

Levelling-up through regional innovation clusters

Universities as central hubs in innovation clusters

Drawing on their research excellence and commercialisation expertise, research-intensive universities are at the heart of emerging and developed technology-themed innovation clusters across the UK. By working with businesses of all sizes as well as public and local partners, our universities have helped to draw in vital external investment and create vibrant new communities accompanied by new infrastructure, homes and high-value jobs. *Illustrative examples are provided below. See Annex A for further details.*

The **University of Cambridge**, for example, is at the heart of Europe's largest technology cluster, home to 5,000 knowledge intensive companies turning over more than £18bn and employing nearly 70,000 people. The **University of Manchester's** new £1.5bn innovation district, 'ID Manchester', will help to commercialise cutting-edge research in the North West, supporting up to 10,000 new high-quality jobs and adding £800m GVA to the regional economy annually.

Supercharging UK innovation clusters: a three-step plan

Emerging innovation clusters centred around research-intensive universities across the UK can help revitalise regional economies. With targeted support, there is an opportunity to scale these pockets of regional innovation excellence, enabling them to deliver much greater benefits for their local areas and to begin to rival more established clusters in the UK and overseas.

Queen's University Belfast is helping to drive the development of Belfast's emerging technology cluster, with the University supporting the creation of nearly 100 technology start-ups, adding 2,700 jobs to the regional economy. The **University of Sheffield** is working with Doncaster Sheffield airport and industry partners to develop an innovation district around the airport with potential to create up to 35,000 jobs and 3,000 new homes worth £6.5bn to the local economy by 2037.

We recommend the Government seizes this opportunity and pursues a three-point action plan to scale innovation clusters across the UK, help position the UK as a world leader in the global innovation race, and build back better after the pandemic:

1. **Scale up existing innovation schemes with a track-record of proven returns.** Under our proposals, a net increase of just under £600m over the three years to 2024/25, can deliver a return of £2.7bn to the UK economy and wider society.
2. **Create a deep-tech university seed fund** with a one-off investment of £200m, targeted at innovative ideas within the Innovation Strategy's seven priority technology families. This would develop disruptive technologies, transform regional economies and boost export revenue.
3. **Reform VAT rules and eligibility for R&D-related tax credits** to encourage increased collaboration between business and universities that will leverage further private R&D.

University of Birmingham • University of Bristol • University of Cambridge • Cardiff University • Durham University
University of Edinburgh • University of Exeter • University of Glasgow • Imperial College London • King's College London
University of Leeds • University of Liverpool • London School of Economics and Political Science
University of Manchester • Newcastle University • University of Nottingham • University of Oxford
Queen Mary University of London • Queen's University Belfast • University of Sheffield • University of Southampton
University College London • University of Warwick • University of York

Step 1: Scaling funding streams with a proven track record of success

Scaling funding streams with a track record of delivering economic impact in the regions will be more efficient, with quicker returns, than creating new programmes from scratch. For an investment of just under £600m over three years, **our plan would deliver a return of almost £2.7bn to the economy and wider society and unlock at least £678m in private investment.**¹ As a priority, we propose investing in the following:

- The **Higher Education Innovation Fund (HEIF)** underpins core innovation activities – leveraging private investment, building co-location spaces and commercialising promising tech. Large research-intensive universities deliver £12.46 of impact per £1 of HEIF funding, but allocations are capped at £4.3m per institution. A £10m supplement is distributed to those who can show this constrains their support for economic growth: raising this by £70m a year would deliver an additional return of £2.5bn over three years.
- The **UK Research Partnership Investment Fund (UKRPIF)** funds state-of-the-art research centres focused on challenges such as accelerating progress towards net zero. For every £1 awarded through UKRPIF, universities must attract £2 in non-public co-investment. Introducing a new funding round worth £330m would leverage at least £660m in private investment and help to scale regional innovation clusters.
- **Knowledge Transfer Partnerships (KTPs)** link businesses with an academic partner to help them improve productivity, grow sales and hit other strategic objectives. Increasing funding by £6m over three years would return £45-£48 million of net extra GVA.
- The **Connecting Capabilities Fund (CCF)** has spurred innovative activities, with over 1,000 projects creating new products or services and 28 new spin-outs created since 2019. Scaling CCF by 12% (increasing funding to £125m) would deliver more durable spin-outs and ensure best practice is shared across every region of the UK.
- **Innovation to Commercialisation of University Research (ICURe)** is a pilot programme providing access to market intelligence. Expanding the programme across the UK, and doubling funding to £24m per annum, could help to return an additional £144m to the economy over three years, creating durable new spin-outs, and supporting hundreds of new jobs.

