RUSSELL GROUP

Russell Group response to the Industrial Strategy Green Paper

1. Summary

- Russell Group universities are ready and well placed to support the Government in delivering an ambitious and successful industrial strategy – both in their own right and as high-value assets for the UK underpinning every other sector. They can and will play a key role in delivering across all ten pillars of the strategy. We have:
    - Research at the forefront of new technologies, with industries growing around them, while also helping to drive change in established sectors
    - World-leading experts, facilities and collaborative partnerships that encourage and draw in investment from business and others, both from the UK and globally
    - The pool of high-level graduate and postgraduate skills that feed into leading edge sectors and will help to drive innovation and productivity.

- Our universities are already major contributors to the economy and society. They are located in every nation and region of the UK and so are uniquely placed to boost jobs and growth right across the country.

- As sources of local leadership in their communities, the UK's world-leading universities bring together key stakeholders at city, regional and national level and can act as co-ordinating hubs to bring the pillars of the industrial strategy together in the regions. They are also able to draw on wide-ranging international links, expertise and knowledge to tackle key challenges and enhance the UK's ability to innovate and succeed against global competition by keeping the UK at the cutting edge of innovation.

- The commitment of £4.7 billion additional R&D investment over this parliament is very welcome and we want to ensure its impact is maximised for the future. The extraordinary value of fundamental basic research for the long-term innovation pipeline needs to be recognised here by ensuring QR funding is appropriately supported to complement the challenge-focused approach of the new Industrial Strategy Challenge Fund.

- Russell Group universities are highly successful in the commercial exploitation of their research, but we recognise the Government's ambition to boost the UK's performance in taking ideas from lab to market. We welcome the opportunity to suggest practical solutions to help improve this, which could include enhancing HEIF (with such funding made consistently available across the UK), reforming the tax environment for research and university-business collaboration, developing a wide-ranging proof of concept fund and maintaining a flexible approach to intellectual property.

- Universities are central to delivering a range of skills, qualifications and training for the economy and society, ensuring the UK has the talent pool to meet the needs of employers. It would be helpful if funding bodies across the UK could make a long-term commitment to boost and then maintain funding levels per student for high-cost subjects such as STEM and medicine to underpin growth in this high-level skills pipeline.

- The best results for the new industrial strategy will be achieved by building on the strength of the UK's higher education and research systems. To maximise the UK's ability to deliver the industrial strategy, a good outcome for universities and research is needed in the Brexit negotiations as well as an immigration system which actively supports universities in attracting, recruiting and retaining talented staff and students.

2. Universities at the heart of the industrial strategy

2.1 The industrial strategy green paper sets out a vision for supporting a resilient and thriving economy across the country, ensuring the UK remains globally competitive in the transition to our exit from the EU and beyond. The message from the Prime Minister is clear, and welcome: a modern industrial strategy must build on Britain's strategic strengths, including the UK's world-leading science base.

2.2 Russell Group universities are ready and critically placed to support the Government in delivering an ambitious and successful industrial strategy – both in their own right and as high-value assets for the UK underpinning every other sector. They are poised to contribute to all pillars of the strategy and can build on their existing strengths to ensure the strategy achieves its long-term aims of: delivering a stronger economy and a fairer society across every community in the UK; helping young people develop the skills they need for the future; and backing Britain for the long term by supporting businesses to emerge, grow and invest.

2.3 Russell Group universities are located across the whole of the UK and welcome the chance to act as strategic assets around which advances in research and future business growth can be catalysed to create jobs, improve productivity and enhance prosperity. They have a compelling track record in contributing to a strong UK economy, supporting around 300,000 jobs and at least £32 billion of economic output every year.[1] For example, almost one in every 50 jobs in Birmingham depends on the University.[2]

2.4 As sources of local leadership in their communities, our universities attract and bring together key stakeholders at city, regional and national level, as well as drawing on much wider international networks. They can act as co-ordinating hubs where all pillars of the industrial strategy can be brought together and actioned in the regions.

2.5 As well as maintaining the UK's excellent science base, the Government's ambition is to keep the UK at the cutting edge of new technologies. Russell Group universities are working hard to exploit the pioneering research they undertake to keep the UK at the forefront of developing advanced technologies, collaborating with business partners to get technological innovations to market fast. For example, research at the University of Southampton led to the creation of a new business sector in fibre laser technology and manufacturing, generating billions for the economy alongside health, manufacturing and digital innovation benefits.

2.6 Our universities are highly successful in the commercial exploitation of their research and have a wide range of partnerships with businesses of all sizes, from financial services and creative industries to right through the manufacturing supply chain. Our members attract external income of £2.4bn from business annually;[3] this is often repeat income, indicating the strength of the business partnerships we have, for example: University College London with Cisco, University of Nottingham with GSK and Durham University with Procter & Gamble.

