



Rt. Hon. Chris Skidmore MP  
Lord Norton of Louth  
Policy Connect  
7-14 Great Dover St  
London SE1 4YR

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Dear Mr Skidmore and Lord Norton

**Inquiry 9: Research funding – driving regional economic prosperity:  
Public Call for Evidence**

Thank you for the opportunity to provide evidence for your inquiry.

We very much welcome the government's commitment to increase research and development (R&D) spending to 2.4 per cent of GDP by 2025. It is a bold ambition, and as Ben Bleasdale of the Wellcome Trust succinctly put it: "Without doubt, the 2020s are the R&D decade."

However, we recognise the need to balance ambition with careful detail and a clear way forward, beyond the broad brushstrokes of the *R&D Roadmap*. Your inquiry sets out to do just that, providing 20 questions for higher education institutions (HEIs) that will help identify challenges and provide solutions to reaching the Government's ambition.

These questions fall into three broad areas: the existing state of R&D relating to our region or organisation; how future work should be funded; and incentivising positive behaviour in engaging with innovation. We propose to address these in turn, bringing together the questions to provide a clear, coherent and straightforward narrative.



## 1. The existing state of R&D across Eastern Arc

(Inquiry questions 1, 17, 18, 19)

Eastern Arc is a regional research consortium that brings together the universities of East Anglia, Essex and Kent, and stretches across the East and Southeast of England. The three partner universities undertake world-leading research and drive regional innovation through collaborations and partnerships.

In 2019 the Consortium mapped the shared research strengths of the three universities, based on field-weighted citation impact, the outcomes of REF2014, grant capture, and a number of more qualitative data. Based on this, we developed and launched a [five-year strategy](#) centred around four themes: Culture, Connection and Creativity; Health Systems, Social Care and Wellbeing; Human Rights, Equality and Conflict; and Sustainability, Natural Resources and Food. We have appointed champions in each of these areas, and are now developing a range of partnerships and collaborations within these themes. Our strengths in these areas are shown in the examples given below.

### *Facilitating and developing partnerships*

It is recognised that relationships between universities and businesses are vital to deliver growth and productivity, and for a healthy future economy across the UK. Knowledge exchange (KE) and impact from the research base is much wider than just economic growth, it drives societal, environmental and cultural impact.

The EARC universities are important catalysts for research and development within their region. This takes two forms: first, undertaking world-leading research through collaborations with significant regional, national and global partners, and second, enabling and facilitating the exchange of knowledge between cutting-edge research and those who can use the findings and developments arising from it.

- **Undertaking world-leading research through collaborations:** The excellence of our research is internationally recognised. In the last Research Excellence Framework (REF2014), Kent and Essex were judged to be in the top 20 for research intensity, and UEA in the top 20 for the quality of its outputs. More than 40 per cent of our research areas were assessed to be in the top 20 per cent in their field. Strong partnerships have been essential for achieving this. A clear, concrete example of this is UEA's involvement in the [Norwich Research Park](#), a co-operative of world-class research facilities, including the Norfolk and Norwich University Hospital (NNUH), the John Innes Centre (JIC), the Sainsbury Laboratory, the Earlham Institute, and the Quadram Institute. As well as undertaking world-changing research and bringing in significant investment and research funding, NRP also provides £420m to the regional economy.



- **Enabling and facilitating the exchange of knowledge:** The role of EARC universities as anchors within the regional knowledge ecosystem are shown in two initiatives: the Norwich-Cambridge Tech Corridor, and the Thames Estuary Production Corridor.
  - [The Cambridge-Norwich Tech Corridor](#) is one of Europe's most exciting tech growth opportunities. A partnership including UEA and Cambridge University, the Tech Corridor drives a vibrant £27.3bn economy, with growth of 13.5 per cent since 2010, outstripping the national and regional averages. By increasing overall population and technology-based, high-value employment opportunities in the Tech Corridor, the initiative has the potential to transform the economy and enable 26,000 additional jobs, creating additional economic value of £2.75bn in real terms.
  - [The Thames Estuary Production Corridor](#) is unique in the scale of its ambition. It will unlock long term, transformational, culture-led growth across North Kent and South Essex and establish the region as a creative hub connected to London, the UK, Europe and other global markets. It is estimated that longer term investment in Estuary's creative industries could deliver 50,000 new jobs, adding an extra £3.1bn to the UK economy. Essex and Kent are key partners in this, with Kent receiving £4.3m funding into a £6.7m programme, Part of this is the [Creative Estuary](#) project, which is working to increase the visibility, identity and future of the area's creative production infrastructure, supporting more than 400 new jobs, and delivering new skills, qualifications, and apprenticeships across an area of 1.5m people.

