House of Commons

Science and Technology Committee

Managing intellectual property and technology transfer: Government Response to the Committee's Tenth Report of Session 2016–17

Second Special Report of Session 2017–19

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Science and Technology Committee

The Science and Technology Committee is appointed by the House of Commons to examine the expenditure, administration and policy of the Government Office for Science and associated public bodies.

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Committee staff

The current staff of the Committee are: Simon Fiander (Clerk); Dr Harry Beeson (Committee Specialist); Dr Elizabeth Rough (Committee Specialist); Martin Smith (Committee Specialist); Sonia Draper (Senior Committee Assistant); Julie Storey (Committee Assistant); and Sean Kinsey (Media Officer).

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Second Special Report

On 13 March 2017 our predecessor Committee published its Tenth Report of Session 2016–17, Managing intellectual property and technology transfer [HC 755]. On 11 August 2017 we received the Government's response to the Report, which is appended below.

Appendix: Government response

Introduction

The Government is committed to a modern industrial strategy as a critical part of our plan for post-Brexit Britain. The industrial strategy aims to improve living standards and economic growth by increasing productivity and driving growth right across the country. This means building on the UK's strengths and extending excellence into the future.

Our long-term prosperity depends upon science, technology and innovation. The UK has an outstanding science base and many world-leading tech companies. We have three of the world's top 10 universities, and 12 of the top 100[1]. Of the G7 countries, the UK has the most productive science base and we rank first in many key global measures of research quality[2]. The 2016 Autumn Statement[3] announced a significant increase in the Government's investment in research and development (R&D) of £4.7 billion to 2020–21. This extra £2 billion a year by the end of this Parliament is an increase of around 20% to total Government R&D spending, and more than any increase in any Parliament since 1979. The Government's manifesto sets out the aim to go further to ensure overall growth in UK funding matches, within ten years, the current OECD average for investment in R&D of 2.4 per cent of GDP, with a longer-term goal of 3 per cent.

We welcome the committee's report and note that it is in broad agreement with the approach that the Government is pursuing. Since the publication of the Dowling and Nurse reviews in 2015, the Government has been taking ambitious steps to reshape the research and innovation landscape to build on our world class strengths in research and to further improve the economic impact of our research investments.

In the last 12 months the Government has announced a £4.7 billion uplift in R&D funding; £100 million for the new Connecting Capabilities Fund; published the Industrial Strategy Green Paper; launched the ambitious new Industrial Strategy Challenge Fund, and, with the passing of the Higher Education and Research Act, established UK Research and Innovation (UKRI), which brings together all of the funding streams for research and innovation to make the linkages and pathways between science, research and innovation more strategic and effective.

1 Times Higher Education World University Rankings 2016–17, https://www.timeshighereducation.com/world-university-rankings

2 Elsevier (2013) International Comparative Performance of the UK Research Base, a report for the Department of Business, Innovation & Skills

3 https://www.gov.uk/government/topical-events/autumn-statement-2016

This document is our response to the Committee's recommendations and draws on these achievements, but the Committee should be assured that work continues, in particular through development and publication of the Industrial Strategy White Paper later this year, and when UKRI becomes operational in April 2018.

Stimulating demand for technology transfer

Research intensity of British business

Successful technology transfer does not begin and end with universities; business also has a vital part to play. Yet, compared to our OECD counterparts, the research intensity of UK business is low. Without a healthy commercial demand for R&D, the scope for universities to engage more in technology transfer will be limited. Responsibility for remedying this problem does not rest solely with the Government, but it should be leading the way by creating conditions that are conducive to businesses investing more in R&D. To date, however, the Government's efforts to increase technology transfer have been disproportionately targeted at the university, rather than business, sector.

The lack of progress forces us to reiterate the recommendation made in our 2013 report, namely for the Government to "create a commercial demand for university engagement to which they are already primed to respond". Facilitating greater investment in UK R&D by British business should be a key goal of the Government's Industrial Strategy. (Paragraphs 15 and 16)

The Industrial Strategy green paper, which the Government published on 23 January 2017, sets out challenges in science, research and innovation that need to be met in order to deliver a more innovative, productive economy across the whole of the UK. Among these challenges is the need to drive more private investment in R&D and to facilitate further commercialisation of our world class science and research.

