



Exploring the UK's
growth infrastructure
potential

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Executive summary

The UK's high-growth ecosystem relies on a complex network of infrastructure. This report examines key components of this infrastructure, including the availability of office and lab spaces, the UK's computing capacity, and its energy infrastructure. Each of these elements will be analysed through the perspective of relevant sectors to understand how they affect the growth of firms within those industries.

The growth of life science companies has significantly increased the demand for specialised lab spaces, exemplified by the 1.3% vacancy rate of lab spaces in Cambridge.¹ While there is currently a limited supply of such spaces in the UK, this presents a significant opportunity to support life science companies in expanding their capacity for

innovation, research, and testing. This report looks at the distribution of life science companies throughout the UK and what is being done in key regions, such as Oxford and Cambridge, to improve the availability of lab spaces and allow these businesses to continue to thrive.

The rapid adoption of artificial intelligence (AI) in businesses will be a key driver of future growth. The ability of the UK to house companies developing and utilising this technology is dependent on its computing infrastructure, specifically the availability of high-performance computing (HPC). However, it is not only AI companies that need access to this technology; those carrying out climate modelling and life science companies focusing on personalised medicine and genomics require access to huge amounts of computing power to carry out calculations and run models.

Many high-growth companies in the UK operate in industries requiring significant energy, including AI, quantum computing, and semiconductors. These companies have the opportunity to innovate and explore new solutions for their energy needs, given the UK's ageing electrical grid and the rising demand for energy. The government has taken several steps to improve the situation, including a £960m investment

over the next five years to improve grid connections.² Renewable energy will also undoubtedly impact these businesses in the near future as the UK looks to reduce its reliance on fossil fuels.

In conclusion, the availability and quality of underlying infrastructure—spanning lab and office spaces, energy, and computing power—are critical to the development of high-growth companies. Building on the strengths and proposals outlined in this report presents a valuable opportunity to support the next wave of innovation. Addressing the gaps and challenges in these areas will be essential to ensuring that companies continue to scale and thrive in an increasingly competitive global landscape.

¹ Oushman & Wakefield. "Life Sciences Golden Triangle Report - Q2 2024." Cushman & Wakefield, 2 May 2024

² Department for Energy Security and Net Zero and The Rt Hon Claire Coutinho MP, "Huge boost for UK green industries with £960 million government investment and major reform of power network," GOV.UK, August 28, 2023.

Introduction

As the UK strives to solidify its position as a global leader in innovation, the infrastructure supporting startup growth is becoming increasingly important. This infrastructure, encompassing key elements such as laboratory spaces and digital connectivity, is crucial for the development and scaling of new businesses. While this offers significant opportunities, there are also challenges that need to be addressed.

Digital infrastructure, including the expansion of gigabit-capable broadband and the rollout of 5G networks, is a crucial factor in the UK's startup ecosystem. The UK government's commitment to improving digital connectivity is a positive development for the startup sector. The new government has emphasised the importance of data centres in supporting the UK's AI sector and digital infrastructure. The government has designated data centres as Critical National Infrastructure, and is consulting on reforming planning rules for new

data centres to allow ministers to designate certain major data centre projects as "nationally important," allowing central government to make planning decisions rather than local councils.³ This policy change could facilitate the construction of data centres and overcome challenges that have stalled similar projects in the past.

The ongoing changes to the UK's energy infrastructure present both opportunities and challenges for startups, particularly those focused on sustainability. The new government has pledged to decarbonise the UK power system by 2030 and introduce the Energy Independence Act. Government investments in clean energy and grid efficiency improvements are intended to support the shift to a low-carbon economy. If successful, these developments could catalyse new opportunities for innovation in the energy sector, particularly in renewable energy technologies.

For startups operating in the life sciences and biotechnology sectors, a key component of growth infrastructure is the availability of laboratory space. The UK is home to numerous science parks, innovation hubs, and university-led initiatives that provide access to state-of-the-art research facilities. For example, the Cambridge Science Park, Oxford Science Park, and the Francis Crick Institute in London are leading

centres that support cutting-edge research and innovation. These developments have bolstered the country's reputation as a hub for scientific innovation. Highlighting the growing demand for laboratory space, especially near major research centres, which signals a thriving interest in life sciences. While this demand currently surpasses supply, it also presents an exciting opportunity to expand infrastructure and resources beyond established innovation clusters like Cambridge and Oxford, ultimately fostering growth for life science startups across a wider range of regions.

This report examines the current state of the UK's growth infrastructure through the lens of digital infrastructure, energy infrastructure, and life sciences facilities. By examining these factors, the report aims to highlight the opportunities and challenges that will shape the future of the UK's startup ecosystem and offer insights into how these factors may impact the broader economic landscape.

³ OtechUK, "Labour Manifesto Recognises the Need for Planning Policy Changes and the Critical Role of the Data Centres Sector," techUK, June 14, 2024

Office and laboratory spaces

UK's laboratory landscape

The majority of laboratory space in the UK is concentrated in the “golden triangle”, a global life sciences cluster made up of London, Oxford, and Cambridge. The demand for lab space in the UK is rising and there has been a persistent undersupply of available space in the rental market. Recent reports from Bidwells highlight this imbalance.⁴ By the end of June 2024, the demand for lab space across Oxford and Cambridge was significantly higher than the available infrastructure. The high level of interest, with much of the available space already under offer, highlights the vibrant growth in the sector and the potential for further expansion opportunities in the second half of 2024.

The demand for lab space in the golden triangle has reached unprecedented levels, highlighting the cluster's significant reputation as a global hub for innovation and research. Even with higher rental prices and lack of space, the persistent high demand

underpins the attractiveness of the golden triangle's lab market. This was especially true during the pandemic when demand for lab space surged in response to the increased emphasis on research and development.

Steps are being taken to boost the supply of lab space and help support the growth of the life science industry. A £650m package aimed at developing the UK's life science sector was announced by the former Chancellor Jeremy Hunt in May 2023. Part of this commitment was geared towards increasing the availability of lab space in the UK through reforms to planning rules.⁵ For the new Government, the life sciences Industry has been identified as a priority sector for growth. To implement this, the Government has put forward proposals to bolster the Life Sciences Council, increasing access to funding, and cutting red tape in the industry.⁶

New developments have begun in an effort to increase the amount of lab space available in the UK. As of Q2 2024, 3.60m sq ft of lab space was under construction in the golden triangle. Some developments will be government funded whilst others are owned and funded by universities. This includes a new 450k sq ft development in the Oxford Science Park⁷ and a new five-storey lab that has been approved for construction in the Cambridge Science Park.⁸ While

these developments will not satisfy the immediate demand, they are positive steps to ensure the current undersupply is not carried into the future.

Outside of the golden triangle, new lab spaces are being developed in areas such as Stevenage and Bristol. In Bristol, lab space is being developed for deeptech startups. ScienceCreates' Old Market incubator opened in late 2021 and offers 30k sq ft of laboratory, office and events space for deeptech startups.⁹ The city has plans to develop 1m sq ft of lab space for deeptech companies over the next 10 years.¹⁰ In Stevenage, a £900m life science campus has begun development. The new development, known as the Elevate Quarter, will provide 1.60m sq ft of lab, office, and manufacturing facilities. The campus will be located alongside GSK's global R&D facility and the Stevenage Bioscience Catalyst.¹¹

⁴ Bidwells, Office and labs Oxfordshire and Cambridgeshire Arc Market Databook, 2024

⁵ HM Treasury, Department for Science, Innovation and Technology, Department of Health and Social Care, "Chancellor reveals life sciences growth package to fire up economy," GOV.UK, August 28, 2023

⁶ BioIndustry Assn. "Labour's Plan for the Life Science Sector." BioIndustry Association, 2023

⁷ Dimitrova, Galya, "Science park development to expand research space" BBC News, June 15, 2024

⁸ Brown, Hannah, "Five-storey lab and offices to be built on city edge," BBC News, August 25, 2024

⁹ Science Creates, "Science Creates: Building a Deep Tech Ecosystem in Bristol," Science Creates, June 2022

¹⁰ West of England Combined Authority, "Demand growing for lab space for deep tech." West of England Combined Authority, July 29, 2021

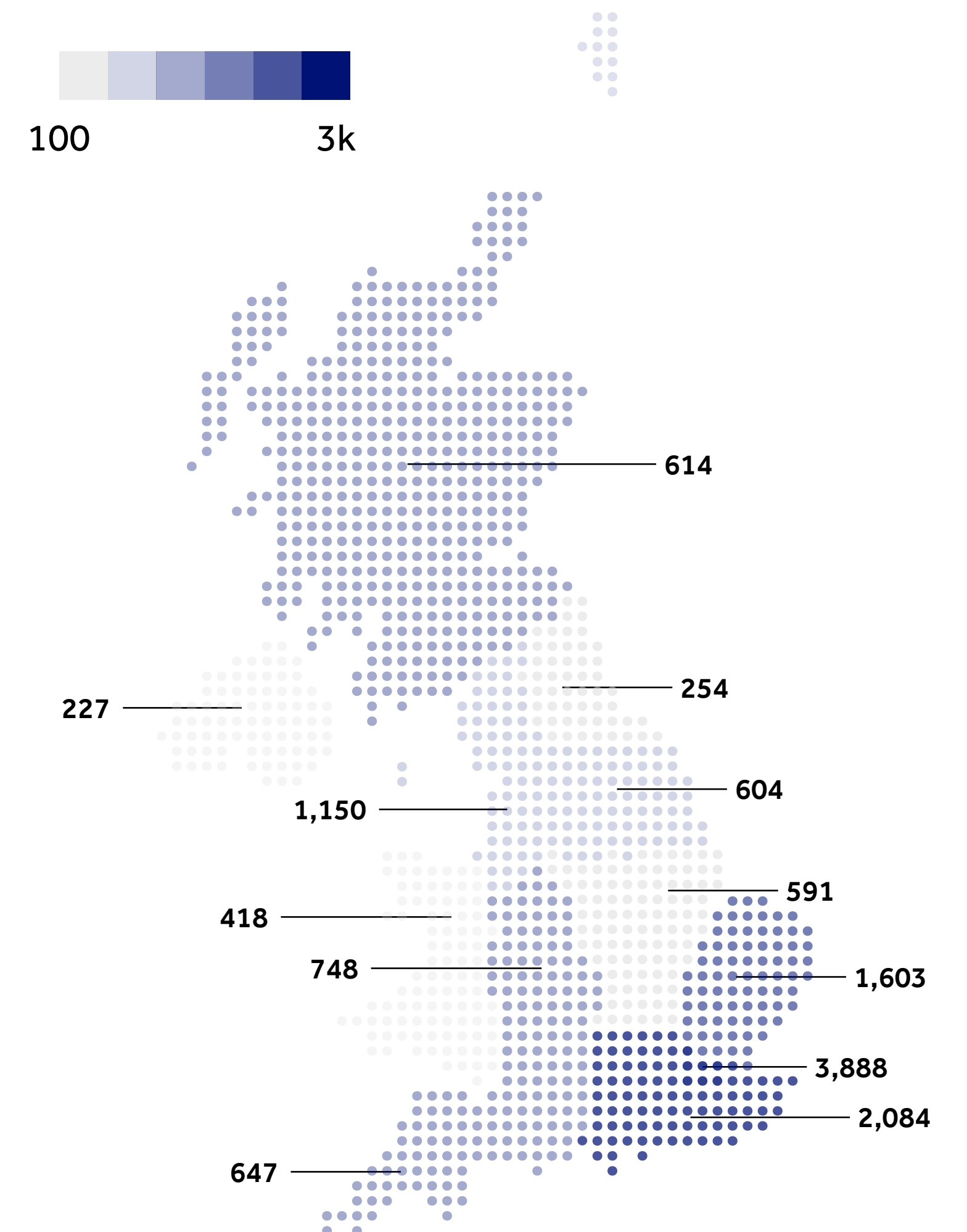
¹¹ Stevenage Catalyst, "UBS Asset Management and REEF Group secure approval for one of Europe's largest life science campuses in Stevenage," Stevenage Catalyst, June 13, 2024

Regional distribution of life sciences companies

London is home to the highest number of high-growth life sciences companies of any UK region, with 3,888 companies, as of August 2024, located in the capital. Several factors contribute to London's high population of life sciences companies. A large portion (65.5% in 2023) of equity investment into UK companies goes into the companies based in London; access to this method of financing is part of the appeal to life sciences companies. London contains a wide range of research facilities, hospitals, and a rich supply of highly-educated workers, all of which make it an ideal location for life science companies.