2.7 We recognise the Government's ambition to improve the UK's performance in translating discoveries into new businesses and welcome the opportunity to work closely in identifying the most effective policies to support universities and businesses to work together to boost their success in this area.

[1] Russell Group analysis of 'The impact of universities on the UK economy' (UUK, April 2014). These figures exclude the wider impact of our research and its longer-term contribution to UK GDP.
[2] 'Our Impact: The Economic, Social and Cultural Impact of the University of Birmingham' (March 2017).
[3] This includes through a combination of contract and collaborative research, the provision of consultancy and Continued Professional Development, use of facilities and equipment, and IP income through licensing and spin-out of new companies. HESA HEBCI survey 2015/16.

2.8 A clear aim of the new industrial strategy is to help businesses expand and grow. Universities are ready to play a strong role here and can build on their experience working with businesses across all sectors of the economy. In 2015/16, over 20,000 SMEs benefitted from Russell Group university consultancy services, providing them with the tools to realise significant productivity gains, the research and commercialisation expertise to deliver new products and services and the skills training needed to upskill the current workforce.[4]

2.9 For businesses to thrive they need people with the right skills and expertise. Our universities are committed to delivering an excellent teaching and learning experience – they are at the leading edge in educating and training the highly-skilled and adaptable workforce the UK needs for the future. This work starts with local schools; as part of their broader commitment to facilitating social mobility and widening participation, our universities have partnerships with more than 2,000 schools across the country. They also collaborate with a range of employers so courses are targeted to business needs and graduates have the right skills and experience to succeed in the workplace; for example, Warwick Manufacturing Group has created a bespoke engineering degree with Dyson and Cardiff University's National Software Academy is training industry-ready software engineers in partnership with business.

2.10 Higher education is a successful export industry and with the right conditions our universities have the potential to grow this market further. International students in the UK generate more than £25 billion for the economy and spending by international students benefits local businesses and supports over 206,600 jobs in university towns and cities across the country.[5] Income from international students is also crucial to support the full costs of teaching, research and innovation. In addition, universities are critical in helping to attract inward direct investment, in particular related to R&D.[6] Their widespread alumni base and network of collaborative links across the globe creates a significant 'soft power' asset for the UK, essential for facilitating future trade, investment and diplomatic links.

2.11 It is important to note, however, that the ability of our universities to maximise their role in delivering cutting-edge research and innovation, boosting jobs and growth and driving productivity is dependent on a strong base of talent and expertise from all over the world – from academics and researchers, to specialists, analysts, technicians and students.

- The UK needs a light-touch, fair and transparent immigration system which pragmatically supports the Government's commitment to ensuring the UK is "a magnet for international talent and a home to the pioneers and innovators who will shape the world ahead".[7] Ease of multilateral international research collaboration is also vital and securing a positive outcome for universities and science in the EU negotiations will be essential to this.

[4] HESA HEBCI survey 2015/16.
[5] 'The economic impact of international students', research conducted for Universities UK by Oxford Economics (March 2017). Several other reports estimate the multi-million pound contributions of international students at different Russell Group universities and the thousands of jobs they support in their local economies e.g. see *London Calling: International students' contribution to Britain's economic growth* (May 2015); *Economic Impact of the University of Southampton* (January 2015); *The Economic Costs and Benefits of International Students* – report produced by Oxford Economics for the University of Sheffield (January 2013); and *The economic impact of the University of Exeter's international students* (April 2010).
[6] As noted in the green paper, 22% of the UK's business R&D investment was financed from abroad in 2013, compared to 7% in the OECD.
[7] 'The United Kingdom's exit from, and new partnership with, the European Union', HMG (February 2017).

3. Investing in science, research and innovation

Sustaining the dual support system, ensuring the diversity and breadth of UK research

3.1 The UK's dual support system of funding for university research plays an essential part in sustaining research of the highest quality. We therefore welcome the legislative protection for dual support given in the Higher Education and Research Bill and the statement in this year's HEFCE grant letter that detailed allocations for the £4.7 billion of additional investment in R&D will reflect the Government's commitment to the "balanced" funding principle.[8]

3.2 It can be hard to predict the exact benefits of individual pieces of research and the role of serendipity in scientific discoveries has been shown throughout history. For example, the development of insulin drugs used to treat millions of diabetic patients worldwide, with drug sales totalling over $6 billion annually, is based on research which took place over decades and collaboration spanning over 16 years between the University of York's Structural Biology Laboratory and the pharmaceutical company Novo-Nordisk. Similarly, the discovery of Graphene by the University of Manchester may revolutionise fields from structural engineering to electronics and medical technology. It is critical there is sustained investment in fundamental, curiosity-driven research to allow this kind of ground-breaking advance to be made. Whilst our analysis shows impacts can be delivered in a relatively short time in some cases, UK research policy should avoid being driven by short-term needs and problems.[9]

3.3 Quality-related 'QR' research funding supports strategic thinking, planning and action by giving universities the flexibility to deploy resources into cutting-edge new research areas (including interdisciplinary research) and allowing them to respond quickly to emerging research and innovation opportunities. It complements a challenge-based approach to research funding by ensuring there is a sustainable pipeline of new ideas to underpin innovation in areas which may not yet have emerged as the global challenges of the future.