However, as well as playing a significant part in major regional initiatives, all three universities take their role as incubators of new talent and small and medium enterprises (SMEs) seriously. Across the Arc, over 200 businesses are benefiting from these, including the new [£13m Knowledge Gateway development](#) on the University of Essex's campus.

More broadly, we work closely with the Southeast Local Enterprise Partnership (SELEP) and the New Anglia Local Enterprise Partnership (NALEP) to facilitate our work with regional businesses, but also to help identify need and opportunity. For instance, we are currently working with SELEP in addressing coastal deprivation through economic development, identified through its [Coastal Communities Economic Prospectus](#), and with Maritime UK to bring together the diverse range of industries in the maritime sector to tackle shared issues across the LEP, facilitating stronger connections between businesses, our universities, and other supporting organisations. This will enable our maritime businesses to benefit from national and



international opportunities e.g. the Maritime Decarbonisation Fund, in line with the aims of Maritime 2050 and the Clean Maritime Plan.

### *Funding for this work*

In supporting our work, we have benefited significantly from the Higher Education Innovation Fund (HEIF) and the Connecting Capability Fund (CCF), as well as the Strength in Places Fund (SIPF). HEIF enables us to undertake the essential, day-to-day support of our knowledge exchange activity; CCF and SIPF have enabled shorter-term projects and programmes that have made a significant difference to our regional engagement. Two examples of programmes resulting from this are given below.

- **Enabling Innovation: Research to Application (EIRA)**. Running between 2017-2021, EIRA was funded by the CCF. It was led by the three EARC universities working with four further regional HEIs, and collaborating with significant regional commercial partners including BT, Catapult Digital, SELEP and NALEP. EIRA supported economic growth in the region by connecting businesses with the research power of universities through knowledge exchange (KE) initiatives. It supported over 140 individual projects in biotechnology, artificial intelligence and the digital creative sector, enabling 103 academics to work with business, funding over 30 start-ups, and providing local businesses with over 138 interns, 28 per cent of which resulted in continued employment. The resulting impact has been substantial: an independent economic assessment of EIRA showed that, for every £1 invested, £3.65 has been generated for the local economy, totalling a GVA net present value of £8.27 million.
- **Growing Kent and Medway**. Funded by SIPF, Growing Kent and Medway is a partnership between NIAB East Malling Research and will be working with a world-class consortium of partners from the APS Group, Berry Gardens Growers, Thanet Earth Ltd, World Wide Fruit Ltd, Hadlow College, the University of Greenwich, and the University of Kent. The consortium's geographical location is home to over 40 per cent of UK high-value horticultural production and a key gateway to global markets. The opportunity for growth in the sector is significant. However, productivity in this region is under-performing in stark contrast to other regions where investment in research and business-led collaboration has resulted in significant economic uplift and prosperity. By driving innovation and productivity throughout the agri-food supply chain, Growing Kent & Medway will deliver sustainable economic and social benefits to a region that has some of the most deprived areas in England.



## 2. How future work should be funded

*(Inquiry questions 2-13)*

The majority of your questions are around how, in practice, R&D (and in particular innovation) should be funded and supported, including the development of skills training. As part of this, you particularly focused on the mechanisms by which funding should be given to organisations to enable such activity.

### *Two key principles*

Broadly, we believe that there are two fundamental principles that should be borne in mind in providing the funding, particularly for innovation: devolution of decision-making (or recognition or regional need), and long-term investment.

Although we will discuss both research and innovation, it is important to recognise that innovation has a clear and discrete set of challenges and opportunities. The Manufacturing Commission's report, [Level Up Industry](#), made seven recommendations that addressed these. Although focused primarily on manufacturing, we believe they offer a good framework for the government's actions in encouraging innovation, and ensuring it is used to greatest effect.

