The state of the English university knowledge exchange landscape

Overview report to HEFCE by RSM PACEC

August 2017

ACKNOWLEDGEMENTS

This study was carried out for HEFCE by RSM PACEC Ltd.

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1 EXECUTIVE SUMMARY

1.1 Introduction

PACEC was appointed by the Higher Education Funding Council for England (HEFCE) to assess the five-year knowledge exchange (KE) strategies of 97 higher education institutions (HEIs) in England in receipt of a 2016/17 Higher Education Innovation Funding (HEIF) allocation. The key components of this commission are the assessment of strategies, the production of an evidence database to inform future monitoring of institutions, and reporting on the key insights from the institutional strategies.

This **overview report examines the state of the KE landscape in England** and aims to:

- Describe the main sector-wide future priorities and plans, and key developments in the performance of KE in the higher education (HE) sector;
- Provide insights for HEFCE and government on what HEIs intend to deliver to further national priorities and objectives (such as productivity) and also the enablers and barriers to delivery; and
- Provide insights on institutional strategies and plans that may help continuous improvement in the HE KE sector. This includes describing good practice in selected strategies.

The institutional KE strategies were assessed using a scorecard system against three criteria: evidence that they met HEFCE's requirements for funding; clarity of presentation; and a holistic assessment of the content and coherence of the strategy as a whole.

PACEC provided feedback on areas for development in a number of the strategies. Following a review of the revised versions, all strategies were accepted as a basis for funding by HEFCE.

1.2 The key aspects of institutional strategies (Chapter 3)

The HEIs had freedom to describe their strategies in terms and language that are appropriate to them, within the constraint of a template with set questions and word limits.

Despite the variety of participating institutions, there are strong patterns and commonalities among the responses in terms of their overarching objectives. Increased engagement activity and development of external partnerships were the most commonly cited priority objectives in the strategies. Other significant objectives for institutions included prioritisation of support to specific sectors, exploiting synergies with research and teaching, development of the physical KE infrastructure, and internal embedding and efficiency in KE.

The main **drivers** affecting KE activity identified in the strategies were:

- The potential impacts of Brexit on KE activity, local economic activity, and funding availability; and
- The impacts of lower public spending, both directly on institutional funding and indirectly via the resources available to public sector partners such as local authorities and Local Enterprise Partnerships (LEPs).

The main **trends** in KE activity were:

- Institutional trends towards increased number and diversification of partnerships, given the public funding constraints set out above;
- Development of activities and priorities driven by recent policies, such as the Teaching Excellence Framework (TEF) and degree apprenticeships;
- Increasing focus on collaborations and strategic partnerships – including long-term, multi-faceted collaborative relationships, and 'place-based' KE activity such as the Science and Innovation Audits (SIAs); and
- Strengthening of relationships between the economic and social impacts of KE and research, and embedding of KE into other institutional strategies.

The **barriers** most commonly identified by institutions include:

- Low capacity or resources for KE;
- Lack of access to specialist facilities or suitable space;
- Low appetite from businesses and partners for some activities (e.g. adoption of technology); and
- Internal pressures within institutions to prioritise teaching excellence over KE activity.

The most frequently cited **enablers** of KE activity exhibited in the strategies were as follows:

- HEIF funding is valued by institutions as a key enabler of KE activity[1];
- The prioritisation of KE as evidenced in having it included in HEI corporate plans and strategies;
- The development of external partnerships to broaden geographical and sectoral reach, and sources of funding; and
- The drive within institutions to embed KE into their corporate plans and strategies.

1.3 Alignment of strategies with other national policy priorities (Chapter 4)

Recent developments in the policy framework for KE that are pertinent to the strategies include the 2015 Spending Review, the 2015 Productivity Plan, and the 2016 Knowledge Economy White Paper. The 2017 Green Paper on Industrial Strategy is clearly relevant to future activity but postdates the preparation of the institutional KE strategies.

The strategies reveal a significant number that are engaging with the **SIAs**, often with HEIs as heads of regional consortia, or as a springboard for institutions to increase collaboration with regional partners and identify how they can contribute to regional innovation and economic growth. Other regional economic engagement is focused on collaboration with **LEPs** as the main bodies that support local economic growth. The institutions have contributed to the evidence bases underlying the SIAs, and many explicitly state that their target sectors for engagement match those identified by LEPs and the SIA evidence bases. Some common target sectors include:

- Creative and digital (particularly in London and major cities);
- Life sciences (with clusters in the South and East around Oxford, Cambridge and London);

[1] HEIF's value as a flexible catalytic source of funding is a common finding from previous HEIF evaluations, and it is mentioned unsolicited by a significant minority of HEIs in their strategies

- Advanced manufacturing and engineering (particularly in areas covered by the Midlands Engine, the North East and counties such as Lancashire and Yorkshire); and
- Other sectors with a strong reliance on inputs from science, technology, engineering and mathematics (STEM) disciplines (nationally).

Changes to **enterprise support** and the **access points** for partners are common across institutional strategies. A few universities refer specifically to making the 'front door' to external partners more accessible. Some institutions are taking steps to make themselves more approachable to businesses through the creation of outward-facing institutes or structures with a tailored business offer.

1.4 Outcomes and impacts of institutional strategies (Chapter 5)

This request for strategies marks the first time that HEIs have been asked to provide outcomes and impacts that HEFCE can monitor against as part of the annual monitoring of their progress against their strategic goals. As a result, the sections of the strategy template dealing with the monitoring and management of KE were seen as crucial to the overall strength of the strategies and were assessed accordingly. Examples of good practice include:

- Clear presentation of the intended outcomes and impacts, linked to institutional strategic objectives, with KPIs;
- Commitment to quantifiable targets or thresholds (i.e. the 'measurable' element of specific, measurable, achievable, relevant and time-bound (SMART) goals);
- Use of benchmarking to track progress (e.g. Higher Education – Business and Community Interaction (HE-BCI) survey returns against comparator institutions, or else against previous years within the institution);
- Classification of outcomes and impacts under headings (e.g. business benefits, or other beneficiaries);
- Explicit differentiation between short- and long-term outcomes and impacts (e.g. within two years versus end-of-strategy and beyond).

The institutional strategies showed a tendency to emphasise their achievements in their evidence bases (e.g. awards of funding; national awards or recognition; performance in the Research Excellence Framework (REF) 2014). In many cases, particularly where REF case studies provide evidence on activities that have led to KE impacts, these are appropriate components of an evidence base; however, our moderation process gave most credit to strategies with a focus on sources of evidence designed to feed back into and improve KE activities; these include internal or external evaluations of KE activity, monitoring and evaluation feedback, reviews of internal KE processes, surveys of stakeholder needs and baselining of activity, as discussed in Section 2.2. It is critical that institutions use evidence to reflect on the lessons learnt from their work and make explicit how KE activity has changed as a consequence.

1.5 Approaches to collaboration between HEIs, maximising efficiency and effectiveness (Chapter 6)

All institutions were asked how many UK institutions they collaborated with. The median number was 15. However, the scale of collaborations varies significantly: the strategies make it clear that some individual collaborations account for most of their collaboration activity, so it is important to

note that the number of significant strategic partnerships for a university is much lower than 15 (perhaps typically one to five). On balance, institutions across the sector clearly value having a small number of significant collaborations, as opposed to casting a wide reach where engagement is less substantial.

The natural starting point for partnerships is working with other HEIs at the regional level, for example with regard to the completion of SIAs, as well as institutions with whom they already have an existing relationship (be it through common research strengths or close proximity). Over half of institutions' main collaborative relationships are with other institutions in their region**.**

Few institutions articulated a specific collaboration strategy, instead typically describing their main collaborations. This may be due to the lack of space provided in the template, but if not, there is the potential for institutions to develop a more strategic approach. Examples of formal collaborations identified by government as 'successful models' include the N8, M6 and GW4 consortia[2].

Some institutions are exploring the potential of a shared intellectual property (IP) commercialisation service at the regional level. Small institutions in particular would benefit from considering collaboration through such an approach, either with other institutions of similar scale or with the region's larger institutions. In contrast, large institutions have significant resources and may have different reasons for collaboration, including collaborating in core research fields (national level and beyond) or in its region.

HEIs should be encouraged to adopt the following good practices, particularly with regard to developing successful collaborations in terms of longevity and focus:

- Think and act strategically about the HEIs they collaborate with in order to maximise efficiency and effectiveness;
- Develop a strategy that considers different paths or contingencies: for example, a plan for a joint initiative that has potential for competitively allocated funding, which includes contingency plans if the funding bid is not successful;
- Formulate the reasons for collaboration, including detail on how there can be mutual benefit through each opportunity identified; and
- Assess how and why past collaborations have ended, in order to inform future collaboration.

1.6 KE funding sources and how HEIF is used and prioritised (Chapter 7)

All institutions were asked to estimate how their HEIF funding for 2017/18 was expected to be spent by staff/activity type, and separately by infrastructure category. Out of the £160m total funding, £89.4m was to be allocated to dedicated KE staff, £26.8m to KE activity by academic staff (including buying out academic time to engage in KE), and £43.7m on other costs and initiatives.

[2] The N8 Research Partnership comprises the eight most research-intensive universities in the North of England: Durham, Lancaster, Leeds, Liverpool, Manchester, Newcastle, Sheffield, and York. Midlands Innovation (M6) is a research and innovation partnership comprising the universities of Aston, Birmingham, Leicester, Loughborough, Nottingham, and Warwick. The GW4 Alliance brings together the 'Great West' universities of Bath, Bristol, Cardiff, and Exeter. All 18 institutions except Cardiff University currently receive HEIF funding.

By infrastructure category, the majority of HEIF funding is expected to be spent on research exploitation of one form or another. There is an expected £26.8m to be spent on commercialisation (technology transfer), and £64.9m used to facilitate the research exploitation process aside from technology transfer – a total of £91.7m, or 57% of the total. The other major categories of infrastructure spend are skills and human capital development (£19.2m), knowledge sharing and diffusion (£18.2m), and social enterprise and entrepreneurship (£14.4m).

The most research-intensive institutions are planning to spend more on research exploitation than other institutions, with 65% of expenditure among the top six institutions and 62% among other high-research-intensity institutions assigned to expenditure in this category. By contrast, 41% of expenditure by low research institutions and 26% of arts institutions is expected to be devoted to research exploitation – these institutions were more likely to be spending more HEIF money on skills and human capital development.

Some comparisons can be drawn with the equivalent statistics for the HEIF 2011–15 funding round. Fifty-three percent of expenditure then was allocated to research exploitation, suggesting that this has risen in importance since then (to 58% of expenditure now). Expenditure on skills development has fallen slightly, from 14% to 12%, and exploitation of physical assets from 6% to 4%.

2 INTRODUCTION

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HEIF funding began in 2002 (following rounds of HEFCE Higher Education Reach Out to Business and the Community (HEROBC) funding), with £77m awarded to institutions based on a competitive process, as part of a range of available funds for KE. A second round of HEIF (HEIF 2) was made for 2004-06. Formula funding partially replaced the competitive funding process for the HEIF 3 round, which covered the period 2006-08. Since 2008, HEIF has been allocated by formula. There have been two multi-year funding rounds, covering 2008-11 (HEIF 4), and 2011-15. The process for each funding round has been for HEFCE to call for institutional strategies, assess and publish these strategies, commend some strategies, and commission an overview report. PACEC produced the last such overview report in April 2012[3]. Subsequently, there have been two years of formula-based allocations, with funding allocated against 2011-15 strategies, covering 2015/16 and 2016/17.

The strategy templates have been changed for each funding allocation period and hence there is limited opportunity for comparison between this period and the last. This report focuses therefore on the characteristics of the current round of strategies.

2.1 Policy background

2.1.1 HEIF in 2016/17

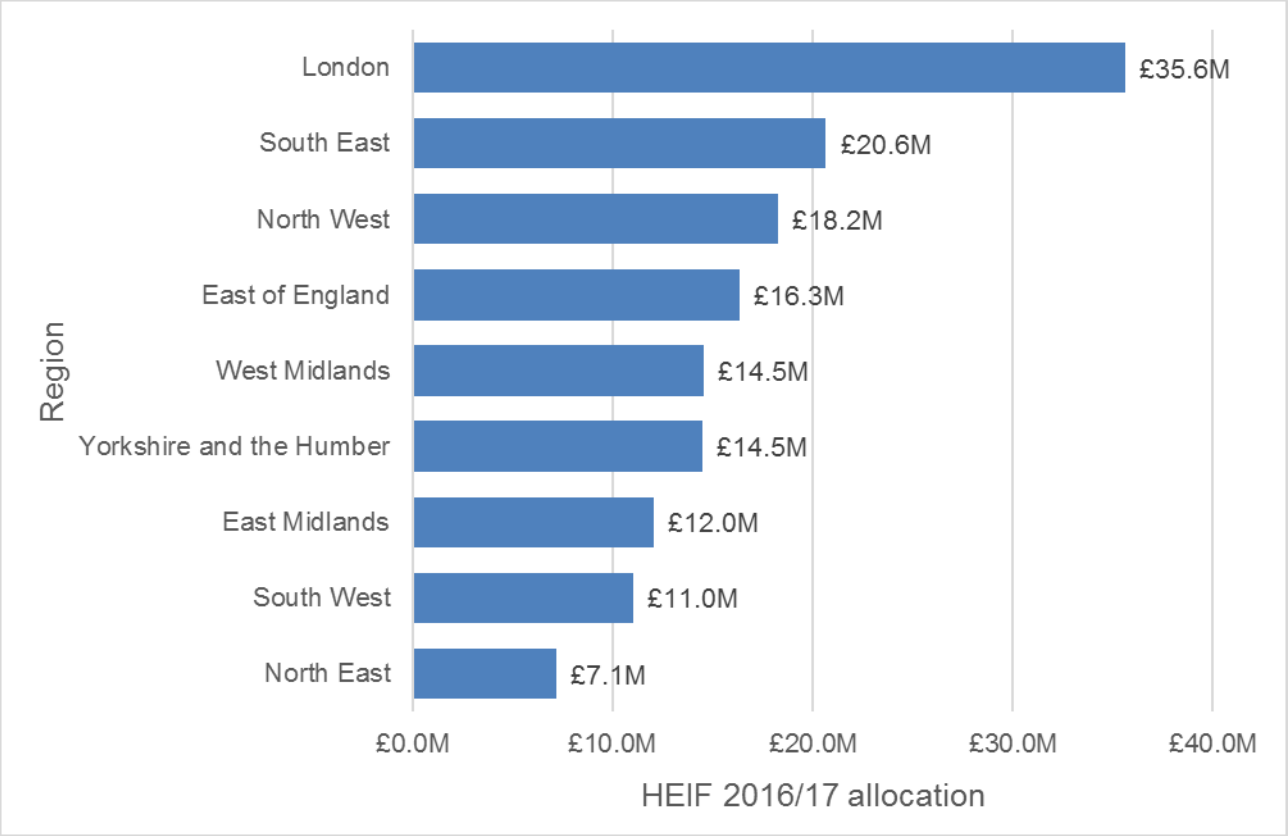
HEFCE has awarded £160m[4] in funding for HEIF in the academic year 2016/17 (between August 2016 and July 2017), with universities in receipt of a 2016/17 allocation required to submit five-year KE strategies.