3.4 QR funding is also used to develop collaborations and partnerships with a range of other organisations. While businesses may find it challenging to invest in risky research, or projects with medium- to long-term returns, QR funding allows universities to share this risk via co-funding, helping to facilitate university-business collaborations. Indeed, there is a positive relationship between QR per head and generation of Third Stream Income per head, i.e. the more QR allocated to an institution, the more evidence of external organisations being willing to pay for a range of research-related activities and commercialisation.[10] The business support element of QR funding is especially valuable in this respect.

3.5 The Charity Research Support Fund (CRSF) allows universities to bid for, and underpin, substantial amounts of research funding from the UK's third sector organisations that might otherwise go overseas. The UK has a vibrant charity sector that benefits from extensive links with universities such as Cambridge[11] and King's College London[12], particularly in medical and health research where UK charities are world leaders in the scale and ambition of their activities. Most charities can only fund the directly incurred costs of a research project, so the

[8] Funding for higher education in England for 2017-18: HEFCE grant letter, DfE (23 February 2017).
[9] Analysis of 240 Russell Group REF impact case studies shows that the 'time-to-impact' from the start of research to the delivery of the first main non-academic impact is on average eight years, with time differences ranging from less than one year to 29 years. See our report 'Engines of growth: The impact of research at Russell Group universities' (November 2015).
[10] *A Review of QR Funding in English HEIs: Process and Impact* – a report to HEFCE by PACEC and Centre for Business Research, Cambridge (December 2014).
[11] For example, the Cancer Research UK Cambridge Institute: http://www.cambridgecancer.org.uk/
[12] For example, work on new blood tests to spot heart disease earlier, with the British Heart Foundation: http://www.kcl.ac.uk/newsevents/news/newsrecords/2017/04-April/Heart-attacks-diagnosed-quicker-by-new-blood-test.aspx

CRSF is essential to support the other indirect costs incurred by universities in undertaking this work. As the charities element of QR has been essentially flat cash since the spending review in 2010 it has not kept pace with the increasing levels of charity research investment.

- We encourage the Government to take this opportunity to allocate a meaningful proportion of the additional £4.7 billion R&D funding to QR, particularly via the business support element and the CRSF, with appropriate allocations to the funding councils in the devolved nations as well. This will be integral to achieving the Prime Minister's goal for the UK to continue to be one of the best places in the world for science.

Leveraging private investment through university-business collaboration

3.6 HEIF is extremely effective at developing knowledge-based interactions between universities and businesses and evidence shows every £1 of HEIF funding results in a return on investment of £9.70 in benefits for the economy and society.[13]

- On this basis, increasing HEIF funding to £250 million per year could lead to benefits of around £2.4 billion, and lifting the caps on the amounts of funding available to individual universities would allow universities with the most success in this area to do even more. In addition, funding of this nature should be consistently available across the UK, as recommended by the House of Commons Science and Technology Committee.[14]

3.7 RPIF has also been a successful initiative in helping universities to leverage significant external investment into projects (from business and other partners) in order to multiply initial public investment. For example, £11 million was provided to support the Materials Innovation Factory at the University of Liverpool, a £65 million partnership between the University, Unilever and HEFCE to develop a unique materials chemistry research hub to accelerate research and reduce new product discovery times. Having universities lead these projects is important as this is where the highest-quality specialist research expertise is found.

- A lower qualification level for project funding would be helpful, but the current focus of RPIF should be maintained.

Driving private investment in R&D by reforming the tax environment

3.8 Universities pay VAT in the same way as other businesses on supplies of goods and services but they qualify for some exemptions/reliefs due to their status as charities or research institutions. However, current uncertainties in liability for VAT on new research facilities and the supply of research services create unnecessary barriers to collaborations between businesses and universities. The maximum threshold for commercial use of a university building before VAT is due is low (5%), and the task of calculating building apportionment for commercial and non-commercial activity is burdensome. VAT liability on university floor space used for business purposes is also a disincentive to co-location of business and university research activities.

- Introducing a targeted VAT exemption for new university buildings used for collaboration with business would remove these disincentives and help support further economic growth and innovation. One of the barriers to doing this in the past was because VAT rules are set by the EU – the UK's exit from the EU could now present an opportunity to improve the tax system for collaborative R&D and innovation in the UK.