The golden triangle contains several of the top universities in the UK, such as the University of Oxford, the University of Cambridge, and University College London (UCL). The South East and East of England regions contain the second and third-largest number of life sciences companies in the UK. These regions are home to Oxford and Cambridge. The universities in these cities are known for their strength in STEM and life sciences and are attractive locations for startups because they can access the specialist labs and science parks that surround the universities, including the Cambridge Science Park and the Oxford Science Park.

Number of life sciences companies per region (August 2024)



Local authority distribution of life sciences companies

Four of the top five local authorities with the highest concentrations of life science companies are London boroughs, with a further three appearing in the top 15. Outside of London, other major UK cities, including Manchester, Birmingham, and Edinburgh, are home to large numbers of life science companies. The large populations of these cities make them attractive locations for companies, offering a rich pool of human capital. Coupled with the presence of top universities, this ensures that the available talent is not only abundant but also highly skilled.

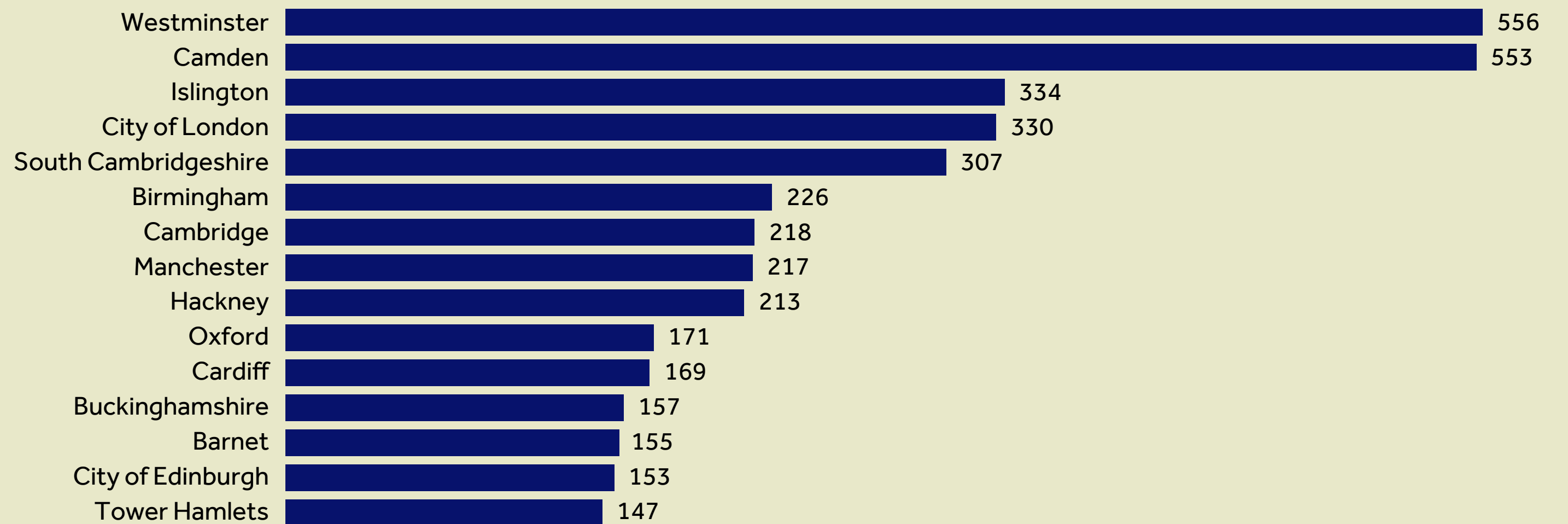
These cities also contain a variety of support mechanisms designed to help companies grow.

For example, the Manchester Digital Startup Activator Programme helps businesses in the outer local authorities of Greater Manchester go from the ideation stage to early traction by providing mentorship, resources, and guidance to diverse founders in the region.

The University of Birmingham has begun development of the Birmingham Health Innovation Campus, with the first stage due to open in 2024. The campus aims to position Birmingham as a premier economic hub for life

sciences, featuring state-of-the-art research facilities and capabilities for conducting clinical trials. The Edinburgh BioQuarter was built to develop Scotland's life sciences industry. The BioQuarter is a partnership between the University of Edinburgh, Scottish Enterprise, NHS Lothian and the City of Edinburgh Council. Several institutions, such as the Royal Infirmary of Edinburgh, the Institute for Regeneration and Repair and Edinburgh Clinical Research Facility, are located within Edinburgh BioQuarter.

Distribution of life science company population in the UK by local authority (August 2024)



HealthTech: Jack Fertility

"Oxford, in particular, is a powerhouse in fertility research and is home to one of the few embryology master's programmes in the UK. This proximity significantly enhances our access to talent and R&D capabilities, ensuring that we remain at the cutting edge of innovation," says Lily Elsner, CEO and Co-Founder of Jack Fertility.

Jack Fertility is an Oxford-based startup looking to address the significant gaps in male reproductive health by offering the UK's first sperm test kit designed to be conveniently sent via postboxes, eliminating the need for an in-person clinic visit. The company was co-founded by Lily Elsner and Nick Shipley in 2022. Jack Fertility's flagship product is a lab-grade semen analysis kit that allows men to assess their fertility from the privacy of their own

homes. Once the sample is collected, it is mailed to Jack Fertility's laboratory in Oxford, where it undergoes comprehensive testing. The results are delivered digitally within 48 hours, accompanied by personalised insights.

"The proximity to academic institutions and research hubs has been a crucial factor in our decision-making process," However, in Oxford specifically, the advantages of location are tempered by the realities of the local infrastructure. "There remains a pressing need for more affordable lab spaces to support the growing number of innovative startups, as many incredible ideas are waiting for just the right opportunity to get going."

In Jack Fertility's early stages, the scarcity of lab space posed a considerable obstacle. The company is not a university spinout, meaning it lacked the inherent access to campus resources and infrastructure that some competitors might enjoy. This challenge is not unique to Jack Fertility. Still, it is indicative of a broader issue within the UK's health tech and biotech sectors, where high demand for lab space often outstrips supply, driving up costs and limiting accessibility for startups.

Elsner recounts how Jack Fertility was "incredibly fortunate" that the Oxford Trust recognised this gap and provided it with subsidised lab space during its critical early stages. This intervention was pivotal and allowed the company to advance its research and development without the prohibitive costs that might have otherwise hindered progress. The support from the Oxford Trust highlights the crucial role that local networks and targeted interventions can play in the success of early-stage companies.

The company previously raised £350k for R&D to develop its kits in the lab and recently launched a £500k fundraising campaign to bring its product to market. Jack Fertility has also received grants, which, as Elsner explains, "were a great benefit to us, especially the Innovate UK grant, which provided crucial equity-free funding during our earliest stages."

Jack Fertility's experience reflects broader challenges startups encounter in the UK's biotech and health tech sectors. Despite the country's strong R&D infrastructure and its leading position in fertility research and treatment, accessing the necessary physical space for development remains a significant hurdle. Addressing this infrastructure gap is important for the UK to sustain its role in these fields and support the growth of emerging startups like Jack Fertility.

Academic spinout distribution

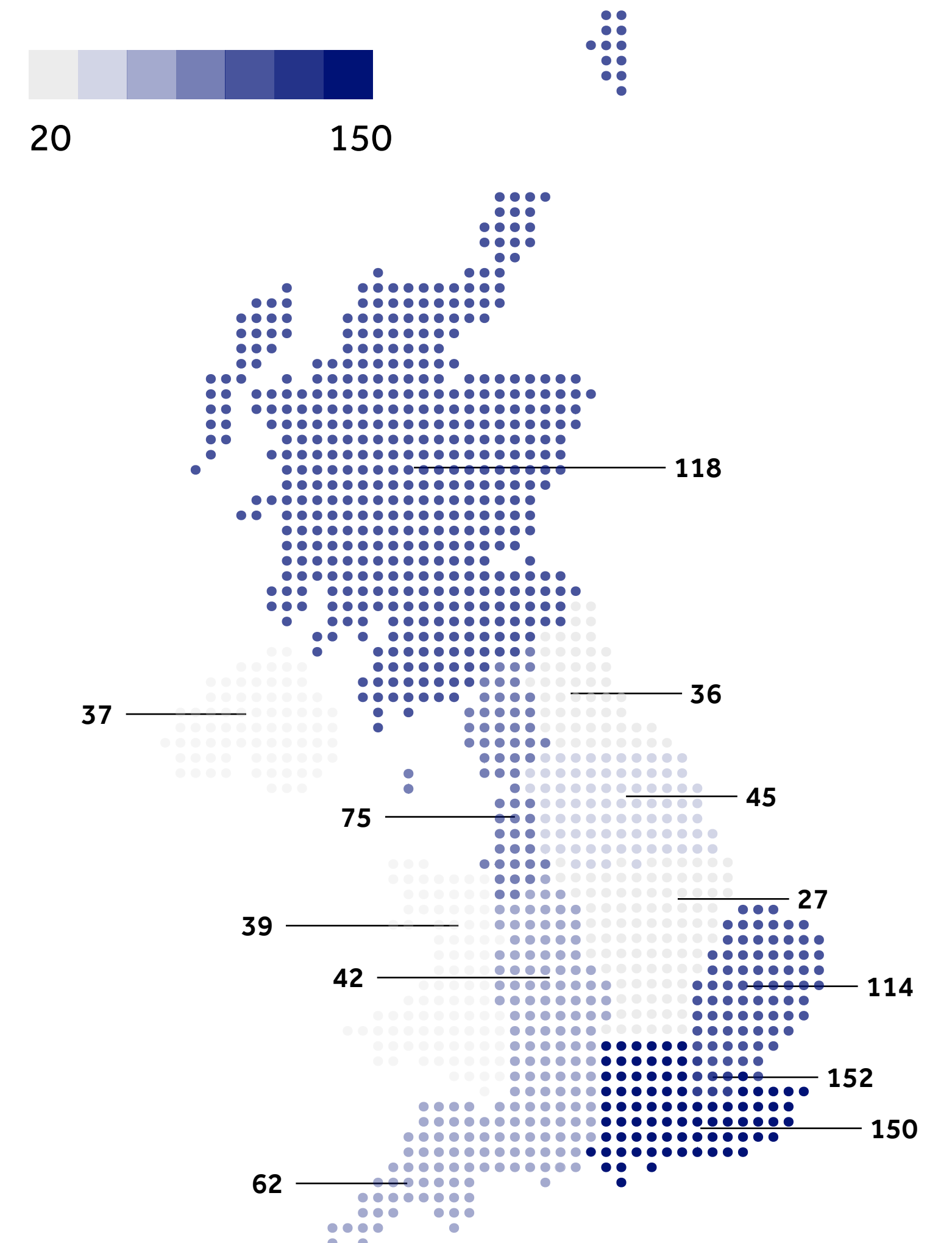
The UK is home to 899 life science academic spinouts, with 46.4% of the nation's life science companies concentrated in London, the South East, and the East of England. London is home to several top universities, including Imperial College London, King's College London, and University College London. Many of the spinouts in the city are founded by individuals directly affiliated with these institutions, who often choose to establish their companies nearby to maintain access to university facilities and talent.

