How can Universities make the most of the Industrial Strategy?
The objective of our modern industrial strategy is to improve living standards and economic growth by increasing productivity and driving growth across the whole country.

Building our Industrial Strategy Green Paper, January 2017

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1. Introduction

In January 2017, Prime Minister Theresa May unveiled the Government’s Industrial Strategy Green Paper¹ (‘the Strategy’), outlining the Government’s long-anticipated plan to revitalise British industry, rebalance the economy, boost growth and tackle the nation’s long-term productivity crisis, as the uncertain future presented by Brexit looms on the horizon.

At the Strategy’s core are 10 pillars upon which its ambitions are based. Whilst their successful delivery relies on the input of a host of different organisations across many sectors, higher education institutions (HEIs) have a particularly prominent role in many of them, highlighted by the fact that the very first pillar of the Strategy is ‘investing in science, research and innovation’. Indeed, in its official response to the launch of the Strategy, Universities UK stated that universities have a central role to play ‘across all the proposed pillars’, and HEIs receive significant focus in the Strategy itself.²

But what role can universities play in making a success of the Strategy? What opportunities does it present for them, and how has the sector responded to the ambitions set out in the plan? Since the publication of the Green Paper, key stakeholders have been offering their feedback about its aims, objectives and approach via an extensive official consultation process. This paper considers these responses whilst exploring what the Industrial Strategy offers to universities and the wider sector.

2. University Challenges

But how does this all relate to universities? Naturally, any policy that impacts on the sector will generate intrigue, but HEIs will have a particular interest in such a high-profile policy announcement affecting them given the unprecedented pressures they are encountering.

One of the most pressing issues facing universities is a stagnation of traditional sources of funding. Although the Government has protected the public science budget since 2010, other countries have been increasing their investment in research and development (R&D) in relation to GDP. Indeed, the Strategy itself acknowledges that the UK’s investment of 1.7% of GDP in private and public funds on R&D is significantly lower than the OECD average of 2.4%, let alone the 3% provided by the leading backers of innovation.

Universities are also dealing with the pressures of competing with other institutions to attract students currently paying up to £9,250 a year in tuition fees. The need to attract international students has also extended this competition beyond the UK’s borders, forcing HEIs to raise their individual profiles at home and abroad for lucrative international student numbers. This also requires universities to rely on the reputation of the UK as a place to study overall, something potentially hampered by perceived tough immigration measures and repeated Government refusals to remove international students from immigration figures.3

Such concerns are exacerbated by the UK’s upcoming departure from the EU. A Times Higher Education survey published a week before the EU referendum indicated 88.5% of all university staff were against Brexit4, something not surprising considering the scale of cooperation and the fluidity of ideas, staff and students between institutions and other organisations. In pure funding terms too, the UK had secured €2.63 billion from the Horizon 2020 (2014-2020) programme by early 2017, the second highest level of funding in the EU.5 Furthermore, the proportion of the UK’s business R&D investment financed from abroad is considerably higher than other countries: 22% in 2013, compared to 7% in the OECD6, and Brexit’s impact on these figures is something that will be closely monitored.

Even cultural factors such as the rise of populism, a mistrust of experts and the recent phenomenon of ‘fake news’ and ‘alternative facts’ have placed the role of universities in a potentially tricky situation. By countering falsehoods and standing against anti-intellectualism, HEIs risk being bracketed in with a perceived aloof elite that have no connection with ‘the real world’. Against this backdrop, the pursuit of knowledge for knowledge’s sake has arguably never been more questioned in recent memory.

Box 1 - The Higher Education and Research Act 2017

» The Government’s flagship policy to outline the direction of higher education in the UK – dubbed as “the most important legislation for the sector in 25 years” by Lords Spokesperson the Viscount Younger of Leckie.

» Received Royal Assent on 27 April 2017 following the ‘ping pong’ process between the House of Commons and House of Lords just before Parliament prorogued at the start of the period of purdah before the General Election.