- University Challenge Funds were instrumental in promoting collaboration across institutions, attracting private sector investment in university companies and developing

[13] 'Assessing the Economic Impacts of the Higher Education Innovation Fund: a Mixed-Method Quantitative Assessment' (October 2015).
[14] 'Managing intellectual property and technology transfer' (8 March 2017).

seed funds in universities. Additional tax incentives, building on the past strengths of the University Challenge Fund, would be beneficial to address gaps in the funding pipeline and take research from conception to commercialisation.

- The eligibility criteria for the Research and Development Expenditure Credit (RDEC) could also be amended to ensure that all research business conducts with universities is automatically eligible for tax relief. This would incentivise greater business-university collaboration and drive further private investment in R&D by providing a clear guarantee that an RDEC claim will be successful. It would also contribute to the Government's commitment to reduce regulatory burden on business.

Supporting research and innovation strengths in local areas

3.9 Russell Group universities are major investors in their local communities. Between 2012/13 and 2016/17, they invested £9 billion of their own resources into major capital resource projects; for example Newcastle University's Science Central development, which will provide incubator space for science and innovation focused start-ups. These capital investments are expected to deliver gross value added of £44 billion for the UK economy and support more than 98,000 UK jobs – many of which will be long-term and high-value.[15]

3.10 Our universities have engaged widely in the Science and Innovation Audits (SIAs). The audit led by the University of Edinburgh, for example, focuses on data-driven innovation and is at the heart of a new City Deal, having identified the potential for public-private-third sector partnerships in and around the city to unlock economic opportunities worth over £5 billion by 2025. The SIAs are a useful exercise to encourage universities to work with local partners to demonstrate areas of local expertise with potential global competitive advantage. They will play a key role in helping identify areas of genuine strength and excellence across the UK.

Developing the pipeline of talented researchers

3.11 Postgraduate research students are vital to the economy and to maintaining and enhancing the country's strengths in research and innovation. We welcome the Government's recognition of this by providing £90 million to fund an additional 1,000 PhD places in areas aligned with the industrial strategy. Whilst we support the Government's intention to boost STEM skills, the value, impact and importance of supporting the next generation of talent in the social sciences, arts and humanities should not be underestimated. For every £1 spent on research by the Arts and Humanities Research Council (AHRC), the nation derives around £10 of immediate benefit and a further £15-£20 of long-term benefit.[16]

- In addition to this new PhD funding, investment could be boosted in the next generation of research and innovation leaders by allowing a portion of the Apprenticeship Levy to be invested in the training and career development of postgraduate researchers. The most efficient and effective way of targeting investment would be to use the tools and channels the Government already has at its disposal via the Research and Funding Councils (and in future by UKRI). The Apprenticeship Levy should also be used to boost support for the development of new degree apprenticeships, as the small competitive pot of funding currently available is inadequate to maximise the potential in this area.

3.12 The Spring Budget announcements around support for global research talent are also very welcome. We hope this funding will be used to support PhD students and postdoctoral researchers, as well as senior researchers, as attracting and sustaining the talent pipeline at all career levels is important for the future sustainability of the research base. A strong base

[15] *Economic Impact of the Capital Investment Plans of the Russell Group Universities*– report produced by BiGGAR Economics for the Russell Group (March 2014).
[16] 'Leading the world: The economic impact of UK arts and humanities research' (2009).

of talent from around the world enables research-intensive universities to remain globally competitive and is fundamental to the excellence in research, innovation and education that helps drive economic growth.

3.13 In particular, EU staff members make a significant contribution to our universities, accounting for 22% of the overall academic workforce at Russell Group universities.[17] Ensuring a sustainable pipeline of international talent beyond Brexit will mean future graduates are taught by the leading global experts in their fields, especially in subjects vital to the economy, such as STEM and modern languages, and our research base will be enhanced by attracting the brightest minds to carry out pioneering research here.

- To ensure the UK can continue to retain top EU talent the Government should confirm as a priority the continued working rights for EU staff (and their dependants) currently at UK universities (both academic and non-academic), and for those who take up positions during the period before the UK has left the EU (including in any implementation period). We would like a commitment that staff and their dependants will retain the same rights to stay and work without a visa that they have now (with no time limit placed on this).
- Any future immigration system should prioritise highly-skilled people (such as researchers and academics at all stages of their careers), those with specialist knowledge and expertise (including technicians, analysts, and expert practitioners), and students (including undergraduate, postgraduate taught and PhD students).

Strengthening investment and identifying priorities

3.14 We support the creation of the new Industrial Strategy Challenge Fund, but encourage the Government to ensure it takes a truly interdisciplinary approach, not just focusing on STEM disciplines but also recognising the crucial role the arts, humanities and social sciences play in understanding technological or digital advances, taking part in these developments and ensuring they can be widely adopted and deliver real benefits.