Last year at Autumn Statement, the Government committed an additional £4.7 billion public investment in R&D to 2020–21. This is the largest increase in public funding in this area since 1979. We have been clear that we expect this public money to leverage further private investment.

The new Industrial Strategy Challenge Fund (ISCF) will draw on some of this funding to bring together business and researchers to identify and accelerate the commercial exploitation of some of the most exciting technologies the UK has to offer. The challenges under the ISCF will require a significant element of match-funding by industry partners. Furthermore, the sector deals being developed under the Industrial Strategy, for example for the Life Sciences sector, will also help to identify priority innovation challenges and science and research needs where Government can facilitate business access to the UK's strong science and research base.

This will build on current successful models of co-investment such as the UK Research Partnership Investment Fund (UKRPIF). We recently announced the latest round of nine projects that will share £177 million of government investment to support research by universities working with business in areas including power electronics, crop science, vehicle propulsion and digital technology for aviation. Through their business and charitable partners, the nine projects have together attracted nearly £363 million in

further funding from private sources. Since the UKRPIF was established in 2012 over £680 million has been allocated to 43 projects, leveraging over £1.65 billion of co-investment from business, charities and private investors. Round six of the competition will allocate a further £220 million for the period to 2020–2021.

We received around 1900 responses to the Industrial Strategy green paper consultation. These help to inform the priority areas for this new investment and the policies being developed for the Industrial Strategy. This will help build industry demand and access to the outputs of our research investment, which will drive effective commercialisation and facilitate further private investment.

R&D Tax Credits

We recommend that the Government's review of R&D tax credits should carefully consider how the qualification and claims process for both the SME, and large company, schemes could be simplified so that they explicitly support business R&D in collaboration with higher education institutions. (Paragraph 21)

R&D tax credits are the Government's single biggest support for business investment in R&D. In 2014/15, 20,935 companies claimed a total of £2.45 billion of support. The amount claimed increased by 38% or £0.7 billion on 2013/14 and the amount of expenditure used to make claims increased by 31% to £21.8 billion.

At Autumn Statement 2016, HM Treasury announced a review of the tax environment for R&D. The review reported at Budget 2017. It found that the UK's R&D tax credits regime is an effective and internationally competitive element of the Government's support for innovation. Nonetheless, recognising the threat from global competition, Government will go further by making administrative changes to increase the certainty and simplicity of claims and take action to improve awareness among SMEs. BEIS will work closely with HMRC in taking forward these measures and we will continue to keep the competitiveness of the UK environment for R&D under review.

Small Business Research Initiative

Government procurement via the Small Business Research Initiative (SBRI) is a valuable means through which to stimulate innovation, especially among SMEs. The SBRI, however, has consistently underperformed against the Government's own targets and has yet to reach its full potential. *We recommend that the current review of the SBRI consider what mechanisms could be put in place to encourage small businesses to collaborate with research institutions as part of the SBRI scheme.* (Paragraph 26)

The Government agrees that the Small Business Research Initiative (SBRI) is a valuable means to stimulate innovation and it has a unique role in the innovation landscape, using the massive public sector buying power and demand for innovative solutions to 'pull through' new ideas and services from business. We acknowledge that SBRI has yet to reach its full potential and recognise that there are many opportunities for it across the public sector.

The independent Review of SBRI led by David Connell is examining how Government can increase the impact of the programme, and will report later in the year.

The principal aim of SBRI is to help small businesses fund development and bring to market new innovative products and services, and access government procurement opportunities. It aims to provide a one-to-one contractual arrangement for a business to provide an innovative solution to a contracting authority to meet a specific need. Whilst businesses can collaborate with a university, SBRI proposals must be business led. Success for SBRI is increasing the number of small businesses that provide innovative solutions to public sector challenges. Government has other mechanisms, through Innovate UK and others, that support collaborative R&D and for this reason the SBRI Review has not focused on business – university collaborations.