» A key measure is the establishment of UK Research and Innovation (UKRI), which will be headed by Government Chief Scientific Adviser Sir Mark Walport and unite the UK’s seven Research Councils, Innovate UK and the research functions of HEFCE into one organisation. It will act as a champion for the UK’s world-class research system and manage funds with cross-disciplinary impact and a ‘common research fund’ as proposed by Sir Paul Nurse. The names and brands of the Research Councils and Innovate UK will be retained.

» Also establishes the Office for Students, which will hold the statutory responsibility for quality and standards, manage the Register of Higher Education Providers, and oversee the awarding of university title and degree awarding powers, and replaces the other functions of HEFCE and the Office for Fair Access (OFFA).

» The Act also requires universities to publish detailed admissions data broken down by ethnicity, gender and socio-economic background.

» The Act attracted controversy for making it easier for new organisations to obtain degree-awarding powers and for enshrining ‘TEF’ into law, allowing institutions to raise tuition fees in line with ‘quality of teaching’. However, the final format of the Act achieved compromises and has been welcomed for the stability it will provide to the sector in turbulent times.

This need for universities to justify specific areas of their work can be more tangibly felt by the continued controversy regarding the Research Excellence Framework (REF) and the Teaching Excellence Framework (TEF) as defining indicators of universities’ funding. The TEF remains a controversial product of the Higher Education and Research Act (HERA – see Box 1) that will allow HEIs to charge higher tuition fee rates based on a ‘Gold, Silver and Bronze’ ranking of teaching quality from 2020.
Add to this uncertainties over how the entire research system will operate as the UK’s research landscape is transformed by the creation of UK Research and Innovation (UKRI), which will bring together the seven Research Councils, Innovate UK, oversee the REF and allocate Higher Education Funding Council for England (HEFCE) research funding, it has never been more important for HEIs to seize upon emerging opportunities.

The publication of the Government’s much-anticipated Industrial Strategy therefore presents a potentially lucrative opportunity for UK universities to both contribute to the Government’s aims and benefit from them. Although many of the measures contained in the Strategy had been announced previously, the document provides further direction of their use and crucially provided the opportunities for stakeholders to have a direct say in how they should be allocated. Universities have a core role to play in the successful delivery of this strategy, but they are not merely passengers, and UK HEIs stand to gain much from helping to deliver the ten pillars outlined by the Government.
But what exactly does the Strategy have to offer universities? The most immediate benefit is offering some clarity over how the Government will allocate the additional £4.7 billion funding in R&D that was announced at Autumn Statement 2016 as part of the National Productivity Investment Fund (NPIF), which was designed to add £23 billion in high-value investment from 2017-18 to 2021-22.\(^7\) This announcement was an unprecedented boost for the research community, and was heralded by the Government as the largest increase in any parliament in almost 40 years. The Campaign for Science and Engineering (CaSE) calculated that the funding brings total public expenditure on R&D up to 2% of GDP,\(^8\) although this remains below the 3% campaigned for by the Business, Energy and Industrial Strategy (BEIS) Committee, amongst others.\(^9\)

The Strategy triggered a consultation process into how this funding should be invested, setting out options ranging from additional finance for dual support funding, investment in local science and innovation strengths, to increased support for commercialisation and investment in future research talent. Options for how these goals could be achieved include investing in successful mechanisms such as the Higher Education Innovation Fund (HEIF),\(^10\) developing a new capital spending roadmap to provide the modern infrastructure to support fundamental research, and increasing the number of PhDs in the STEM subjects of science, technology, engineering and maths.

