

## **2.4% R&D target: how to generate economic growth through place-based R&D policy**

### Introduction

Central to the UK Government's Industrial Strategy White Paper, published in 2017, is the target to increase the UK's spend on research and development (R&D) to 2.4% of GDP by 2027. UK Research and Innovation (UKRI) has organised a series of workshops with our stakeholders, to explore the biggest questions for UKRI and the UK research and innovation landscape more broadly over the coming years. Workshop outputs are being used to develop our evidence base and inform our policy and analysis work.

On 25 April 2019, Sir John Kingman chaired a workshop, co-hosted by the What Works Centre for Local Economic Growth, which gathered experts from across the research and innovation landscape to explore a series of questions around the role of R&D investment in growing the economy across different regions of the UK.

### Background

Economic benefits of R&D, such as employment and salaries, are felt strongest at local and regional scales<sup>1</sup>. Universities act as anchor institutions within regions, with businesses in some sectors positioning themselves to take advantage of proximity to excellent research, skills and other capabilities<sup>2</sup>. As a result, clusters of economic activity based around centres of excellence have high levels of productivity and sectors that align closely to local university strengths tend to experience higher rates of growth and productivity. However, the evidence base on the impact of specific government interventions (and how they map through to employment and productivity) is considerably weaker. Identifying where there is potential to grow R&D capacity and capability across the UK and supporting clusters of strength will be an essential lever in achieving the 2.4% R&D target.

### Summary of the discussion

#### **Strengthening and generating high-impact clusters of R&D strength**

Delegates reflected on the differences between 'generating' and 'strengthening' clusters, agreeing that generating new areas of R&D strength was especially challenging. However, it was identified that there are a small number of interesting case studies which could be examined, such as the creation of a critical mass of research infrastructure in Sweden through decentralisation and the formation of new universities<sup>3</sup>. In this case, it was highlighted that it was the research activities rather than the presence of the student body which drove economic growth (through the impact on local businesses and relocation of businesses to take advantage of the research). Delegates noted that there are information constraints hindering the identification of R&D and innovation clusters, both top down and bottom up, alongside difficulties in relation to incentives. For example, local decision makers may decide to reflect national priorities (e.g. the Grand Challenges) when identifying local

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<sup>1</sup> See, for example, N. Hausman, "University Innovation, Local Economic Growth, and Entrepreneurship", (2012)

<sup>2</sup> See, for example, L. Abramovsky and H. Simpson, "Geographic proximity and firm-university innovation linkages: evidence from Great Britain", *Journal of Economic Geography*, (2011), 11(6), 949-977

<sup>3</sup> R. Andersson, J.M. Quigley, and M. Wilhelmsson, "Urbanization, productivity, and innovation: Evidence from investment in higher education", (2009), *Journal of Urban Economics*, 66, 2-15. For historical evidence, see also: S. Kantor and A. Whalley, "Research Proximity and Productivity: Long-Term Evidence from Agriculture", (2019), *Journal of Political Economy*, 127, 819-854.

priorities, rather than focusing on their major strengths – as they may think this is where the funding opportunities will lie.

Delegates discussed different interpretations of ‘high-impact’ clusters, such as whether this meant maximum impact on the 2.4% target or local economic impact, agreeing that local economic growth should be the main driver for place-based R&D policy. There is robust evidence that universities have a positive impact on innovation in local firms, especially where there are more developed local innovation ecosystems to support absorption and transfer of knowledge. However, delegates emphasised that universities and research organisations are not the only important R&D infrastructures with local economic impact. For example, large businesses can play a key role, such as Jaguar Land Rover in the West Midlands, and increased business R&D expenditure (both national, regionally and locally) will be key to reach the 2.4% target. It was also noted that whilst there is a tendency to talk about annual R&D expenditure within the context of regional funding trends it should be considered that this reflects the accumulation of R&D funding over long periods of time, which is important in building and solidifying strengths.

In terms of strengthening clusters varied thoughts were raised: delegates asked whether UKRI was confident that its funding processes were place-neutral; incentivising collaboration between excellent people, institutions and regions was highlighted as a potential lever to generate critical mass where it does not yet exist; and it was suggested that a focus on how new technologies and drivers impacted on existing industrial strengths could inform how new clusters were considered and developed.

### **Strategically expanding the UK’s research capacity without undermining national excellence**

Delegates discussed the definition of excellence, with some suggesting that it can have different definitions in different contexts (e.g. excellence in the context of discovery research may be different to excellence in the context of industry-sponsored research, research teams of different sizes have different strengths<sup>4</sup>). It was also noted that some people would disagree with the implication that expanding research capacity across the UK would undermine national excellence. Delegates acknowledged that spreading R&D investment more evenly could act to decrease the disparity in GDP across regions in the UK, but it was questioned whether this would have a negative impact on national-level returns on public investment. For example, one delegate noted that the EU Commission’s requirement for collaboration with weaker R&D nations has diminished returns on its R&D investment, notwithstanding potential longer term returns as capacity is built.

The different distributions of public and private R&D investment across the UK were explored, with delegates questioning whether more could be done for those areas with significant private R&D expenditure but very little publicly-funded R&D. Whilst crowding out of private R&D could be a concern, a review of innovation evidence has found limited evidence of public R&D investment crowding out private R&D, and some evidence of crowding in<sup>5</sup>.

Whilst it was agreed that individual policies can add value and have real benefit, and that return on investment is greatest where investments build upon existing strength, delegates noted that there is less evidence on how R&D specifically impacts on general local growth.