Primarily, there is a need to give businesses the certainty to invest for the long-term. With the twin seismic changes of coronavirus and Brexit, business needs assurance that policy (and associated funding) will not shift under its feet.

Leading on from this, there should be more devolution and autonomy to the regions to enable local enterprise partnerships to assess and exploit synergies and intra-regional opportunities for collaboration and growth. SMEs should play a key part in this: they make up 99 per cent of businesses in the UK, and their involvement is therefore crucial.

Within fundamental research, devolution would also be welcome. Our experience in managing the 'block grant' element of the Global Challenges Research Fund showed the benefit of doing so and demonstrated that universities could and should be trusted to make investments, particularly for pilot projects or small-scale interventions. It enables a flexibility and speed that encourages agile thinking and facilitates the most interesting and ground-breaking research.

Similarly, our CCF project, EIRA (outlined above), was responsible for managing its own funding programme, and the results have been exceptional. Such devolution and flexibility is essential to enable successful long-term partnerships between universities and industry on innovation.

Devolution would also enable us to identify and map the areas where we can make a difference to the national effort, based on a close knowledge of our strengths. At a time when much of the national narrative is about science and technology, there should also be a recognition of the part that can be played by the arts, humanities and social sciences. We have incorporated these within our four themes, but it is also reflected in projects such as the Thames Production Corridor, and the recent response to Covid, including the uptake of the vaccine, has shown that the behavioural sciences play a crucial role in ensuring our safety and resilience in the face of the infection.

### *Taking account of regional need*

Allied to the issue of devolution, we believe it is essential that, in your words, ‘national agencies, including UKRI...better take the needs of local communities and economies into account in policy and funding decisions.’

The East and Southeast of England are in a slightly unusual position. Although in very broad terms they are seen as relatively affluent, their coastline is home to some of the most deprived communities in the country, including Great Yarmouth, Tendring, Castle Point, and Thanet ([Corfe 2017](#)); indeed, Jaywick in Tendring was [identified](#) as the most deprived area in the UK. 11 of the 100 ‘priority places’ identified by the government in its [Community Renewal Fund](#) are in our region; nine of them are coastal communities. [The House of Lords](#) has recognised the challenges that have led to this situation and stated that it ‘warrants dedicated attention and support.’

At the same time, the Eastern Arc area has been portrayed as synonymous with the ‘golden triangle’ of universities; the *R&D Roadmap* described the triangle as being ‘London, the South East and the East of England’, not the six institutions that traditionally make up the triangle.

In doing so, there is a very real danger that the specific needs of the region are overlooked in the wider conversation around the place agenda, and that local communities and economies lose out as a result.

There is a need, then, for national agencies to take account of regional need at a granular level and are careful in differentiating significant variations within regions. This was recognised by Nesta in its report, [The Missing £4 Billion: Making R&D work for the whole UK](#), which broke UK R&D funding down into subregions.

Within regions of prosperity, there are areas that need additional investment. Conversely, within regions of relative under-investment there are areas (or institutions) that do not need any further funding and are as prosperous as the most affluent elsewhere.

As with the Research Excellence Framework, the Government’s place agenda should ensure ‘that excellent research continues to be well supported wherever it is found,’ and not

just in the larger institutions. Eastern Arc endorses CaSE's recommendations that 'investment should be focussed on R&D excellence that already exists – even if it is small and nascent', and that 'places should clarify their distinctive strengths and sectors.'

We would recommend that the Government should work with Research England and Innovate UK, together with local enterprise partnerships (LEPs), to undertake a comprehensive study on a sub-regional basis to identify areas that are underperforming in terms of investment in research and development, but are punching above their weight in terms of excellence.

In parallel with this, it should work with the [University Partnerships Programme \(UPP\)](#) to further understand how universities connect with their cities and their regions, and how they can be the catalyst for regional development and growth.

### *Skills training*

To enable greater R&D output, skills provision and training needs to change in two ways: first, we need to provide a secure, stable and sustainable framework for those developing a career within research and innovation, and secondly we need to better understand and service the needs of those in the commercial sector.

In the first area, we are supportive of the work being led by the Wellcome Trust, and the intentions of UKRI articulated by its CEO, Ottoline Leyser. We have already been working with Wellcome in this area. Eastern Arc hosted one of its nine national workshops to discuss its findings with the sector and to take the initiative forward. We will continue to play an active part in this, and we are already putting in place actions to overcome this 'toxic' environment.