Online brokerage platforms

We welcome the development of 'Konfer' as a straightforward way for businesses to identify potential academic collaborators. Algorithms alone, however, will not produce productive collaborations: potential 'matches' will need to be nurtured through supportive human interventions. ***We recommend that the Government works with the National Centre for Universities and Business to publicise the Konfer platform. A business engagement team should also be established alongside Konfer to work with businesses and help develop the potential partnerships identified by the platform.*** (Paragraph 31)

Konfer[4] has been developed by the National Centre for Universities and Business (NCUB, is an independent and not-for-profit membership organisation[5]), in partnership with the Higher Education Funding Council for England (HEFCE) and Research Councils UK (RCUK). Konfer supports the journey from finding a research partner and funding to planning and co-creation. It does this by giving direct access[6] to:

- 12,076 academics[7]
- 14,386 facility and equipment listings
- 1,732,279 web pages from university sites and social media
- 27,526 YouTube videos from university channels
- 238,274 news, funding and events articles from curated feeds
- 51,537 publicly funded research projects

The next major update for the platform is scheduled for autumn 2017, which will see the site's functionality transition from 'alpha' to 'beta' development status. This will be accompanied by a programme of promotion as the platform takes a major step forward.

With the research and knowledge exchange elements of HEFCE (becoming Research England), Research Councils and, Innovate UK forming UKRI, it will be for UKRI to take forward the relationship with NCUB and Konfer and to consider how it might work with its business support and engagement activities.

4 https://konfer.online/
5 http://www.ncub.co.uk/
6 Latest statistics from https://konfer.online/statistics
7 This is currently based on ORCiD data, but there are concerns over the extent of this data and alternative sources are being considered.

VAT Rules

The UK's exit from the European Union, combined with the Office for Tax Simplification's reviews of the VAT system, present an opportunity to revise VAT rules on the income from academic buildings in a way that facilitates greater collaboration with business. ***We encourage the Office for Tax Simplification to examine the VAT rules on shared academic buildings with business as part of its current VAT review, and consider how they could be revised to enhance collaboration opportunities.*** (Paragraph 35)

The Government recognises that VAT can be a burden for some organisations and that there may be opportunities to reform and simplify aspects of the VAT system from both a tax technical and an administrative stand point. That is why the Government has asked the Office of Tax Simplification (OTS) carry out a review of a range of aspects of VAT in order to consider whether the VAT system is working appropriately in today's economy and to identify simplification opportunities.

The OTS published a progress report on its VAT review and made a call for further evidence on 28 February 2017. The final report will be published in the Autumn. The terms of reference for the review are available online at gov.uk[8].

The future of VAT is one of many complex issues that will be subject to EU exit negotiations. The government will work hard to get the best deal for Britain and is determined to make the most of the opportunities that are presented. Until we have left the EU, the UK will remain a member of the EU with all of the rights and obligations that membership entails; that includes adherence to EU VAT rules.

Regional and sectoral differences

Sharing best practice

The lack of a 'one-size-fits-all' approach to successful technology transfer does not preclude the sharing of best practice. We recommend that UK Research and Innovation (UKRI) should, once it is established, work with Praxis Unico to develop and share best practice in identifying and nurturing opportunities for technology transfer. Guidance should be developed with the needs of smaller technology transfer offices in mind and take account of regional and sectoral differences. (Paragraph 41)

The Government agrees and has made sharing best practice across the sector a key component of its policy and has backed this policy with action and funding.

HEFCE and UKRI (the research and knowledge exchange parts of HEFCE will form Research England when part of UKRI) will continue to develop a Knowledge Exchange (KE) Performance Framework[9]. The KE Performance Framework programme aims to support a culture of continuous improvement in universities. Its steering group is chaired by Professor Trevor McMillan, Vice-Chancellor of Keele University and brings together university leadership, academic experts and expert practitioners.