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<sup>4</sup> See, for example, B.F. Jones, “The Burden of Knowledge and the “Death of the Renaissance Man”: Is innovation getting harder?”, (2009), *The Review of Economic Studies*, 76, 283-317 and L. Wu, D. Wang and J.A. Evans, “Large teams develop and small teams disrupt science and technology”, (2019), *Nature*, 566, 378-382

<sup>5</sup> [whatworksgrowth.org/policy-reviews/innovation/evidence-review/](https://whatworksgrowth.org/policy-reviews/innovation/evidence-review/)

Delegates considered potential different foci for place-based R&D policy. For example, it was proposed that there was a gap in support for R&D at higher technology readiness levels (TRL), which could more naturally align with a place-based lens, and that for economic impact there could be a greater focus on innovation and the pull factors for business. It was also suggested that place could be viewed as a type of diversity within the R&D landscape, and that more diverse systems could lead to stronger outcomes.

### **UKRI's role in supporting areas with low R&D intensity**

For areas of lowest R&D intensity, delegates agreed that a lack of R&D is not the biggest challenge faced by these places and that increasing R&D investment may not lead to direct benefits for those living there. It was emphasised that we should not expect all places to be as innovative as each other, but that developing the general skill base in places is crucial to support productivity growth. Universities were highlighted as one of the best place-based policies for supporting the distribution of skilled people across the UK, and it was noted that there is evidence that experiencing innovation in youth makes individuals more likely to innovate.

Delegates suggested that UKRI is best positioned to support places to build upon existing R&D strengths. UKRI's new Strength in Places Fund was discussed. Delegates identified the two-stage application process (with funding associated with development of full bids) as a positive feature, which helps address capacity constraints in a wide range of institutions and organisations. The Industrial Strategy Challenge Fund is not place-based. However, it focuses on the biggest pull opportunities from business and it was noted that its regional pattern of spending to date has been different to UKRI's core funding, though some delegates felt that more could be done to engage with stakeholders. More widely, delegates identified that a number of places are being held back by not engaging with basic tech adoption, which could be addressed through a focus on place, although it was recognised that UKRI's role was limited in this area.

It was acknowledged that attempting to achieve the 2.4% R&D target by focusing only on existing high R&D intensity areas (notably Oxford, Cambridge and London) may be an economically inefficient approach and could result in an increase in the cost of doing research in these areas. As such, there are benefits to investing in more R&D in places without such supply side constraints. However, with all place-based mechanisms it was noted that there was a risk of continuing to privilege particular places, just different ones.

Delegates highlighted that there is a fundamental interaction between geographical location and research and innovation infrastructure which needs further consideration. The importance of ensuring a joined up approach across different funds (such as the UK Shared Prosperity Fund) and wider infrastructure (such as roads and transport) in order to drive local growth was also emphasised.

### **How can we generate economic growth through place-based R&D policy?**

A strong focus on leveraging research strengths and forging local collaborations to develop world-leading clusters of innovative businesses that drive social and economic impact in every region and nation of the UK will form a crucial aspect of achieving the 2.4% target. Delegates proposed a number of ideas that could help us to achieve this:

- increase our understanding of how to identify potential R&D clusters of strength and address information constraints which hinder this, including through the use of innovative data sources;
- consider how to define and identify excellence in the context of place-based R&D;

- continue to explore the right policy mix for achieving impact and economic growth through place-based R&D policy;
- understand decision systems in other countries which are sensitive to place in allocating R&D funds, and consider how these could apply in the UK;
- consider the behaviours and cultures we want to see in the R&D ecosystem, and how incentives can be used to steer these;
- be clear about what we are trying to achieve for the UK through place-based R&D policy;
- explore how UKRI can support the development of wider funds, e.g. the UK Shared Prosperity Fund, ensuring strategic alignment of objectives;
- consider interventions appropriate to different-sized businesses, taking into account the different needs of SMEs and large businesses;
- consider how incentives could be used to ensure universities and other research organisations maximise the positive impact they have on their local economies;
- explore the potential to improve the evidence base through standardising, bringing together, and making available for research the diversity of evidence around R&D and place; and
- consider how to develop the capacity required to make the most of the place evidence base in the UK.

In summary, Sir John Kingman emphasised that the workshop conversation was just a starting point. UKRI has a responsibility to rise to the opportunity, and challenge, of the target to increase the UK's investment in R&D to 2.4% of GDP by 2027, and 3% in the longer term, improving productivity and economic growth across the UK.

## Annex A – delegate list

<b>Name</b>	<b>Organisation</b>
John Kingman (Chair)	UK Research and Innovation
Dame Kate Barker	Strength in Places Fund Panel Chair
Dr Annette Bramley	N8 Research Partnership
Rebecca Endean	UK Research and Innovation
Jarmo Eskelinen	University of Edinburgh
Katrina Hann	Greater Manchester Combined Authority
Professor Richard Jones	University of Sheffield
Bairbre Kelly	Department for Business, Energy and Industrial Strategy
Juan Mateos-Garcia	Nesta
Dr Max Nathan	What Works Centre for Local Economic Growth and University of Birmingham
Professor Henry Overman	What Works Centre for Local Economic Growth and London School of Economics
Professor Helen Simpson	University of Bristol
Paul Swinney	Centre for Cities
Tomas Coates Ulrichsen	University of Cambridge
Dr Anna Valero	London School of Economics
Dr Pam Waddell	Innovation Alliance for the West Midlands
Naomi Weir	CBI
Stian Westlake	Senior Associate at Nesta
Professor Andy Westwood	University of Manchester