For instance, our [second strategic objective](#) focuses on supporting experimental, risk-taking activity, and this includes putting in place a cross-institutional mentoring system, so that researchers and academics at all levels can get objective support in identifying and tackling issues they face.

But this is just a first step. To significantly change the culture and attract, retain and develop people to R&D, the Government must be proactive. Actions may include:

- Training for principal investigators (PIs). In the Wellcome report, 80 per cent of managers had confidence in their ability to manage, yet only 48 per cent had received any training to do so. However, training should not just be a one-off session or even a series of events. Rather, it should be more supportive and continuous mentoring and coaching.
- Monitoring of a PI's performance in supporting early career researchers (ECRs) and others. If it is found to be poor, restricting the PI from accessing future funding.



- A whistle-blowing process to enable those who are victims of bullying to report their experiences.
- A more structured and clear roadmap for doctoral students and post-doctoral researchers, in line with [Vitae's researcher development framework](#).

To address the second area - to better understand and provide for the needs of the commercial sector - we are supportive of the higher and degree apprenticeships programme, and see it as a necessary and important framework through which local industry can develop the skills they need for their business.

However, we would also emphasise the need to provide short courses that respond to the needs of business. Our universities have demonstrated their agility in adapting to external needs and drivers by developing online provision in response to the coronavirus pandemic, and we would want to ensure that such agility is fully utilised in skills provision.

#### *Facilitating more extensive pan-regional collaboration on innovation*

Elsewhere in this response we have given concrete examples of our collaborations within our region, but it is worth pausing to consider other ways in which collaborations could and should be fostered beyond our region and, if we go back to the original state-based definition of 'pan-region', to our European region.

Eastern Arc is one of at least [12 regional research consortia](#) in the UK. These provide an invaluable and efficient framework by which to coordinate and consult on our national R&D efforts. The directors of four of these consortia - Eastern Arc, N8, GW4 and Midlands Innovation - meet regularly to discuss common issues and share best practice. One area of common cause is equipment-sharing and support for technicians. We are currently going through the process of developing our opportunities here, and the other consortia have helped in providing insights from their experience. Together, we are also talking to Jisc and UKRI and working collaboratively to ensure that both provider and user benefit from the relationship.

By auditing our significant, strategic and platform equipment and making it available to those across our consortium, we will also be able to make it available to commercial organisations and therefore support their R&D activities. Similarly, by bringing together our technicians to share their knowledge, to gain help, and to have a more structured career path, we are enabling them to develop the skills necessary to support both research and innovation.

In terms of our European pan-region, we were pleased that the Government supported the UK's association with the EU's new €96bn framework programme, Horizon Europe. The programme recognises and actively encourages activity across the whole research-innovation spectrum, demonstrated most clearly in the introduction of a European Innovation Council, following a pilot exercise in Horizon 2020. This will provide support for





disruptive and break-through innovations that may be too risky for private investors. As such, we would encourage the Government to continue its commitment to Horizon Europe as an essential way to support collaboration in the UK's pan-region.

### *The Advanced Research and Invention Agency*

The Advanced Research and Invention Agency (ARIA) offers a significant and exciting opportunity for the UK research base. However, there is a danger inherent within the opportunity: that a significant investment is made in areas that promise much - based on either the track record of the investigators or the timeliness of the challenge - but deliver little.

The question, then, is how the Government can ensure that investments in research have the greatest effect?

In 2016 Michael Lauer, the National Institutes of Health's (NIH) Deputy Director for Extramural Research, [attempted to identify](#) the most productive use of its funding by looking for a correlation between the amount of funding a project had received and the number of citations it got. This he described as "citations per dollar".

Lauer's analysis suggested that there was some correlation between the amount of funding a project received and the resultant citations, up to a point. For non-human NIH-funded studies, this was around the \$1 million mark. After that it tailed off markedly.

Given this, and the fact that it was almost impossible to predict where breakthroughs in science were going to happen, Lauer concluded that 'the best way to maximise the chance of such extreme transformative discoveries is...to do all we can to fund as many scientists as possible.'