[3] PACEC, 'Strengthening the Contribution of English Higher Education Institutions to the Innovation System': see http://www.hefce.ac.uk/ke/heif/previous/

[4] The total recurring annual amount of KE funding is £150m, as set out in the Annex A, Table 1 of the August 2016/16 request for institutional strategies by HEFCE. £10m is also available per year to contribute to the economic growth agendas of HEIs that are constrained by the HEIF funding cap.

Ninety-seven institutions were awarded HEIF funding in 2016/17. Twenty-eight institutions were awarded the maximum funding of £2.85m in 2016/17; therefore, 53% of the £150m core funding is distributed to 29% of institutions. Figure 2.1 below has a chart to illustrate the scale and distribution of the 2016/17 allocation across England.

Figure 2.1: Distribution of HEIF 2016/17 allocation by region



Source: HEFCE; PACEC

The current request for strategies covers the five-year period 2017/18 to 2021/22. From 2017/18 onwards, there will be annual allocations of HEIF funding. Institutional allocations will therefore vary, though there is intended to be significant stability through use of a capped annual modifier. However, these allocations will be secured against the institutional strategies assessed as described in this report, which are intended to be long-term, and hence strategies provide evidence on anticipated use of HEIF over multiple future years.[5]

2.1.2 Policy drivers and responses

The 2012 HEIF overview report described 'seismic shifts in the underlying landscape for knowledge exchange', driven by:

- The introduction by the research funding bodies of an impact aspect to research assessment and funding;

[5] HEFCE, 'HEFCE 2016/16', §§19–26

- The fundamental changes to the student fee regime with a greater share of the cost of undergraduate degrees being shifted towards the student;
- The effects of the economic recession; and
- The reconfiguration of the regional landscape with the abolition of the Regional Development Agencies (RDAs).

Compared to the challenges and barriers set out in the previous overview report, the KE landscape is currently relatively stable. **Local Enterprise Partnerships (LEPs)** have replaced the RDAs as the main regional bodies supporting local economic growth, and are mentioned in a number of KE strategies. The economic recession which provided the economic backdrop for the last HEIF period has ended; however, the return to national growth has been slow, and there are continuing pressures on public expenditure affecting all government services. The vote to leave the European Union (EU) may have destabilising effects; most directly, there are potential consequences for KE related to EU funding for research and regeneration (especially European Structural and Investment Funds, ESIF).

Some of the key policy developments relevant to KE have occurred since the change of government in 2015 and subsequent Spending Review[6]. In particular, the Government's policy framework for economic growth and productivity as set out in the 2015 Productivity Plan[7] provides a context for the potential contribution of KE to economic growth. This sets out a framework for increasing productivity in the economy through two pillars:

- Encouraging long-term investment in economic capital, including infrastructure, skills and knowledge; and
- Promoting a dynamic economy that encourages innovation and helps resources flow to their most productive use.

Following approval of the Higher Education and Research Bill, a single research funding body, UK Research and Innovation (UKRI), will be created as a partnership of nine councils: the seven Research Councils, Innovate UK, and a new body called Research England which will perform the research and KE functions of HEFCE (the remainder of HEFCE, and the Office for Fair Access, will be merged into an Office for Students, OfS). The creation of UKRI is intended to put more strategic focus on research and innovation. The Government's rationale for restructuring the government bodies in this way is outlined in a 2016 knowledge economy White Paper[8].

HEFCE's response to evolving government policy on KE has included steps to develop a KE framework, as initially requested in the Government's 2014 science and innovation strategy[9] and then developed in the 2016 knowledge economy White Paper. This framework is focused on continuous improvement in KE intended to increase efficiency and effectiveness of publicly funded

[6] HM Treasury, 2015, 'Spending Review and Autumn Statement 2015', *Cm 9162*

[7] HM Treasury, 2015, 'Fixing the foundations: Creating a more prosperous nation', *Cm 9098*

[8] BIS, 2016, 'Success as a knowledge economy: Teaching excellence, social mobility and student choice', *Cm 9258*

[9] BIS/HMT, 2014, 'Our plan for growth: science and innovation', *Cm 8980*

KE. A steering group chaired by Professor Trevor McMillan has been established to develop the framework; its first publication has been a report on good practice in technology transfer[10].

Since HEFCE's request for 2016/17 strategies, and their submission, the Department for Business, Energy and Industrial Strategy (BEIS) have published a Green Paper[11] and consultation on the Government's proposed industrial strategy, including ten 'pillars', or areas where evidence shows that growth can be generated. These include investment in research and development, more highly skilled people, better infrastructure, more affordable energy, and higher rates of capital investment. The role of HEFCE and UKRI in stimulating KE and commercialisation is directly relevant to the pillar of investment in science, research and innovation, which states "we must become a more innovative economy and do more to commercialise our world leading science base to drive growth across the UK."

Some institutional responses to these policy developments, as set out in the strategies, are covered in Section 4.1 of this report.

2.2 Assessment of strategies

In November 2016, HEFCE provided 97 institutional KE strategies for the project team to assess. HEFCE and PACEC agreed a methodology for assessing and analysing strategies.

These are the key documents that were used throughout the strategy assessment process, and are referenced in this report:

- **HEFCE August 2016/16**: HEFCE's formal request for strategies from HEIs in receipt of 2016/17 HEIF allocation, including detail on the policy context for the fund12. The request is accompanied by three annexes:
- **Annex A1**: The template for institutional strategy submissions. This is subdivided into 14 questions for institutions to answer in the space provided (with word limits for each question) to give evidence that their strategies are suitable for HEIF funding.
- **Annex A2**: An Excel workbook to be completed by HEIs to give financial details to support their answers to Questions 9 to 11 in Annex A1:
    - Table A: The percentage of the university's KE output, by category, which can be attributed explicitly to HEIF (for aggregate analysis only)
    - Table B: Breakdown by category of the expected use of the year's HEIF allocation (to inform annual monitoring)
- **Annex B**: HEFCE's guidance notes for completing the institutional strategy templates.

The strategies were assessed against three criteria as set out in HEFCE 2016/16:

1. The HEI has a sound strategic approach to KE, in line with its individual corporate strategies and core institutional mission, and linked with appropriate management systems.

[10] HEFCE, 2016, 'University Knowledge Exchange (KE) Framework: good practice in technology transfer'. See http://www.hefce.ac.uk/pubs/rereports/Year/2016/ketech/

[11] BEIS, 2017, 'Building our Industrial Strategy'

[12] See the relevant documentation at http://www.hefce.ac.uk/pubs/year/2016/201616/

2. The HEI provides assurance that management of its KE activities is robust, including demonstrating that efficiency and effectiveness in KE activities is being actively sought.
3. HEIF is being spent in line with the overall objectives of the programme, and appropriately in the context of the institution's overall strategic approach to KE, and government and HEFCE policies and priorities.

Our methodology for assessment was structured around the three criteria above, plus a holistic assessment of the strategy as a whole. As in the assessment system for the 2011-15 HEIF round, this element allows the strategy assessor to record their views on the strength, clarity and suitability of the strategy for funding release based on a holistic reading of the strategy.

The template for submission of institutional strategies has a series of set questions, accompanied by guidance on which elements need to be covered in each question. However, HEIs have freedom to describe their strategies in terms and language that are appropriate to them. It is therefore difficult to compare and summarise these all together, but we have been able to draw out some of the common features and also make recommendations for exceptional strategies for commendation through the threefold discipline of scoring the strategies and summarising the evidence for each score, our moderation meetings where the features of the strategies (and their scores) were discussed, and our work to create a searchable database of strategies.

The remainder of this overview report addresses:

- the key aspects of institutional strategies (Chapter 3);
- the alignment of strategies with other national policy priorities (Chapter 4);
- the expected outcomes and impacts of institutional strategies, and how they are to be monitored (Chapter 5);
- approaches to collaboration between HEIs (Chapter 6); and finally
- what HEIF is expected to be spent on (Chapter 7).

3 THE KEY ASPECTS OF INSTITUTIONAL STRATEGIES

3.1 The KE objectives of institutions

Institutions have a variety of objectives for KE according to their overarching strategic goals, their environment and specialisms; however, there are some patterns and commonalities among the responses, and there are some objectives that appear to have become more important to institutions since our own analysis of strategies for HEIF 2011-15[13]. Institutions typically specified up to six KE objectives in their strategies.

The objectives most commonly cited by institutions were:

- Engagement activity and development of external partnerships (with e.g. industry, other universities): 77%[14] of institutions;
- Research to address major societal challenges or have more societal impact: 61%;
- Meet the needs of businesses and industry (e.g. enterprise support; co-creation of research and curriculum): 60%;
- Support economic development, at a spatial context ranging from local to national (mainly at the regional level, e.g. as an 'anchor institution'): 57%; and
- Support enterprise and entrepreneurship, for students and/or staff: 56%.

The **development of collaborations with other HEIs and partnerships with industry** is the most prevalent issue across institutions in their institutional strategies. Other significant objectives for institutions included **prioritisation of support to specific sectors, exploiting synergies with research and teaching, development of the physical KE infrastructure and internal embedding and efficiency in KE.**

3.2 External economic and societal partnerships

Collaborations with other HEIs for the purpose of achieving greater effectiveness and efficiency in KE are investigated in depth in Chapter 6. Regarding partnerships with organisations other than HEIs, some universities are developing an engagement strategy (e.g. University of Central Lancashire; Teesside University; University of Kent; and Durham University) in order to support their interaction with partners.

Specialist institutions, and those with the largest research income, are more likely to have formed significant ongoing collaborations with organisations outside the HE sector such as large companies. For example, Durham University has Procter & Gamble as its main collaborator at the institutional level, whereas the Royal College of Art identifies museums across London as its significant collaborators. Cranfield University has a KE key performance indicator (KPI) to "create and formalise a new partnership with at least one business each year for the next five years". As a specialist institution in science and technology research, Cranfield's KE activity is largely "driven by

[13] PACEC/HEFCE, 2012, 'Strengthening the contribution of English higher education institutions to the innovation system: Knowledge exchange and HEIF funding', *HEFCE*

[14] There was no recommendation or limit on the number of objectives for each institution; the percentages cited here therefore sum to more than 100%.

[its] industry sector focus" according to its institutional strategy, evident from major strategic partnerships with organisations such as the Atomic Weapons Establishment (AWE) and the Defence Science and Technology Laboratory (DSTL).

As another example of a strategic partnership the University of Warwick identifies Tate Exchange as one of its major collaborators.

> *"Tate Exchange is a new project for the Tate Modern, that sets out to create a common space for the public to debate contemporary topics and ideas, get actively involved, and make a difference themselves. […] The Tate Exchange will work in response to a theme each year, co-developed with Warwick and other Associates, allowing our researchers to collaborate with other Associates across disciplines and sectors in order to generate new perspectives, provoke debate, stimulate creativity and create new collaborations. […] This partnership with a prestige organisation also offers our researchers the opportunity to rethink the ways in which their work could be of relevance and interest to those outside the academy, and to develop non-traditionally academic outputs with Tate staff and partners in the form of exhibitions, events, co-created digital content, etc."*
>
> —University of Warwick strategy

3.3 Trends/drivers, barriers, and enablers of KE activity

Institutions were asked to describe the **trends and drivers** of opportunities for KE, as well as the **barriers and enablers** of KE activity. Some institutions listed barriers and enablers separately, whereas others outlined (internal) enablers that would address barriers.

In terms of **trends and drivers** that affect KE activity at institutions, there are significant recurring trends mentioned by institutions, as follows:

- Institutions have identified changes in national education policy, namely the Teaching Excellence Framework (TEF) and Degree Apprenticeships as opportunities to develop their activities.
- Developing research excellence is a priority for institutions, and its relationship with KE can be symbiotic: KE can be used as a means of generating more economic and social impact from research; the development of research portfolios can provide more opportunities for KE.
- There is a sector-wide drive to develop collaborations and strategic partnerships as a means of achieving goals such as regional economic growth and fostering open innovation.
- The impact of Brexit on KE activity was commonly identified as a driver of future change. Institutions typically link Brexit to uncertainty in their funding, particularly around research funding and the funding of initiatives through the European Structural and Investment Fund programme.
- The trend in the national public spending environment is for reduced expenditure. HEIs can have lower resources internally to dedicate to KE activity as a result of this. In addition, their public sector partners (e.g. local authorities and LEPs) have fewer resources available to participate in KE projects (e.g. projects relating to the transformation of public services). The HEIs report that to counter this trend they are diversifying their partnerships with a wider range of potential organisations with the resources to support joint KE activity.

Significant **enablers** identified by institutions included the following:

- HEIF funding is valued by institutions as a key enabler of KE activity. It adds value to institutional strategies by catalysing activity and helping to build capacity – this is a key finding of previous HEIF evaluations and KE studies, and a small group of HEIs explicitly mentioned it in their strategies when describing their priorities for use of HEIF. The flexibility of HEIF funds is valued by institutions and used to fund various aspects of KE activity depending on institutional needs.
- Investment by institutions as part of wider corporate plans (e.g. for campus and facilities) is complementing KE activities. For example, the creation of new institutes or research centres may link with institutional goals to promote regional economic growth and develop the curriculum.
- The development of partnerships with external bodies particularly businesses is enabling institutions to leverage additional funding sources.
- There is a trend towards KE being embedded in HEI corporate plans, which has enabled a number of different KE activities to take place through teaching as well as commercialisation. For example, the incorporation of entrepreneurial activities in the curriculum for students may lead to a greater number of student start-ups.

These are some of the main **barriers** to KE activity:

- Low resourcing for KE activity is an issue for some institutions. This can be driven by factors such as low prioritisation for KE internally in the context of the overall size of an institution (by number of FTE staff) and its access to funding, and the availability of the necessary professional skills to engage and exchange knowledge.
- Access to specialist facilities or suitable space is also an issue for some institutions. The cost of appropriate facilities and real estate is a barrier, particularly in areas such as London where land values are high.
- Where there is low appetite from businesses for joint working with HEIs, linked to low absorptive capacity to recognise, fund and adopt new technology, this can be a barrier to KE. This is especially an issue for research-intensive industries such as the life sciences, due to finance issues faced by small companies, particularly at the 'proof of concept' stage of research commercialisation, described as the 'valley of death'[15].
- Following parliamentary approval of the Higher Education and Research Bill, there will be reward systems in institutions in response to the TEF. This is an example of internal pressure within institutions to focus attention on teaching excellence, which are identified as reducing the incentive for academics to engage in KE activity.