In its response to the consultation addressing how this funding should be spent, Universities UK stated that HEIF ‘at the very least’ should be expanded, highlighting the fact that this fund generates £7.30 for the taxpayer for every £1 spent,\(^11\) while the Russell Group backs this call and highlights the need to maintain the UK’s dual-support system of funding, stressing that quality-related (QR) funding, Charity Research Support Funding (CRSF) and Research Partnership Investment Funding (RPIF) must be maintained.\(^12\)

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\(^1\) https://www.gov.uk/government/publications/autumn-statement-2016-documents
\(^2\) http://www.sciencecampaign.org.uk/news-media/case-comment/reflections-on-the-2016-autumn-statement.html
\(^3\) https://www.publications.parliament.uk/pa/cm201617/cmselect/cmbeis/616/616.pdf
\(^4\) http://www.hefce.ac.uk/ke/heif/
\(^5\) http://www.universitiesuk.ac.uk/blog/Pages/The-industrial-strategy-and-universities.aspx
\(^6\) https://www.russellgroup.ac.uk/media/5488/russell-group-industrial-strategy-response-april-2017.pdf
But the scheme that has attracted the most attention is the Industrial Strategy Challenge Fund (ISCF), which represents a striking £1 billion of the £4.7 billion allocated in the NPIF. Modelled on the US Defense Advanced Research Projects Agency programme, this brand new cross-disciplinary fund has been designed to enable UKRI to back technologies at all stages where the UK has the potential to take an industrial lead, from early research to commercialisation, and will support collaborations between business and the UK’s science base across six key areas.

Some industrial activities that will be supported through the ISCF include: joint research projects between businesses and academic researchers; placing graduate students into companies; setting up demonstrators to test near-to-market technologies in real-world environments; and creating centres to bring together academic experts with entrepreneurs to promote commercialisation. In some cases a challenge could lead to the creation of a new institution to drive forward a priority technology.

The Government announced at Spring Budget 2017 that the first three areas of ISCF – healthcare and medicine; robotics and artificial intelligence; and batteries for clean and flexible energy storage - would shortly receive funding, and in late April the Business Secretary confirmed the total investment in each field. The funding is allocated as follows:

- **Clean and flexible energy** or the ‘Faraday Challenge’ – a £246 million investment over four years to help UK businesses seize the opportunities presented by the transition to a low carbon economy, to ensure the UK leads the world in the design, development and manufacture of batteries for the electrification of vehicles.

- **Cutting-edge healthcare and medicine** - a £197 million investment over four years to develop first-of-a-kind technologies for the manufacture of medicines that will speed up patient access to new drugs and treatments.

- **Robotics and artificial intelligence (AI)** - a £93 million investment over four years to make industry and public services more productive, by developing AI and robotics systems that can be deployed in extreme environments which occur in off-shore energy, nuclear energy, space and deep mining.

In addition to the above, the following three areas will also receive ISCF grants in the next four years:

- **Driverless cars** - a further £38 million will be invested in new collaborative research and development projects, working with industry partners to develop the next generation of AI and control systems needed to ensure the UK is at the forefront of driverless vehicle technology.

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• Manufacturing and future materials - a new £26 million fund to help the UK’s civil aerospace industry develop the next generation of affordable lightweight composite materials for aerospace, automotive and other advanced manufacturing sectors.

• Satellites and space technology - £99 million will be allocated for a satellite test facility supporting new launch technologies and the manufacturing and testing capabilities that will allow the UK to construct future satellites and deliver payloads into orbit.

This funding is noteworthy not just for its scale, but also the way in which it will be distributed, as it enables business to set identifiable challenges that UK researchers will subsequently tackle. According to Deputy Director of the Science Policy Research Unit at the University of Sussex, Paul Nightingale, this approach represents a potential shift in the way the UK prioritises its research; a move away from what he dubs the ‘failed model’ of funding basic science that aims to produce products and technologies out of new discoveries, to a model that directly asks industry to identify the ‘intractable’ problems they face, with scientists receiving funding to help deliver solutions to these.15

5. Commercialisation and the Connecting Capability Fund

Indeed, this shift away from prioritising basic research towards greater commercialisation is a core thread of the Industrial Strategy, and seeks to address a long-term issue the UK has with translating its strong research base into commercial gains. The Strategy itself notes that, although the UK produces a similar number of spin-off companies when measured per unit of research funding as US universities - and significantly more than Japanese institutions - the UK registers far fewer patents, and none of the UK’s universities feature in the Reuters ‘Top 10’ list of institutions’ performance in innovation and commercialisation.16