Scotland has the third highest number of life science university spinout companies of any region in the UK. The cities of Edinburgh and Glasgow are responsible for 58.5% of all the spinout companies in Scotland. These cities have the fourth and fifth largest population of life science spinout companies of any local authority in the UK. There are several

developments in Scotland that are encouraging the growth of the life sciences industry, including the Medicines Manufacturing Innovation Centre and the Precision Medicine Living Lab, both located in the Glasgow area. These facilities allow life science companies to carry out research, processes, and manufacturing and whilst fostering relationships with industry, academia, and regulators.

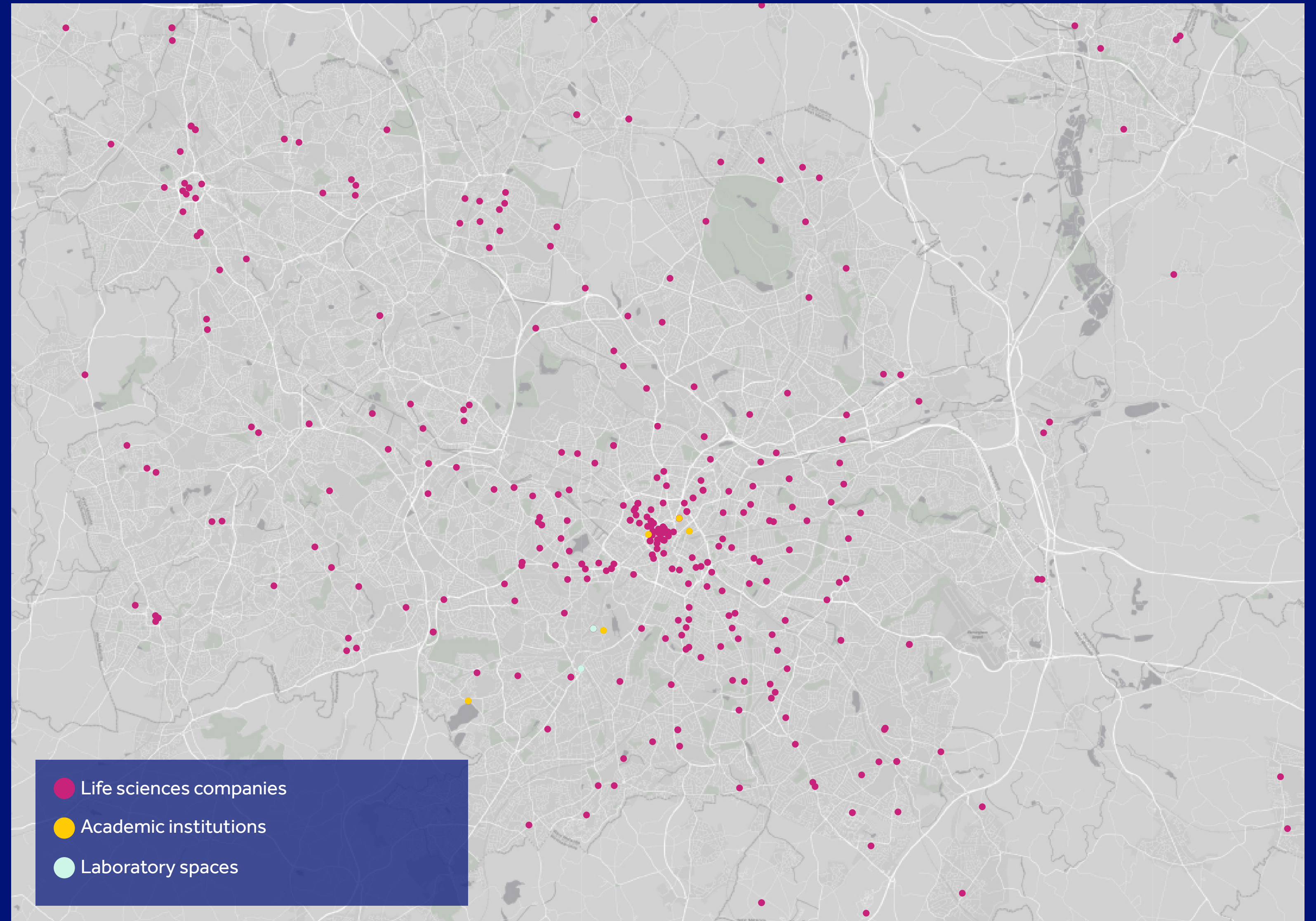
The University of Edinburgh also hosts the Venture Builder Incubator, which assists PhD students and academics in commercialising their research. These programmes help to increase the number of spinout companies that the university produces.

Regional distribution of life sciences spinout companies (August 2024)



Birmingham: Map

Birmingham is home to five academic institutions, including Aston University and the University of Birmingham. It boasts significant infrastructure to support life science companies, such as the BioHub—a fully serviced biomedical incubator and accelerator—and the Birmingham Research Park, which offers office and laboratory spaces to companies.



Equity investment into life sciences companies

The value of equity investment in life science companies peaked at £4.42b in 2021, a year that saw elevated investment across all industries. The economic stimulus measures from the COVID-19 pandemic and low interest rates encouraged money to move into riskier assets such as private equity and venture capital. The resilience of the life science sector in the context of global downturns, as well as the demand the pandemic created for vaccines and treatments, led to considerable levels of equity investment during this period.

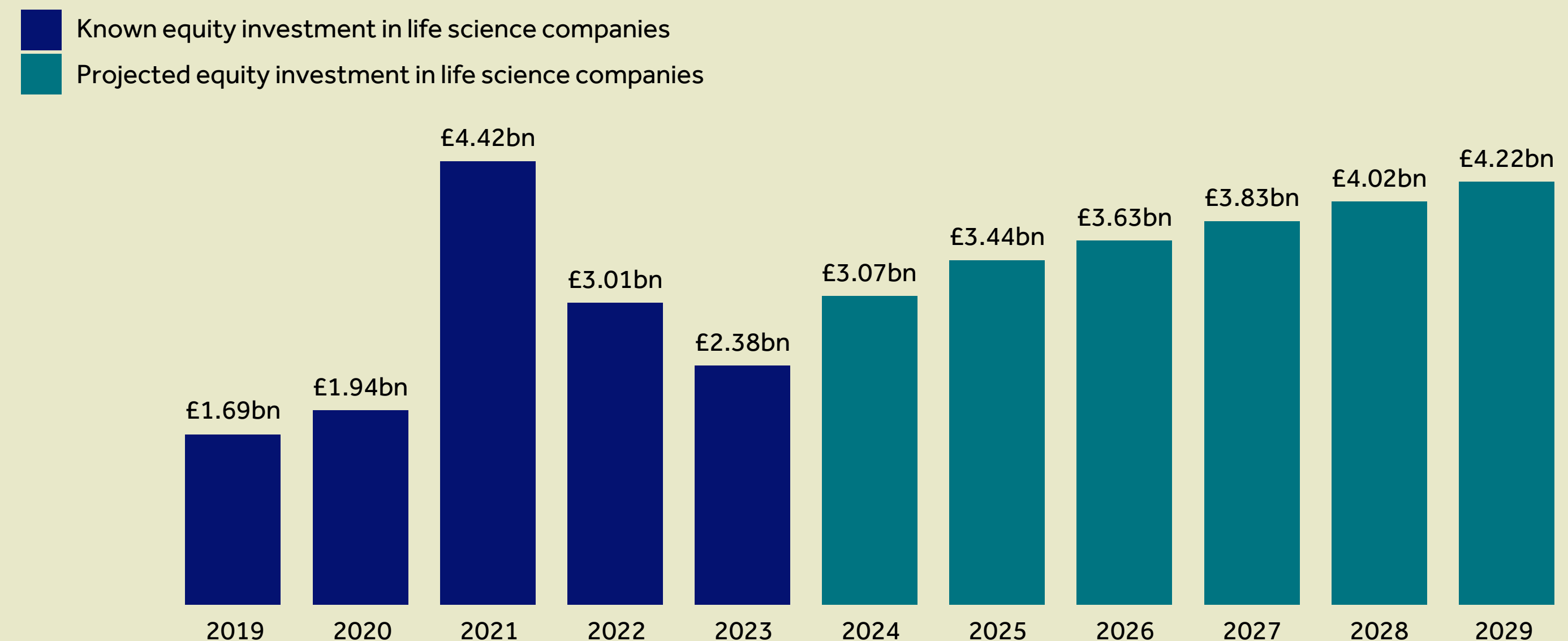
Eight of the top 10 largest equity deals into life science companies occurred in 2021, with the largest raise of £432m coming from Cambridge-based CMR Surgical, the second largest raise by any UK high-growth company in that year.

The level of equity investment saw a readjustment to regular levels during 2022 and 2023. The stimulus measures introduced during the pandemic were cut and life sciences companies reduced R&D expenditure as capital became more expensive. This correction still puts equity investment levels above pre-pandemic amounts, demonstrating the resilience and continued attractiveness of the sector.