Step 2: Unlocking breakthrough UK tech – a new ‘deep-tech’ university seed fund

‘Deep tech’ – early-stage technology which requires extensive R&D and capital investment – can deliver transformative technologies, creating jobs and attracting private investment to the UK’s regions. **Investors have been reluctant to invest in deep tech:** US early-stage venture capital investment is about five times as large per head as in the UK.

Research-intensive universities are well placed to invest additional funding for tech: the **University of Southampton’s** Zepler Institute, for example, is at the centre of a photonics cluster with spin-outs employing more than 400 people and generating turnover of over £100m a year. However, universities are limited in how many spin-outs they can nurture. **A £200m deep-tech university seed fund could support over 350 new deep-tech spin-outs over three years.**

Step 3: Low-cost reforms to taxation and cutting bureaucracy

To boost collaborative R&D, leverage investment from businesses of all sizes, and make research and innovation infrastructure projects more appealing, the Government could:

- **Tweak R&D tax relief eligibility** to unlock its full potential and stimulate additional private investment across the UK. We propose that SMEs undertaking collaborative R&D with

¹ The return on investment figure is based on projected net returns for additional investment in HEIF, KTPs and ICURe based on the impact these funds have had to date. The leveraging figure solely comprises the additional investment we would expect UKRPIF and CFF to stimulate. The real return on our package of proposals is therefore likely to be higher.

universities should be automatically eligible for SME tax relief and R&D expenditure credit, while firms in all sectors should be able to apply for both schemes in non-STEM areas.²

- **Take back control of VAT rules on buildings used for joint industry/university R&D.** Universities pay full VAT on buildings where usage exceeds 5% for commercial activities within 10 years of construction. These rules, derived from EU regulations, deter business from R&D investment. Buildings built, or acquired by, universities for charitable purposes should thus be zero-rated initially. Universities could then report and pay VAT on commercial/non-research use up to the 10-year limit.³

Annex A: regional innovation clusters centred around research-intensive universities

| Cluster | Tech theme/strengths | Examples of impact |
|------------|---|--|
| Belfast | FinTech, Digital tech, AI, Cybersecurity, Advanced Manufacturing, Photonics | Queen's University Belfast has supported the creation of nearly 100 start-ups, adding 2,700 jobs to the regional economy. An additional 1,800 roles have been created via a cutting-edge cybersecurity cluster based around Queen's Institute of Electronics, Communications and Information Technology (ECIT). |
| Birmingham | Telecommunications, FinTech, AI, Environmental and Energy Technologies, Quantum, Defence and Security | The UK Rail Research and Innovation Network (UKRRIN) is designed to drive collaboration between academia and industry, accelerating new technologies and products from research into market applications globally. The network has already leveraged £61m of new private industry funding. |
| Bristol | Telecommunications, FinTech, AI, Environmental and Energy Technologies, Quantum, Defence and Security | Science Creates incubator is a deep-tech cluster centred around the University of Bristol, offering specialised incubator spaces, a £15m investment fund, and a network of strategic partners. The cluster has raised £14.4m in the first half of 2021 alone, housing 37 companies (60% of which are University of Bristol spin-outs, with one, Ziylo, acquired in a deal potentially worth US\$800m). |
| Cambridge | Europe's largest technology cluster, with strengths across the board, particularly in Life Sciences and Computing | Cambridge is the leading university globally for investment raised by its spin-outs, raising nearly £350m in 2019, and with the same number of high-tech start-ups matching the whole of the 'Enterprise Nation' Israel. The Cambridge Cluster is home to 5,000 knowledge intensive companies turning over more than £18bn and employing nearly 70,000 people. |
| Cardiff | Compound semi-conductors, cybersecurity, social sciences | CSconnected is a compound semiconductor cluster, created following a Strength in Places bid by a consortia led by Cardiff University. Compound semiconductor firms account for over 1,400 jobs in the region, with the Welsh economy benefiting from a contribution to GVA by CSconnected firms of £121.3m. |
| Durham | Energy and environmental technologies, Advanced Materials, Semiconductors | Durham University leads the Northern Accelerator consortium of five local universities. Orbit, Durham's University Enterprise Zone, provides a physical hub for knowledge exchange, networking and co-location of SMEs with University academic expertise and targeted business development support. |
| Edinburgh | Environmental and energy technologies, Data | The University of Edinburgh's Bayes Centre for Data Science has been integral to the development of a high-tech cluster. Opened in 2018, the Centre has already attracted over 50 corporate R&D teams, established 15 high-growth ventures, attracted over £90m in external investment and created 372 high-value jobs, with an additional 117 indirect jobs. |
| Exeter | Environmental intelligence, Energy technologies | The University of Exeter and the Met Office have developed a new Joint Centre, consolidating global expertise in Environmental Intelligence. The global market for Environmental Intelligence Solutions is currently worth over £100bn each year. The Centre is pioneering the use of Environmental Intelligence to underpinning decision-making and improve risk management, helping to accelerate progress towards net-zero. |