8 https://www.gov.uk/government/publications/ots-publishes-vat-review-terms-of-reference
9 http://www.hefce.ac.uk/ke/goodpractice/

An online portal[10] to support communication of the framework includes links to data tools and resources, to engage universities in the development of benchmarking resources that can help them identify their comparators and sources of peer support and improvement. The portal will continue to be developed, in consultation with the steering group and further resources will be added. For example the external research into commercialisation commissioned by BEIS, discussed later, will feed into this development of best practice.

The KE Performance Framework steering group has also asked[11] the Association for University Research and Industry Links (AURIL), PraxisUnico and the Association of Research Managers and Administrators (ARMA) to help compile evidence about existing good practice in research commercialisation. A summary of evidence collected to date has been published, and university experts have been asked to submit further evidence by Monday 4 September 2017.

In October 2016, we announced the "Connecting Capability Fund" (CCF) backed with £100m over 4 years. The fund will support the sharing of good practice and capacity internally across the higher education sector, forge external technological, industrial and regional partnerships, and help deliver the Industrial Strategy priorities. For 2017/18, HEFCE is allocating £15 million from the CCF alongside universities' main Higher Education Innovation Funding (HEIF) allocations. £85 million will be allocated to projects on a competitive basis and HEFCE has announced[12] the first call for proposals in May, which closed on 10 July 2017, with the first awards to be announced in autumn 2017. A second round call for bids will also follow in early Autumn.

Science and Innovation Audits

Science and Innovation Audits have focused on mapping the UK's existing scientific strengths. This is valuable information but the Government also needs to know where the weaknesses lie, and where innovation and technology transfer are being held back. The gap analysis to date has uncovered weaknesses within existing sectors, however, rather than identifying where new sectors need to be developed. *The Government should task UK Research and Innovation (UKRI), once established, with identifying where our research and innovation gaps lie, especially where they are holding back technology transfer, and consider how these can be addressed.* (Paragraph 47)

The Government is committed to delivering an economy that works for all parts of the United Kingdom. This is not the Government directing the economy or determining the industries of the future from Whitehall. Instead it is about identifying strengths and working with industry and others to explore the ways in which the Government can help. This approach is discussed throughout the Industrial Strategy green paper and the way in which the different areas discussed in the green paper relate to specific places will vary, and will change over time.

Our excellence based research and innovation landscape and funding system is world-leading and we are committed to ensure that we preserve these strengths and build on these firm foundations.

10 http://www.hefce.ac.uk/ke/KEportal/
11 http://www.hefce.ac.uk/news/newsarchive/2017/Name,114431,en.html
12 http://www.hefce.ac.uk/ke/ccf/

The Government's programme of Science and Innovation Audits provides a process, undertaken with government support, for self-selecting local consortia to come together to analyse the economic potential of their selected technological themes and chosen geography. These themes are selected by the consortia, based on their local knowledge and experience, where they have identified and agreed research strengths, innovation capability and market potential. The consortia chose geographies that aligned with the value chains of the themes. The consortia consist of businesses, universities, Local Enterprise Partnerships (and equivalents in Devolved Authorities) and others involved in research and innovation. The process generates new and stronger collaborative relationships, as well as analytical evidence with which the future opportunities may be taken forward. They are not a comprehensive map of everything; rather they are a selective deep dive around opportunities with great potential that the consortia members have identified.

The creation of UKRI presents an opportunity to strengthen our position and ensure the strategic objectives of, and opportunities presented by, the new organisation are successfully seized. These include: identifying research and innovation gaps and creating a coherent overall strategy based on greatly improved analysis of cross-cutting evidence and data; improving the ability of researchers and institutions to collaborate in cross-disciplinary research, drawing on respective innovation and research strengths of partners; maximising the impact of business-led innovation; promoting stronger commercialisation, business and policy links; and delivering a simpler research and innovation system for end-users.

Local Enterprise Partnerships

The 39 Local Enterprise Partnerships in England are potentially well placed to help connect local businesses and universities. It is therefore disappointing that they are currently lacking any firm obligation, or support, to do so. In contrast, the four University Enterprise Zones, established with the explicit aim of increasing interaction between universities and businesses in particular geographic areas, face an uncertain future.