There have been numerous reports exploring the reasons behind this failure. Enterprise Research identifies two market failures that occur in the formulation of innovation collaborations: firms’ lack of awareness of the potential benefits from university collaboration and their lack of knowledge of potential university partners.17 Furthermore, University Alliance identifies four crucial areas in which universities benefit their local areas – namely knowledge, talent, access to finance and space - but states that the full benefits of these positive aspects are not fully realised due to the ‘myth that the main contribution of universities to innovation is through the commercialisation of their research’.18 The Green Paper itself highlights the fact that UK public funding is relatively concentrated on early stage research compared with competitor nations, meaning that less funding is invested in riskier experimental development research that can result in economic success.

Whatever the reasons for this state of affairs, the Government is keen to see the UK’s enviably capable university and research sector translated more successfully into commercial success. Aside from major funds such as the ISCF, one way in which the Strategy aims to achieve this is by expanding existing streams supporting universities’ commercialisation activity to enable them to do more for their local economy and support more local small businesses. Further measures to support commercialisation are as follows:

- The Government has commissioned independent research on approaches to commercialisation in different institutions, including how they approach licensing intellectual property and taking equity in spin-outs.
- A new challenge prize programme was launched in August 2017 to reward the UK’s home-grown inventors and stimulate user-led innovation. The prize, piloted through the NESTA Challenge Prize Centre, helps inform Government support for ‘everyday entrepreneurs’ operating in companies and at home, with potential options including supporting enabling environments, incubators and maker spaces.

16 http://stateofinnovation.com/the-worlds-most-innovative-universities
17 https://www.enterpriseresearch.ac.uk/publications/accessibility-utility-learning-effects-university-business-collaboration-research-paper-no-57/
18 http://www.unialliance.ac.uk/blog/2016/06/02/creating-innovative-regions-the-role-of-universities-in-local-growth-and-productivity/
• The Government is in the process of reviewing the best way to maximise the incentives created by the Intellectual Property system to stimulate collaborative innovation and licensing opportunities, and the Alliance for IP has stated that it will work with the Minister for Intellectual Property to achieve this.  

• The Government will also examine the option of expanding Knowledge Transfer Partnerships, which place PhD students into companies. This would allow universities to provide greater support for their local economy and small businesses. Potential new types of interventions could also be identified to enable research and business to collaborate, such as skills, or funding time away from the laboratory in businesses.

These approaches are supplemented by ongoing Government programmes to support the Industrial Strategy, including the Connecting Capability Fund (CCF). Originally outlined at Autumn Statement 2016, the CCF involves the allocation of £100 million to support university collaborations in research commercialisation. It is specifically designed to help universities deliver the Government’s industrial strategy priorities, forge external technological, industrial and regional partnerships, and share good practice and capacity internally across the higher education sector.

HEFCE is allocating up to £85 million from the CCF for competitive projects in two rounds, with 320 million announced in autumn 2017 and the remaining £65 million awarded in early 2018. In addition, HEFCE is allocating £15 million in 2017-18 from the CCF through a formula linked with evidence of collaboration strengths underpinning the main HEIF allocations. This initial funding will enable universities to further their established knowledge exchange collaborations and identify new opportunities to work with business and seize opportunities for commercialisation.

20 http://www.hefce.ac.uk/news/newsarchive/2017/Name,113409,en.html
An issue highlighted by the increased focus on commercialisation is raising the impact of universities more evenly throughout the UK. It is no secret that the focus of research spending is localised to specific areas of the UK, and the Strategy itself acknowledges that 46% of Research Council and HEFCE funding is spent within the so-called ‘golden triangle’ of Oxford, Cambridge and London. Such is the nature of this imbalance that, in its official response to the Strategy, the LEP Network stated that UKRI should be issued with a formal objective to take ‘place’ and UKRI’s impact on ‘place’ and local variations in productivity into account.21

Tackling this imbalance is a key aim of the Strategy, and is necessary for raising productivity. This was highlighted in the Chartered Association of Business Schools’ response to the Green Paper, which emphasised the need for local solutions to local problems, as specific regions have their own unique barriers to growth.22 What is therefore required are regional solutions, not regional implementation of national programmes.