3.15 Whilst we broadly support the challenge areas identified so far, the creative industries should also be included as this would fit the criteria identified in the green paper. Agriculture could be another sector to explore as a particular opportunity after Brexit and an area that could benefit from further research and innovation and sustainable cities could also be considered.

3.16 To enable the UK to grow its international competitive advantage and support universities' international collaborations, the Government should complement the additional £4.7 billion R&D investment, by:

- Negotiating continued participation in EU research, for the full duration of Horizon 2020 and for future Framework Programmes with a focus on excellence and where the UK is able to influence their direction. These programmes provide a platform for UK universities to access vital networks, multi-lateral collaborations and world-class research activity.
- Developing a long-term roadmap for increasing public and private sector R&D investment in the UK to 3% of GDP.[18]

[17] In some disciplines this is much higher e.g. 39% of economics academics, 37% of modern languages academics, 32% of IT and computer software engineering academics and 31% of mathematics academics are EU nationals – HESA staff data 2015/16.

[18] To note, this target is also supported by the CBI, who want to see this achieved by 2025: 'Now is the time to innovate: the road to three percent' (March 2017).

4. Developing skills

Supporting STEM skills for the future

4.1 Russell Group universities teach strategically important subjects at the highest level and with a reputation for quality, drawing on research and links with business, the NHS and many others to create a research-engaged learning environment. Our universities train over 80% of the UK's doctors and dentists and around half of mathematics and physical sciences graduates, helping to ensure the UK has the talent pool to meet the needs of employers.[19]

4.2 The training of graduates and postgraduates with STEM skills is vital for the prosperity of the UK and leads to a range of positive impacts including the delivery of innovative new technologies and products; improvements in health and quality of life; productivity gains and economic growth. A training in STEM at a Russell Group university endows students with the skills needed to become the high-quality labour force and leaders required for the future development of the UK's economy and society.

4.3 Teaching costs for STEM subjects and medicine are higher than other subjects because of the requirement for expensive laboratories and equipment and for practical hands-on experience in the field and elsewhere to develop the skills that will be valuable to employers and in future researchers. Tuition fee income alone does not cover these costs and in some subjects increased student numbers has led to less funding per student, which will ultimately impact on the quality of provision.

- To secure the financial sustainability of high-cost and strategically important subjects, funding bodies across the UK should make a long-term commitment to boost and then maintain funding levels per student, helping underpin growth in this high-level skills pipeline – this will help support the aim articulated in the green paper to ensure the higher education sector is able to meet the STEM skill needs of employers.

4.4 We welcome the opportunity to increase medical student numbers. This expansion should ensure a focus on maintaining quality of education and will also require additional 'Band A' and 'Band B' funding to make this increase financially sustainable.

4.5 As highlighted above, the ability to retain and attract leading international experts to undertake teaching and research will be essential in training the next generation of UK graduates; ensuring universities are able to do this easily and flexibly is especially important.

Adapting provision for a modern workforce

4.6 Russell Group universities work closely with a wide range of employers to ensure courses are targeted to business needs. This includes working collaboratively on curriculum design and on the provision of placements, as well as careers advice. All our universities provide students with the opportunity to undertake work-based placements.

4.7 As well as the traditional three year undergraduate degrees, our members have engaged in the development of new qualifications, offering alternative routes into the professions. Russell Group universities are engaged in degree apprenticeships and a number have been at the forefront of their development and delivery in areas such as digital technology, IT and engineering, among others. In many cases, they have worked closely with employers to develop degree apprenticeships, such as the University of Exeter's collaboration with IBM and Renishaw engineering company, or Queen Mary University of London's partnership with organisations including the BBC, John Lewis and GSK.

[19] 2015/16 HESA Student record.

5. Upgrading infrastructure

5.1 As core regional stakeholders, universities are well placed to help identify where investment in infrastructure could have most impact. University research is also highly relevant to this area: the University of Sheffield, for example, is leading research into how Britain's ageing water infrastructure can deliver sustainable supplies across the country, while the University of Southampton is among those leading work on improving the UK's rail infrastructure.[20]

5.2 We support the proposal for UKRI to develop a new R&D capital spending roadmap to provide the modern infrastructure to support fundamental research.

- It will be important that UKRI ensures sustainable funding for the on-going resource costs associated with operating, maintaining and upgrading world-class capital facilities, as without these, large-scale capital programmes will not be viable in the long-term. It would be helpful to have a resource element tied to the original capital investment to ensure facilities and equipment can operate to full capacity for the long term.