[15] House of Commons Science & Technology Committee, 2013 'Bridging the valley of death: improving the commercialisation of research'

4 ALIGNMENT OF STRATEGIES WITH OTHER NATIONAL POLICY PRIORITIES

4.1 Alignments with the 2015 Government Productivity Plan

The policy landscape for HE continues to evolve, with some of the key policy developments occurring since the 2015 Spending Review. As a consequence, institutions are expected to take into account the Government's new policy priorities over the next five years in **economic growth and productivity.**

The Government's main policy for achieving these goals was outlined in the Productivity Plan (2015)[16]. The Industrial Strategy Green Paper[17] is consulting on specific recommendations for investment in science, research, and innovation, but was published subsequently to the call for strategies and is not directly referenced here.

Some of the areas in which universities are expected to contribute to these priorities, with reference to sections of the Productivity Plan and further information incorporated from the 2016 White Paper on the knowledge economy (by section, marked §x.x), are as follows:

- §8.7: Universities are encouraged to be involved in **Science and Innovation Audits (SIAs)** and other regional strategy/mapping exercises. These are regional exercises for benchmarking regional strengths in innovation, first announced in 2015. Five consortia were funded to undertake SIAs in the first wave, and eight more in 2016; the third call for expressions of interest was in January 2017[18].
- §§8.8 and 15.14: The Government encourages universities to **strengthen local collaboration**, wherever this will achieve key objectives. The Government has identified 'successful models', such as the N8, the M6 and the GW4 consortia[19].
- §4.7: The Government is introducing the **TEF** to give greater incentives for institutions to provide excellent teaching (not only excellent research). This is seen as a major means to improve the efficiency and effectiveness of universities' teaching activities.
    - The new Office for Students will be the regulatory body for the TEF.

[16] HM Treasury, 2015, 'Fixing the foundations: Creating a more prosperous nation', *Cm 9098*

[17] BEIS, 2017, 'Building our Industrial Strategy'

[18] First wave and second wave SIA reports are available online. For more information on SIAs see the call for expression of interests: https://www.gov.uk/government/publications/science-and-innovation-audits-submit-an-expression-of-interest

[19] The N8 Research Partnership comprises the eight most research-intensive universities in the North of England: Durham, Lancaster, Leeds, Liverpool, Manchester, Newcastle, Sheffield and York. Midlands Innovation (M6) is a research and innovation partnership comprising the Aston University and the universities of Birmingham, Leicester, Loughborough, Nottingham and Warwick. The GW4 Alliance brings together the 'Great West' universities of Bath, Bristol, Cardiff and Exeter. All 18 institutions except the University of Cardiff currently receive HEIF funding.

Universities have attached great importance to these policy developments, judging by their inclusion in the institutional strategies in the sections on strategic objectives, evidence base, and fit with national policy. They are particularly engaged in the series of **SIAs**, often as heads of regional consortia**.** The SIA bids have been a springboard for institutions to collaborate with regional partners and to identify how they can contribute to the region's innovation strengths. For example, Lancaster University is 'building on the recommendation' of the Lancashire and Sheffield SIA (co-developed with the University of Sheffield), which addresses issues such as how regional innovation actors can drive the development of Industry 4.0[20] in manufacturing supply chains in northern England. The largest SIAs have involved many universities: 27 in the case of the Midlands Engine SIA in the first wave, and 16 in the Innovation South SIA approved in the second wave.

Universities have contributed to developing the evidence base in SIAs and there are examples of institutions that have framed their target sectors for KE around **regional policy strategy**, for example:

- The University of Salford: its overarching goal to develop sector-specific Industry Collaboration Zones will target sectors of importance to both the university and the region. The local LEP, councils and other policy stakeholders were consulted in the development of the proposed activities and encompass regional strengths such as engineering and health. The institutional strategy has built upon pieces of evidence such as reports on Greater Manchester's manufacturing strategy and health devolution agenda.
- The University of Wolverhampton: the institutional strategy is 'fully integrated' with relevant regional Strategic Economic Plans and the target sectors of its KE activity have been mapped to different spatial levels, including local, Midlands Engine, national and international levels.

Other regional economic engagement is focused on collaboration with **LEPs**, which have been in place since the start of the last 2011-15 HEIF rounds as the successors to Regional Development Agencies (RDAs) as the main bodies that support local economic growth. LEPs have promoted networks between industry, universities and other local stakeholders. The LEPs are recognised as major policy actors by institutions and KE strategies have a LEP focus as a result, as evidenced by the strategic responses on collaboration, fit with policy, and the evidence base for the strategies. Some universities have particularly focused on local growth: e.g. the University of Northampton and the University of Hertfordshire. The evidence base for engagement with local businesses is frequently drawn from the strategic economic plans of LEPs and local councils, and in some cases the HEIs have collaborated in the production of the evidence bases, e.g. by conducting surveys of businesses.

As well as a regional geographic focus, the strategies contain evidence that some institutions are seeking to target their activities in industrial **sectors,** which are themselves sometimes aligned to sub-regional innovation policy: some universities explicitly identify their target sectors as those identified by LEPs and the SIA evidence bases. Some common sectors include:

- Creative and digital: particularly in London and major cities;

[20] Industry 4.0 refers to the 'fourth' wave of industrialisation, driven by the use of smart technology and cyber-physical systems in the manufacturing process.

- Life sciences: transformation in the delivery of public health goals and world-leading research, with clusters in the South and East around Oxford, Cambridge and London;
- Advanced manufacturing and engineering: particularly in areas covered by the Midlands Engine, the North East and counties such as Lancashire and Yorkshire; and
- Other sectors with a strong reliance on inputs from science, technology, engineering and mathematics (STEM) disciplines (nationally).

Some institutions have framed the focus of their KE activities across **research/innovation themes** and in a few cases have done internal restructuring to target activity, for example:

- The University of Reading has set out KE initiatives in its strategic research areas e.g. food research, the environment, heritage and creativity; and
- London South Bank University (LSBU) has developed Enterprise Institutes that map to the priority sectors of Innovate UK. The KE strategy outlines three reasons for adopting a sector focus for these institutes, including fostering further university-business collaboration.

There is evidence that institutions across the sector have become **increasingly international** in the scope of their KE activities compared to the previous exercise in 2010. For example, the University of Central Lancashire has established strategic partnerships in China and Mauritius. St George's, University of London, also has many activities linked to new international opportunities, namely its partnership with the University of Nicosia Medical School.

All institutions have **collaboration with HEIs to improve their KE** as a critical element to their strategies and Chapter 6 explores institutions' approaches to collaboration with other HEIs in detail. Chapter 6 also examines how institutions can maximise the success of collaboration.

Some institutions are also using KE activity to enhance their **teaching excellence.** For example, the University of Salford "will direct its KE activity to enhance [its] research and input into teaching excellence to deliver sustainable growth" and the University of Lincoln is increasing the opportunities for work placements as part of its aim to deliver teaching excellence. The University of Gloucestershire also intends to change its course delivery through "more intensive business engagement and KE activity, resulting in improvements in student satisfaction". King's College London is a noteworthy example of an institution that has the importance of student experience and the competitive nature of the student marketplace as key elements of its strategy; the evidence base for King's had a focus on feedback relating to student experience.

4.1.1 Improving interactions with businesses

The 2015 Productivity Plan, in its section on 'high quality science and innovation, spreading fast' makes reference to Dowling Review[21] recommendations on making it easier for business to find help and support from universities and government. Changes to **enterprise support** and the **access points** for partners, to make it simpler for businesses to locate and engage with universities, are common across institutional strategies. A few universities refer specifically to making the 'front door' to external partners more accessible or a simplified offer to partners, e.g.:

[21] BIS, 2015, 'The Dowling Review of Business-University Collaborations', BIS/15/352

- The University of Central Lancashire (UCLan) will "build on the UCLan Centre for SME development as a doorway into the university, facilitating all types of knowledge exchange engagement".
- Aston University says that it will achieve its improvements in intellectual property (IP) and technological development "predominantly through [its] Business Front Door Strategy".
- Nottingham Trent University will have a new Compacts and Commercial Services Team to deliver a "simplified offer to business and the professions" and "improved co-ordination of all the university's business-facing functions".
- The University of Huddersfield aims to locate its new Business Engagement Centre, a 'comprehensive business engagement and support facility', at its 3M Buckley Innovation Centre.

Some institutions are restructuring their business interfaces so that they have identities that are more approachable for businesses. For example, the Enterprise Institutes referred to above have allowed LSBU to restructure its enterprise support by developing a tailored sectoral offer to businesses. The rationale for this restructuring is threefold:

> *"to present the university clearly and succinctly to potential collaborators, mapping areas of expertise to broad sectors, rather than academic discipline; foster cross-discipline collaboration within LSBU to help build new relationships, collaborations and ideas; and provide the infrastructure to positively support university-business collaboration through specialised and dedicated resource."*

LSBU sought to map its institutes to Innovate UK and Research Council sectors. For example, the LSBU's Global Challenges Institute corresponds to the goals of the Global Challenges Research Fund and the Health and Wellbeing Institute.

5 OUTCOMES AND IMPACTS OF INSTITUTIONAL STRATEGIES

5.1 The headline outcomes and impacts

A new feature in this round of HEIF strategies was to ask HEIs to provide information about their outcomes and impacts on the economy and society. It has become a critical issue for Government to demonstrate wider societal impact from KE activity, rather than undue focus on generating income. Finding evidence for these impacts is a difficult challenge given the diversity of the economic and societal partners to HEIs, and hence the wide range and large number of potential outcomes and impacts. This chapter therefore discusses the format and approach to describing outcomes and impacts used across the sector in some detail. It also suggests ways in which reporting structure might be improved in future. It also shows in aggregate for the HE sector the outcomes and impacts that are intended to be delivered. This chapter may help HEIs improve in setting strategic goals and measuring success, but may also help HEFCE in improving format and guidance in requesting this information in future exercises.

5.2 Good practice in monitoring outcomes and impacts

The Magenta Book[22] is a publication of HM Treasury setting out recommended central government guidance on evaluation. It sets out the concept of the theory or 'logic model' describing a government policy intervention. Logic models describe the relationship between the following characteristics of an intervention:

- The **inputs**: the resources required to achieve the policy objectives;
- The **activities**: what is actually delivered to a recipient (e.g. a training course);
- The **outputs**: what the recipient does with the resources (e.g. successful completion of the course);
- The **outcomes**: the intermediate effects of the intervention (such as jobs or turnover generated, or reductions in costs); and
- The **impacts**: the wider economic and social outcomes (such as changes in personal incomes and wellbeing).

Logic models provide a useful framework for defining what the aims and objectives of the strategies are and how they will be met. Use of logic model terms in the strategies is important as they can: [23]

- Inform the evidence base of KE strategies;
- Guide the data collection and monitoring processes; and
- Inform the objectives of a policy or strategy.

While there were many examples of strong strategies that did not use a formal and high-level logic model for impacts and outcomes, we recommend that institutions should at least use a range of logic model terminology to make their strategies effective. In doing so, institutions will develop a clear rationale for their activities and KPIs that can be used to monitor them.

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[22] HM Treasury, 2011, 'The Magenta Book: Guidance for evaluation', *HM Treasury* PU1120

[23] See §5.7 in Part B of the Magenta Book for the relevant reasons outlined here.

5.2.1 HE Sector-wide outcomes and impacts

The intended outcomes and impacts of KE strategies vary across institutions, but there are commonalities across them. For the purposes of this exercise, the outcomes and impacts across the sector have been grouped under four headings, outlined below and explored in depth in Table 5.1.

- **Business, public and third sector benefits:** direct benefits to partners/clients involved in KE activities at a transactional level. Benefits to business typically concern business performance, whereas benefits to public and third sector partners are more focused on the delivery of services.
- **Social and community group benefits:** benefits to individuals (e.g. improved wellbeing) and communities. This encompasses direct benefits such as new facilities for community use and wider benefits such as the promotion of cultural heritage.
- **Wider economic and social benefits:** effects that accrue in the wider economy, beyond the areas in which an institution operates. The benefits can be at different spatial levels, ranging from the local level (e.g. local economic growth) to the international level (e.g. improvement in public health in developing countries).
- **Institutional benefits:** outcomes and impacts that are internal to institutions, which include contributions to delivery of core missions of teaching and research, staff and student capabilities to do KE, and development of internal structures and capabilities to support KE toward external benefits (for example, KE offices). These benefits can affect institutional culture, as well as staff and students.

These categories build upon those established in PACEC's evaluation of the non-monetised benefits of HEIF for HEFCE[24]. A fourth category – institutional benefits – has been added for this report as some institutions expressed the effects of KE activity on their staff and students in considerable detail. Institutions were signposted to the categories in the strategy completion guidance provided by HEFCE and they appear to be a useful guide for institutions in articulating their headline outcomes and impacts. Table 5.1 seeks to conceptualise the outcomes and impacts across the sector more formally, in addition to outlining the different beneficiary groups identified by institutions.