The Government should use the opportunity presented by the Industrial Strategy to oblige all LEPs to work with their local universities and build on the strengths of the university enterprise zones or else reassign a proportion of their funding sufficient to roll-out a national university enterprise zones programme. (Paragraphs 52 and 53)

All Local Enterprise Partnerships (LEPs) have representatives from a range of further education organisations and most have university level representation, largely at Vice Chancellor level. They have worked together across a range of issues such as preparing LEP Strategic Economic Plans partnering with industry to unlock growth opportunities in the area (as the Greater Lincolnshire LEP has done with the University of Lincoln and Siemens), Growth Deal proposals or working together on Science and Innovation Audits. Universities also host some LEPs and their functions such as Growth Hubs. We will continue to support the development of these local relationships as a cornerstone of our Industrial Strategy.

The four University Enterprise Zone (UEZ) pilots in England are testing how university-led local collaboration can support local growth and innovation. They seek to increase university interaction with the business-led LEPs, provide physical space/facilities for

small business, and help businesses gain access to wraparound business support packages, specialist facilities and expert knowledge. Together, they are expected to create nearly 2,300 jobs in high-tech small businesses by 2027.

Government has invested £15 million capital over three years (14/15–16/17) to enable the universities to establish four pilot UEZs. The universities have leveraged over £47 million of co-investment from private and public sector sources to support their projects. BEIS will be evaluating the four pilot UEZ projects (in 2017 and 2023) to inform any future case for further activity.

Each pilot has an innovative sector focus that draws upon the academic strengths of the universities. Through their partnership arrangements, the projects are set within the local economic context and endorsed by the LEPs.

- University of Bradford (Leeds City Region) – Digital Health Zone, Communications-Enabled Healthcare
- University of the West of England (Bristol) – Robotics and Autonomous Systems, Bio-Health Sciences
- Universities of Liverpool and Liverpool John Moores (in partnership as 'Sensor City Liverpool') – Sensor Systems and Measurements
- University of Nottingham's Technology Entrepreneurship Centre - Big Data, Digital and Satellite Applications, Advanced Manufacturing, Aerospace and Energy.

Finance, funding and support

Access to finance

Difficulties accessing long-term finance have been a persistent barrier to commercialising the UK's scientific and technological breakthroughs. A handful of UK universities have been at the forefront of developing the 'patient capital' model to address this funding gap. It is therefore surprising that the terms of reference for the Government's forthcoming Patient Capital Review do not mention universities, nor is there any indication that they will have a place on the 'industry panel' that will support the review.

The Government's Patient Capital Review must engage with the university sector and learn from those universities that have developed patient capital schemes." (Paragraphs 63 and 64)

Though the UK has an excellent record in creating businesses, many of them face barriers to scaling up. The Government's Industrial Strategy green paper identifies one part of the challenge as improving access to finance for businesses looking to grow. There is also some evidence that the supply of equity finance varies between different parts of the UK and is concentrated in London and the South East. In response the Government has launched a Patient Capital Review, led by the Treasury. It will consider the availability of long-

term finance for growing innovative firms and assess what changes in the Government's policy, if any, are needed to support the expansion of long-term capital to support growing innovative firms.

University research spinouts are one example of the businesses that can sometimes struggle to get access to finance and we recognise that they are a particularly challenging case. They often involve technologies at the earliest stage of development and which are a long way, in terms of both time and financial investment, from being able to sell products and services. The Patient Capital review is inviting views on issues around investing in spin-outs and input from universities will be welcome. We will be drawing on all the responses to the green paper and the Patient Capital Review as we develop the broader Industrial Strategy response to this challenge.

IP valuation and negotiations

Technology transfer offices (TTOs) should be focused on taking a long-term approach to developing IP. Some, it is claimed, look primarily for short-term revenue, though the extent to which this influences TTO practices is unclear. TTOs are often situated in the middle of complex IP negotiations, balancing competing priorities, with varying degrees of support.