- Half of Russell Group members are involved in the UK Collaboratorium for Research on Infrastructure and Cities (UKCRIC), which engages government, city and commercial policymakers, investors, citizens and academia in a joint venture to drive innovation and value creation in the exploitation of services provided by national infrastructure. It would be useful to consider how good practice evolving from this collaborative experience could be shared and built on further.[21]

5.3 The UK can currently access and take advantage of large-scale infrastructures supported by the EU; these play a vital role in underpinning large, complex and collaborative research projects and help add to the UK's competitive advantage. European Structural and Investment Funds (ESIF) also support the construction of research infrastructure in the UK.

- As part of the negotiations with the EU, the UK should seek to secure continued access to EU research infrastructures. We are particularly concerned about the long-term future of the six pan-European research infrastructures headquartered in the UK, which support numerous high quality jobs and represent an important part of UK research capacity.

- It would be helpful for the Government to provide clarity on how it might replace ESIF at a national level once the UK leaves the EU and how engagement with the European Strategy Forum on Research Infrastructures (ESFRI) will be maintained.

6. Supporting businesses to start and grow

6.1 The green paper presents a challenge to universities to do more to commercialise research and translate scientific discoveries into new businesses. Our universities are ready to rise to this challenge and can draw on their extensive experience to maximise opportunities.

6.2 Russell Group universities are major contributors to the UK's success in start-up development. Spin-outs, start-ups and social enterprises formed by Russell Group universities, their academics and graduates, employed over 16,000 full time equivalent (FTE) staff in 2015/16, and in the same year our universities were responsible for 59% of all university spin-out companies still active after three years.[22]

[20] More on this work can be found here: http://www.sheffield.ac.uk/research/impact/stories/water-innovation-sheffield-centre-clear-ideas-1.573950 and here http://www.southampton.ac.uk/news/2016/04/revolutionising-rail-infrastructure.page

[21] http://www.ukcric.com/

[22] Higher Education-Business and Community Interaction Survey (HEBCI) 2015/16 survey.

6.3 Reports from the World Economic Forum consistently rank the UK amongst the best countries in the world for business-university collaboration.[23] Our universities work very closely with SMEs across the country, helping them access management training, skills, technology and innovative ideas needed to increase productivity. For example, the Quantum Technologies Enterprise Centre (QTEC) created in partnership between University of Bristol and Cranfield University provides a one-year programme to equip PhD-qualified quantum technology researchers with the necessary business skills, planning and enterprising vision to kick-start and anchor an emergent QT industry within the UK.

6.4 We recognise the Government's ambition to boost collaboration further to keep improving how we translate world-class research into commercial outcomes and we would welcome additional support to facilitate this.

6.5 As well as boosting HEIF (and access to similar support in the Devolved Administrations) and reforming the tax environment (see section 3, above), the Government could:

- Create a proof of concept fund available across the research spectrum to help take research ideas through to commercialisation. An evaluation commissioned by Innovate UK of proof of concept funding available to businesses and universities has shown that such funding tends to be fragmented and is not always consistently available.[24]

- Ensure universities maintain autonomy to manage their own intellectual property (IP). The successful exploitation of IP is complex and a single, one-size-fits-all approach is unlikely to be fit for purpose. We look forward to engaging in the research Government will commission on principles and practices on commercialisation and IP; we support the approach that this will be used to identify and spread best practice rather than mandating particular methods.

- Explore ways to reduce the time and effort required to establish a Knowledge Transfer Partnership (KTP) and consider how to raise greater awareness with the SME community. KTPs provide a valuable mechanism to help businesses improve their competitiveness and productivity through the use of knowledge, technology and skills that reside within the UK research base – Queen's University Belfast, for example, has been a leading institution in delivering this initiative over many years.

- Optimise access and use of Impact Accelerator Accounts (IAAs) by supporting the creation of a cross-Research Council IAA through UKRI, which would help support interdisciplinary research through proof of concept to commercialisation.

6.6 We welcome the opportunity to engage with the upcoming review into entrepreneurship led by Professor Tim Dafforn. Russell Group universities help develop critical thinking, communication skills and problem solving skills, underpinning an entrepreneurial attitude in their graduates. They are working hard to bolster entrepreneurship and business skills through a variety of mechanisms, such as Imperial College London's mini-MBA programme, which provides courses for science and medicine PhD graduates in business skills and commercial awareness.

7. Improving procurement

7.1 Russell Group universities are already helping find innovative solutions to secure value for money from Government purchasing. For example, new software developed by the University of Leeds delivered at least £230 million worth of cost savings to public transport

[23] World Economic Forum, *The Global Competitiveness Report: 2014-15.*
[24] 'Review of UK Proof of Concept support', report by IP Pragmatics (September 2015).

systems in the UK between 2008 and mid-2013.[25] Meanwhile the LSE has developed an auto-assessment tool to help clinical commissioners in England estimate the health gains of different interventions to compare their relative value for money.[26]

7.2 To enhance the ability of universities to drive innovation in public procurement:

- Universities would welcome the chance to work more closely and consistently with Government departments and agencies (rather than on an *ad hoc* basis) in order to utilise the value of the UK's excellent research base and expertise in this area
- The Government could consider running pilot initiatives to help facilitate the take-up of innovative services and technology ideas from university research in the NHS and other areas of the public sector. These pilots could investigate how the interface between universities and Government bodies could be strengthened to increase the take-up of university R&I and facilitate the adoption of innovative practices across Government.