Further feedback to the Strategy has highlighted other areas that could improve local performance. The Russell Group, for instance, noted the important role Science and Innovation Audits (SIAs) play in encouraging universities to work with local partners to demonstrate areas of local expertise with potential global competitive advantage, and states that these will play a ‘key role’ in helping identify areas of genuine strength and excellence across the UK.23 The National Centre for Universities and Business (NCUB) echoes this support for SIAs, and adds that the Government should support their development with additional support for the Smart Specialisation Hub, which seeks to help LEPs and local partners in England understand their position relative to others, and helps them target their investments in areas that push and strengthen their local comparative advantage.24

The Government itself has acknowledged the success of regional groups of universities like the N8, SET squared and Midlands Innovation groups working together on projects. It will therefore support networks of universities that wish to unite to improve commercialisation, which could involve creating new research institutions to back local strengths in world-class research.

Specifically, the Strategy notes the role the Research Partnerships Investment Fund (RPIF) plays in supporting capital projects in universities with an eye to local economic strengths, but acknowledges the scheme’s limitations, as RPIF projects have to be led by universities and are for capital infrastructure only, with funding limited between £10 and £50 million per project. Currently, there is no equivalent fund that can take bids from groups of companies, so the Government is looking

Universities, as anchor institutions across many areas in the UK, are ready to step up and play a bigger role in local growth and development.

Julie Tam, Assistant Director of Policy at Universities UK

into the possibility of creating new funding streams to support world-class clusters of research and innovation in all parts of the UK, whether they are led by business or universities, and for large or small projects where they meet quality thresholds.

This drive to create more flexible innovation clusters represents a significant opportunity for universities to have a more visible and impactful presence in their local areas. This was encapsulated by professor of further education and higher education at Wolverhampton University Andy Westwood, who wrote in a recent Guardian article that universities “must be as passionate about the communities and people on our doorsteps, as we are about those from the EU and beyond. We are international, but we are local too.”

Indeed, one criticism levied at university-industry partnerships is that they often fail to benefit smaller local employers, with Enterprise Research finding in 2017 that university-industry collaborations result in “no significant sales effect for small firms”. One way in which the Strategy can focus efforts is to ensure that employers wishing to recruit locally are able to access local graduates. Likewise, it is stated that all graduates who wish to take up employment in the same area as their university should have sufficient access to the opportunities available at small, medium and large employers. The potential benefits of this renewed focus on localism and regionalism were summarised by Universities UK’s response to the Industrial Strategy, which read:

“There is much potential for universities, linking with Local Enterprise Partnerships, to bring together local businesses and other key players in a concerted effort to drive growth at the local level. Universities could also collaborate with local schools and public service providers, working together so no individual is left behind. Universities will be exploring how we put this into practice in a series of consultation events with key players at the local level, to inform the government’s industrial strategy.”

Yet challenges remain despite this renewed focus on regionalism. The Council for Higher Education in Art & Design (CHEAD) highlights the fact that universities often play a more central role in poorly performing regions than in highly productive ones, but that these universities are often performing less well than counterparts in more productive areas of the country. Finding solutions to the problems these regions and institutions themselves face will therefore be necessary if attempts to replicate the success of the ‘Golden Triangle’ are to be successful.

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27 http://www.universitiesuk.ac.uk/blog/Pages/The-industrial-strategy-and-universities.aspx
7. Skills

It is of course impossible to consider attempts to rebalance the nation’s economy and raise productivity levels without acknowledging the need to improve skill levels in the labour market, an issue that has dogged successive UK Governments for decades. In July 2015, the UK Commission for Employment and Skills revealed that 43% of vacancies in STEM roles are hard to fill due to a shortage of applicants with the required skills,29 while a December 2016 survey of 844 members of the Institute of Directors (IoD) found that 95% believed a focus on developing skills would be an important element of the Industrial Strategy.30 These problems are exacerbated by the UK’s impending departure from the EU and the unknown impact on skilled immigration levels this may bring.