The life science sector will have a key part to play in the

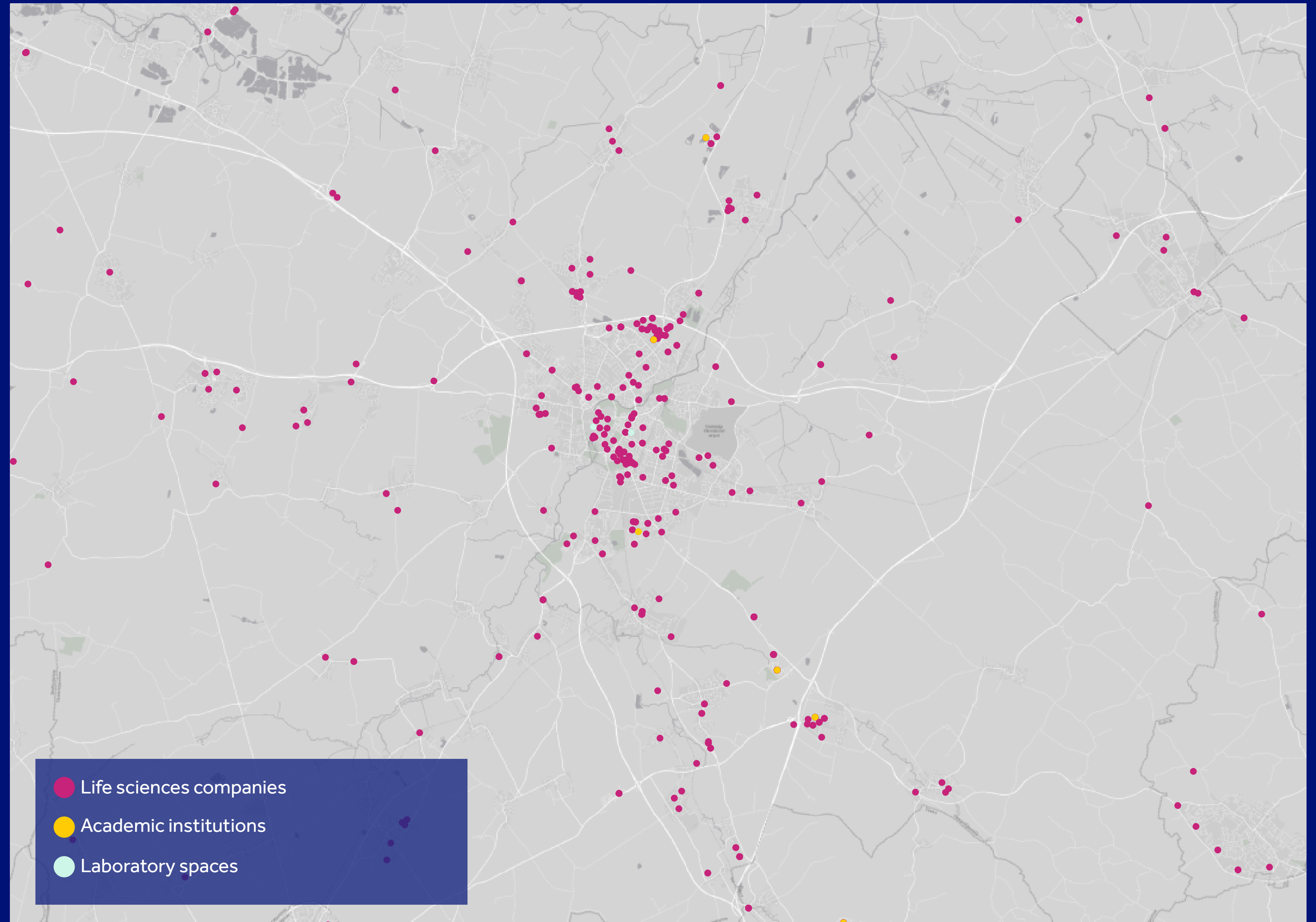
future growth of the UK economy and is prevalent in the government's industrial strategy. This will see the government continue to invest to allow the life science sector to thrive, funding the creation of more lab spaces and developing infrastructure in key life science clusters. The government's support will help the sector achieve the consistent increase in investment predicted up to 2029, which shows equity investment rising to £4.22b, a 77.3% increase on 2023 levels.

Equity investment into life science companies (2019-2029)



Cambridge: Map

Cambridge is a well-established hub for research and development, anchored by the University of Cambridge and Anglia Ruskin University. The region features a range of cutting-edge laboratory and innovation spaces, including the TusPark Bio-Innovation Centre, Babraham Research Campus, and Granta Park. The Cambridge Biomedical Campus, located in Trumpington, is the largest centre of medical research and health science in Europe. These centres solidify Cambridge's status as a leading centre for scientific advancement in the UK.



Case study: Bruntwood

"At Bruntwood, our overarching purpose is to create thriving cities. To achieve this, we focus our activity in a relatively small number of cities and their surrounding towns, recognising the importance of having strong economies across both. This means we support the businesses and communities that make them up and support economic growth across the regions and for the UK as a whole. We offer offices, labs and retail spaces alongside services and community support which enables businesses to grow with us, develop new ideas, and build a strong community of businesses, leaders, entrepreneurs, and teams in our spaces," explains Jessica Bowles, Director of Strategic Partnerships.

Bruntwood is a UK-based property company that specialises in the development, management and letting of commercial properties and caters for

businesses of all sizes from start ups to global brands. With a strong presence in northern England and the Midlands, Bruntwood offers a diverse range of offices, coworking environments, laboratory and retail spaces. Its portfolio covers 5 cities with 9 campuses, 42 city centre hubs, 19 regional hubs and a four town centre redevelopments in joint venture with local authorities.

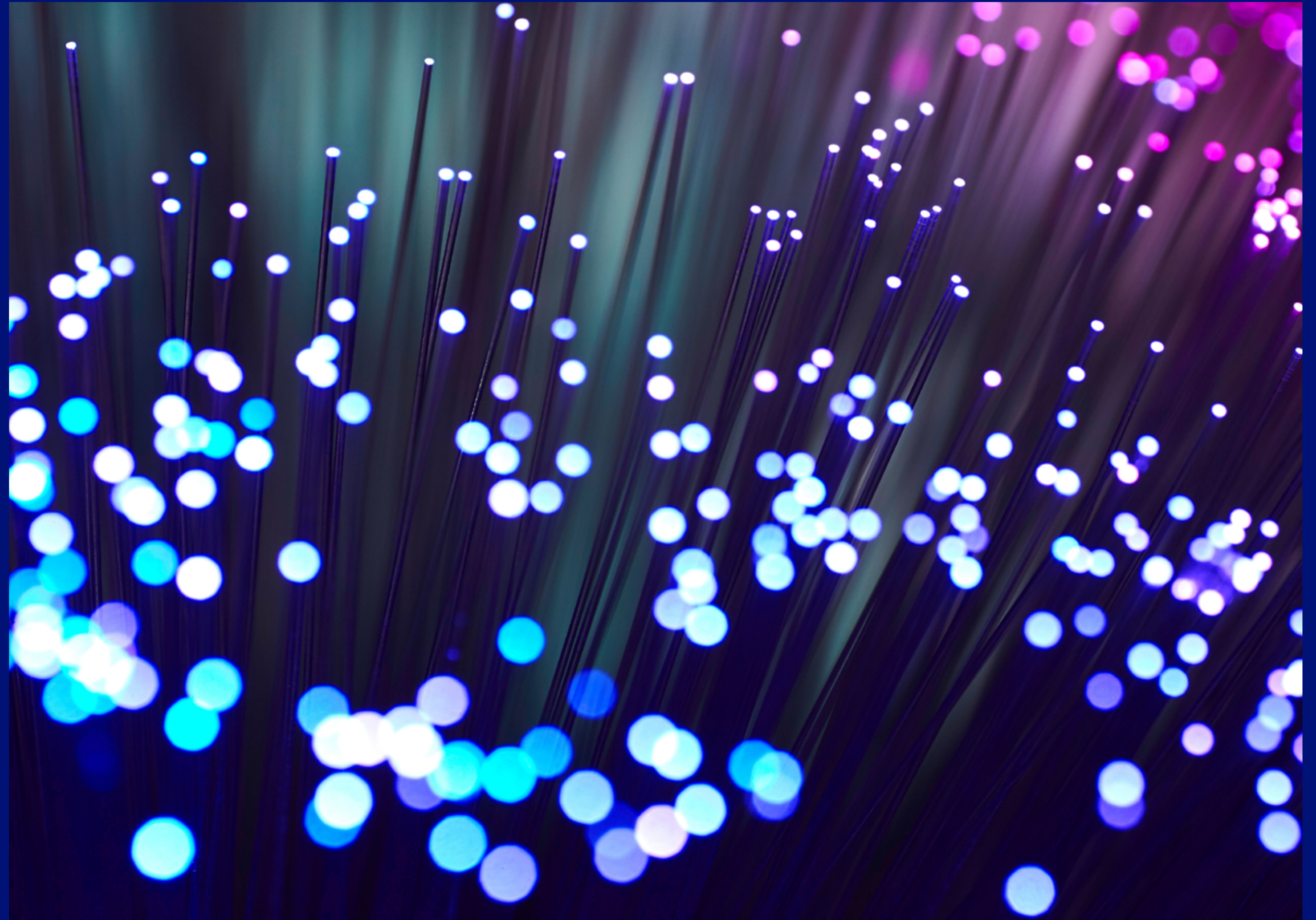
Bruntwood SciTech, part of the Bruntwood Group that provides specialist science and tech facilities and innovation hubs, is a £1.5bn joint venture between Bruntwood, Legal and General and Greater Manchester Pension Fund. Bowles agrees that "the UK has brilliant R&D which helps to feed its exceptionally strong science and tech sectors." However, she adds "there's still a lot more to be done to help all types and sizes of businesses take up that R&D, absorb innovation into their businesses, and use it to drive productivity." One of the opportunities to do this, she explains, is to improve the connections between different areas - towns and cities, cities and their neighbours, and the North, Midlands and South. This is about transport infrastructure but also business, civic and academic connections. "Government intervention, alongside action by businesses like ours, is needed to help address these gaps" says Bowles.

Bruntwood SciTech is actively involved in projects designed to boost innovation and economic growth in cities across the UK. One such example is Sister, Manchester's newest innovation district, a joint venture with the University of Manchester, located a stone's throw from Manchester Piccadilly. The first phase, a community facing innovation centre that will support hundreds of businesses, centred on the Renold Building, has been undergoing a refurbishment and hosted the unveiling of the new Sister brand at the end of September. "We are developing a global innovation district that capitalises on the University's specialisms in advanced manufacturing, digital technology, and AI. It will be a new neighbourhood that will create at least 10,000 jobs, thousands of homes, and be totally embedded into the life blood of the city and its communities" Bowles explains.