² More information on these proposals can be found here: <https://russellgroup.ac.uk/media/6011/rg-briefing-on-tax-credits-eligibility.pdf>

³ Further details on this proposal can be found here: <https://russellgroup.ac.uk/media/6008/rg-briefing-on-vat.pdf>

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| Glasgow | Precision medicine, Quantum | The University of Glasgow is at the heart of a quantum technologies cluster. The university's James Watt Nanofabrication Centre (JWNC) enables the translation of world-leading research in quantum technologies for application in computing, high precision timing and navigation, sensing, communications and imaging. The University of Glasgow is a partner in Innovate UK quantum projects predicted to generate GVA over £1bn within the next eight years. |
| Leeds | Various, with particular strengths in FinTech | The University of Leeds' innovation hub Nexus facilitates the co-location of industry and academics. The Hub hosts 35 businesses, has created over 125 jobs, and increased collective turnover by over £2m in the first 12 months after opening. |
| Liverpool | Computing, Healthcare, Advanced Materials | The Material Innovation Factory (MIF) is a collaboration between the University of Liverpool and Unilever bringing together materials chemistry expertise with computational and robotic equipment. The MIF aims to discover new materials to address challenges including sustainable energy, clean water and energy storage. |
| London (King's, Imperial, UCL, QMUL, LSE) | High-tech 'super' cluster with strengths across the board, particularly in Life Sciences, Biotech, Defence, FinTech, Healthcare, and Computing | London is the UK's highest ranked innovation cluster in the Global Innovation Index. Universities in the capital have supported the growth of the high-tech cluster through effective commercialisation of promising IP. In 2019/20, there were 755 active spin-outs from the five London-based Russell Group universities, employing over 6,220 people, with a combined turnover of over £253m and attracting £602m in external investment. |
| Manchester | Advanced materials, Life Sciences, Industrial Biotechnology, FinTech | The University of Manchester's new 18.2-acre, £1.5bn, innovation district, 'ID Manchester' will help to commercialise cutting edge research in the North West, creating incubators, collaboration spaces and 10,000 new high-quality jobs. ID Manchester is also projected to add £800m GVA to the regional economy annually. |
| Newcastle | AI, Data, Photonics, Energy and environmental technologies | Newcastle University's £350m Helix, a joint endeavour with Newcastle City Council and Legal & General, has re-developed a former industrial site in the centre of Newcastle bringing together businesses, spin-outs and researchers. So far, the Helix hosts 60 organisations comprising over 1,800 professionals with over 2,300 jobs created. |
| Nottingham | Life Sciences, Healthcare, Electronics, Advanced Materials | The Centre of Excellence for Sustainable Chemistry is developing new chemistries that are both energy and resource efficient, providing British customers with high value products that have minimal environmental costs. The Centre attracted over £12m of funding from GlaxoSmithKline and will enhance the University of Nottingham's industry collaborations in sustainable chemistry. |
| Oxford | High-tech cluster with strengths across the board, particularly in Life Sciences and Healthcare | The University of Oxford is the anchor institution at the heart of Oxford's globally renowned high-tech cluster. Almost a quarter of the employment in the city is in the digital tech sector. Oxford's cluster contributed £1.8bn in revenue to the economy and employed over 37,000 people in 2018. The city is responsible for creating five of the UK's leading tech unicorns. |
| Sheffield | Advanced Manufacturing | The University of Sheffield, Doncaster Sheffield airport, and industry partners have begun work to develop a high-value innovation district around the airport. The district will build on regional strengths in advanced manufacturing, with the potential to create up to 35,000 jobs and 3,000 new homes worth £6.5bn to the local economy by 2037. |
| Southampton | Photonics, electronics, maritime | The University of Southampton's Zepler Institute is at the heart of a world-leading photonics and nanoelectronics cluster, with turnover of digital technology businesses in Southampton reaching £2.1bn by 2017. The Zepler Institute's spin-out companies employ more than 400 people with turnover of more than £100 million annually. |
| Warwick | Advanced Manufacturing | The National Automotive Innovation Centre, the largest research centre of its kind in Europe, will drive the future of the automotive industry. Its initial 15-year programme will exceed £650m in turnover and add over £5bn in gross value. The Centre is a partnership between WMG at the University of Warwick, Jaguar Land Rover and Tata Motors. |
| York | Biotech, Robotics and Autonomous Systems, Quantum, Communications, Creative, and Digital | BioYorkshire is a strategic initiative led by the University of York, using bio-based innovation to transform Yorkshire's economy through world-class research and translation facilities, a network of specialised business incubators, training, networking and entrepreneurial support generating up to 4,000 high-value jobs. |