[24] PACEC, 2015, 'Evaluating the non-monetised achievements of the Higher Education Innovation Fund', *HEFCE*

Table 5.1: Overview of outputs, outcomes and impacts across institutional strategies

Category	Outputs, outcomes and impacts	Beneficiaries
Business, public and third sector benefits	**Outputs** • Placements for staff and students • More services for businesses (e.g. Knowledge Transfer Partnerships (KTPs), continuing professional development (CPD), executive education, incubation support) • Businesses assisted/supported (e.g. through enterprise support initiatives) • Business spin-outs and start-ups • New university–industry partnerships **Outcomes/Impacts** • Job creation or job safeguarding • Product and process innovation • Improvement in business performance (e.g. profit, productivity, turnover, lower costs) • Technology transferred • Transformation of public service delivery models	• Small and medium-sized enterprises (SMEs) • Large companies • Start-ups • Public services in local authorities • Social enterprises and charities
Social and community group benefits	**Outputs** • New facilities for community use (e.g. sports or other community assets) • New services for local groups and residents (e.g. from social enterprises) **Outcomes/Impacts** • Greater engagement with local community • Economic regeneration • Skills development of local residents • Higher retention of graduates • Public engagement in research • Direct benefits from volunteering activity • Development of culture and promotion of cultural heritage	• Individuals • Communities • Public services (national and local) • Third sector services

Category	Outputs, outcomes and impacts	Beneficiaries
Wider economic and social benefits	**Outcomes** • Highly-skilled, employable and entrepreneurial graduates • Synergies between KE activity and capital investment • Greater linkages in supply chains • Reduction in national skills shortages • Widening of participation in HE • Influence on policy agendas (especially local to national levels) **Impacts** • Commercialised research (e.g. patents) • Improvements in public health (e.g. from local to international levels) • Higher social capital • Higher economic productivity • Inward investment in local area • Economic growth; Gross Value Added • Job creation or safeguarding (including indirect effects)	Society and individuals within many spatial contexts: • Local • Regional • National • Continental • International

Category	Outputs, outcomes and impacts	Beneficiaries
Institutional benefits	**Outcomes** • Skills development of staff and students (e.g. enterprise skills) • More interdisciplinary approaches • Expansion in research portfolio • Strengthened innovation system • More accessible interface with potential partners and clients • More industry-relevant curriculum (e.g. via Degree Apprenticeships) • More activity through strategic partnerships • Risk-sharing and co-ordination of resources with partners (efficiencies) **Impacts** • Diversification in income streams • Reputational impacts (e.g. improvement in research excellence performance) • Co-location of high-value businesses and organisations (clustering and network effects, e.g. at innovation centres or science parks) • Internationalisation of activities	• Academics • Early career researchers • KE staff • Students

Source: PACEC via institutional strategies

5.2.2 Monitoring of outputs, outcomes and impacts

Part B of the Magenta Book contains a suggested **framework for structuring data collection** (in Chapter 7 – 'data collection'), which can be applied to the KE strategies. This framework has eight key considerations for designing and implementing a monitoring system:

- What data need to be gathered to give reliable and consistent measurement against a policy's objectives?
- What additional data should be collected to meet the policy maker's requirements for feedback on the policy and to support any planned evaluations?
- Who will have responsibility for gathering data?
- When will the data be gathered?
- What are the key timeframes for collection?
- How will the data be gathered, transferred and stored?
- What format are the data required in?
- How will the data be verified to ensure they are accurate and consistent with the relevant requirements?

Table 5.2 applies this framework with examples of monitoring information presented by institutions across their strategies.

Table 5.2: Examples for an effective KE monitoring system

Key considerations for an effective monitoring system	Relevant examples from KE strategies
What data need to be gathered to give reliable and consistent measurement against a policy's objectives?	Mixture of qualitative and quantitative data (not exhaustive): Data at this level should measure the outputs, outcomes and impacts Examples include: • Higher Education – Business and Community Interaction (HE-BCI) survey returns • Economic metrics (e.g. Gross Value Added) • Partnership data (e.g. deal value) • Project uptake (e.g. number of beneficiaries) • Project outputs (e.g. number of active KTPs) These should form KPIs or targets.
What additional data should be collected to meet the policy maker's requirements for feedback on the policy and to support any planned evaluations?	• Evidence of linkage to relevant strategies • Financial data (e.g. project expenditure) • Monitoring and evaluation (M&E) feedback • Stakeholder surveys • Feedback from partners • Post Project Evaluation Reports
Who will have responsibility for gathering data?	Staff within faculties; project managers; KE staff and committees (e.g. Enterprise Sub-committee)
When will the data be gathered? **What are the key timeframes for collection?**	Specify a frequency for specific datasets or for the whole data monitoring process: e.g. monthly, quarterly, and annually Alignment of data collection timing with reporting processes

Key considerations for an effective monitoring system	Relevant examples from KE strategies
How will the data be gathered, transferred and stored? **What format are the data required in?** **How will the data be verified to ensure they are accurate and consistent with the relevant requirements?**	• Partnership data (e.g. deal value) collected and monitored on a customer relationship management (CRM) system • HE-BCI data analysis and statistics prepared for executive reports on progress • Data collected with the original purpose of monitoring projects based on funders' requirements (e.g. ESIF-funded projects) • Various sources of data collected together in a dashboard or scorecard • Data monitoring reports monitored by a range of committees, sub-committees, boards and staff • Post Project Evaluation Reports completed by an independent assessor/evaluator – either within the university or by external provider.

Source: Magenta Book Part B; PACEC

Other approaches which could inform HEI process and practice include the following:

- UK Evaluation Society, 2013, 'Guidelines for good practice in evaluation': a short set of guidelines set by the UK Evaluation Society, accessible to readers of any discipline or level of experience in evaluation; and
- Higher Education Academy, 2016, 'Evaluating teaching development activities in higher education': an evaluation toolkit designed for providers of CPD in HE. There are 12 evaluation templates for different activities expressed in the toolkit. The activities of focus are CPD and teaching, but the templates and principles described in the toolkit could give inspiration for data monitoring processes, e.g. 'evaluating satisfaction with an activity' and 'deciding which method(s) to use in evaluation'.

5.2.3 Classification of outcomes and impacts under headings

Institutions specified their outcomes and impacts in a range of ways, based on what seemed appropriate given how they structured their strategies. The grouping of outputs, outcomes and impacts under headings varied between institutions. For example, institutions mapped their outcomes and impacts to their KE objectives, the category of outcome/impact (e.g. business benefits), KE activities, outputs and any monitoring detail (e.g. indicators/measures of progress). Below are some indicative examples of how institutions classified their outcomes and impacts**.**

- Broad collections of outputs, outcomes, and impacts, grouped under institutional objectives (e.g. University of Lincoln, University of East Anglia)

Corporate Plan principle	Outputs/outcomes/impacts
Teaching Excellence and a	• Increasing the number of placement and work experience opportunities as a result of fostering 'wide and deep' industrial relationships across a

Corporate Plan principle	Outputs/outcomes/impacts
Great Student Experience	range of different interventions • Achieving high levels of satisfaction in all student related surveys - engagement of industry with the curriculum design and delivery provides them with the skills and research they need to grow and develop, but also provides our students with a high quality learning experience

- Separation of outcomes, impacts, and *types* of impacts, all grouped under an institutional objective (e.g. Brunel University)

Key Priority	Intended Outcome	Intended Impact	Type of Impact
Priority 1	• Outcome 1 • Outcome 2 • Outcome 3	• Impact 1 – not necessarily linked to Outcome 1 • Impact 2 • Impact 3	• Type 1 – not necessarily linked to Impact 1 • Type 2

- Categories of benefits (or beneficiaries), each with a collection of outcomes and impacts, and a set of activities to deliver them (Liverpool School of Tropical Medicine; St George's, University of London; Teesside University)

Category	Outcomes/impacts	Activities
Category of benefits (or beneficiaries)	• Outcome 1 • Outcome 2 • Impact 1 • Impact 2	General description of the set of activities intended to realise these benefits

- A grid of categories (e.g. objectives), and benefits (sub-categorised by type of beneficiary), showing which benefits are realised by which objective. (The University of East Anglia again, elsewhere in its strategy)

	Benefits by category					
	Business benefits			Wider benefits		
Priority objectives	**Bus 1**	**Bus 2**	**Bus 3**	**Wide 1**	**Wide 2**	**Wide 3**
Objective 1		✓	✓		✓	✓
Objective 2	✓			✓	✓	

- A category (such as type of beneficiary) with sets of outputs, the outcome associated with each output, and a KPI for measuring each outcome (e.g. Royal Holloway, University of London)

Beneficiary sector	Outputs	Outcomes/benefits	Monitoring info
Sector 1	Output 1a	Outcome 1a	KPI 1a
	Output 1b	Outcome 1b	KPI 1b
Sector 2	Output 2a	Outcome 2a	KPI 2a
	Output 2b	Outcome 2b	KPI 2b

- List of outcomes and impacts, plus a set of relevant KPIs (Salford, Middlesex, Derby, Nottingham Trent)

e.g. "By 2021, Salford will deliver the following outputs, outcomes and impacts:

  - A substantial increase our HE-BCI returnable outcomes to £22m
  - A quantifiable growth in our social and economic impact benchmarked from our social and economic impact report across the main categories by 15%
  - …"

Examples of these specifications from institutional strategies are presented in **Appendix 2.** In a few cases, institutions produced two specifications that inter-linked: for example, the University of East Anglia presents one table structured as 'Objective \\ Outcome/impact' and another of the format 'Category \\ Outcome/impact \\ Indicators/measures', so that detail on monitoring can be mapped to areas of outcome and impact clearly.

The Liverpool School of Tropical Medicine (LSTM) has a particularly novel approach to specifying the outcomes and impacts of its KE activities. The strategy has a table that maps each 'significant' outcome/impact to ten areas of KE activity (Q4 response). See the excerpt in Table 5.3 below. For example, activities under 'OI 2'[25] are for 'Establishing basic research that defines the optimal placement of vector control prevention tools for malaria, dengue and leishmaniasis'.

These areas of activity appear to be based loosely on Technology Readiness Levels (TRLs), as the later groupings of activity concern the development of routes to market for drugs and the middle stages focus on clinical trials.

Question 12 of the strategy template asks for information on how the HEIF 2016/17 allocation will be used to deliver the strategy, and what the priority areas of expenditure are. The institutional responses make it clear that all activity areas excluding 'OI 5' to 'OI 7' will receive HEIF funding. Therefore from the detail given in the LSTM strategy, it should be possible to **trace the additionality of HEIF funding on KE outcomes and impacts.**

[25] The abbreviation for 'OI' is not outlined in the strategy, but these categories relate to areas of KE activity.

Table 5.3: LSTM – significant outcomes and impacts mapped to ten areas of activity (excerpt)

Mapping of Significant Outcomes and Impacts	OI1	OI2	OI3	OI4	OI5	OI6	OI7	OI8	OI9	OI10
Business (public and third sector) benefits										
Skills for KE to understand issues and develop ideas and solutions	✓			✓	✓		✓		✓	✓
Benefits to start-up/spin-out businesses. Consolidated start-ups and improved management to achieve business growth	✓				✓			✓		
Improved innovation, the development of technology and IP through testing and application to products and services	✓	✓	✓	✓	✓	✓		✓		
The successful development of marketable products and processes	✓	✓	✓	✓	✓	✓		✓		✓
The commercialisation of IP and products and services	✓		✓	✓	✓	✓		✓		
Improved business performance (sales, employment opportunities, productivity, profits)					✓			✓		

Source: Liverpool School of Tropical Medicine strategy

5.2.4 Explicit differentiation between short- and long-term outcomes and impacts

A specification of **outcomes and impacts** by their timescales enables routine monitoring of KE activity to be more transparent within the institution and with external bodies. The differentiation between short- and long-term outcomes and impacts also makes elements of the strategy 'time-bound' (as in the specific, measurable, achievable, relevant and time-bound (SMART) goals). These can be accompanied by annual targets linked to activities, outputs, and some outcomes (in the short-term), three-year outcomes and impact targets (medium-term), and five-year impacts (long-term).

The Royal Veterinary College (RVC) structured its intended headline socio-economic impacts into short- and long-term impacts. The short- and medium-term impacts accrue within five years, so they fit within the scope of the strategy period. There are long-term impacts beyond five years identified by the RVC, which concern economic growth and impacts on wellbeing. The RVC's specification of outcomes and impacts by timescales is outlined below.

"The socio-economic impacts of the Royal Veterinary College's Strategy are expected to be:

- *Short- to medium-term (one to five years): improved support offered to the RVC's strategic partners and other clients in industry, government and academia, resulting in financial and other benefits for these client organisations (e.g. exchange of know-how through networking; placement of skilled specialist graduates; licences for the use of RVC's intellectual property, leading to the development of new products and services; access to specialist equipment, clinical services and experimental animal facilities; evidence-based policy-making; improvements in animal husbandry, resulting in more sustainable farming practices in the UK and overseas);*
- *Longer term (beyond five years): we envisage that by focusing on the RVC's core strengths and resources, implementation of our KE Strategy will contribute to growth in the UK economy, notably in London and SE England, while also providing benefits internationally in terms of supporting advances in One Health (human and animal medicine, health and well-being)."*

The University of Liverpool (UOL) has seven KE **objectives** and most of them have timescales specified, so that the strategy's short-term and long-term objectives are clear. For example, "UOL will enable and accelerate KE through priority partnerships, aligned to our priority research themes (by 2021) and by developing a partnership framework to support learning across the sector (by 2018)."

This specification of timescales enables milestones of progress to be marked out over the strategy period, for the benefit of internal staff and external audiences.

5.2.5 Tabulation of outcomes and impacts against metrics, KPIs or monitoring information

As shown briefly in Section 5.2.2 above some institutions produced tables that map monitoring information (e.g. KPIs) to their outcomes and impacts. The typical format for such a tabulation is:

Category \\ Outcome/impact \\ Indicators/measures

Table 5.4 below sets out some examples of institutions that have provided clear tabulations of monitoring information.

Table 5.4: Good examples of tabulation, by type of tabulation

Tabular information	Examples of institutions
Each outcome/impact maps to metric(s)	• Exeter • Warwick • Roehampton • University of East Anglia
Set of outcomes/impacts maps to a set of metrics	• Wolverhampton • Queen Mary University of London • Oxford
Outline of institutional or high-level KPIs that are relevant to KE activity	• University College London • Southampton
The data sources for metrics are presented	• Kingston • Durham

Source: PACEC

The most effective monitoring systems map outcomes and impacts to metrics, typically expressed in a table. For example, the University of Exeter has five KE outcomes specified in its strategy (see Table 5.5) and has a KPI for each outcome**.**

Table 5.5: University of Exeter – outcomes/impacts mapped against metrics (excerpt)

Outcome	KPI
Strengthened business research and development (R&D) performance in Key Sectors	Growth in Business expenditure on R&D (BERD) at University of Exeter compared with the national growth in BERD
Support for High-tech and Innovative Business Cluster	Number of businesses supported in Exeter and Cornwall sector clusters or who are based at Science Park/Innovation Centre
Key skills Development and Student Engagement with Key Companies	Number of student placements/education activities with business
Strengthening the Innovation System through Business and Regional Agencies	Qualitative survey response from key regional players

Outcome	KPI
Benefits to Start-up/Spin-out Businesses	Number of jobs and new companies generated by start-ups/ new ventures over the period compared with sub-region

Source: University of Exeter institutional strategy

Other institutions have a broad set of outcomes and impacts and map them to a corresponding set of metrics. The University of Wolverhampton for example has a branching map of objectives, associated outcomes, and impact metrics. Table 5.6 below shows how this structure is used.