Recognising that location is a key consideration for many businesses, Bruntwood and Bruntwood SciTech offer a range of options depending on the customer's needs. Bowles adds, "We understand that for some businesses, being in close proximity to universities is hugely important because they want to be right there, immersed in the culture and environment that a research university can create. Others prefer to be located in city centres, and that's fine too." Key developments in Bruntwood SciTech's portfolio include

Circle Square in Manchester, a neighbourhood that blends workspace with cultural and social venues, Alderley Park, a major science hub in Cheshire that supports biotech and health tech businesses, Birmingham Health Innovation Campus at the University of Birmingham and Melbourn Science Park a few miles south of Cambridge.

By focusing on the development of infrastructure that supports innovation, Bruntwood SciTech plays a pivotal role in creating ecosystems where businesses can thrive. As projects like Sister, Birmingham Health Innovation Campus, Manchester Science Park, Alderley Park and Melbourn Science Park progress, the company continues to play a role in the development of regional innovation networks and connects these to the surrounding towns that provide workspace, good homes and a great town centre offer.



Compute: hardware, software and data systems

UK's computing capacity

The UK is experiencing a sharp increase in demand for HPC, driven by its strategic focus on industries such as AI, climate modelling, and life sciences. The growth of these industries in recent years has intensified demand for the nation's computing infrastructure.

AI, a cornerstone of future economic growth, requires vast computational resources for tasks ranging from natural language processing to autonomous systems. This need is emphasised in the UK government's National AI Strategy.¹² At the forefront of this effort to expand the UK's AI capabilities is the Isambard-AI supercomputer. The computer is based at the University of Bristol and was funded by DSIT and UKRI.¹³ Isambard-AI is the first supercomputer in the country based on NVIDIA's new Grace-Hopper GPU-CPU. The supercomputer will play a vital role in increasing

efficiency in automated drug discovery and climate research.¹⁴

Climate modelling relies heavily on HPC to understand and mitigate climate change. This is crucial to helping the government achieve its net zero ambitions. The UK Met Office uses these resources to simulate complex weather patterns, highlighting the necessity of powerful computing for accurate environmental forecasting.¹⁵ A recent development is ARCHER2, located at the University of Edinburgh. This serves as the UK's national supercomputing service. It allows researchers and industry to access supercomputing resources without the high costs of owning or maintaining one themselves.¹⁶ ARCHER2 contains 5.86k compute nodes and over 748k CPU cores. It supports a broad spectrum of scientific research, including climate modelling.

Life sciences is another strategic sector that relies on substantial computing power, particularly in genomics and personalised medicine. The UK Biobank relies on advanced HPC systems to store and analyse the complex health data of over 500,000 participants. This powerful computing infrastructure enables researchers to conduct studies that link genetic variations to specific diseases, thereby enhancing our understanding of health and disease across the

population.¹⁷ Additionally, specialised facilities like the Rosalind Franklin Institute are pivotal in advancing research in genomics and drug discovery. The Institute leverages HPC to analyse data from cutting-edge imaging technologies, which capture atomic details of biological molecules. This capability is essential for understanding molecular structures and developing new therapies.¹⁸

The UK's computing capacity reflects its commitment to leading strategic sectors like AI, cleantech, and life sciences. Further investment in HPC infrastructure is expected as demand continues to grow. Expanding HPC capabilities will drive breakthroughs in these key sectors and strengthen other vital sectors, ensuring the UK stays at the forefront of global innovation and scientific research.

¹² Department for Science, Innovation and Technology, Office for Artificial Intelligence, "National AI Strategy," Gov.UK, Last updated 18 December 2022

¹³ & ¹⁴ University of Bristol, "Bristol Supercomputer to Power Groundbreaking Research," Last modified November 2023

¹⁵ Met Office, "Climate Modelling," Accessed August 30, 2024

¹⁶ The University of Edinburgh, "Archer 2," Accessed August 2024

¹⁷ UK Biobank, "Genetic Data," Accessed August 30, 2024

¹⁸ Rosalind Franklin Institute. "Correlated Imaging." Accessed August 30, 2024

Equity investment into companies reliant upon HPC

Equity investment in companies reliant upon HPC hit record highs of £9.94b in 2021. The shift to digital technologies was largely driven by the COVID-19 pandemic. As businesses adapted to remote work, online commerce, and the growing need for digital infrastructure, demand for cloud computing and AI soared, attracting significant capital.

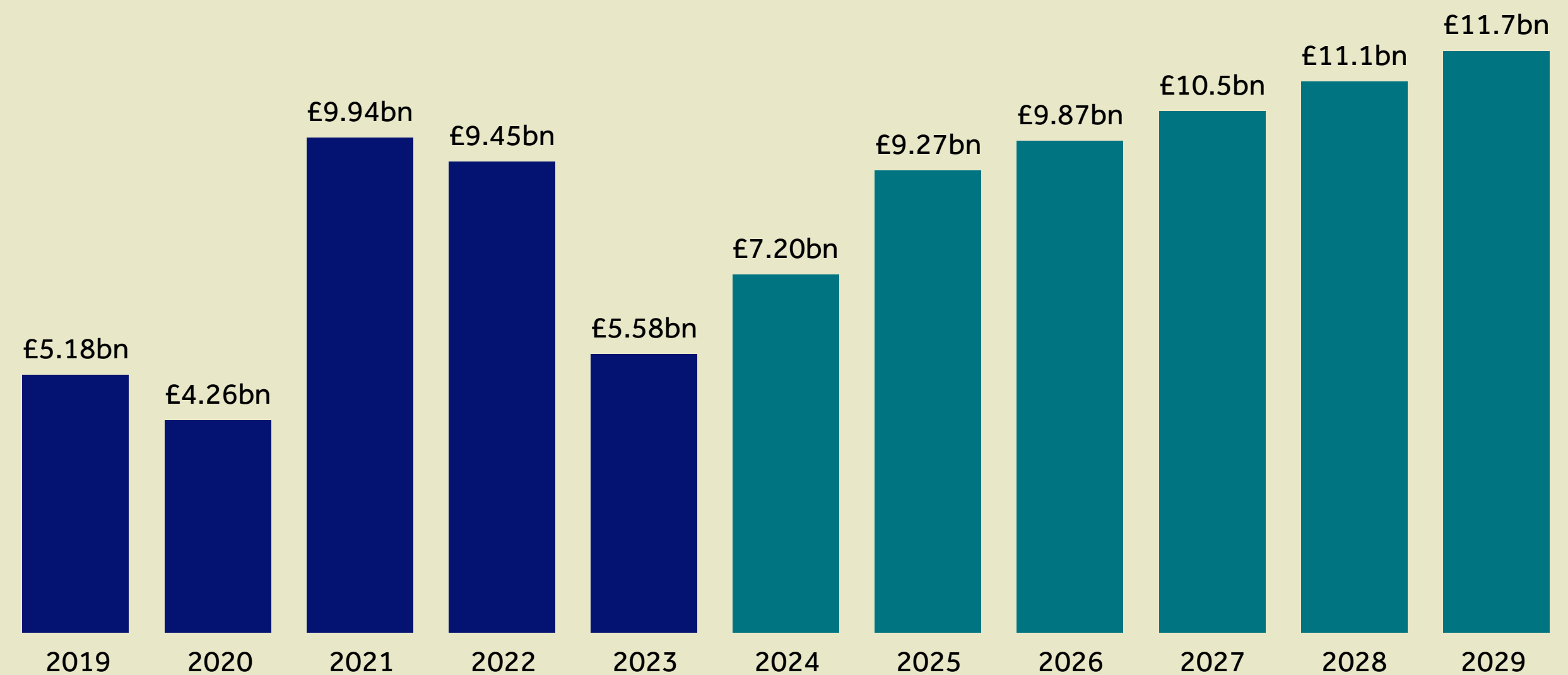
Investment tapered off to £5.58b in 2023 as the market normalised and settled into a post-pandemic rhythm. Importantly, investment levels in 2023 remained higher than the pre-pandemic £5.18b recorded in 2019. This trend reflects the pandemic's lasting impact, as investors continued to value the critical role of digital solutions brought by compute-reliant technologies.

Equity investment in compute-reliant companies is projected to grow to £7.20b in 2024, surpassing the 2023 figure by 29.0%. The sector's recovery is underpinned by a continued focus on digital transformation, with the growing recognition of AI technologies. Looking beyond 2024, the projected upward trajectory suggests a sustained positive growth trend.

The analysis presented here uses linear regression based on equity investment data from 2019 to 2024. Full details can be found in the methodology section.

Equity investment in companies reliant upon compute (2019-2029)

■ Known equity investment in companies reliant upon compute
■ Projected equity investment in companies reliant upon compute



Top sectors for companies reliant on HPC

Application software leads the ranking with 4,508 startups, highlighting the crucial role of advanced computing in the development of modern applications. Data provision and analysis ranks second with 3,491 startups, highlighting the substantial reliance on computing within data-centric industries.

Other notable sectors include data management (969) and data aggregation (566). High-growth startups within these industries rely heavily on compute-intensive tasks such as data processing, storage, and analysis.

The Software-as-a-Service (SaaS) sector, with 2,512 startups, exemplifies the shift toward cloud-based business models, where scalable software solutions

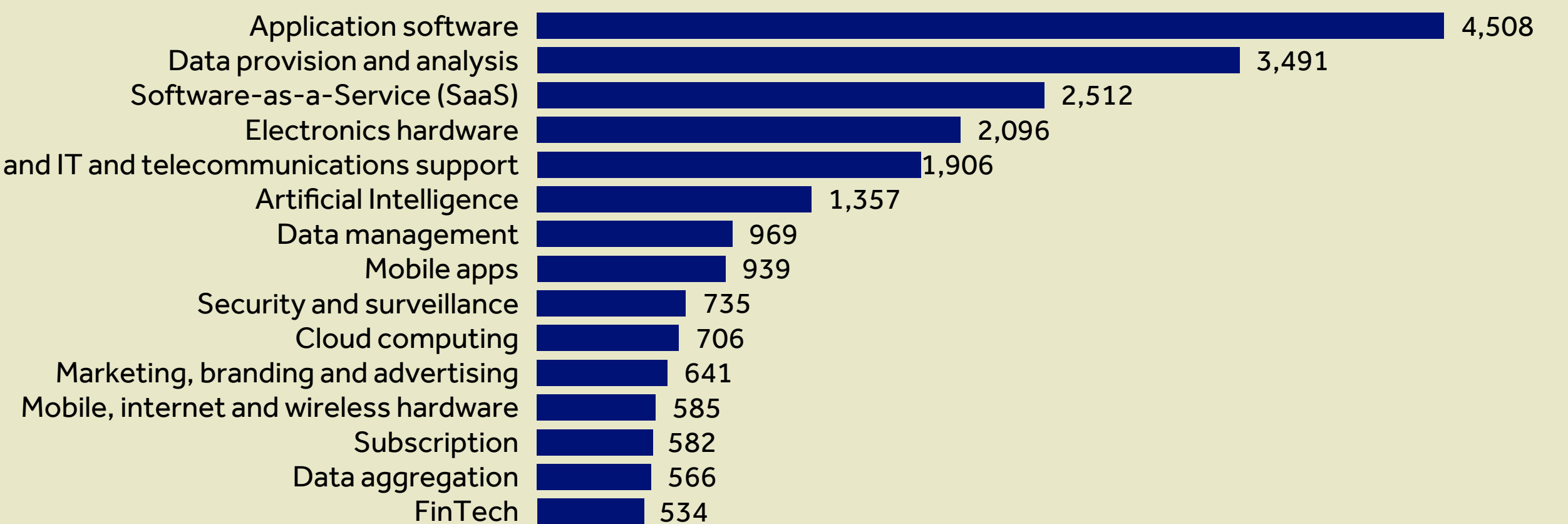
are delivered directly to users. Complementing this is the significant presence of cloud computing companies (706), highlighting the essential role of computing power in providing the infrastructure that enables other sectors to thrive.