8. Encouraging trade and inward investment

8.1 Russell Group universities are highly internationalised with over 190,000 students of non-UK nationalities (making up 37% of all first year students compared with 23% UK-wide). This strong base of overseas talent is fundamental in underpinning excellence in research, innovation and education – and brings a wide range of economic, trade and social benefits.

8.2 Growth in international student numbers is stalling across UK universities on average and numbers of international students from some key markets have even fallen at Russell Group universities[27]; this is in the context of an expanding market for international higher education. Education is the UK's fifth largest services export sector and the Government and the industrial strategy should be capitalising on this strength.

8.3 Our universities are pioneering innovative approaches to transnational education (TNE) overseas, undertaking collaborative activity with international partners. Russell Group universities have established branch campuses in countries across the globe and the number of offshore students at Russell Group universities has grown by over 70% in recent years.[28] However, efforts to grow TNE activity overseas should not be seen as a replacement for the valuable contribution international students make to the financial sustainability of UK higher education and the broader benefits they bring to the economy.

8.4 If we are to maintain our place in the premier league of global higher education, Government policies must continue to support the efforts of our leading universities to attract the very best students, academics and researchers from around the world. With the new industrial strategy as an impetus, the Government should:

- Minimise visa burdens for international students (as well as academics and researchers) and sponsoring institutions. In particular, any new post-Brexit immigration system should treat students as a separate, low-risk category of migrant and should fast-track their access to the UK – as many of our competitors do. More comprehensive post-study work opportunities for overseas students should also be introduced.

[25] University of Leeds REF 2014 impact case study, Scheduling research leads to optimised cost efficient public transport – the Tracsis spin-out, available: http://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=6337
[26] More information on this case study is available at: http://www.lse.ac.uk/researchAndExpertise/researchImpact/caseStudies/morton-airoldi-better-healthcare-delivery-nhs.aspx
[27] For example, between 2010-11 and 2014-15, the number of new Indian students at Russell Group universities declined by over 34%.
[28] HESA aggregate offshore record, 2010/11 to 2015/16.

- Implement a comprehensive communications strategy to promote the message that the UK remains open and welcoming to international students. The education strand of the GREAT campaign – Study UK Discover You – is a good starting point to build from and could be expanded to promote the UK's research strengths.

- Explore opportunities to create a national strategy to promote UK HE overseas to attract the brightest and best international students to study here, following the example of Australia with its National Strategy on International Education. Such a strategy should include a new target to grow HE exports, building on the Government target to grow HE exports to £30 billion by 2020.[29]

8.5 We are engaging with the Department for International Trade to help shape a higher education export offer, including on medical education overseas. The following initiatives would help our world-leading universities take further advantage of opportunities to grow their overseas activities, and could help to ensure that HE forms a core part of future trade deals:

- A coordinated support package tailored specifically for universities to support them in their international activities such as building valuable relationships with overseas partners and offering transnational education abroad. This should involve the range of organisations active in this space working together more closely to deliver a joined-up approach (e.g. British Council, international trade officials, the Foreign Office, Science and Innovation Network).

- There should be consultation on how to address the issue of tariff payments for international medical students before any changes to the tariff are made

- In seeking to boost UK higher education activities overseas, a focus on quality should be retained. Our universities' outstanding reputation for excellent research, teaching and links with business underpins the strength of the UK higher education brand overseas.

8.6 World-leading experts, facilities and collaborative partnerships at our universities encourage and draw in investment from business and others, both from the UK and globally. For example, universities in Scotland, including Edinburgh and Glasgow, are cited as a determining factor in almost half of all foreign direct investment projects that come into the country.[30] In December 2016 the University of Oxford announced that almost £600 million of capital had been raised worldwide, including from some of Asia's leading technology companies, to scale innovative ideas from the university into world-class companies.[31] Universities do not just attract investment directly into their institutions but into the wider innovation ecosystem and they can also act as export platforms for local businesses.

9. Delivering affordable energy and clean growth

9.1 The green paper articulates an aim for the UK to capitalise on its strengths in the energy industries, which will require strategic investment in innovation and new technology. Russell Group universities are at the cutting-edge of energy and clean-tech research, working closely with industry partners. They can help the Government maximise impact in this area by utilising and building on established partnerships and centres of excellence – such as at the University of Glasgow, with its research focus on the efficiency of energy conversion technologies, and the University of Bristol with its new National Composites Centre.