Table 5.6: University of Wolverhampton – outcomes/impacts mapped against metrics (excerpt)

Category	Obj(s)[26]	Outcomes/impacts	Metrics
Business (public and third sector) benefits	*1*	• Benefits to start-up/spin-out businesses. • Consolidated start-ups and improved management to achieve business growth	• 12 hot desk (launch pad facilities) utilised in SP/ACE[27] • 220 potential entrepreneurs assisted to be enterprise ready
	5	• Improved innovation, the development of technology and IP through testing and application to products and processes • The successful development of marketable products and processes • The commercialisation of IP and products and services	• 40 enterprises supported to introduce new to market/new to firm products
	4, 3	• Improved business performance (sales, employment opportunities, productivity, profits) • Increased benefits for SMEs • Support and outputs for high tech and innovative clusters/sectors	• 15 Higher Value knowledge transfer partnership interventions and 30 tactical knowledge transfer interventions a year • 200 enterprises supported to introduce new to firm /new to market products • 500 businesses referred from Growth Hub and EU projects to other University services

[26] Objective(s)

[27] 'SP/ACE for Enterprise', a facility at The University of Wolverhampton Science Park

Source: University of Wolverhampton institutional strategy

Queen Mary University of London has developed a set of indicators of progress which are directly associated with outcomes and impacts under each of its objective areas. An excerpt from their submission for a single objective area (Employability and Entrepreneurship) is shown below in Table 5.7 below.

Table 5.7: Queen Mary University of London – outcomes/impacts mapped against metrics (excerpt)

Objective area	Outcomes/impacts	Indicators of Progress (IoPs)
Employability and Entrepreneurship	• Increasing labour market benefits by ensuring QMUL students are fully prepared for the complexities of the 21st century, and that they are in the best position to be successful in further study, their career in graduate-level jobs, and their contribution to society. • Improving enterprise support for start-ups and SMEs by increasing the engagement of our students with entrepreneurship and enterprise schemes, and ensuring that there are opportunities and guidance for them to exploit innovative ideas in commercial products or services.	• A 100% increase in the number of individual students using entrepreneur support services by 2018/19. • A 100% increase in number of student businesses still trading two years after receipt of QMUL enterprise funding by 2018/19. • To increase year-by-year the percentage of Queen Mary graduates employed in graduate jobs or further study so as to at least match that of the Russell Group median in the HESA employability performance indicator data by 2018/19.

Source: Queen Mary University of London institutional strategy

University College London's KE activity is monitored on a quarterly basis through a dashboard of KPIs and metrics, which are directly linked to the strategy's intended outcomes and impacts (lettered A-I in Table 5.8 below). These outcomes and impacts are in turn grouped under four thematic groups of benefits:

- Business, Public and Third Sector benefits (outcomes/impacts A-C);
- Social and community group benefits (D);
- Wide economic and social benefits (F, G); and
- UCL Benefits (H, I).

There is therefore a complex two-way mapping from KPIs to their coordinating teams (e.g. 'Life Learning' below), and also to the four themes, shown in part in Table 5.8 below.

Table 5.8: University College London – outline of institutional KPIs that are relevant to KE activity, by managing team within University College London (excerpt) and type of benefit (A-I)

Life Learning	• Income from supported course portfolio (I) • Learner hours delivered (E) • Faculty engagement (qualitative) (H)
KE funding management	• Number and value of projects funded (A, B, D, H) • Progression rates and types: further collaboration, follow-on funding or spin-out/start-up formation (C, F, G)
Business and Enterprise partnerships	• Number of collaborative relationships supported (A, B, C, G) • Volume (number and value) of new contracts; repeat business vs new engagements (A, B, I) • Major institutional relationships and their health (qualitative) (A, C, G)
UCL Business (UCL's Technology Transfer Office and a wholly-owned subsidiary business)	• IP income to UCL (I) • Value of project portfolio (A, C, I) • Number of licence deals (A, C) • Number of spin-outs (C, F) • Portfolio of enduring spin-out businesses: jobs, turnover, investment (C, F, G)

Source: University College London institutional strategy

Effective monitoring systems have the data sources for their measures clearly specified. The framework presented in Table 5.2 (via the Magenta Book) has these points to consider on data sources: *"What data need to be gathered to give reliable and consistent measurement against a policy's objectives?* and *What additional data should be collected to meet the policy maker's requirements for feedback on the policy and to support any planned evaluations?"*

Kingston University London's strategy is one of few to tabulate its measurements against sources of data directly (see an excerpt in Table 5.9). The strategy shows whether metrics will use HE-BCI returns or local records as data sources. The table also outlines the 'additional' requirements needed for their monitoring system: e.g. the university will need to establish a single database of external organisations in order to measure key accounts. As another example of data sources being specified against metrics, Durham University shows which part of the HE-BCI return will be used for each relevant measure (e.g. HE-BCI Table 4 will be used to measure progress on spin-outs).

Table 5.9: Kingston University London – data sources for metrics are presented (excerpt)

KPI	Measurement/definition	Source	Additional requirements
Increase in Business incubation facilities for start-ups	• Number of desks/ spaces • % utilisation	Local records	Step change will occur as major new facilities are developed.
Improve graduate prospects/ employability	• Number of graduate start-ups • % of students engaging in entrepreneurship activities • New KPI to measure % programmes with industrial placements	• HE-BCI • Local records	
Increase number of key accounts	Number of relationships that demonstrate: • Repeat business/transactions • Profitable	Local records	Effective measurement will require a single University database of external organisations.

Source: Kingston University London institutional strategy

Some institutions make it clear in their monitoring systems that they have relied primarily on HE-BCI and Destinations of Leavers from Higher Education (DLHE) survey returns for tracking their progress in KE performance to date and are developing new metrics for this strategy period. For example, the University of Westminster states in its strategy that its measures are "quantified and reported via the HE-BCI return", but it is introducing new measures of success "to provide predictive indicators and to measure the intensity of engagement with our target markets".

5.2.6 Commitment to measurable outcomes and impacts

We suggest that institutions set targets or thresholds for their outcomes and impacts, so that progress can be measured against a reference point. A reference point can often be implicit: e.g. achieving 'new' strategic partnerships (or else an 'increase') has an in-built reference point of zero partnerships.

A few HEIs give numeric targets for their range of outcomes and impacts. For example, the University of Derby is committed to achieving "1,330 jobs created or safeguarded" and "44 enterprises to introduce new to the firm products" as impacts of its strategy. Brunel University has also set a large number of outcomes and impacts with targets, e.g. "15 KE secondments per annum" and "two spin-outs per annum".

While institutions may be unwilling to commit to KPIs for outcomes and impacts, especially if they feel a number may be arbitrary, they certainly can commit to a set of outputs to deliver within the strategy period at least. For example, Coventry University has committed to the delivery of these activities in its strategy: support to identify and address skills gaps; leadership and management

development; entrepreneurship and start-up support. As long as the delivery of outputs is articulated well and there are anticipated outcomes and impacts associated with them outlined, then it should be possible to monitor progress routinely and transparently.

To provide context to targets or thresholds, some institutions are benchmarking their progress, either against their own past performance or against a comparator HEI, for example through:

- Benchmarking against key partners (e.g. University of Bristol benchmark against its SETsquared partners);
- Benchmarking against comparator HEIs (e.g. University of Brighton); or
- Benchmarking internal outcomes and impacts against 2016 (e.g. Teesside University).

Many institutions are adopting sector-wide benchmarks, which enables richer comparison of progress over time and is also scalable for future needs. HE-BCI and DLHE returns form standard sources of data for institutions, although institutions are in tune with new developments in benchmarking KE. As external benchmarking information becomes more readily available, this approach is likely to become more widespread: for example, the University of Hertfordshire is incorporating the set of KE benchmarking metrics proposed in the 2016 'Benchmarking for Knowledge Exchange' report produced for HEFCE[28], e.g. gross sales of licensed products.

5.3 The evidence base of strategies

Few institutions produced broad evidence bases for their KE strategies, which ought to encompass a variety of pieces of evidence: evaluations of KE activities; M&E feedback; internal reviews of activity. Particularly strong evidence bases are able to say how different pieces of evidence influenced the course of the strategy and activity.

These are some weaknesses in understanding of what constitutes a KE evidence base:

- Many institutions listed their achievements as major sources of evidence: e.g. awards of funding; national awards or recognition; performance in the Research Excellence Framework (REF) 2014 and accompanying case studies on research excellence. **This type of evidence does not always reflect directly on KE activity, or how improvements can be made in the future.**
- Many institutions presented lengthy paragraphs of statistics relating to their annual economic impact. **Again, this type of evidence does not inform the direction of KE activity at institution**s. **Economic impact studies can be examples of good pieces of evidence, as they are independent evaluations, but many institutions relied too heavily on them in their evidence bases for KE activity, or presented expenditure effects as direct evidence of KE impacts.**

These are examples of the evidence that should be used by institutions to shape their KE strategies:

- Evaluation of KE initiatives;
- M&E feedback on KE activities (from beneficiaries, partners and other stakeholders);

[28] E Eggington & R Osborn, 2016, 'Benchmarking for knowledge exchange: Key areas in development of a set of benchmarking indicators and a benchmarking tool for higher education knowledge exchange', *IP Pragmatics*

- Review of internal structures and KE processes, with actions put in place following feedback and evidence from sources such as:
    - Internal stakeholders (e.g. workshops, meetings or surveys to generate feedback from staff);
    - The institution's major partners and funders (public and private);
    - Independent consultants commissioned by the institution; and
    - Changes to government policy (e.g. TEF; regional initiatives and strategies)
- Sectoral/market demand impact studies;
- Stakeholder survey of needs; and
- Baselining of research activity and outputs, by faculty or research theme.

Some institutions use an appropriate mixture of pieces of evidence to shape the course of their strategy and reflect on past KE performance.

For example, LSBU has a rich evidence base that incorporates a stakeholder survey of needs, market demand studies, evaluations of activities and an internal review of KE activities. The LSBU strategy uses pieces of evidence to **underline the rationale or business case for its proposed activities.** In one case, LSBU has developed a new online Master's programme in response to findings from its longstanding stakeholder survey of needs.

> *"LSBU have undertaken multiple surveys with various stakeholders to understand needs and corroborate our assumptions on market need. One particular point of interest is the increased expectation of online delivery for CPD and Post Graduate Study. The evidence base used to formulate the strategy for online expansion comes from an Ipsos Mori stakeholder engagement survey commissioned by LSBU. The survey explored the changing needs of stakeholders' workforce and projections of future requirements. Over the six years this survey has been taken, the appetite for online provision has moved from 2% to well over 40%. As a direct response we have developed the first fully online Master's programme in Obesity Care and Management."*
>
> —London South Bank University strategy

The Guildhall School of Music & Drama has an evidence base that explicitly **addresses each of its KE objectives,** which enables all key components of the strategy to have a rationale outlined. The strategy incorporates a range of evidence, such as evaluations, partner feedback and sector studies. The extract below is just one example of how its activities are being shaped in response to new evidence (e.g. piloting of training programme in workshop of companies):

> *"Sharing the distinctive skills and learning of our sector beyond the arts*
>
> *Art of Development training has been developed with input and critical review from a variety of HR managers from the private sector. We also piloted workshops with companies and rephrased our approach following feedback from them. Companies who engage us to run training are asked to submit online feedback, and we elicit more in-depth feedback from our client contacts; HR and event managers.*
>
> *As we extend our coaching activity beyond the institution we will continue use evaluation tools such as surveys and interviews (coaches and clients) to monitor and develop the offer in the best way possible."*
>
> —Guildhall School of Music & Art strategy

5.4 Findings on the approach to presenting KE outcomes and impacts

In summary, the overarching findings from the KE strategies and accompanying recommendations, as regards their **headline outcomes and impacts**, are as follows**:**

- Many institutions did not use logic model terms according to their proper meanings in the Treasury's Magenta Book guidance (i.e. activity, output, outcome, impact). For example, some strategies described outputs as 'outcomes' or 'impacts'. **Institutions should be encouraged to use these terms in line with the Treasury's Magenta Book definitions and guidance, in order to make the headline outcomes and impacts of strategies easy to follow and fit with good public policy practice.**
- Some institutions did not specify their headline outcomes and impacts clearly. Institutions that expressed them as bullet points (or else in a table) tended to have concise and well-specified headline information. **Institutions should be encouraged to ensure that their outcomes and impacts are clearly specified, and may find it useful to specify their headline outcomes and impacts in a list format. Supplementary detail and free-form information could be used to complement that specification.**

Appendix 2 outlines the key information required from institutions on governance and monitoring processes. These are some issues that institutions had with their responses:

- *Too much focus on the governance structure of monitoring processes, rather than important aspects such as data collection.* For example, some institutions described structure diagrams and the roles of various committees in depth, without much exposition on how progress will be measured, which levels of the structure have access to which information, and or how often it is refreshed.
- *General lack of detail.* For example, some institutions are currently developing or refreshing their monitoring processes, so little detail was given on them as a result.
- *No detail on how monitoring processes (Q6), e.g. data reporting, relate to the headline outcomes and impacts (Q4).* In a few strategies the detail on monitoring processes made little or no reference to the headline outcomes and impacts – this information is required to judge whether or not they are suitable.

These are specific examples of good practice used by institutions in developing their approaches to monitoring the outcomes and impacts:

- **Classification of outcomes and impacts** under headings (e.g. business benefits, or other beneficiaries);
- **Explicit differentiation** between short- and long-term outcomes and impacts;
- **Tabulation of the outcomes and impacts** using KPIs or other monitoring information;
- **Commitment to measurable[29] outcomes and impacts** (e.g. quantifiable targets or thresholds); and
- **Use of benchmarking to track progress** (e.g. HE-BCI returns against comparator institutions, or else against previous years within the institution).

[29] As in the 'measurable' element of SMART goals

6 APPROACHES TO COLLABORATION BETWEEN HEIS, MAXIMISING EFFICIENCY AND EFFECTIVENESS

6.1 The level of supply side collaboration

All KE involves partnerships between HEIs with economic and societal bodies other than HEIs, and those types of partnerships were discussed earlier in Sub-section 3.2. Via the request for institutional KE strategies, HEIs were particularly asked to provide further information in this round of HEIF strategies about **their collaborations with other HEIs to improve their ability to undertake KE**, as a means to share good practice, gain critical mass and use public funding more effectively and efficiently.

The institutional strategies outline the institutions' approaches to collaboration with other HEIs to improve the effectiveness and efficiency of their KE activities. **Across the sector, institutions have collaborations with a median of 15 other HEIs.** The caveats and context behind this figure are explained in the rest of this sub-section.

The aggregate figure presented above covers the **main collaborations** that universities have and excludes cases where one collaboration may be a small-scale research project. Universities recognise that some collaborations account for most of their collaboration activity, so it is important to note that the number of significant strategic partnerships for a university is much lower than 15 (perhaps typically one to five), but the strategy template required a single figure that best represents the number of universities collaborated with. For example:

- University of Bedfordshire works with 25 HEIs across KE activity, but is currently working with five UK HEIs on projects that will last over three years;
- University of Cambridge has strategic collaborations with nine universities;
- In the past year, the University of Bristol had formal KE collaborations with nine universities, rather than relationships limited to networking or sharing of best practice alone; and
- Imperial College London has 111 active KE collaborations, through the technology transfer arm Touchstone Innovations. However, Imperial has strategic collaborations in technology transfer with five universities.