The AI industry, represented by 1,357 companies, stands out for its rapid growth and deep reliance on computational resources. These companies demand immense processing power to train complex machine learning models, execute deep learning tasks, and perform real-time data analytics. AI's influence spans industries, from healthcare to finance, where advanced

computing drives innovations like predictive analytics, natural language processing, and autonomous systems.

Additionally, the presence of sectors such as electronics hardware (2,096) and mobile, internet, and wireless hardware (585) signals significant activity in developing physical devices that rely on computing power. This points to a thriving ecosystem where companies are not only building software but also innovating at the hardware level to support compute-heavy applications.

Top industries of startups reliant on compute (August 2024)



Big tech in the UK

Microsoft is planning a significant expansion of its data centre infrastructure in the UK, responding to the growing need for cloud computing and AI resources. Glen Robinson, Microsoft UK's National Technology Officer, confirmed that the company is committed to "more than doubling" its data centre capacity over the next three years. This expansion will involve deploying over 20,000 advanced graphics processing units (GPUs) which are required for scalable computing power. According to Robinson, this investment will play a crucial role in helping the UK manage its growing digital infrastructure needs, particularly in AI.

Robinson noted that the selection of expansion locations—London, Cardiff, and potentially West Yorkshire—was influenced by strategic factors such as the availability of brownfield sites, which allow for

large-scale development, with minimal disruption to local residents. "The regions we're investing in offer promising growth trajectories for digital industries," says Robinson.

Microsoft's infrastructure investments are not only focused on technology but also on benefiting local communities and economies. Robinson explained that Microsoft's Datacentre Community Pledge ensures that investments contribute to a sustainable future, promoting local prosperity and responsible operations. "By 2025, we will procure 100% renewable energy on a global scale, both significantly expanding and decarbonising local electricity grids," he states, adding that the company's data centres are designed to be more water-efficient, with a goal of replenishing more water than they consume by 2030.

In addition to environmental goals, Microsoft is dedicated to creating employment in the UK. "Increasing access to digital skills and local job opportunities is crucial to ensuring inclusive economic growth across all regions," Robinson says. Through the Get On programme, Microsoft aims to help 2.50m people build careers in technology and connect 300,000 people to new tech jobs.

Microsoft's long-term vision for the UK centres on supporting public and private sectors with advanced technology. Robinson highlights the company's £2.50b investment in new infrastructure, security, and workforce development to meet this goal. As part of this, Microsoft is helping to boost the UK's computing capacity, which remains relatively small despite the country's tech prowess. "The UK made up only 1.30% of global compute capacity in 2022," Robinson explains, emphasising the need for further investment in data centres and GPUs to keep the UK competitive.

With these investments in data infrastructure, renewable energy, and workforce development, Microsoft's UK expansion is positioned to support the country's technological advancement and economic growth. By enhancing its data centre capacity and aligning with the UK's AI ambitions, Microsoft is playing a key role in shaping the future of the UK's digital landscape.

Case study: Twin Path Ventures

"The UK has good infrastructure, whether it be physical, logistical, or, in the case of AI, sufficient data centres and cloud platforms," says John Spindler, Partner at Twin Path Ventures. This infrastructure is crucial for the growth of early-stage AI and deep tech companies, which depend on reliable digital resources to develop and scale their technologies.

Twin Path Ventures, a London-based venture capital fund, focuses on pre-seed and seed investments in startups operating in AI and deep tech. Established in 2023, the firm targets high-growth businesses, particularly those emerging from leading academic institutions and developing innovative solutions.

The firm typically invests around £500k per deal, providing not just funding but also ongoing guidance and support to its portfolio companies.

Deep tech startups rely heavily on robust digital infrastructure to support their complex technological needs, from data processing to cloud computing. "There are deep tech ecosystems wherever there is a high-quality, research-intensive university," Spindler explains. "Deep tech and frontier AI companies tend to emerge where strong research programmes are present. You see this with Russell Group universities such as Manchester, Glasgow, Edinburgh, Belfast, Southampton, and Bristol."

Spindler acknowledges that while the UK has made strides in providing digital infrastructure, there are still opportunities for improvement in other areas crucial for the growth of startups. "We need more wet labs," he emphasises. "It's a much more challenging thing to encourage and incentivise, but it's necessary and achievable. We need wet labs for startups at a reasonable price."

Wet labs, which provide controlled environments necessary for handling chemicals, biological materials, and other substances, are important for startups working in sectors like biotechnology, materials

science, and environmental science. Access to such facilities can be limited and expensive for early-stage companies. The need for affordable wet labs is a challenge that Spindler and others in the ecosystem are aware of.

Spindler also suggests the need for more "sandboxes" for startups—environments where computing resources, "whether from big data centres or companies like NVIDIA, are available at low cost or even for free," he says. "These resources should be accessible to startups working on projects that are deemed worthy of support, whether due to their social or economic impact or their focus on specific sectors or areas. Right now, the cost of this computing power is mostly covered by VCs and investors."

Spindler's comments highlight the potential for further strengthening the UK's thriving startup ecosystem. While the digital infrastructure is strong, there are great opportunities to provide more targeted support, such as increasing access to physical spaces like wet labs and offering subsidised computational resources. By expanding these resources, the UK can foster innovation across a wider range of sectors, ensuring that startups have the infrastructure they need to grow and succeed, regardless of their specific requirements.

Case study: Digitech Oasis

“The quality of data infrastructure is critical to the innovation efforts of Digitech Oasis, particularly in the development of autonomous robotics solutions,” says Ayan Mohamed, founder and CEO of Digitech Oasis. Incorporated in July 2022, Manchester-based Digitech Oasis provides retailers with an end-to-end platform designed to predict, improve, and automate critical business functions. The effectiveness of these solutions heavily depends on the quality and reliability of the digital infrastructure supporting them.

The company’s offerings include tools like Asante AI, designed to automate manual processes, and Autonomous Mobile Robots (AMRs), which optimise

warehouse operations. “A robust data infrastructure enables us to efficiently process and analyse large volumes of data generated by robots in real-time,” Mohamed explains, emphasising how integral this infrastructure is to their operations.

The decision to establish the company’s headquarters in Manchester, after previously operating in Kenya and the US, has proven advantageous. “The UK’s robust digital infrastructure provides us with high-speed connectivity and reliable data centres, which are crucial for developing and operating artificial intelligence solutions. The UK’s advanced telecommunications network, including the ongoing rollout of 5G technology, supports our efforts to develop edge computing capabilities for our AMRs,” says Mohamed.

Digitech Oasis allocates a substantial portion of its IT budget to the security and maintenance of its data infrastructure. “We prioritise regular security audits, software updates, and employee training to maintain a strong security posture,” Mohamed notes. These efforts underscore the company’s commitment to safeguarding its operations and the sensitive data it handles, which is essential for sustaining client trust and operational integrity.

Digitech Oasis has benefited from strategic partnerships and collaborations that have provided support for its R&D efforts. Its involvement with the Digital Security Hub (DiSH) in Manchester, which includes Barclays Eagle Labs, has been particularly beneficial. Mohammed explains that “Partnerships and collaborations have been instrumental in helping Digitech Oasis secure the necessary infrastructure for our R&D efforts, particularly in specialised facilities and access to talent.”

The company is also planning for the future by anticipating the evolving nature of data infrastructure needs. Mohammed notes that, “We anticipate increased costs associated with adopting emerging technologies, such as edge computing and quantum robotics, which will enhance our robots’ performance and data processing capabilities.”

Looking ahead, Digitech Oasis is preparing for future changes in data infrastructure by focusing on emerging technologies and maintaining key partnerships. This approach will help the company navigate evolving requirements and continue its work in autonomous robotics.

Energy infrastructure

UK's energy infrastructure

The UK's energy infrastructure is navigating a transformative period, which presents opportunities for early-stage companies, particularly those in energy-intensive sectors such as AI, semiconductors, and quantum computing. The shift to net-zero is driving innovation and influencing businesses to develop sustainable cutting-edge solutions that, as a result, enhances their global competitiveness.

One major challenge that energy-intensive companies face is power constraints and grid limitations. Many startups that rely on substantial data centre capacity or high power consumption are struggling to secure the energy resources they need. This difficulty is compounded by delays connecting to the national grid and the high costs associated with energy infrastructure upgrades. For example, Paragraf, a Cambridge-based startup specialising

in graphene-based sensors and electronics, faced a cost of £1m and a year-long wait to connect to the main grid.¹⁹ While these delays are challenges for startups, they also reveal areas where improvements can be made to support the development of a more sustainable infrastructure.

The UK's existing electricity grid presents a significant opportunity for innovation and development. Clean energy and technologies are at the core of this opportunity, offering the potential to meet the demands of modern tech startups by expanding the UK's grid capacity while preserving the environment. Modernising the grid systems will ensure they can better support industries that require scalable power solutions and are in high-demand areas such as London, driving sustainable technological advancements.

The UK's current infrastructure offers significant growth opportunities, and in response, the government has introduced several initiatives to enhance and support this potential. This includes infrastructure reforms to expedite grid upgrades. Industry experts have also suggested additional actions to support companies in this area. Recommendations include creating a dedicated task force for energy infrastructure, incentivising

green energy sources, enhancing the electricity network to better utilise renewable energy, and providing standardised guidance for data centre planning applications.

As the UK aims to maintain its position as a global leader in deep tech and achieve its carbon reduction goals, modernising the energy infrastructure will be essential for supporting innovative startups and fostering a thriving tech ecosystem.

¹⁹ [Cristina Gallardo, "UK's Power Struggle gets real as data centres plea for energy reforms," Sifted, 1 December, 2023](#)

Renewable energy sources and scalability

Renewable energy and scalability are pivotal factors shaping the UK's cleantech startup landscape. The regulatory environment that goes alongside these industries provides a framework for innovation and development within the sector.

The UK's focus on renewable energy has opened up numerous opportunities for startups to develop innovative solutions that address pressing climate challenges. Many startups are actively working on improving efficiency, optimising energy storage, and finding ways to integrate renewable sources more effectively into the national grid. By concentrating on these specific areas, they are positioned to make meaningful contributions to the broader transition to a low-carbon economy, overcoming obstacles

that currently limit the deployment and scalability of renewable energy.