9.2 The Government has stated the UK will be leaving Euratom when we leave the EU. Without further resolution, this puts nuclear research and related activities in significant jeopardy.

[29] 'International higher education', speech by Minister of State for Universities and Science (1 June 2015).
[30] 'Grow, export, attract, support: Universities' contribution to Scotland's economic growth', Universities Scotland (October 2013).
[31] http://www.ox.ac.uk/news/2016-12-09-more-global-investors-back-oxford-ideas-and-britains-technology-future

Whilst we welcome that the Government fully recognises the importance of international collaboration in nuclear research and development and has indicated it will ensure this continues by seeking alternative arrangements,[32] we urge the Government to clarify as soon as possible what these arrangements might be.

10. Cultivating world-leading sectors

10.1 UK universities play a key role in supporting different sectors through delivering pioneering R&D, developing innovative new products and services to keep British businesses at the forefront of global competition, and providing skilled graduates to meet labour market needs.

10.2 However, the higher education sector should also be recognised as a leading sector in its own right, particularly given the international strength of our world-class universities and the wider impact of the sector on the economy, inward investment and exports, as set out above.

11. Delivering growth across the whole country

11.1 Russell Group universities are active members of their local communities and anchors for growth in their regions. They work with the Devolved Governments, LEPs, City Regions, local authorities and others to provide local leadership and help to develop local and regional innovation capacity. For example, the success of the University of Sheffield's Advanced Manufacturing Research Centre (AMRC) and the partnership approach of the University, the Sheffield City Region LEP, Sheffield City Council and its inward investment arm, Creative Sheffield, led to McLaren Automotive announcing it will re-shore the manufacturing of its car chassis to a new Composites Technology Centre next to the AMRC. This new centre hopes to deliver £100 million of GVA benefit to the local economy by 2028.

11.2 The value of a university to its geographic area should not be underestimated and there are numerous analyses which show our universities are contributing billions of pounds to the national and regional economies and are supporting thousands of jobs.[33] Of course the impact of our universities also goes far beyond the local.

- As major local employers, a source of local institutional leadership and as institutions which straddle the skills, research and innovation agendas, universities are a natural focal point for City Deals and regional plans for growth – this should be reflected in the final industrial strategy[34]
- The industrial strategy should have an ambition to be more than just the sum of its parts and more than just a set of local actions – in particular, the collective impact universities have across the wider UK economy must be recognised and supported.

12. Creating the right institutions to bring together sectors and places

12.1 Universities act as magnets for the creation of knowledge-intensive industry clusters, attracting research partners and inward investment. They also have extensive networks and partnerships with a range of actors, including local government, businesses across different

[32] 'The United Kingdom's exit from, and new partnership with, the European Union' (February 2017)

[33] For example, the economic activity of the 'N8' universities is worth £12.2 billion to the northern economy per year and they deliver 119,000 jobs: N8 Research Partnership, *The Power of 8: Knowledge, Innovation and Growth for the North* (September 2016). See also: *Economic Impact of the University of Warwick* – report by BiGGAR Economics (February 2016); *Economic Impact of the University of Southampton* – report by BiGGAR Economics (January 2015); *The Economic Impact of Britain's Global University* – report by Oxford Economics for University of Nottingham (October 2015), amongst others.

[34] A number of Russell Group universities are actively engaging in setting strategy for LEPs in their regions and participate on LEP boards.

sectors, charities and other parts of the education system. Our universities act as portals to the rest of the world, facilitating local-international linkages, bringing in ideas, talent, money and providing the basis for trade and other links.

12.2 We would support the introduction of joint investment funds to support networks of universities. Once the UK leaves the EU, the Government could consider replacing EU Structural and Investment Funds (currently an important source of funding for many universities) with these kinds of joint investment funds. It will be important to ensure funding is allocated to support specific work in the regions, but with a focus on excellence, drawing on the findings of the Science and Innovation Audits to identify areas of local strength.

12.3 Using existing institutions, such as Mayoral Combined Authorities and LEPs to deliver the Industrial Strategy in the regions may be more efficient than seeking to create new institutions from scratch, but it will be important that these bodies include universities as well as local businesses within their structures to ensure work on skills, research, innovation, infrastructure and trade and investment are properly joined up.

12.4 The potential of a university to act as a centre for industry is noted in the consultation's use of Cambridge as an example of a successful local cluster, and our universities would welcome the opportunity to expand their work in this area through the partnership and support of local institutions. To attract R&D investment from a diverse range of global companies it is important for the UK to capitalise on clusters where they are of sufficient scale and excellence to compete with major international centres such as Boston, the San Francisco Bay Area and emerging centres in South East Asia.

April 2017