburgh, focussed on data-driven innovation. The audit indicates that by 2025, with the right investment, the region will be a destination of choice for data-led organisations and a digital cluster that is the best in Europe in terms of its size and dynamism. By that date, public-private-third sector partnerships in the area could secure £500 million of investment, unlock economic opportunities worth in excess of £5 billion, and deliver 50,000 new jobs plus a further 50,000 up-skilled jobs.67

The Midlands Engine SIA has identified four investment opportunities to further exploit its local strengths in advanced manufacturing, including a Life Science Opportunity Zone and further investment into the Energy Research Accelerator.68

The SIA for South West England and South East Wales recommends and provides business cases for a number of investments, based on the area’s proven strengths in compound semiconductor technology, composite materials and low carbon technologies. These include capitalising on the Compound Semiconductor Applications Catapult, and fully funding the proposed Institute for Advanced Automotive Propulsion Systems (IAAPS) and the Composites Excellence programme (which is with the National Composites Materials Centre).69

The SIA for the Sheffield City Region and Lancashire identifies a number of technology areas that should be taken forward to transform the high value manufacturing sectors that the region specialises in, including the internet of things; data analytics, machine learning and artificial intelligence; innovation in materials and processes; and additive manufacturing.70

Greater Manchester and East Cheshire’s SIA identifies fast growth opportunities for local investment focused on the future potential of Digital, Energy, and Industrial Biotechnology.71

71 https://www.greatermanchester-ca.gov.uk/downloads/download/69/greater_manchester_and_east_cheshire_a_science_and_innovation_audit_report_sponsored_by_the_department_for_business_energy_and_industrial_strategy
ANNEXE: PILLAR 9 – DRIVING GROWTH ACROSS THE WHOLE COUNTRY

Annexe 9.A: University initiatives to retain graduates in the local area and region in England

Universities are increasingly collaborating with businesses, councils, Local Enterprise Partnerships (LEPs) and other stakeholders to encourage graduates to remain in the local area as a means of boosting the skills base and contributing to local economic growth.

Examples of initiatives include:

- Graduate Advantage, based at Aston University, and funded by a consortium of universities and university colleges with support from the European Regional Development Fund (ERDF) up to 2015. It aims to change the attitude of employers – SMEs in particular – to hiring graduates. It helps SMEs to hire graduates on a temporary basis to demonstrate the value they can add and graduates in turn can see that small firms can make good use of their skills and offer career development opportunities. Through close links with local organisations and employers, the programme can stay aware of what skills and vacancies employers have, and to share feedback from firms that have taken on a new graduate with firms interested in doing so.

Reacting to the needs of its stakeholders, a post-graduate student arm has been created. Part-funded by ERDF, and in partnership with the University of Wolverhampton, it offers a higher level skill and knowledge base.

- Grad Central was established to help businesses in the West Midlands access the best in graduate talent. Supported by regional government funding, and backed by business, Grad Central are a specialist graduate recruitment consultancy and cater for graduates from all over the country wishing to be placed into businesses in West Midlands locations.

- Gradsouthwest is an independent body that offers a brokerage role between graduates and employers to retain graduate-level skills in the South West. Employers contact the organisation when they have a graduate role to fill, and Gradsouthwest places the advertisement on their website. Careers departments in local universities refer students and graduates to GradSouthWest. The organisation also helps graduates moving into the region.

- In 2015 the University of Exeter launched a 'Stay in the South West' campaign to promote graduate careers in the region. In 2014 only 12.9% of Exeter graduates remained in the South West, despite the fact local businesses reported that up to 13% of their graduate positions were hard to fill. The campaign supports Exeter City Council’s 'Knowledge Economy' strategy “to increase graduate retention by making businesses aware of the pool of highly qualified talent in Devon and encouraging them to employ graduates.”

- The Plymouth Graduate Internship Programme (PGIP) connects Plymouth University with businesses based in the South West and is open to graduates of any
UK university or further education college. Launched in 2010, PGIP offers employers financial assistance towards creating eight-week minimum graduate internships paying at least £300 per week. By 2014 the scheme had supported 84 graduates to take up positions at 60 firms.

- **Falmouth University**’s Launchpad programme helps postgraduates from the university create companies in Cornwall and the Isles of Scilly, helping retain graduate entrepreneurs locally as well as expand high-value jobs, investment and the growth of the digital and technology sector.

- **RISE for Sheffield**: RISE is a joint initiative between **Sheffield Hallam University**, the **University of Sheffield**, Sheffield City Region (its Growth Hub and local authorities) and SMEs that aims to match graduate talent with local businesses. During 2014 and 2015 the scheme placed over 200 graduates as interns in 150 local businesses. Participating firms are based in several sectors, including engineering, manufacturing, the third sector, technology, HR and recruitment. Positions last for a minimum of six months.

- **Birmingham City University, Coventry University, Nottingham Trent University, and the universities of Derby, Lincoln and Wolverhampton** have launched Midlands University Enterprise. The programme will be focused on the health, advanced manufacturing and engineering, transport technologies, creative digital and design, and agrifood and drink industries. It aims to improve skills through both work-based learning and apprenticeships, build a talent pipeline through work experience, and support skills development.

**Annexe 9.B Universities working at the local level in England to improve higher education participation and social mobility**

Universities are working through local consortia to improve higher education participation in disadvantaged areas and to drive social mobility,\(^\text{72}\) including:

- the Network for East Anglian Collaborative Outreach Network\(^\text{73}\)
- the London National Collaborative Outreach programme partnership, led by Kingston University
- the North East Collaborative Outreach programme
- the Next Steps South West partnership
- the Aim Higher West Midlands programme
- the Derbyshire and Nottinghamshire Collaborative Outreach Programme
- the Greater Manchester Higher Partnership
- the Sussex Learning Network (which includes the Universities of Brighton, Sussex and Chichester)
- Higher York.