The funding and investment landscape for renewable energy startups in the UK is strong, driven by the combined focus on renewable energy development and the need for scalable solutions. UK impact startups collectively raised £2.00b in 2021, with a large portion of these funds going to companies addressing global energy and climate issues.²⁰ Climate tech companies now account for 65% of deals in the impact investment space, indicating strong investor interest in scalable renewable energy solutions.²¹ This interest is further supported by the potential of these startups to provide innovative technologies and approaches that could be applied on a global scale.

Support from various initiatives also plays a crucial role in advancing renewable energy innovation. Programmes such as the Carbon 13 Venture Launchpad accelerator, delivered by Barclays Eagle Labs and Carbon 13, offers support to companies operating in the climate tech sector with their carbon reduction potential, investment, and scalability. The UK leads Europe in the number of net-zero companies, including a substantial share of early-stage and late-stage startups.²² This support network provides essential resources and mentorship to help startups

navigate the complexities of scaling their operations and achieving market success.

Startups often face challenges in scaling their technologies. Around 40% of the technologies required to meet net-zero targets are not yet at mass market scale, presenting a chance for startups that can innovate and bring these solutions to wider adoption.²³

^{20 & 21} Department for Digital, Culture, Media & Sport, "UK impact startups raise £2 billion to solve the world's greatest challenges," Gov.UK, 29 November (2021)

²² Lanna Deamer, "The 30 UK Tech Scaleups Tackling Climate Change To Watch, Startups Magazine, Accessed August 2024

²³ IEA, "Clean Energy Innovation," IEA, Paris (2020)

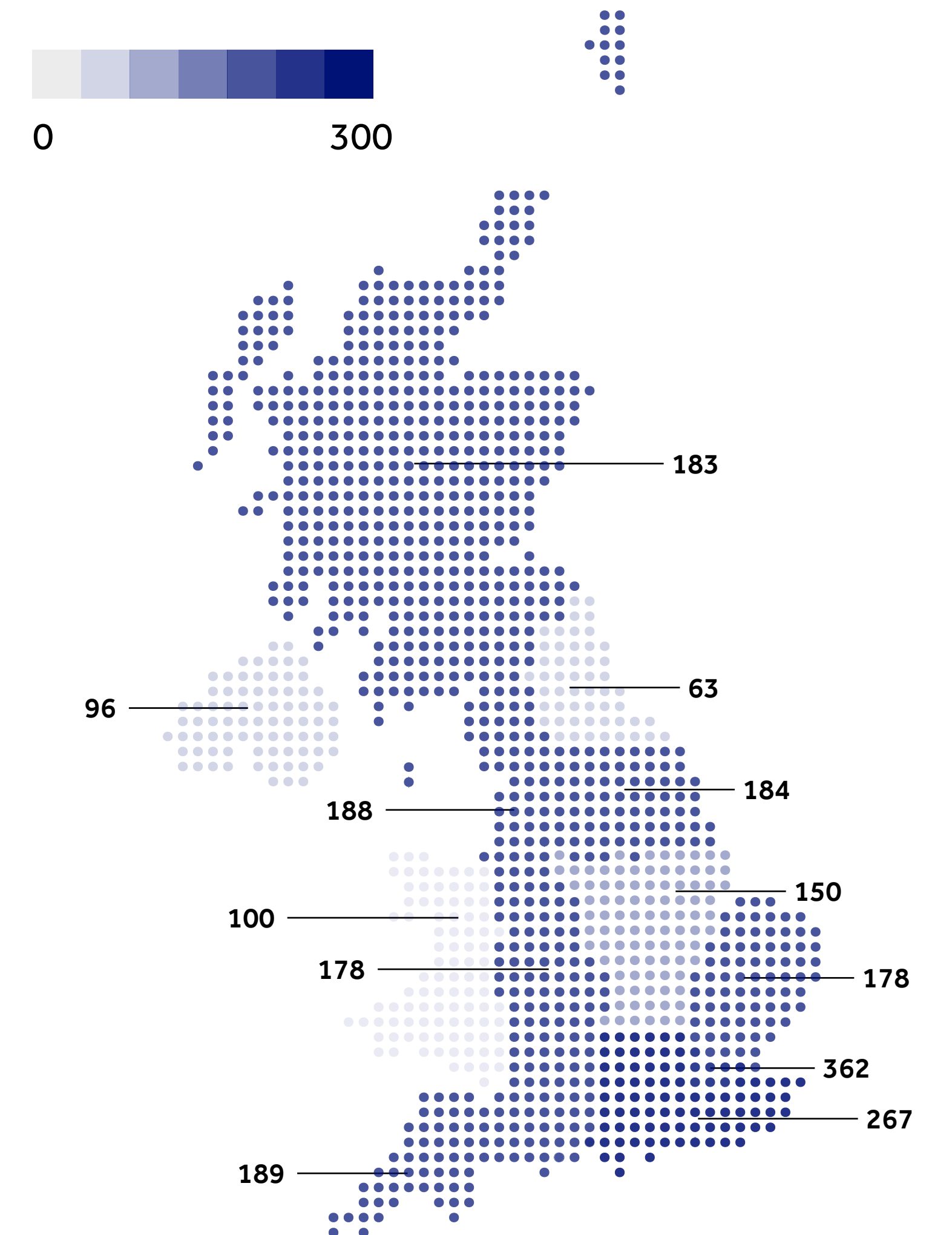
Regional distribution of energy-intensive companies

Energy-intensive companies significantly support local economies across the UK, with London hosting the largest concentration (16.9%), followed by the South East (12.5%) and East of England (8.84%). London's dense business ecosystem, access to capital, and robust academic environment make it a prime location for these industries.

The South East and East of England also benefit from proximity to London's investor networks and leading research institutions like Cambridge and Oxford, which host 10.9% and 6.59% of energy-intensive spinouts, respectively.

The North West (8.79%) and Yorkshire (8.60%) form notable clusters, leveraging coastal locations for logistical advantages and access to raw materials, underscoring the strategic distribution of these industries across the nation.

Regional distribution of energy-intensive companies (August 2024)



Investment in energy-intensive companies

Energy-intensive companies saw a significant surge in investment in 2022, with funding levels almost doubling to £882m from £450m in 2021. This record-setting investment was bolstered by two major fundraisings: a £123m fundraising by carbon capture firm Carbon Clean in May and a £110m fundraising by EV company Connected Kerb in September. These figures reflect investor confidence and the increasing recognition of these companies' critical role in transitioning to a low-carbon economy.

In 2023, energy-intensive companies saw a moderate contraction in investment, with a 24.8% decline, mirroring the broader high-growth ecosystem, which experienced a 28.6% decrease. The drop can be partly attributed to a more cautious investment environment due to several factors.

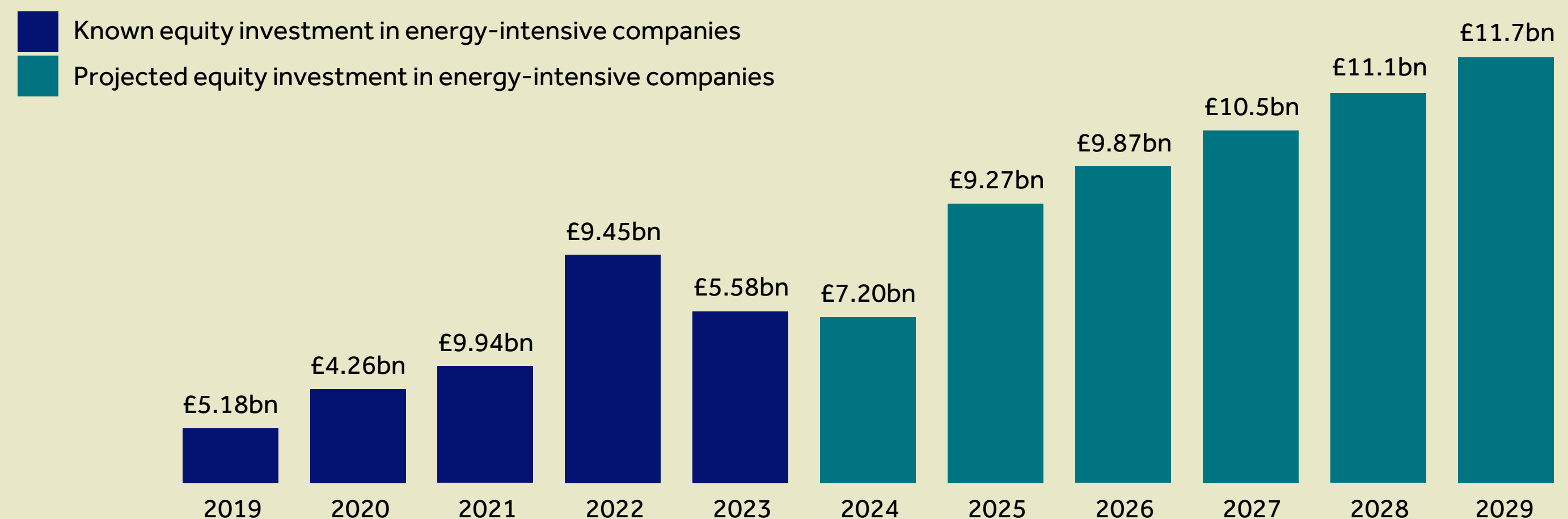
Overdeployment of funds across the high-growth ecosystem in 2020 and 2021 led to inflated company valuations. Increasing interest rates in recent years led to more risk-averse behaviour from limited partners—as a result, riskier businesses received less investment. Increased investment due to pandemic-related stimulus measures and significant fundraisings by energy-intensive companies contributed to a temporary spike in overall funding, making the decline in 2023 appear more pronounced. Rather than signalling a downturn, 2023 figures represent a return to more typical levels of investment activity.