Over half of institutions' main collaborative relationships are with other institutions in their **region.** For some institutions, all of their collaboration is with nearby HEIs: for example, the University of Northampton collaborates with four universities, all of which are based in the South East Midlands LEP region; Leeds Beckett University collaborates with over 11 universities, all of which are based in Yorkshire.

Regional partnerships can span multiple LEPs, such as the Midlands Enterprise Universities and Innovation South consortia, each involving more than 15 HEIs[30]. They can also include institutions

[30] Innovation South has 16 university members, spanning the Enterprise M3, Solent, Dorset and Thames Valley Berkshire LEP regions and the Kent & Medway Economic Partnership (South East LEP):
Arts University Bournemouth; Bournemouth University; University of Brighton; Canterbury Christ Church University; University for the Creative Arts; University of Chichester; University of Greenwich; University of Kent; Newbury College; University of Portsmouth; University of Reading; Royal Holloway, University of London; University of Southampton; Southampton Solent University; University of Surrey; University of Sussex; and University of Winchester.

from within the devolved administrations which do not receive HEIF funding – an example would be the SE Wales and SW England SIA, which includes Cardiff University as part of the GW4 Alliance. Other significant regional groups highlighted by institutions as being critical to their strategies include Yorkshire Universities, the N8 Research Partnership, U9 Universities (South East LEP grouping), Knowledge London and Universities West Midlands. The KEEP+ programme[31] led by Anglia Ruskin University is also a significant regional initiative identified by its regional partners as a key element of their collaborations with HEIs.

6.2 The ambitions for collaboration

As a general observation on institutional strategies, many institutions went into significant description of their collaborations, including long-standing existing initiatives. It is evident from the content of the strategies that these collaborations are significant to the institutions, and that some strategic consideration has been given to their number and scale. On balance, i**nstitutions across the sector clearly value having a small number of significant collaborations**, as opposed to casting a wide reach where engagement is less substantial. The Royal Veterinary College (RVC) explains the rationale for having a small number of partners succinctly in its institutional strategy (the emphasis below is retained from the original submission):

> "*The RVC's strategy for maximising collaboration with other UK HEIs in KE is built on the premise that 'best with best' (ideally long-term) relationships with a limited number of strategic partners are more effective than a 'scatter-gun', opportunistic approach. Such relationships enable essential* ***trust*** *to be developed, and allow one to appreciate (and hence to map) where* ***complementarity*** *exists in terms of academic strengths and professional services expertise.*"

True to its explanation, the RVC says that it has active engagement through only four strategic partnerships: the London International Development Centre; the London Centre for Neglected Tropical Disease Research; One Nucleus; and Knowledge Quarter (King's Cross).

The Universities of Birmingham and Nottingham have established a significant bilateral HEI partnership collaborating on specific initiatives such as Midlands Innovation, a Manufacturing Technology Centre, an Energy Research Accelerator, and research and innovation in the life sciences. The partnership is cross-referenced in both strategies and the venture has its own .ac.uk web site, giving it instant external credibility. Other bilateral collaborations referred to in the strategies, many of which are local in nature, include:

- University of the West of England, Bristol – University of Bristol
- Bournemouth University – The University of Southampton
- University of Gloucestershire – Royal Agricultural University
- Institute of Cancer Research – Imperial College London
- Kingston University London – St George's, University of London
- Lancaster University – University of Sheffield
- University of Lincoln – De Montfort University
- University of Liverpool – Liverpool John Moores University
- London School of Hygiene &Tropical Medicine – University College London

[31] See http://www.anglia.ac.uk/business-employers/knowledge-exchange/keep-plus

- University of Nottingham – Nottingham Trent University
- University of Oxford – Oxford Brookes University
- Royal College of Music – Imperial College London (centre for performance science)
- University of Sheffield – Sheffield Hallam University.

One natural starting point for partnerships is at the regional level, including through recent initiatives such as the Science and Innovation Audits, as well as institutions with whom they already have an existing relationship (be it through common research strengths or close proximity).

In some cases institutions set KPIs on the number of strategic partnerships they will develop annually over the five-year period: e.g. Goldsmiths, University of London will "maintain at least two major strategic partnerships per annum and increase the depth and breadth of existing interactions"; Nottingham Trent has a target of four institutional partnerships at the international level by 2019/20.

Few institutions articulated a specific collaboration strategy, instead typically describing their main collaborations. While this may be due to the lack of space provided in the template, if the majority of institutions do not have a considered strategic approach to their collaborations there may still remain latent capacity for developing this further or strengthening existing ties. Section 6.3 below explores best practice from institutions in elements of strategy and assesses the sector's landscape for collaboration, which could aid the development of institutions' approach to a collaboration strategy.

6.3 Making a success of collaboration

Some good practices that could be adopted more widely, particularly with regard to developing successful collaborations in terms of longevity and focus include:

- Develop a strategy that considers different paths or contingencies: e.g. when planning a joint venture that would benefit from competitively allocated funding, develop alternative funding plans or scales of activity if the bid is unsuccessful;
- Formulate the reasons for collaboration, including detail on how there can be mutual benefit through each opportunity identified; and
- Assess how and why past collaborations have ended, in order to inform future collaboration.

Many institutions have formed **consortia** with other universities to undertake joint funding bids, e.g. for co-production of research or co-delivery of large-scale programmes, often at the regional level but also at the national level. For example, many universities led the bids for SIAs in their pan-LEP regions. Institutions have evidently committed significant resources to ad-hoc consortia, but the potential for collaboration can be substantial once the relationships are established, after the original purpose of the consortium has been fulfilled.

The University of Reading is one institution that presents a **strategy on how to develop collaboration, including contingencies depending upon the outcomes of joint funding bids.** Reading bid with the University of Cambridge and Queen's University Belfast to host the European Institute of Innovation & Technology (EIT) Knowledge & Innovation Communities (KIC) partnership on food research. Reading says that it will "continue to develop existing partnerships" with the universities involved in the bid, "irrespective of success" in the consortium bid, as the bidding process has clearly brokered connections between the institutions and prompted new opportunities to explore:

- Following a successful bid: *"we will establish a jointly owned, not for profit venture with these HEIs and other partners. Our aim is to create a UK-led KE, innovation and incubation ecosystem supported by enhanced professional development and teaching excellence in food industry innovation and entrepreneurship."*
- Following an unsuccessful bid: *"the University is committed to taking our relationship with these HEI partners through into a productive collaborative KE relationship with the successful consortium as we value these relationships and this route as being of transformational potential. Our existing investment in TVSP [Thames Valley Science Park] and commitment to health collaboration across HEIs and NHS are to be used as accelerating factors in our food-related KE collaborative initiatives."*

Institutions could maximise the chance of success in their collaborations by **formulating the reasons for engaging in collaboration.** Goldsmiths, University of London developed a categorisation of its reasons for collaboration into these four categories:

> "***Access to funding**: HEIs with complementary areas of academic expertise. In particular, institutions which have strong STEM/STEAM portfolios; **Access to networks**: HEIs that have access to networks of non-academic partners that would not necessarily consider Goldsmiths as an obvious collaborator; **Access to KE expertise**: HEIs with KE expertise complementary to our own; and **Access to KE capacity**: HEIs with overlap in terms of academic expertise, brand and networks where we can leverage synergies to increase our joint capacity to scale our KE offer.*"

The response from Goldsmiths, University of London ("Goldsmiths" below, for brevity) covers the strategy angle of collaboration in depth. Goldsmiths identifies opportunities for collaboration through the categories it has developed and crucially considers how a collaboration can bring **mutual benefit** to the institutions involved. For example, a joint funding bid (access to funding) is identified as an opportunity for Goldsmiths; the institutional strategy suggests that Goldsmiths believes it is not in a position to lead on larger scale Research Council applications/awards due to its "disciplinary mix and [its Research & Enterprise] R&E support resource". Goldsmiths describes its "appeal as a partner is often based on the established [Creative, Digital & IT] CDIT networks" it can bring to consortia.

Universities such as Keele University are exploring the potential of a shared IP commercialisation service at the regional level. Specialist institutions and small institutions in particular would benefit from considering collaboration through such an approach, either with other institutions of similar scale or with the region's larger institutions. Goldsmiths show that the latter approach has enabled them to develop new partnerships with University of Oxford and University College London where there are complementary strengths with very different types of HEI i.e. specialist vs multi-disciplinary. In contrast, large institutions have significant resource and may have different reasons for collaboration, including for collaborations to exploit core research fields (national level and beyond) or in its region.

In the evidence base for the University of Greenwich strategy, the university outlines that it has been collecting information on the **reasons for partners withdrawing from projects.** It seems likely that understanding why their partnerships or collaborative projects come to an end can be valuable in developing a robust collaborative strategy in the first place.

Significant collaborations require investment of time and effort to set up and maintain. As a result, **institutions will need to consider the trade-off between the breadth of partners sought and**

the resource needed to build trust with the partners and monitor the results of the collaborations. A number of institutions expressed a desire to increase investment in key strategic partnerships. Some institutions have focused on getting comprehensive evidence from a small number of strategic partners through consultations. Others who have a high number of transactional relationships gather evidence through tools such as online stakeholder surveys of needs.

6.3.1 Strategic collaborations

There is not an established typology of **strategic collaborations for universities** in recent literature, but some examples of the **types** of strategic collaboration that are being pursued by institutions are outlined in Table 6.1. The **scope** of strategic collaborations for institutions can fall under two kinds:

- Resources: integration or co-ordination of resources (e.g. physical assets, technology, finance, personnel) to increase the efficiency or effectiveness of institutions' KE activities.
- Networks: brokerage of the connection of staff and/or students between institutions and organisations, for purposes such as incorporating best practice in the sector, developing skills/experience, sharing knowledge and tackling common challenges.

Table 6.1: Strategic collaborations and partnerships in KE activity

Type of strategic partnership	Scope	Examples
Integrated /merged resources	Resources	• **Shared faculty:** e.g. Kingston University London and St George's have a shared Faculty of Health, Social Care and Education. • **Shared institutional staff:** e.g. Business Development Managers (BDMs) shared between three Greater Manchester HEIs (MMU, Salford and Manchester); head of procurement shared between Surrey and Roehampton. • **Shared specialist services:** e.g. Northwest Universities European Unit (NwUEU) procurement of state aid legal frameworks, state aid training, etc.; UCL Business and Middlesex shared development of IP in bioengineering.

Type of strategic partnership	Scope	Examples
Pooling/co-ordination of resources for large-scale projects	Resources	• **Enterprise support schemes:** e.g. Growth Programme and two "Dek"-branded centres in Lewisham (LSBU and Goldsmiths). • **Festivals and event programmes:** e.g. regional Venturefest events; Great Exhibition of the North. • **Shared and arranged access agreements for specialist equipment:** e.g. Combined Universities Brain Imaging Centre (CUBIC) based at Royal Holloway but also co-run by Brunel, Roehampton and Surrey. • **Regional co-ordination of specialist resources:** e.g. Midlands Enterprise Universities (MEU); West Midlands Combined Universities (WMCU).
Exchange of staff	Networks	• **Staff exchange programme**: e.g. St George's staff exchange with the University of Nicosia; Liverpool School of Tropical Medicine exchange of staff to the College of Medicine Malawi. • **Executive development of staff:** e.g. Entrepreneurial University Leaders Programme (EULP).
Exchange of students	Networks	*No notable examples discussed in institutional strategies. However, international opportunities for students are raised as part of some institutions' KPIs (e.g. Lincoln).* *Specialist medical institutions tend to have staff and student exchange as part of one programme, as the purpose is for researchers to develop their expertise in settings outside the institution.*
Joint research projects	Resources; Networks	• **Network funding bid:** e.g. Reading, Cambridge and Queen's Belfast bid for EIT Food KIC. • **Interdisciplinary research projects:** e.g. London International Development Centre. • **Regional research networks:** e.g. N8 Research Partnership has long-standing research themes such as agri-food. • **Doctoral training programmes:** e.g. White Rose consortium doctoral training programmes in themes such as mechanistic biology.

Type of strategic partnership	Scope	Examples
Public policy networks /umbrella groups	Resources; Networks	• **Healthcare policy partnerships:** e.g. the Health Innovation Network (south London). • **Education policy partnerships:** e.g. regional teaching alliances; Lifelong Learning Network National Forum.

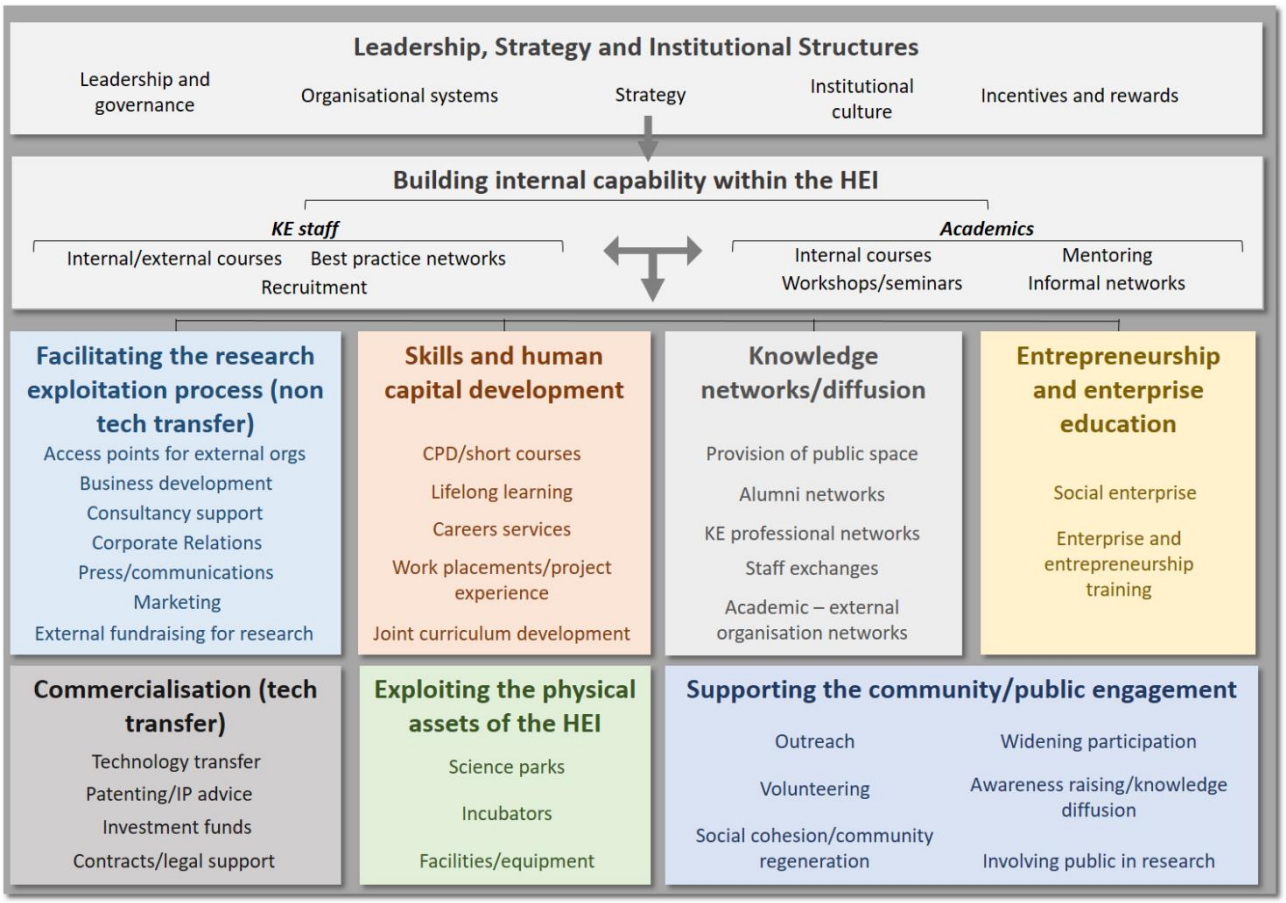
Source: PACEC analysis of institutional strategies

7 KE FUNDING SOURCES AND HOW HEIF IS USED AND PRIORITISED

7.1 Funding sources for KE and how HEIF is used and prioritised

PACEC established a methodology for categorising KE infrastructure and support functions based on the 2009 HEIF evaluation, which has been used subsequently in the analysis of 2011-15 KE strategies for HEIF and in the development of the KE framework. Figure 7.1 below is an updated version of the diagram in *Understanding the Knowledge Exchange Infrastructure in the English Higher Education Sector*, a working paper for HEFCE (PACEC/CBR 2011). It shows which functions fall within each category and their relationship to institutional structures.