We encourage the Government to use its forthcoming research on the commercialisation of intellectual property to examine what skills are needed to successfully value IP and broker negotiations, as well as how these skills may vary by sector. The research should engage with technology transfer offices (TTOs), Innovate UK, the research councils, funding councils and sector-specific bodies. The resulting best practice guidance must be made available online to TTOs, with consideration given to disseminating the material further through training courses and through establishing a mentoring scheme. (Paragraphs 73 and 74)

The Government has made commercialisation of research a key focus in its Industrial Strategy consultation and was grateful to receive many responses from businesses, universities, sector-specific bodies and funders on this topic. As well as the formal green paper consultation, we have spoken directly to a wide range of stakeholders and have commissioned external research. This research is focussed on the formation of spinout companies and licensing of IP from Universities and looking at the roles of the University, the Technology Transfer Office, individual academics, investors and businesses. The research is being carried out by PACEC (part of RSM) and will be concluded in autumn 2017. Evidence from this research, alongside the other discussions and consultations, is directly supporting the development of the Industrial Strategy, and we will ensure that evidence on best practice generated by this research is disseminated to universities, businesses and investors.

As well as the Industrial Strategy, and as discussed earlier, we are continuing to support and encourage the promulgation of best practice and advice. The Knowledge Exchange Performance Framework is being led by HEFCE and will be continued to be developed under UKRI. It includes an online portal to support promulgation of the framework with links to data tools and resources. This portal will continue to be developed using the outputs of this research as well as other sources of evidence, such as the consultation with

the Association for University Research and Industry Links (AURIL), PraxisUnico and the Association of Research Managers and Administrators (ARMA) on good practice in research commercialisation.

Higher Education Innovation Funding (HEIF)

The Higher Education Innovation Fund (HEIF) has played a crucial role in enabling universities to develop their technology transfer capabilities. We welcome the additional £100 million investment in knowledge exchange activities by the Government and its commitment to HEIF-type funding. *Such funding should be consistently available across the United Kingdom.* (Paragraphs 77)

We welcome, and agree with, the Committee's support of HEIF. The Government has already made clear its long term commitment to supporting Knowledge Exchange (KE), including through HEIF. We acknowledge the crucial role this funding has in helping universities develop their capabilities for commercialisation and other forms of Knowledge Exchange. Building on the recommendations of the Witty and Dowling reviews, and allocated from the additional funding for R&D announced at Autumn Statement, we recently announced a £40 million pa uplift to HEIF over 2017–21, taking the total allocation to £200 million for 2017–18. The uplift to HEIF recognises the important role that universities will play in delivering the Government's Industrial Strategy, and will enable the sector accelerate the commercialisation of knowledge from our world-class research base.

As previously mentioned, in October 2016, we announced the "Connecting Capability Fund" (CCF) backed with £100 million over 4 years. For 2017/18, HEFCE is allocating £15 million from the CCF alongside universities' main HEIF allocations. The remaining £85 million will be allocated to projects on a competitive basis.

The additional funding for England allocated for HEIF/CCF has automatic consequences for devolved budgets, however Higher Education policy and funding is a devolved matter, and it is for each administration to determine their own priorities and approach to supporting Knowledge Exchange.

Advice and simplifying the innovation landscape

Efforts to simplify the innovation landscape are slowly moving in the right direction. We remain concerned, however, that while Innovate UK has streamlined its funding schemes, the proposed shift away from awarding grants, and towards loans, could undermine the progress that has been made to date.

We recommend that the majority of the Industrial Strategy Challenge Fund should be disbursed in the form of grants. A small proportion of the Fund should be set aside to provide support for business training and mentoring, in order to maximise the success rate of the awards that are made. (Paragraphs 86 and 87)

The Government will be piloting loans as part of its overall support for Innovation. The Industrial Strategy Challenge Fund (ISCF) is a grant fund delivered through Innovate UK and the Research Councils that will invest in the development of disruptive technologies which have the potential to transform the UK economy. The first wave of challenges was

announced[13] in April 2017 and the first competitions under the Robotics and artificial intelligence challenge (up to £16 million for technologies and systems for extreme and challenging environments) were launched in June[14].