In July 2024, the Chancellor announced the creation of a National Wealth Fund to mobilise further investment in green industries. This fund will include £7.30b of earmarked funding to support the UK's transition to a net-zero economy by 2050.²⁴ This investment will be focused on five priority sectors: green steel, green hydrogen, industrial decarbonisation, gigafactories, and ports.²⁵ This initiative could catalyse substantial investment in energy-intensive companies, potentially pushing total sector funding to £1.65b by 2029. This

²⁴ HM Revenue & Customs, "Boost for new National Wealth fund to unlock private investment," Gov.UK July 2024

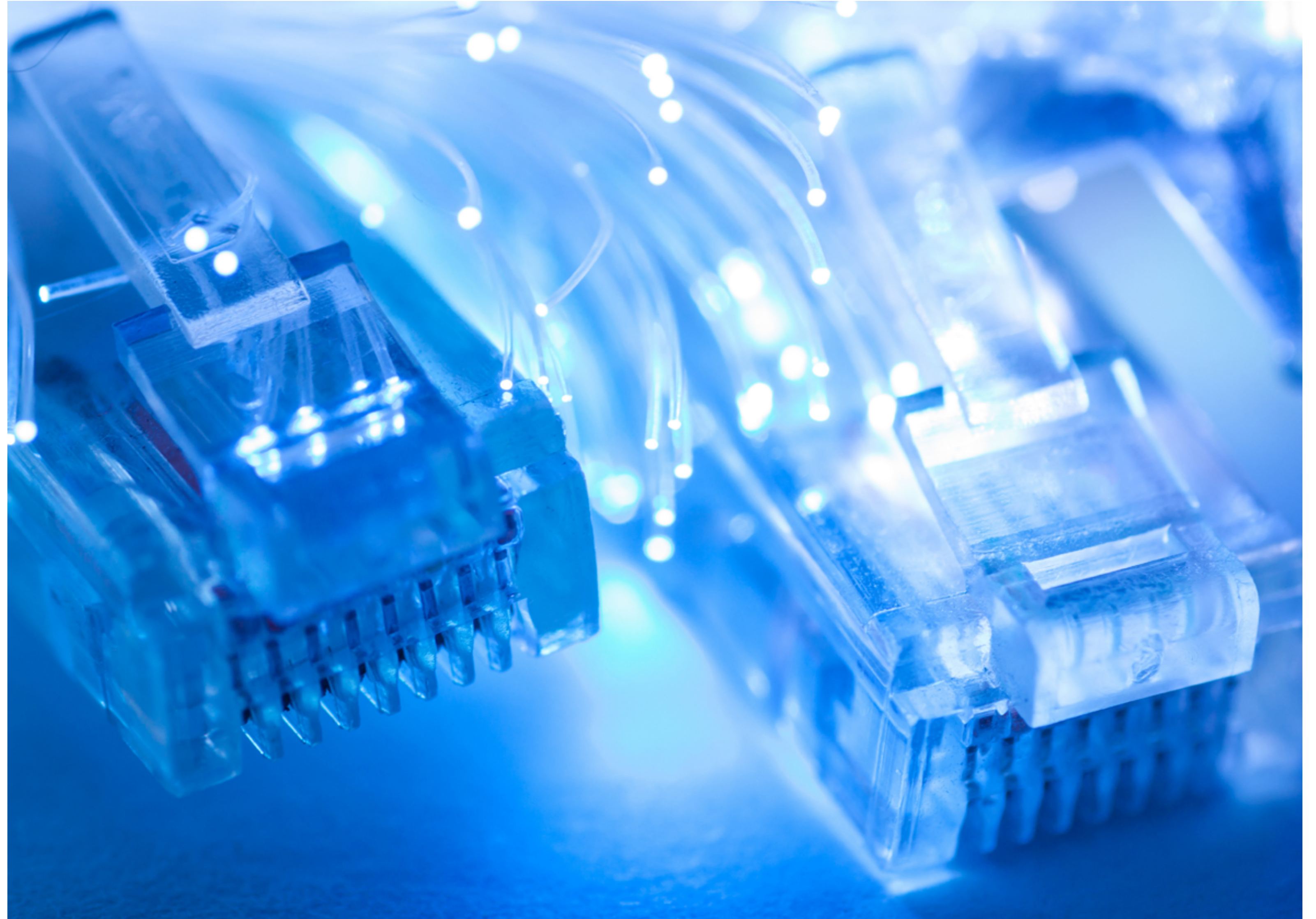
²⁵ Green Finance Institute, "National Wealth Fund Taskforce," July 2024

Equity investment in companies reliant upon compute (2019-2029)



projection underscores the vital role of government policy in providing investment opportunities and driving sustainable industrial growth.

The analysis presented here uses simple linear regression based on equity investment data from 2019 to H1 2024 to project investment into the future. Full details can be found in the methodology section.



Top sectors of energy-intensive startups

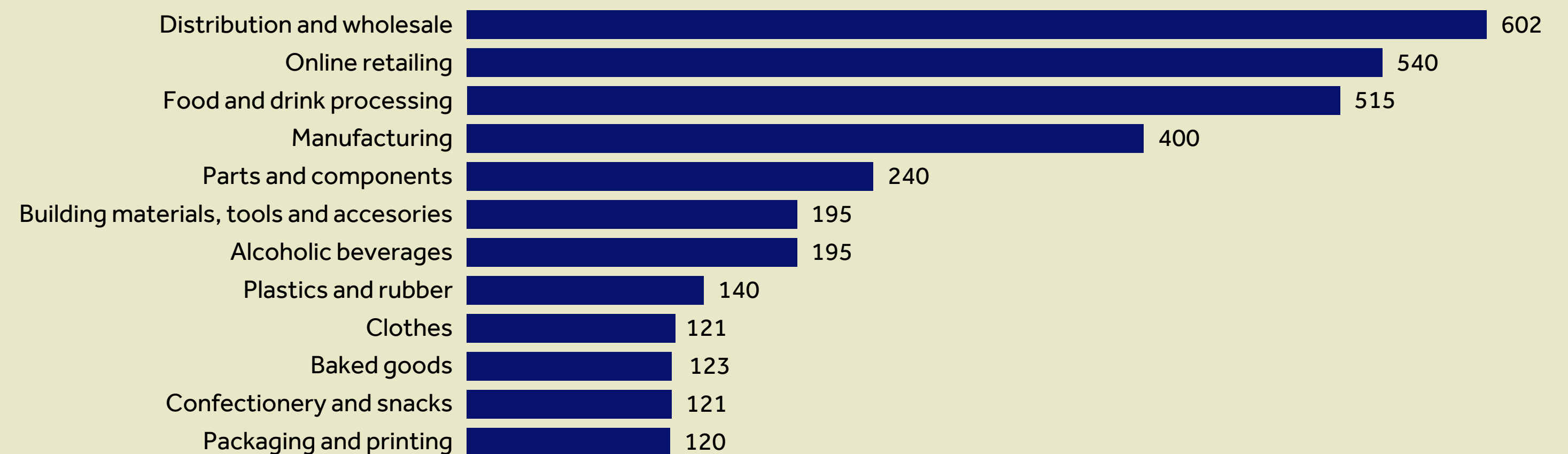
Energy-intensive companies are pivotal in propelling economic growth and sustainable innovation across sectors. Distribution and wholesale emerge as the leading subsector, with 602 active companies, followed by online retailing (540), and food and drink processing (515).

In the distribution and wholesale space, companies are increasingly specialising in developing and manufacturing products. One example is Crust & Crumb, an Irish company known for its chilled and frozen bread products. The firm's extensive range of gluten-free and vegan offerings reflects its commitment to cater to diverse consumer demands. Online retailing, the second-largest subsector, is harnessing the power of e-commerce to address social and economic challenges. This can be

observed in companies such as MyOva. The London-based company combines commercial success with a mission-driven approach. It offers health supplements tailored to women with polycystic ovary syndrome (PCOS). The food and drink processing sector is equally vital, with companies striving to innovate in sustainable food production and processing technologies. London-based Symplicity produces plant-based alternatives as a way to reduce reliance on meat. Since its inception in 2019, Symplicity Foods has collaborated with top restaurants and Michelin-starred chefs to develop high-quality meat substitutes such as burgers, sausages, and mince. The company has raised over

£3m in equity investment via three fundraising rounds, reflecting investor confidence in its sustainable mission.

Top sectors for energy-intensive companies (August 2024)



Methodology

Defining high-growth companies

Beauhurst identifies high-growth startup companies using eight triggers (outlined on this page) that it believes suggest a company has high-growth potential. More detail on Beauhurst's tracking triggers is available via its website.

Active companies

"Active" companies refer to companies that are at the seed, venture, growth, or established stages of evolution by Beauhurst analysis. The term excludes companies that are zombie, dead or have exited via an IPO or acquisition.

Life science companies

Active companies categorised under life sciences and medical technology according to Beauhurst's industries classification system.

Companies reliant on compute

Active companies categorised under information, technology, telecommunications, and data according to Beauhurst's industries classification system.

Energy-intensive startups

Energy-intensive industries have been defined according to a government-created standard industry classification (SIC) code list on energy-intensive industries. SIC codes classify business establishments by the type of economic activity they operate in.

Energy intensity was based on electricity and gas consumption as a percentage of a sector's gross value added (GVA) using ONS data. Trade intensity was based on goods trade using ONS data. To qualify as an energy—and trade-intensive industry sector, the sector had to be above the 80th percentile for energy intensity.

For more information on SIC codes, refer to the Office for National Statistics guidance [here](#).

For more information on energy-intensive companies, you can refer to government guidance [here](#).

Equity investment

Equity investment refers to the purchase of shares within a company. This type of investment means buying into the equity (ownership) of the company. It is a common investment approach across various company types and stages, attracting a diverse range of investors. Venture capital firms typically engage in equity investments in early-stage startups, providing capital to fuel their growth. On the other hand, growth investors and private equity firms often target later-stage or more established companies, with private equity investors sometimes acquiring large, or even controlling, equity stakes.

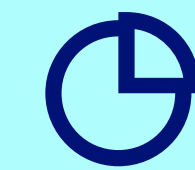
To be included in our analysis, any investment must be:

- Some form of equity investment
- Secured by a UK company
- Issued between 1 January 2019 and July 2024

Projected values

The analysis uses linear regression to predict future investment. This is based on equity investment data from 2019 to H1 2024. A linear forecast was used to calculate potential H2 figures for 2024. We then combined the actual fundraising totals for H1 2024 with these estimates to project the total for the year. A linear forecast was then used to predict the potential equity investment for 2025 to 2029.

High growth triggers



Equity investment



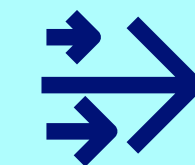
Academic spinouts



Scaleups



High-growth lists



Accelerator attendances



Major grant recipients



Management Buy-outs/
Buy-ins



Venture debt

Barclays Eagle Labs

Barclays Eagle Labs is an entrepreneurial network providing support to ambitious startup and scaleup businesses, particularly those that are focused on technology and innovation.

Our mission is to connect the UK's entrepreneurial ecosystem through our networks, support and expertise with the aim of helping businesses innovate and grow. We champion inclusivity and are committed to driving positive change and reducing barriers to entry for diverse founders.

We provide dedicated growth programmes, access to experts and a collaborative community designed to help businesses on their growth journey through virtual support and physical spaces across the UK.

Eagle Labs also help to positively disrupt key industries by bringing together corporates, industry bodies, leading universities, startups and scaleups, giving them a facilitated environment to collaborate and innovate.

Whether you're at idea stage, starting, growing, or scaling, Barclays Eagle Labs can support your tech business.

Find out more at labs.uk.barclays

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Through our data platform, we provide data on every UK private company—from investments and hiring status, to patents and trade data—identifying hidden growth, innovation, risk, and ESG signals across UK companies.

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Contact

4th Floor, Brixton House
385 Coldharbour Lane
London
SW9 8GL

www.beaurourst.com

T: +44 (0)20 7062 0060

E: consultancy@beaurourst.com

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eaglelabs@barclays.com



labs.barclays



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