Figure 7.1: Types of KE infrastructure and support functions[32]



The seven broad categories used in Figure 7.1 are used by the institutions to record the division of planned HEIF expenditure in Table B of the strategy templates. The categories under which planned expenditure are recorded in the strategies are therefore as follows:

[32] The diagram, originally developed for "*Understanding the Knowledge Exchange Infrastructure in the English Higher Education Sector"*, has been updated by Tomas Coates Ulrichsen (2017).

- **Facilitating the research exploitation process (non technology transfer):** e.g. consultancy, collaborative and contract research, research partnerships, funding for research translation.
- **Commercialisation of research (technology transfer):** e.g. support for spin-outs and start-ups.
- **Skills and human capital development:** development of students e.g. employability, and people external to the HEI and workforce and skills developments (e.g. apprenticeships). This includes through CPD, executive education and bespoke training.
- **Supporting the community & public engagement** via public engagement in research (PER), outreach and widening participation activities, work with local charities, voluntary activities supported by students' union, support for the delivery of voluntary services, etc.
- **Knowledge sharing and diffusion:** stimulation of interactions between HEI external stakeholders, through e.g. the development of alumni networks, professional networks and umbrella groups, and events at community assets.
- **Enterprise and entrepreneurship:** includes social enterprise e.g. developing entrepreneurial knowledge and skills of academics and students, enterprise education, entrepreneurs in residence.
- **Exploiting the physical assets of the HEI:** e.g. science parks, incubators, workshops, use of facilities and specialist equipment.

Expenditure on these activities can fall under three broad types:

- **Investment in dedicated KE staff:** costs of employing and supporting staff involved directly in KE (e.g. KE offices; enterprise offices). This can include staff salaries and investment in office infrastructure (including top-up of central HEI funds);
- **Investment in academic staff:** e.g. training of academics and buying the time of academics for KE activity, as well as leadership in KE; and
- **Expenditure towards other costs:** e.g. all forms of projects including proof of concept, seed funding and pump-priming, and costs of managing KE activities.

The table below shows the breakdown of HEIF expenditure by category. Over half of the HEIF expenditure by HEIs is being invested directly in KE staff (£89.4m, or 56%). HEIs often mention that there would be few funds available for KE staff internally without the use of HEIF and it is the element of HEIF expenditure that is typically prioritised by HEIs. For example, the University of Northampton notes that the bulk of its HEIF allocation is used to fund its business support team. A few institutions have allocated all of their HEIF allocation to KE staff costs (e.g. University of Bedfordshire, University of Sunderland).

Table 7.1: Breakdown of HEIF expenditure across the HE sector, 2016/17

Expenditure category	Infrastructure category	£ million
Total HEIF funds	***Total***	***160.0***
Dedicated KE staff	***Subtotal***	***89.4***
	Facilitating the research exploitation process (non-technology transfer)	39.8
	Commercialisation (technology transfer)	14.1
	Skills and human capital development	10.8
	Knowledge sharing and diffusion	9.5
	Supporting the community and public engagement	4.1
	Enterprise and entrepreneurship	7.4
	Exploiting the HEI's physical assets	3.8
Academic staff KE activity (including buying out academic time to engage in KE)	***Subtotal***	***26.8***
	Facilitating the research exploitation process (non-technology transfer)	10.2
	Commercialisation (technology transfer)	4.3
	Skills and human capital development	3.8
	Knowledge sharing and diffusion	3.8
	Supporting the community and public engagement	2.2
	Enterprise and entrepreneurship	1.6
	Exploiting the HEI's physical assets	1.0
All projects costs and management costs (including proof of concept and seed funding)	***Subtotal***	***43.7***
	Facilitating the research exploitation process (non-technology transfer)	15.0
	Commercialisation (technology transfer)	8.5
	Skills and human capital development	4.6
	Knowledge sharing and diffusion	4.8
	Supporting the community and public engagement	3.4
	Enterprise and entrepreneurship	5.4
	Exploiting the HEI's physical assets	2.0

Source: Institutional strategies; PACEC

The infrastructure categories can be summed to give a breakdown of HEIF expenditure across the sector as a whole:

Table 7.2: Breakdown of HEIF expenditure across the HE sector by infrastructure category, 2016/17

Infrastructure category	Expenditure (£ million)	Proportion
Facilitating the research exploitation process (non-technology transfer)	64.9	41%
Commercialisation (technology transfer)	26.8	17%
Skills and human capital development	19.2	12%
Knowledge sharing and diffusion	18.2	11%
Supporting the community and public engagement	9.7	6%
Enterprise and entrepreneurship, including social	14.4	9%
Exploiting the HEI's physical assets	6.8	4%
Total	***160.0***	***100%***

Source: Institutional strategies; PACEC

For comparison with the 2011-15 analysis of KE strategies, we have provided an analysis of expenditure by infrastructure category and by 'KE cluster', a categorisation of KE activity at HEIs which was developed by PACEC for the evaluation of HEIF 4. The clusters were based on a number of statistical indicators, with the most significant differentiator of KE activity being research intensity. The categories are not exactly comparable[33] in that 'facilitating research exploitation' has been divided into 'technology transfer' and 'non-technology transfer' categories for the 2016/17 analysis. However, it can be seen by recombining these categories that the distribution of funding across the infrastructure types in 2016/17 is broadly similar to that provided for the 2011-15 strategies. The allocation of funding to research exploitation has risen slightly, from 53% to 58%, and in both analyses the percentage of expenditure in this category increases with the research intensity of the institutions. Skills development has fallen slightly from 14% to 12%, and exploitation of physical assets from 6% to 4%.

[33] Although these two categories cover the old 'research exploitation' category exactly, any rewording has the potential to make respondents think differently about how they assign expenditure to each category.

Table 7.3: Breakdown of HEIF expenditure across the HE sector by infrastructure category and HEI KE cluster, 2016/17

	Percentage share of expenditure by KE cluster					
Infrastructure category	**Total**	**Top 6**	**High research**	**Medium research**	**Low research**	**Arts**
Facilitating the research exploitation process (non TT)	**40**	**44**	**44**	**40**	**28**	**25**
Commercialisation (technology transfer)	**17**	**21**	**19**	**16**	**11**	**1**
Subtotal: All research exploitation (TT and non-TT)	***58***	***65***	***62***	***55***	***41***	***26***
Skills and human capital development	**12**	**10**	**9**	**12**	**22**	**37**
Knowledge sharing and diffusion	**11**	**10**	**11**	**11**	**14**	**12**
Supporting the community and public engagement	**6**	**2**	**6**	**6**	**9**	**9**
Social enterprise and entrepreneurship	**9**	**11**	**8**	**11**	**11**	**11**
Exploiting the HEI's physical assets	**4**	**3**	**4**	**4**	**6**	**6**
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 7.4: Breakdown of HEIF expenditure across the HE sector by infrastructure category and HEI KE cluster, HEIF 2011-15

	Percentage share of expenditure by KE cluster					
Infrastructure category	**Total**	**Top 6**	**High research**	**Medium research**	**Low research**	**Arts**
Research exploitation (TT and non-TT)	53	64	58	50	33	36
Skills and human capital development	**14**	9	10	18	25	17
Knowledge sharing and diffusion	**10**	10	11	9	12	7
Supporting the community and public engagement	**7**	3	7	6	8	13
Social enterprise and entrepreneurship	**10**	10	8	11	16	22
Exploiting the HEI's physical assets	**6**	3	6	6	6	5
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

APPENDIX 1 LIST OF ABBREVIATIONS

List of abbreviations

BEIS	Department for Business, Energy and Industrial Strategy
BERD	Business expenditure on Research and Development
CPD	Continuing professional development
CRM	Customer relationship management
DLHE	Destinations of Leavers from Higher Education (survey)
DTP	Doctoral Training Programme
EIT	European Institute of Innovation & Technology
ERDF	European Regional Development Fund
ESIF	European Structural and Investment Funds
EU	European Union
FE	Further education
HE	Higher education
HE-BCI	Higher Education – Business and Community Interaction (survey)
HEFCE	Higher Education Funding Council for England
HEI	Higher education institution
HEIF	Higher Education Innovation Funding
HEROBC	Higher Education Reach out to Business and the Community
HESA	Higher Education Statistics Agency
IP	Intellectual property
KE	Knowledge exchange
KPI	Key Performance Indicator
KTP	Knowledge Transfer Partnership
LEP	Local Enterprise Partnership
M&E	Monitoring and evaluation
NHS	National Health Service
OfS	Office for Students
PACEC	Public and Corporate Economic Consultants
PER	Public engagement in research

R&D	Research and development
RDA	Regional Development Agency
REF	Research Excellence Framework
SIA	Science and innovation audit
SMEs	Small- and medium-sized enterprises
SMART	Specific, measurable, achievable, relevant and time-bound
STEM	Science, technology, engineering and mathematics (disciplines)
TEF	Teaching Excellence Framework
TRL	Technology Readiness Level
TT	Technology transfer
UKRI	UK Research and Innovation

HEI abbreviations mentioned in report:

Goldsmiths	Goldsmiths, University of London
LSBU	London South Bank University
LSTM	Liverpool School of Tropical Medicine
RVC	Royal Veterinary College
QMUL	Queen Mary University of London
UCL	University College London
UCLan	University of Central Lancashire
UOL	University of Liverpool

HEI partnerships mentioned in the report:

GW4 The GW4 Alliance (“Great West”): a research partnership between The University of Bath, The University of Bristol, Cardiff University, and The University of Exeter

M6 Midlands Innovation: a research and innovation partnership between Aston University, The University of Birmingham, The University of Leicester, Loughborough University, The University of Nottingham and The University of Warwick.

N8 The N8 Research Partnership: Durham University, Lancaster University, The University of Leeds, The University of Liverpool, The University of Manchester, Newcastle University, The University of Sheffield and The University of York.

SETsquared The SETsquared Partnership, an enterprise collaboration between The University of Bath, The University of Bristol, The University of Exeter, The University of Southampton, and The University of Surrey.

APPENDIX 2 STRATEGY TEMPLATE AND ASSESSMENT TESTS

Table A2.1: Questions in the strategy template

Number	Question
1	Summarise the key aspects of your five-year KE strategy:
1a	Priority objectives
1b	Relation of KE strategy to wider institutional mission /corporate strategies
1c	Key trends and drivers creating opportunities and challenges
1d	Likely barriers and enablers to implementing the strategy
1e	Key activities to realise the objectives
2	Further detail on focus of key activities, such as:
2a	Target sectors, technologies, or societal 'grand' challenges
2b	Geographical focus (international, national, regional, local)
2c	Focus on types of groups or organisations
3	Describe the evidence base used to formulate the strategy, including:
3a	Feedback from economic and societal partners
3b	Evaluations and reviews
4	Main intended outcomes and impacts of the strategy
5	Alignment with national priorities such as Government economic growth and productivity agenda, UK Research Councils and Innovate UK
6	Policies, procedures, and approach to monitoring and evaluate the HEI's progress in KE, including assessing outputs, outcomes and economic and societal impacts, with any KPIs used
7	How do you propose to increase efficiency and effectiveness of KE over the funding period?
8a	Please set out the total number of UK HEIs with which you collaborate in KE
8b	Outline your strategy for HEI collaboration to achieve greater efficiency and effectiveness in KE
9	Attribution of HE-BCI outputs to infrastructure categories, and to HEIF inputs (Excel response)
10	Breakdown of HEIF use in 2016/17 by expenditure and infrastructure category (Excel response)
11	Explanatory notes on completion of Q9 and Q10
12	How HEIF is being used to deliver the strategy, and anticipated priorities for future HEIF use
13	Institutional equality and diversity policies that relate to KE activities
14	Any additional comments

Table A2.2: Evidence tests for 'sound strategic approach'

Test	Source questions
The strategy has clarity in its prioritisation of objectives and intended outcomes for KE	1a, 4
The strategy has consistency in its objectives, activities, outcomes and targeting of funding	1a, 1b, 1e, 2, 4
The strategy has a strong relationship with wider institutional missions (e.g. research and teaching)	1a, 1b
The strategy has been developed based on a sound evidence base, encompassing a broad range of sources (e.g. internal formal reviews, M&E feedback from partner organisations and stakeholders)	3
The strategy recognises and appropriately adjusts for anticipated changes to KE funding (including external sources)	9, 10, 12
The strategy is consistent with the barriers/enablers that are expected to create opportunities and challenges	1c, 1d
The strategy is appropriate for the HEI's specific spatial context (with reference to regional, national or international context)	ALL

Table A2.3: Evidence tests for 'KE management'

Test	Source questions
The strategy clearly integrates the details on monitoring processes (Q6) and the focus on specified outcomes and impacts (Q4)	4, 6
There are clear processes specified to ensure that performance is routinely monitored	6
KPIs or other appropriate measures are relevant to the outcomes specified in the strategy, rather than referring only to the KE activities that will be delivered	4, 6
The monitoring processes specified enable performance to be compared over time	6
The monitoring processes specified enable performance to be measured against clear reference points (i.e. targets, thresholds, benchmarks)	6
The strategy has robust proposals for increasing the efficiency and effectiveness of KE activities in relation to the stated strategic priorities	1, 7
There are evident proposals for collaboration with other UK HEIs and these proposals fit with the delivery of the strategy	1, 8a, 8b

Table A2.4: Evidence tests for 'alignment of HEIF investment'

Test	Source questions
The investments outlined are consistent with the institutional strategy	1, 9, 10, 12
It is made evident that HEIF provides a distinctive contribution in relation to the institution's KE strategy	9, 12
There is evidence that HEIF allocations will provide additional social and economic impact in line with government policies and priorities (in relation to growth and productivity)	4, 5, 9, 12
KE activities are supported by policies promoting institutional equality and diversity	13

Table A2.5: Evidence tests for 'holistic assessment'

Test	Source questions
Assessor's view on the strength of the strategy	ALL
Assessor's view on the clarity of the strategy	ALL
Assessor's view on the suitability of the strategy for funding	ALL

APPENDIX 3 SPECIFICATION OF OUTCOMES AND IMPACTS – EXAMPLES

Objective \\ Outcome/impact

Table A3.1: University of East Anglia

The table below identifies the success measures which will be used to judge achievement of the outcomes and impacts.