- Robotics and artificial intelligence – To improve the productivity of industry and public services, innovations using artificial intelligence (AI) and robotics systems will be developed, that can be deployed in extreme environments. This includes industries such as offshore energy, nuclear energy, space and deep mining.
- Healthcare and medicines – To develop first-of-a-kind technologies for the manufacture of medicines. The aim is to speed up patient access to new drugs and treatments.
- Clean and flexible energy – To design, development and manufacture of batteries for the electrification of vehicles to support the business opportunities presented by the low carbon economy and tackle air pollution.
- Driverless vehicles – Government will use the fund to invest in collaborative R&D projects to develop the next generation of AI and control systems need to ensure the UK is at the forefront of the driverless cars revolution.
- Manufacturing and materials of the future – The fund will develop new, affordable, light-weight composite materials for aerospace, automotive and other advanced manufacturing sectors.
- Satellites and space technology – A satellite test facility will be established. This will support new launch technologies, manufacturing and testing capabilities to construct future satellites and deliver payloads into orbit.

During 2017, UKRI will be engaging further with stakeholders across business and research to identify further challenges and we expect further waves of these to be announced from late 2017 onwards.

The Government recognises the importance of supporting skills and training of those involved in innovation. Training and development features throughout the Industrial Strategy green paper consultation, including a review of entrepreneurship, and will be a part of the development of the Industrial Strategy.

Whilst individual projects under the ISCF may contain appropriate elements of training, our support for training and mentoring goes much further than the ISCF. In the Budget the Government committed £250 million from the National Productivity Investment Fund (NPIF) over the next four years to increase the number of highly skilled researchers and innovators. This included:

- £90 million to fund 1,000 new PhD places. 40% of which will directly help strengthen collaboration between business and academia through industrial partnerships.

13 https://www.gov.uk/government/news/business-secretary-announces-industrial-strategy-challenge-fund-investments

14 https://www.gov.uk/government/news/robotics-and-ai-apply-in-the-industrial-strategy-challenge-fund

- A further £160 million will support new fellowships for early and mid-career researchers and innovators. £30 million of this will go to Innovate UK for Knowledge Transfer Partnerships.
- Funding is for programmes that align with the Industrial Strategy and start in 2017–18, and at least 80% will be directly aligned with Industrial Strategy Challenge areas.

Conclusion

The Government has recently sent several strong signals—through the establishment of UK Research and Innovation (UKRI), the forthcoming Industrial Strategy, and the creation of the Industrial Strategy Challenge Fund—that it is serious about technology transfer. Together, these three developments present a valuable opportunity to break this cycle of reviews, and shift the Government's focus towards taking actions that will help to foster technology transfer. At the same time, the Government must be careful not to damage the UK's pre-eminent position in academic research in pursuit of ever-greater commercialisation.

To ensure the current momentum in advancing technology transfer is maintained, the Government should task UK Research and Innovation (UKRI) with publishing annual progress reports against the recommendations made in Dame Ann Dowling's review. Those reports should highlight what actions have been taken, and how the UK's technology transfer ecosystem is developing. (Paragraphs 90 and 92)

UKRI will produce an annual report including a statement of accounts, and the exercise of its functions. This report will highlight key activities and programmes delivered through UKRI, and will be laid before Parliament by the Secretary of State.

Over the coming months UKRI will develop specific metrics as part of an overall framework to monitor success. This will include monitoring of UKRI performance against outcomes such as creating the best possible research and innovation environment in the UK, and measuring how UKRI activity contributes to longer term societal and economic impact.

Our long-term prosperity depends upon science, technology and innovation. The UK has an outstanding science base built and nurtured by a hugely successful funding system that is focussed on excellence and protected by the Haldane principle. We will now build on this to continue to develop our strengths in innovation and maximising the economic benefits of our investments.

The reshaping of the research and innovation landscape that is now underway, and is driven by the creation of UKRI (including enshrining the Haldane principle in law for the first time), the development of a new Industrial Strategy and the largest increase in public support for R&D funding since 1979, will provide an essential component for the success of post-Brexit UK.