Given the extent of these problems, it is not surprising that ‘Developing Skills’ is the second pillar of the Industrial Strategy. Much of this lies outside of the direct remit of universities, covering everything from ensuring school-aged children are more aware of the possibilities of STEM to simplifying the technical education landscape for those leaving secondary education, with the technical-level qualification ‘T-Levels’ announced at Spring Budget 2017 aiming to raise the profile of alternative post-16 pathways.31 Yet these issues are interconnected, and the sector will have reacted positively to the Strategy’s focus on lifelong skills and on promoting the skills in lagging areas.


Our poor performance in basic and technical skills is key to the UK’s persistently lower levels of productivity compared with other advanced economies.
Nevertheless, Universities UK reflects that the Strategy is ‘strangely silent’ on the importance of graduate skills to the UK’s economy, while concerns have also been raised over the extent of Government prioritisation of the STEM subjects, with innovation foundation Nesta warning that a lack of focus on the arts risks a marginalisation of vital human skills such as creativity, problem-solving and collaboration, particularly as these areas are at much less risk of automation in the future workplace.32

Alongside this, universities have been pressing the Government to ensure that the UK continues to attract the most skilled students and workers as it renegotiates its role with the EU. In its response to the Green Paper, Imperial College London stated that cross-border collaboration with those from different backgrounds, cultures and nationalities ‘is what drives the world’s best universities’, and that UK institutions need access to EU programmes, collaboration, and the best and brightest students, academics and entrepreneurs.33 This sentiment was echoed in the House of Commons BEIS Committee First Review of the Industrial Strategy, which urged the Government to exclude international students from official immigration figures,34 a sentiment that will surely be shared throughout the sector and beyond.

34 https://www.publications.parliament.uk/pa/cm201617/cmselect/cmbeis/616/616.pdf
At this time, the UK’s political landscape is in a state of flux. The next steps for universities will depend on the outcome of a number of ongoing processes, not least the implications of the Higher Education and Research Act, including the impact of UKRI on the research community, and how the Government ultimately proceeds with the Brexit process.

Yet universities are in prime position to benefit from focusing on the core priorities identified by the Government in the Strategy. In a time of uncertainty, HEIs may be able to display their true value to policymakers by proactively working on the challenges the Government has identified and responding to the support that is being offered, even where this calls for new working practices. As Professor of Physics at the University of Sheffield, Richard Jones, wrote on higher education blog WONKHE:

“Universities can and should play a key role in helping to address the UK’s productivity problem and its regional economic inequalities. This will, though, mean that some universities will need to move out of their comfort zone – just as the government is moving out of theirs – to give greater emphasis to translational research, innovation, and skills across a wider landscape.”

Whatever happens, the direct funding offered by the Government in Autumn Statement 2016 and refined through the Strategy will be seized upon, and the sector will press the Government to follow through on these commitments, with Universities Scotland arguing that continued investment in the higher education R&D base will be a “prerequisite to the success of the strategy.”

As Europe’s leading provider of funding and policy information, Idox are experts in helping organisations identify, secure and manage grant funding. We have been working with universities and businesses for some 30 years, supporting them to become more competitive, and will continue to provide the most comprehensive and up-to-date database of all funding and policy information for universities as the Industrial Strategy Challenge Fund continues to unlock funds and the Government develops its priority areas of funding in the run up to the UK’s departure from the European Union.
9. Further Information

GRANTfinder is Europe’s leading publisher of funding and policy information and boasts a repository of over 12,000 funding programmes. It has supported organisations in the public, voluntary and private sectors for some 30 years in identifying and applying for funding information.

As part of its watching brief of funding and policy changes, it produces whitepapers and blogs on subjects of interest to its audience.

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