Although large 'moonshots' are important to galvanise and coordinate efforts in a particular area, and to 'inspire a whole new generation of scientists' (as suggested in the *R&D Roadmap*) there is a real danger of investing heavily in a few areas that are decided centrally. As [Fortis and Currie \(2013\) found](#), 'impact is a decelerating function of grant size.'

It may seem counterintuitive to provide a large number of smaller investments than a small number of larger ones, and may run counter to the ethos of ARIA. However, as [Jon Lorsch, the Director of the US National Institute of General Medical Sciences, wrote](#): 'it is impossible to know where or when the next big advances will arise, and history tells us that they frequently spring from unexpected sources. It is also impossible to know what threads of foundational knowledge will be woven together to produce a new breakthrough. Supporting a wide variety of lines of inquiry will improve the chances of important discoveries being made.'

We would, then, caution the Government in its approach, and encourage it to consider how best to stimulate such discovery. We would also suggest that the Government look at investing more in mid-career researchers. [An analysis](#) of 2,000 twentieth century Nobel prize winners and other notable scientists found that the age at which most had their breakthrough ideas was between 34 and 39, although this [differs markedly](#) depending on the field.

Nevertheless, the principle still stands: there's a lack of funding directed specifically at those who have established themselves, but haven't yet got the profile where management and other demands distract from their primary research. A stronger concentration of funding on this age group offers the opportunity to make a significant difference.

### **3. Incentivising positive behaviour in engaging with innovation**

*(Inquiry questions 14, 15, 16 and 20)*

[Newman \(2021\)](#) suggested that the current attitude of many researchers to innovation was akin to the early stages of those on the Kubler-Ross model: 'research academics remain locked into the first 2 steps of shock and denial, and now require an incentive to move through the frustration and depression phases into experimenting and deciding to invest in the new reality'.

It's a situation that many of us wishing to encourage innovation are familiar with. The problem is that academia is, in Newman's words, 'liberal in outlook but deeply conservative in maintaining traditional "industrial" practices.' Such practices value research excellence, demonstrated through such metrics as publication number, citation impact, and grant capture, and reward them through promotion. There is rarely such promotion for those who excel at KE, or indeed teaching.

Where there have been incentives for commercialisation, some countries have shifted or removed them, with predictable results. [Jones and Hvide \(2018\)](#) examined the effect of removing 'professor's privilege' in Norway, which had previously allowed the creators of intellectual property to retain the rights to it. The reform shifted the balance towards universities, which took two-thirds of those rights. The result was a dramatic drop in both entrepreneurship and the rate of patenting by university researchers.

So what can be done? Newman suggests a change of culture through three policy changes: changing funder rules and making innovation (and customer-focused methodologies) explicit; changing the incentives inherent in the REF, such as increasing the weighting of impact; and managing the transition to a more innovation-focused attitude within universities by making KE activity explicitly rewarded.

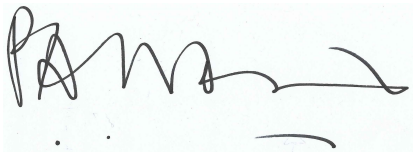
These three suggestions are sensible, and we support them, although the REF weighting should be open to a wider consultation as to the scale needed to be effective. Change will take time, and we would not want to replace one imbalance with another. We need to

recognise and incentivise excellence in all of the fields in which universities work: research, innovation, education and engagement. To do so, there needs to be a clear framework of achievement so that those seeking promotion can understand the expectations they need to fulfil.

For funders, we would encourage the wider involvement of non-academic stakeholders in making funding decisions, particularly those relating to innovation grants. Historically, decisions on funding are made by academics and for academics. There needs to be more involvement of those outside of academia in making decisions, with a balance that goes beyond the nominal commercial representative on grant-making panels. Moreover, any barrier to involving non-academics in projects should be removed, including the reimbursement of salary costs.

As we said at the beginning, we very much welcome the work of your inquiry in starting to consider the detail of the Government's investment in R&D and are grateful for the opportunity to input into its work. We hope that this is the beginning of a positive and productive conversation and are more than happy to continue contributing to it.

Yours faithfully



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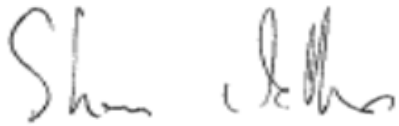


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