Headline outcomes and impacts	Success measure
Business (public and third sector) benefits	
Skills from KE to understand issues and develop ideas and solutions	Number of policies influenced
Improved innovation, the development of technology and IP through testing and application to products and processes	Increased number of external interactions
	Increased commercial consultancy income
	Increase in number of licences to commercial organisations
Increased benefits for SMEs	Increased number of SMEs interacting with the university.
Wide economic and social benefits	
Shaping and developing regional partnerships, such as LEPs, local authorities, business groups	Maintain current level of involvement with policy setting.
	Maintain current level of involvement with committees.
Strengthening the innovation system through businesses and regional agencies	Increase number of academics involved in external interactions
	Increase number of strategic relationships with businesses
Greater technology diffusion	Increase number of technology offerings (commercial and free)
	Increase awareness of technology offerings available (monitor through enquiry rate)
Labour market benefits	Increase number of internship/year in industry placements
	Increase number of companies interacting with University Careers Service
	Increase numbers of students entering graduate level employment within six months of graduation

Source: University of East Anglia institutional strategy

Table A3.2: University of Lincoln

Principles from Lincoln's Corporate Plan shape the course of KE activity and so they are mapped to Lincoln's KE outcomes and impacts below.

Corporate Plan principle	Outcomes/impacts
Teaching Excellence and a Great Student Experience	• Increasing the number of placement and work experience opportunities as result of fostering 'wide and deep' industrial relationships across a range of different interventions • Achieving high levels of satisfaction in all student related surveys - engagement of industry with the curriculum design and delivery provides them with the skills and research they need to grow and develop, but also provides our students with a high quality learning experience
Graduate Success	• Increasing our levels of graduate salaries, in part influenced by the premium that employers place on securing the services of our graduates through their close engagement and partnership with us • Increasing the number of students developing their own businesses, through the entrepreneurial culture and support that we will provide to them during their studies • Increasing the percentage of employer-developed curricula • Increasing the number of work placement and work experience opportunities
Research with Impact	• A further step-change improvement in any research assessment framework, which we know will place an increased value on research with impact and therefore the quantity and quality of KE • Increasing the number of high-quality national and international research collaborations, which will be supported by the strength and opportunities created by our KE activity • Increased numbers of impact case studies
Strong Partnerships and Employer Engagement	• Increased numbers of high-calibre partnerships with employers • Increased numbers of global opportunities for staff and students through employer and university partnerships • Increased numbers of work-based learning programmes • Increased income generated from consultancy activity • Increased numbers of spin-out companies • Increased numbers of staff engaged with staff placements in and exchanges with industry

Source: University of Lincoln institutional strategy

Table A3.3: Brunel University – excerpt

Key Priorities	Intended Outcomes	Intended Impacts	Type of Impact
Building our strategic KE initiatives	New scientific and technological advances in liquid metal engineering scaled up for industrial application in automotive and wider transport sectors Over 500 NSIRC postgraduate students trained in structural integrity of transport and energy infrastructure 443 new graduate start-ups and early stage businesses supported at the Central Research Laboratory (CRL) University Campus for Integrated Health and Care developed as exemplar of best practice in community healthcare New strategic KE partnerships established	Growth in UK metal casting industry, uptake of aluminum in vehicles, reduction in CO2 emissions UK established as leader in advanced training of structural integrity engineers, NSIRC graduates in leadership positions in industry CRL delivers over 1700 new jobs and economic growth in West London, recognised as national leader in product design, innovation and entrepreneurship Improved health and well being for Hillingdon community and beyond	Improved innovation, development of technology and IP through testing and application Labour market benefits Support and outputs for high tech and innovative clusters/sectors Development of services to meet the needs of local groups and residents
Developing KE capacity and culture	15 KE secondments p.a. 30 student KE Internships p.a. More challenge-led research with user involvement 15,000 members of the public engaged via events, media, exhibitions and cultural activities 150 Brunel staff engaged in regular provision of consultancy 250 postgraduate students complete industrial placements 100% of undergraduates offered industrial placements 30,000 school students p.a. engaged with STEM	All staff have a broad understanding of the policy/industrial context of their research KT built into new research and teaching programme development form the outset Brunel established as west London cultural hub 100% of postgraduate student leavers in employment or further study 90% of undergraduate student leavers in graduate level employment or further study Growth in STEM-related student numbers at Brunel and nationally	Skills from KE to understand issues and develop ideas and solutions Increased benefits to meet needs for partners and residents Labour market benefits

Source: Brunel University institutional strategy

Category \\ Activities \\ Outcomes/impacts

Table A3.4: St George's, University of London – excerpt

Category	Outcomes/impacts	Activities
Business (public and third sector) benefits	• Opportunities for new spin-out companies to be formed around the developing technologies, creating a clear business benefit • Stimulated interest from external commercial funders and investors in SGUL's technologies and provide opportunities for the successful development of marketable products from the spin-out companies, commercial funders and investors	SGUL will be improving the quality of research outcomes, working with existing and new collaborators to improve the quality and quantity of research projects
	• Improved innovation and IP commercialisation resulting in progress towards the development of new products and services and improved business performance • Clear benefit to commercial businesses generally, including start-ups and spin-out companies with new product offerings and increased IP assets	The Enterprise team will work to increase commercial contacts for licensing and funding and to understand better the focus of each commercial company so that licensing of SGUL's IP will become more efficient and lucrative.
Social and community group benefits	• Greater understanding of issues and solutions for patient care and validation of SGUL's research outputs from real patient interaction • Benefits to the wider NHS and our substantial healthcare networks	A key driver for SGUL's research focus is its strong working relationship with the Trust and this will be further expanded to enhance the productivity of the university's research for patient benefit.
	• Greater understanding for patient care with the development of the bespoke courses and services directly addressing these needs.	The Joint Faculty will develop a number of new short courses and bespoke courses, which will be available to a wider market, in particular private healthcare providers.

Source: St George's, University of London institutional strategy

Table A3.5: Teesside University – excerpt

Category	Outcome/impact	Activities
Business benefits	**Improved and simplified access to KE support; enhanced perceptions of University KE, particularly for SMEs**	• TU external and internal coordination of innovation and skills services: bringing together 'innovation hubs' working with the Business Growth Hub to deliver a strategic, coordinated response to innovation challenges; • Promoting the Forge as the university's front door for business; • Use of highly skilled Business Innovation Managers to help businesses navigate the complex innovation landscape.
	Growth of SME absorptive capacity and networks; scale-up of High Growth Potential businesses	• A programme of in-depth interventions, incorporating innovation tools, graduates on ESIF/IUK-funded KE projects, leadership and management, a strong knowledge base and extensive networks.
	Improved productivity	• Adoption of new products and processes; • Enhanced skills and knowledge through graduate recruitment, HDAs, consultancy and CPD, particularly focusing upon the development of leadership and management capability.
	Support and outputs for high tech sectors and clusters – digital, bio, low carbon, advanced manufacturing	Delivered through major partnership initiatives: • DigitalCity • Creative Fuse • National Horizons Centre • Innovate Tees Valley • Enterprise Europe Network
	Improved graduate recruitment	• Strong employer-university-student engagement, influencing content, experience, skills and attributes; • Growth in take-up of TU Higher and Degree Apprenticeships.
	Increase in sustainable, graduate-level start-ups delivering high-value products and services in sector supply chains	• Launchpad • DigitalCity

Source: Teesside University institutional strategy

Table A3.6: University of East Anglia – excerpt

The table maps the outcomes and impacts against our stated objectives and illustrates which of the benefits will be delivered through the achievement of our objectives.

Priority Objectives	Benefits (PACEC, HEFCE Oct)							
	Business (public and third sector) benefits				Wide economic and social benefits			
	Skills from KE to understand issues and develop ideas and solutions	Improved innovation, the development or technology and IP through testing and application products and services	Increased benefits to SMEs	Support and outputs for high tech and innovative clusters/ sectors	Shaping and developing regional partnerships, such as LEPs, local authorities, business groups	Strengthening the innovation system through businesses and regional agencies	Greater technology diffusion	Labour market benefits
Ensuring research expertise, outputs and facilities are made available and exploited in a manner beneficial to funders, local and national economy and internal and external stakeholders	✓	✓	✓	✓		✓	✓	
Encouraging, supporting and recognising enterprising behaviours across both students and staff	✓	✓	✓	✓	✓	✓	✓	✓
Actively promoting the UEA offer to external organisations including those in the private, public and third sector			✓			✓		
Supporting the development of the regional economy through thought leadership, collaboration and development capital			✓			✓		✓
Partnering with HE, PSHE, and other relevant public and private sector bodies to ensure objectives are met efficiently and effectively		✓	✓		✓	✓	✓	

Source: University of East Anglia institutional strategy

Category \\ Outcome/impact \\ Outputs \\ Indicators/measures

Table A3.7: Royal Holloway, University of London – excerpt

Beneficiary sector	Outcomes/Benefits	Outputs	Monitoring info
Business (private, public and third sectors)	1. Skills from KE to understand issues and develop ideas and solutions	Specific commissions (contract research and consultancy) from 3rd parties analysing unmet skills/training needs of clients, advise on design and implementation of solutions/interventions	Number of contracts/financial value of contract to RHUL /estimated lifetime market value to client /track actual value if possible
	2. Improved innovation, the development of technology and IP through testing and application to products and processes	Specific commissions from 3rd parties to use our specialist facilities – likely to be early stage (probably TRL4) – i.e. lab testing of prototype components or processes	Number of contracts/financial value of contract to RHUL /estimated lifetime market value to client / track actual value if possible
	3. The commercialisation of IP and products and services	Licenses of HEI owned-IP aimed to add value for end-users	Number of contracts/financial value of contract to RHUL /Time from inception of contact to signing agreement/ estimated lifetime market value market to licensee/track actual value if possible
	4. Support and outputs for high tech and innovative clusters/sectors	Combination of 1-3 above by cluster end-user members	Combination of 1-3 above by cluster end-user members
Social and community group benefits	5. Greater understanding of issues and solutions for organisations, local community groups, and clients	Specific commissions /projects relating to research skills from 3rd parties analysing unmet skills/training needs of clients, advise on design and implementation of solutions/interventions	Number of contracts / RHUL /estimated lifetime market value market to client / track actual value if possible

Source: Royal Holloway, University of London institutional strategy

List of outcomes and impacts, plus a set of relevant KPIs

Text A3.8: University of Salford

By 2021, Salford will deliver the following outputs, outcomes and impacts:

1. A substantial increase our HE-BCI returnable outcomes to £22m;
2. A quantifiable growth in our social and economic impact benchmarked from our social and economic impact report across the main categories by 15%;
3. We will grow our CPD income through our wholly owned subsidiary company SPD by 50% by developing products and resources with our academic staff and industry partners for a bespoke and generic CPD portfolio across our four collaboration zones;
4. Working with the Mayor of Salford Office and his Greater Manchester Combined Authority portfolio of Business and Innovation, contribute to the local economy through SME consultancy, bid co-creation and development of IP and KE opportunities;
5. Develop a number of exceptional industry research and development partnerships to act as a catalyst for regional wealth and job generation;
6. Creation of novel funding and match funded schemes for industry partners to stimulate and grow income generation opportunities. This will create a positive effect on the local economy and offer flexible and accessible responses to sector challenges;
7. Creation and sustained development of strong, multi-faceted collaborations with Industry partners – supporting the development of the Industry Collaboration Zone strategy and supporting its financial sustainability and its closer links to the curriculum and future workforce;
8. Increase in the number of HEI/Industry collaborations by 30% from current benchmark;
9. Positive contribution to wealth and job creation targets of GMCA benchmarked by the findings of our social and economic impact report.

Source: University of Salford institutional strategy

Text A3.9: Nottingham Trent University – excerpt

Impacts

- An increased number of businesses engaging with the university and benefiting from student and graduate talent, executive education and CPD, and our commercial services to support innovation;
- Sustained strategic relationships with public, private and third sector organisations facilitated through Compact Agreements;
- Business growth and job creation, particularly in the local and regional economy, through the recruitment of graduate talent and innovation resulting from contract and collaborative research;
- The acquisition of high level skills aligned to identified spatial and business need;
- Local economic and social policy that is underpinned by NTU academic insight;
- A growth in graduate enterprise skills and an increased number of graduate businesses contributing to UK and local economic growth;
- A curriculum that is enhanced through greater employer engagement and which provides innovative experiential learning;
- An increase in the number of students gaining graduate level employment, as evidenced by the (DLHE survey;
- A significant increase in the income the university receives for commercial activity as measured by the HE-BCIS survey.

KPIs:

Action	Target	By when
Deliver institutional international partnerships	4	2019/20
Establish strategic relationships with key partners including agreed shared goals	25+	2019/20
Grow additional income in research	£1.0m p.a.	2019/20
Develop and grow additional income from commercial services including (Executive Education and CPD)	£0.7m p.a.	2019/20
Align our activity to economic priorities and grow further regeneration income	£3.0m p.a.	2019/20
Increase our annual income from IP	£250k p.a.	2019/20
Grow the number of graduate businesses per year	80	2019/20
Overall KPI – to grow the value of the income measured by HE-BCIS ranking in HEIF in comparison to other HEIs	Top 50	2019/20

Source: Nottingham Trent University institutional strategy