\(^{72}\) For a full list, see: [http://www.hefce.ac.uk/sas/nnco](http://www.hefce.ac.uk/sas/nnco)

\(^{73}\) Bringing together Anglia Ruskin University, Norwich University of the Arts, the University of East Anglia, the University of Suffolk, and the University of Cambridge
ANNEXE: PILLAR 10 – CREATING THE RIGHT INSTITUTIONS TO BRING TOGETHER SECTORS AND PLACES

Annexe 10.A Existing local networks and collaborations of universities In England

GW4 – an alliance of four leading research-intensive universities in the South West of England and Wales, combining intellectual capacity and physical resources (http://gw4.ac.uk/)

London Higher - represents over 40 publicly funded universities and colleges in London (http://www.londonhigher.ac.uk/)

Midlands Enterprise Universities – seven universities combining their research, expertise and facilities to further increase growth and prosperity across the region (http://midlandsenterpriseuniversities.co.uk/)

Midlands Innovation - six universities focusing on research and innovation, equipment sharing, attracting investment, creating jobs and increasing productivity (http://midlandsinnovation.org.uk/)

N8 Research Partnership – formed of the eight most research intensive universities in the north of England, promoting collaboration, establishing innovative research capabilities and programmes of national and international prominence, and driving economic growth (http://www.n8research.org.uk/)

North West Universities European Unit - facilitates the collective European Structural Fund activities of 12 universities in the North West (http://www.nwueu.ac.uk/)

SETsquared Partnership – an enterprise collaboration between the universities of Bath, Bristol, Exeter, Southampton and Surrey, supporting high-tech start-up companies, providing student enterprise and enabling academics to maximise the impact of their research (http://www.setsquared.co.uk/)

Universities West Midlands – a membership organisation working to support 12 universities in the West Midlands. It fosters collaborative solutions and strong partnerships in support of economic, social and cultural wellbeing and public benefit (https://www.universitieswm.co.uk/)

White Rose University Consortium - a partnership between the universities of Leeds, Sheffield and York to add value from partnership activity in research, enterprise, innovation and learning and teaching (https://www.whiterose.ac.uk/)

Yorkshire Universities - represents 12 higher education institutions in Yorkshire to promote Yorkshire nationally and internationally, and foster collaboration and partnership working (http://www.yorkshireuniversities.ac.uk/)
Annexe 10.B University involvement in leadership initiatives on local growth and development in England

Nearly all Local Enterprise Partnerships (LEPs) have university members on their board or chairing innovation and skills committees, or seconded to work on local planning. The University of Lincoln and Greater Lincolnshire LEP have a joint Director of Policy who represents both organisations. The Dorset Local Enterprise Partnership (LEP) is housed within Bournemouth University.

Universities also work alongside LEPs and other local partners on specific initiatives. The local Growth Hub at the University of Gloucestershire worked with 179 businesses in 2014–15.

Another example is the collaboration between the University of Surrey and Enterprise M3 LEP on the 5G Innovation Centre. The University of Surrey is home to the world largest industry/academic 5G R&D collaboration and the world’s only full scale end-to-end open 5G test bed. The Enterprise M3 Growth Fund provided £1.7m to fund equipment and staff costs for the Test Bed facility and to pave the way for engaging small business with the wider project. Through Enterprise M3 LEP’s involvement and its role in bringing the SME community on board, the wider benefits of the 5G programme are being shared with smaller businesses. In turn this will build their capacity to develop new products and services that will work in 5G networks as the technology emerges.

In the next phase of regional development, during 2017, the 5G Innovation Centre will work with a further £1.75m of Enterprise M3 growth funding to develop the world’s first 5G digital gaming support facility. Industry members have already committed an additional £5m to this programme. Also, the 5G Innovation Centre will work to extend its existing network of SMEs to approximately 100, with an increasing focus on supporting company scale up opportunities within the regional Digital Economy.

A further example is the place-based research led by Queen Mary University of London working alongside Barts Health NHS of 100,000 people of Bangladeshi and Pakistani origin, the largest ethnic minority groups in East London. The research is supported by £4 million in funding from the Wellcome Trust and Medical Research Council, and researchers are studying the genetic code and medical records of local South Asian people – with the aim of improving understanding of the links between genes and environmental factors in causing disease. These findings will then contribute to improving healthcare and the long-term prevention and treatment of a number of diseases particularly affecting local communities and the wider population, such as heart disease and diabetes.

The Leading Places Programme is a pilot programme to build and transfer best practice in collaborative leadership between combined or local authorities, universities and other local anchor institutions. Pilot areas include:

- Manchester – Partners are: Greater Manchester Combined Authority, Greater Manchester LEP, Cheshire and Warrington LEP, New Economy Manchester, University of Manchester, University of Salford, Manchester Metropolitan University and Bolton University.
  Potential themes: Developing a science and innovation capabilities map for Manchester.
- Coventry – Partners are: Coventry City Council, the University of Warwick and Coventry University
  Potential themes: Healthy communities and the wider integration of students into/with the city.

- Gloucestershire – Partners are: Gloucestershire County Council, University of Gloucestershire and the Royal Agricultural University
  Potential themes: Development of a 2050 and beyond vision and agreement on a range of strategic, economic initiatives to transform Gloucestershire.

- Bristol – Partners are: Bristol City Council, the University of the West of England, Bristol and the University of Bristol
  Potential themes: Engaging communities through the office of the newly elected Mayor.

- Brighton – Partners are: Brighton and Hove City Council, University of Brighton and University of Sussex
  Potential themes: Improving health and wellbeing in communities. Themes within this area include maximising the role of the city pharmacist in supporting GPs and using green and open space to support wellbeing.